APPENDIX A

Public Scoping Report - 2011

APPENDIX A

Public Scoping Report
Otay River Estuary Restoration Project

Public Scoping Meetings held on December 6, 2011
at 1:30 P.M., and 6:00 P.M

Swiss Park & Club,
2001 Main Street Chula Vista, California 91911

Prepared for:

U.S. Fish and Wildlife Service
P.O. Box 2358
Chula Vista, California 91912

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024

JANUARY 2012

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APPENDIX A
2011 Public Scoping Report

OTAY RIVER ESTUARY RESTORATION PROJECT

Scoping Comments from Scoping Meetings of December 6, 2011

Flip Chart Comments

- Will any of the excavated fill go to Pond 20?
- Bird watching opportunities included with restoration project
- Public access
- Concern about how the Carlsbad project is connected with the Otay restoration project (transfer of materials)
- Allow some freshwater storm flow from the river through the project to benefit marsh vegetation
- Limit the deepest water depth to something like the lowest tide level (-2 or so) as it might have been previously – include the historic T map in the EIR as background information
- Build trash trap at outflow from Nestor Creek
- Provide benign public view point
- Consider a retention system in project design
- Include some small areas in the midst of the project that are above the water elevation during storm flows for high water refuge and for nesting
- Require maintenance and monitoring for as long as the desal plant is in operation
- Include a trash trap at Nestor Creek
- Attempt a trash trap where Otay River comes under the freeway
- Attempt to strategically add sediments through inflow water to offset wetlands loss resulting from sea level rise
- What/where will the Otay freshwater influence connect to the proposed estuary?
- Make an additional connection with Otay to allow for freshwater flow into marsh – to create balance and support healthy cordgrass pop.
- Need for non-vegetated tidal mudflats for shorebirds
- Need to maintain some upland grassland for gull-billed tern foraging
- Work with Port and City of San Diego to comprehensively plan habitat restoration for all undeveloped parcels, including Pond 20A and City Park land

- Sediment testing for toxicity and disposal
- How will the project be influenced by sea level rise? Where will buffers be?
- Include measures so project values will survive sea level rise
- Public access included?
- Wildlife viewing platform possibilities?
- If get another 1916 event – what will be the effect?
- If there is any dredging of the Otay River channel, what will be the effect on existing mudflats that are currently exposed (and used) during low tides?
- Has sea level rise been considered?
- Soil disposal – if any?
- What are we doing to prevent siltation of our new area form sediment coming down the Otay River?
- Integrated with other efforts to enhance the south bay area
- Resource restoration with public access for wildlife enjoyment, recreation, and open space

Comment Card

Consider an alternative that has freshwater from Otay River feed into restoration site to provide estuarine transition (i.e., freshwater to saltwater) and freshwater to promote growth of cordgrass.

Work with Port and City (aka adjacent landowners) to comprehensively plan restoration for the entire Pond 20A and parklands to south of the restoration

Attendees at the Otay River Estuary Restoration Project Scoping Meetings: December 6, 2011

Gene Mullenix, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Warren Dodd, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Tracy Strahl, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Mark Stephens, 500 W. Harbor Drive, Unit 514, San Diego, California 92101

Vivian Moreno, Office of San Diego Councilmember David Alvarez (District 8), 202 C Street, MS 10, San Diego, California 92101

Julie Lambert, 5420 Repecho Drive, #208, San Diego, California 92124

Phil Pryde, 7784 Cedar Lake Avenue, San Diego, California 92119

Robert Patton, 4444 La Cuenta, San Diego, California 92124

Anne Jarque, City of San Diego, Streets Division, 2781 Caminito Chollas #44, San Diego, California 92154

Sam and Maria Mendoza, 2170 Leon Avenue, San Diego, California 92154

Marrelle White, Port of San Diego, 3165 Pacific Highway, San Diego, California 92101

Joe Ellis, 1350 5th Street, Imperial Beach, California 91932-3208

Jim Nakagawa, City of Imperial Beach

Carolyn Lieberman, USFWS, 6010 Hidden Valley Road, #101, Carlsbad, California 92011 (Coastal Program,

Carlsbad Fish and Wildlife Office)

Not at meeting but please add – Sandy Vissman, USFWS, 6010 Hidden Valley Road, #101, Carlsbad, California 92011 (Ecological Services, Carlsbad Fish and Wildlife Office)

Jim Janney, Mayor, City of Imperial Beach

Edith Gutterrez, City of San Diego, Storm Water Division, 9370 Chesapeake Drive, Suite 100

(MS 1900), San Diego, California 92123

Eileen Maher, Port of San Diego

Jim Peugh, San Diego Audubon

Dan McKirnan, 1404 Law Street, San Diego, California 92109 (Environmental Health Coalition)

Julie Hagen, 1 Viejas Grade Road, Alpine, California 91901

Peter MacLaggan, 501 W. Broadway #2020, San Diego, California 92101

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APPENDIX B

Public Scoping Report - 2013

APPENDIX B

Public Scoping Report
Otay River Estuary Restoration Project

Public Scoping Meeting held on January 23, 2013

Prepared for:

U.S. Fish and Wildlife Service
P.O. Box 2358
Chula Vista, California 91912

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024

JANUARY 2013/ REVISED MAY 2015

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OTAY RIVER ESTUARY RESTORATION PROJECT

Scoping Comments from Scoping Meetings of January 23, 2013

Attendance: 14 people signed the attendance sheet

Comment Cards: One comment card was submitted.

Is it possible Poseidon could buy the magnesium pond and restore them, so maybe salt production could continue for a while longer. (Although I am for the ultimate restoration of the entire area.) Theresa Acerio

Comments from the Flip Charts:

Biological Resources

- Consider hydrologic interconnections namely Pond 20 restoration
- Intact nesting capacity concern for predator population
- Concern about impact of climate change on species assemblages and human pathogens (e.g., West Nile Virus, avian flu)
- (Although not recorded, Wayne Dickey indicated that he had provided information on potential sites for soil disposal [two park sites in the area] – did someone write those suggestions down? If not, we should try to get that information for the meeting notes.)

General Project Information:

- Potential impacts to south bay salt works?
- Design should consider and include a model for massive flooding events and flood modeling
- Does design for 2050 reduce current functions and values?
- Design access for future rework to address sea level rise
- Please design an outflow for Otay River to connect to Pond 13 as soon/close as possible so the river has somewhere to go in case of a flood. Since we cannot widen the river bed, or breach a levee of Ponds 22 and 23.
- Otay River floodplain values - uses are maximized

Physical Environment:

- What is driving the project design, fish mitigation or habitat desires?
- What is the impact of pond restoration to nesting seabirds?
- Describe the impact on salt production and the effect on ecosystem of the project, including effect on brine invertebrates and associated bird species, describe shift in biodiversity (current conditions versus restored conditions)
- Provide for brine invertebrate production with restoration - can it be done?
- How small can we go and still have salt production?
- Berm between refuge and rest of Pond 20 – how can this project relate to possible future restoration in Pond 20, will timing allow for a coordinated restoration effort?
- Don’t maintain a levee between the project and Pond 20
- How does the implementation of this project affect restoration planning for Pond 20 – will the future restoration of Pond 20 be constrained due to the current project?
- Can the Otay project be designed to allow future restoration of the rest of Pond 20 (removable berm or other features)?
- Describe how excavated material would be used – beneficial use in ponds or could it be used to restore eelgrass habitat in Emory Cove
- In consideration of sea level rise, allow for future access of construction equipment for maintenance activities and to keep pace with sea level rise

Attendees at the Otay River Estuary Restoration Project Scoping Meetings: January 23, 2013

Gene Mullenix, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Don Grace, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Tracy Strahl, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Wayne Dickey, 3813 Coleman Avenue, San Diego, California 92154 (Planning Group member)

Joe Ellis, 1350 5th Street, Imperial Beach, California 91932-3208

John Holder, WildCoast, 925 Seacoast Drive, Imperial Beach, California

Jim Janney, Mayor, City of Imperial Beach

Mike McCoy, SWIA, Imperial Beach, California 91932

APPENDIX B (Continued)

Bill and Shannon Davis, 1185 East Lane, Imperial Beach, California 91932

Jim Peugh, San Diego Audubon

Khari Johnson (no address provided)

Michael De la Rosa, Office of San Diego Supervisor Greg Cox, 1600 Pacific Highway, San Diego, California 92101

Theresa Acerro, 3730 Festival Court, Chula Vista, California 91911

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APPENDIX C

Final Restoration Plan

DRAFT

Final Restoration Plan
for the Otay River Estuary Restoration Project

Prepared for:

California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, California 94105
Contact: Kate Huckelbridge

Prepared by:

Poseidon Water
5780 Fleet Street, Suite 140
Carlsbad, California 92008
Contact: Stan Williams, Vice President

MAY 2014

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1 INTRODUCTION

1.1 Background

The Otay River Estuary Restoration Project (ORERP) is a partnership between Poseidon Water (Channelside) L.P. (Poseidon), the U.S. Fish and Wildlife Service (Service or USFWS), and San Diego Bay National Wildlife Refuge (Refuge). The ORERP project involves the creation, restoration, and enhancement of 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 Refuge (see Figure 1). Restoration is consistent with the goals and objectives of the Service's San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan (CCP) (USFWS 2006a) and the terms and conditions of the permits issued by the California Coastal Commission (Coastal Commission) and San Diego Regional Water Quality Control Board (Regional Board) for the Carlsbad Desalination Project. In 2006, the Service completed the CCP and accompanying Environmental Impact Statement (EIS) and Record of Decision (ROD). The CCP guides the management of the Refuge over a 15-year period and describes the wildlife and habitat management goals for the South San Diego Bay Unit.

On November 15, 2007, the Commission approved a Coastal Development Permit (CDP No. E-06-013) for Poseidon's proposal to construct and operate a desalination facility in 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 facility's use of estuarine water and its entrainment of marine organisms. The MLMP was conditionally approved by the Coastal Commission on August 6, 2008 (CCC 2008). With the incorporation of the Commission's revisions, the MLMP was finalized on November 21, 2008 (Poseidon 2008). On May 13, 2009, the RWQCB added a fish productivity requirement and approved the MLMP, as incorporated within the March 27, 2009, Minimization Plan. This approval is outlined within Order No. R9-2009-0038. In September 2009, Poseidon agreed to increase the number of restored acres from 55.4 to 66.4 to provide 11 additional acres.

The MLMP and associated actions described above require Poseidon to submit a proposed mitigation site and preliminary restoration plan that achieved the following mitigation requirements:

- Create or substantially restore tidal wetland habitat preferably in the San Diego Region
- Provide at least 66.4 acres of mitigation at a maximum of two sites
- The chosen site must be available and protected against future degradation
- Fish productivity must be at least 1,717.5 kg/year

After conducting a comparison study that evaluated 15 sites in the Southern California Bight based on the MLMP's objectives, and meeting with Commission staff and the Scientific Advisory Panel (SAP) with representatives from Federal and State agencies over the course of a year, Poseidon concluded that the Otay River Floodplain Site was the most suitable mitigation site to fulfill the requirements, objectives, and restrictions outlined in the MLMP. On February 9, 2011, the Commission agreed with Poseidon and unanimously approved the Otay River Floodplain Site and preliminary restoration plan (CCC 2011). The site was approved by the Regional Board on March 9, 2011 (RWQCB 2011). The Service and Poseidon Resources entered into a Memorandum of Understanding (MOU) to establish a partnership to facilitate the restoration of property within the Refuge consistent with the CCP and Poseidon's Commission permit requirements.

Since November 2011, Poseidon's project team has worked in conjunction with the Service, Commission staff, the SAP, Regional Board staff, 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. Collectively, this collaborative relationship is known as the "MLMP Workgroup." The MLMP Workgroup has reviewed site opportunities and constraints, and evaluated restoration project design alternatives prior to finalizing the ORERP for the environmental review process.

In coordination with the MLMP Workgroup, Poseidon conducted several site-specific studies to aid in the development of project alternatives. Based on these studies, Poseidon proposed a revised mitigation site and preliminary restoration plan. The revised mitigation site would encompass two restoration areas – the Otay River Floodplain Site and Pond 15 Site, located in the southeast corner of the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (Refuge). The revised preliminary restoration plan would decrease the mitigation footprint of the Otay River Floodplain Site to the area west of Nestor Creek, to avoid potential impacts associated with cultural resources and contaminated soils, and expand the mitigation footprint to incorporate Pond 15. Poseidon would receive approximately 70% of the required mitigation credit from the restored salt ponds and approximately 30% from the Otay site. On December 11, 2013, the Coastal Commission approved the proposed modification to the Otay River Floodplain Mitigation 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. A Draft EIS, concurrently written with this Final Restoration Plan (FRP), analyzes two alternatives for the ORERP that would fulfill requirements of the MLMP. These alternatives are the Intertidal Alternative and the Subtidal Alternative. Between these two alternatives, the Intertidal Alternative was determined to be the preferred action and is subject of this FRP. A detailed description of the proposed restoration plan is provided in Section 4.0 of this FRP.

BASE SOURCE: ESRI

FIGURE 1

Regional Map

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1.2 Final Restoration Plan Purpose

This FRP focuses primarily on the restoration effort proposed by Poseidon and the Service of subtidal, intertidal mudflat, intertidal coastal salt marsh, and transitional habitats as well as associated upland habitats on a total of approximately 168 acres among two non-contiguous sites San Diego Bay National Wildlife Refuge-South San Diego Bay Unit as compensatory mitigation for estimated entrainment and impingement impacts associated with the Carlsbad Desalination Plant stand-alone operations.

1.3 Final Restoration Plan Elements

The required FRP elements are presented below, including each element's corresponding section within this FRP:

1. Detailed review of existing, biological, hydrological conditions, ownership, land use, and regulation (Section 2.0).
2. Evaluation of site-specific and regional restoration goals and compatibility with the goal of mitigating for the Carlsbad Desalination Plant impacts (Section 5.0).
3. Identification of site opportunities and constraints (Section 3.0).
4. Restoration design, including: (Section 4.0)
    a. Proposed cut and fill, water control structures, stormwater control measures, buffers and transition areas, management and maintenance requirements.
    b. Planting programs, including removal of exotic species, sources of plants and/or seeds (local, if possible), protection of existing salt marsh plants, methods for preserving top soil and augmenting soils with nitrogen and other necessary soil amendments before planting, timing of plant, plans for irrigation until establish, and location of planting and elevations on the topographic drawings.
    c. Proposed habitat types (including approximate size and location).
    d. Assessment of significant impacts of design (especially on existing habitat values) and net habitat benefits.
    e. Location, alignment and specifications for public access facilities.
    f. Evaluation of steps for implementation (e.g., permits and approvals, development agreements, acquisitions of property rights).
    g. Cost estimates.
    h. Topographic drawings for final restoration plan at 1"-100' scale with a one-foot contour interval.

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2 EXISTING CONDITIONS

2.1 Land Use

The approximately 168-acre project site includes two separate non-contiguous areas, the Otay River Floodplain Site and the Pond 15 Site, as shown in Figure 2. The 78-acre Otay River Floodplain Site is open space, primarily used for wildlife habitat purposes. The project site is located within the City of San Diego and is designated as an open space floodplain zone (City of San Diego 2005). The purpose of this zoning designation is to protect the natural character of floodplains while permitting development that will not constitute a dangerous condition or an impediment to the flow of flood waters. It also seeks to preserve the function of floodplains including the moderation of flood water flows, ground water recharge and wildlife habitat (City of San Diego 2012).

The Pond 15 Site is located within the City of National City, within the jurisdiction of the San Diego Unified Port District. The San Diego Unified Port Master Plan identifies the Pond 15 Site within the South Bay Salt Ponds Planning Subarea, which designates the area for "conservation/wetlands" land use (Port of San Diego 2012). The approximately 90-acre Pond 15 Site is an active salt pond within the 1,068 acre South Bay Salt Works. The Salt Works is a salt production facility that as of 2006, produced between 60,000 to 80,000 tons of salt per year. Various portions of the Salt Works are owned privately or leased from the Airport Authority (USFWS 2006a).

Interstate 5 (I-5) is located within one-quarter mile east of the project site, and provides regional access to the project area. Public access to the site is restricted to both portions of the project site, due to wildlife preservation on the Otay River Floodplain Site and active salt production within the Pond 15 Site. The Saturn Boulevard right-of-way contains a paved recreational trail that runs along the eastern border of the Otay River Floodplain Site, located in City of San Diego jurisdiction. This trail runs between Palm Avenue to the south and Main Street to the northeast. The Bayshore Bikeway, which extends 26 miles around the San Diego Bay, passes directly 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 and Arizona eastern railroad right-of-way (USFWS 2006a).

Land uses surrounding the project site generally include open space, neighborhood residential and commercial development. Directly east of the project site are lands that currently exist as wildlife habitat bounded to the east by I-5. This land is located within the Otay River floodplain as a part of the Refuge. The open space area contains various underground and overhead public utilities located within easements or dedicated street rights-of-way within City of San Diego jurisdiction and are not included within the Refuge boundary (USFWS 2006a). Parcels zoned for agricultural residential and light industrial uses by the City of San Diego are located to the northeast of I-5. Further northeast, the City of Chula Vista maintains jurisdiction over land zoned for limited industrial and thoroughfare commercial uses (City of Chula Vista 2009).

Additionally, the 55 acre Chula Vista Wildlife Reserve is located north of the Pond 15 Site, built from dredged material from the development of the Chula Vista Harbor. The Chula Vista Wildlife Reserve is managed by the Port in addition to tidelands within the bay and on the bayfront currently used for various recreational, open space and marine-related industrial purposes. City of Chula Vista and the Port-owned lands within this area are subject to development as governed under the Bayfront Redevelopment area. These improvements would include an increase in the intensity of uses around the Chula Vista Marina and improved public access to the bay (USFWS 2006a).

Areas located southwest of the project site, under the jurisdiction of the City of Imperial Beach, are primarily zoned for medium density or two-family detached residential uses and contain various residential neighborhoods, including light industrials uses, an elementary school and a mobile home park (City of Imperial Beach 2010). Lands owned by the Navy are located further northwest of the project site, including uplands and wetlands currently used for military training operations. The Imperial Beach General Plan encourages the increase of public access opportunities to the bay and the extension of bicycle and pedestrian paths along the bay front.

South of the project site includes lands located within the City of San Diego zoned multi-unit residential and community oriented commercial development. These lands contain a mobile home park and commercial developments including a Home Depot, Vons and several financial institutions. A sewer pump station operated by the City of San Diego's Metropolitan Wastewater Department is located further west. Additionally, Pond 20A, located immediately south of the Otay River Floodplain Site, is owned by the Port of San Diego and occurs within the City of San Diego jurisdictional boundaries. The northern portion of Pond 20A is included within the management acquisition boundary for the Refuge (USFWS 2006a).

2.2 Property Ownership

Both portions of the project site are located within the Refuge. The Service is the current owner and manager of the Refuge that is part of the larger San Diego National Wildlife Refuge Complex. Specifically, the Pond 15 Site is within the South Bay Salt Works, which is a private facility that operates in accordance with a Special Use Permit issued by the Service to the Airport Authority. South Bay Salt Works operates under this lease with the Airport Authority and under an agreement with the Port of San Diego to continue production until 2009 (USFWS 2006a).

SOURCE: BING MAPPING SERVICE

FIGURE 2

Project Site and Vicinity Map

Final Restoration Plan for the Otay River Estuary Restoration Project

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2.3 Regulation

A number of federal, state and local agencies have jurisdiction over the restoration actions that would occur on the site. The Service owns the Otay River Floodplain Site, while the Pond 15 Site is owned by the State Lands Commission, and leased to the Service. Both portions of the project site exist within the Refuge. Therefore, the project must be consistent with the San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan and Environmental Impact Statement prepared in August 2006. Compliance with Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System, Refuge Recreation Act of 1962, as amended, and the National Wildlife Refuge System Act of 1966, as amended, and the National Wildlife Refuge System Improvement Act of 1997 would also be required.

The Service's Consistency Determination for the project with the CCP would also need to receive concurrence from the Coastal Commission. This involves a determination that the CCP is consistent to the maximum extent practicable with the California Coastal Management Program in Section 307 of the Coastal Zone Management Act of 1972. The Coastal Commission will also be required to determine if the project is consistent with the requirements, objectives and restrictions in the Marine Life Mitigation Plan (MLMP).

Through a wetlands delineation, it was determined that the project site does contain waters and wetlands that could be jurisdictional by the Army Corps of Engineers (ACOE), the San Diego Regional Water Quality Control Board (RWQCB) and the Coastal Commission. Although the non-tidal portion of the Otay River channel would have qualified for California Department of Fish and Game (CDFG) jurisdiction, the portion is on federal land, and thus not subject to Section 1600 et seq. of the California Fish and Game Code. As shown in Section 2.5, Biology, there are 14.51 acres of wetlands and non-wetland waters under the joint jurisdiction of the ACOE, RWQCB, and Coastal Commission as shown in Figure 6 (Dudek 2012). As such, the project would be subject to regulation under the Clean Water Act. Activities proposed within the project site would require a Clean Water Act 404 Permit from the ACOE.

Prior to obtaining a Section 404 permit, a Section 401 Water Quality Certification from the RWQCB will be required. Through the certification review process, the RWQCB is expected to require a National Pollution Discharge Elimination System (NPDES) permit for the disposal of dredged/excavated material and may require coverage under the State's General NPDES permit to control potential water quality impacts from construction activities. A portion of the project site is also located within the Otay River floodplain and will need to comply with Executive Order 11988, Floodplain Management, which prohibits federal agencies from contributing to adverse impacts associated with the modification of floodplains. In addition, a USACOE Section 10 Rivers and Harbors Act Section 10 Permit would be required due to the impacts associated with the existing wetlands and filling waters of the U.S. Depending on the final construction methods, all dewatering activity may be subject to the appropriate RWQCB permit.

Additionally, the project would require a project-level internal Section 7 consultation, as appropriate under the authorities of the Endangered Species Act (ESA), prior to the implementation of the action proposed in accordance with the CCP that may affect federally listed endangered or threatened species in the Otay River floodplain. A programmatic Biological Opinion was prepared under the authorities of the ESA for the CCP. Furthermore, the project must comply with the Migratory Bird Treaty Act of 1918, as amended, the Fish and Wildlife Act of 1956, as amended, Executive Order 13113, Invasive Species, and Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. The project could also affect fish habitat and would require consultation with the National Marine Fisheries Service (NMFS) under the Magnuson-Stevens Fishery Conservation and Management Act for federal permitting and funding activities that could adversely affect Essential Fish Habitat, affect the endangered east Pacific green turtle.

Wildlife habitat changes resulting from proposed project implementation would also apply to the City of San Diego Subarea Plan for the Multiple Species Conservation Program (MSCP), which addresses the multiple species habitat needs and the preservation of native vegetation communities in southwestern San Diego County. The Subarea Plan was prepared prior to establishment of the CCP, and therefore, is not entirely reflective of the current plans for the South San Diego Bay Unit as described in the CCP. The project site is also located on federally owned land and would not need to comply with the provisions of the MSCP. However, the Subarea Plan does clarify that if the site is converted to a new use, the use should be "compatible with the resource goals and objectives of the MHPA and other regulations and polices applicable to the site, or enhanced/restored" (City of San Diego 1997).

To ensure protection of potentially occurring cultural resources on-site, the project would be required to comply with Executive Order 11593, Protection and Enhancement of the Cultural Environment, Executive Order 13007, and the National Historic Preservation Act of 1966, as amended. Protection of cultural resources would also be required to follow the provisions of the Indian Sacred Sites, Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, Antiquities Act of 1906, the American Indian Religious Freedom Act of 1978, and the Native American Graves Protection and Repatriation Act of 1990. Furthermore, compliance with the Archaeological Resources Protection Act of 1979 and the 36 CFR 79: Curation of Federally Owned and Administered Archaeological Collections would be required to protect archaeological resources that may exist on the site the project.

Regarding air quality, the project would need to comply with Rule 1501 of the San Diego Air Pollution Control District's (District) Rules and Regulations. This would ensure that Federal Agencies do not take actions that are inconsistent with the efforts of the District to achieve the National Ambient Air Quality Standards (NAAQS), and that federal agencies do not fail to take advantage of opportunities to assist in the achievement of the NAAQS (San Diego Air Pollution Control District 1995).

2.4 Physical

2.4.1 Geology/Soils

Soils

The Pond 15 Site is comprised of 140 million gallons of water, and underlain by Quaternary Alluvium. This is a silt, sand, clay, and gravel with minor cobbles and boulders generally found in river and stream bottom, valley fill, flood plain, fan, beach sand, swamp, and sand dune deposits. The Pond 15 Site is within a liquefaction hazard area, or 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 EIR Geologic Maps (Figures 5.5-1 and 5.5-2 in the General Plan EIR) (City of Chula Vista 2005).

The Otay River Floodplain Site is located at the western terminus of the Otay River within the Otay River floodplain. The groundwater level exists between a range of 3 to 8 feet below the surface due to the local groundwater gradient (USFWS 2006a). In general, the floodplain is characterized by soft Alluvial/Bay Deposits under three to five feet of uncompacted fill soils. As shown in Figure 3, the Otay River Floodplain Site is almost entirely composed of Grangeville fine sandy loam at 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. This soil type extends onto the open space land to the east of the project site where Visalia gravelly sandy loam ranging from 2 to 5% slopes comprises the majority of the land. Visalia gravelly sandy loam is also commonly found in alluvial fans and has a high capacity for transmitting water. However, this soil only contains a moderate available water capacity compared to the soil on the project 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 capacity (NRCS 2011).

As outlined within the report titled, "Sampling and Analysis Report Otay River Estuary Restoration Soil Characterization Program" as prepared by Anchor QEA, L.P. (Anchor QEA, L.P. 2013), the Otay River floodplain was sampled for grain size, total organic carbon (TOC), metals, pesticides, total petroleum hydrocarbons (TPHs), polycholoronated biphyenls (PCBs), and semi-volatile organic carbons (SVOCs). Borings were taken from six locations within the project site, ranging from the surface to eight feet below the surface. 10 additional boring sites with the same elevation ranges were sampled within the floodplain adjacent to the Otay River Floodplain Site. Within the boundary of the Otay River Floodplain Site, none of the soil samples included the tested contaminants. However, contaminants were detected within samples in the Otay River floodplain in the vicinity of the project site, including DDTs, toxaphene, PCBs, and elevated concentrations of metals including copper, zinc, and lead.

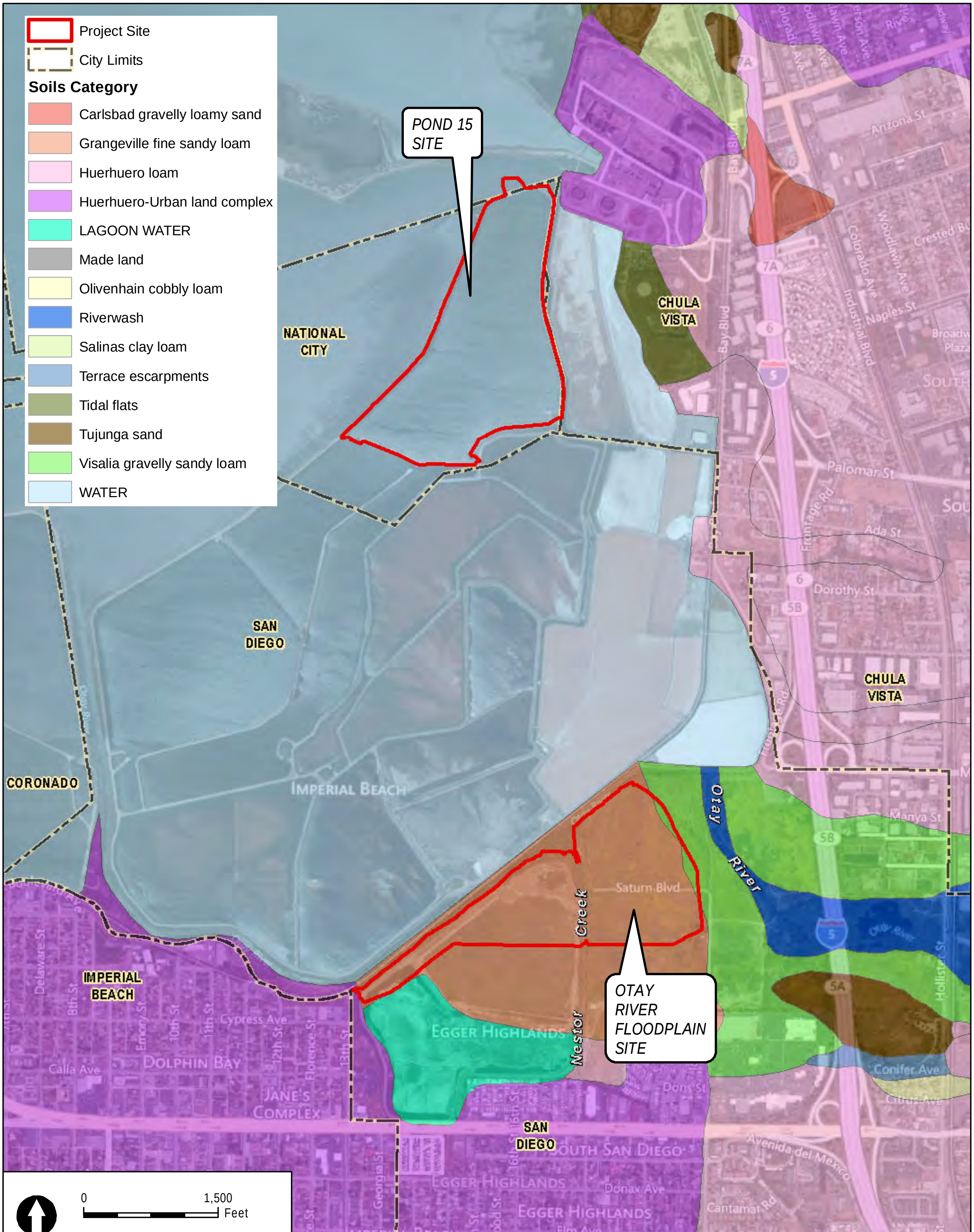
Seismicity

Faults

No known faults exist on the project with the closest mapped fault being the Rose Canyon Fault that traverses through downtown San Diego and passes the project site offshore 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). The La Nacion Fault Zone, a quaternary fault area, also exists approximately 4 miles to the east of the project site (California Geological Survey 2010). 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 traverse approximately 10 to 25 miles west of the project site. These fault zones are considered to be “potentially active” having produced a Magnitude 4.6 earthquake on June 29, 1983 approximately 10 miles west of San Diego (GEOCON 1986).

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 span of time, range from approximately 0.25 g to 0.32 g (California Geological Survey 2003).



SOURCE: BING MAPPING SERVICE

FIGURE 3

Project Site Soils

Final Restoration Plan for the Otay River Estuary Restoration Project

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Liquefaction

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 produce by earthquakes, and causes the water pressure in the pores of the soil to increase, decreasing soil strength. The Pond 15 Site is comprised of approximately 140 million gallons of water, and therefore liquefaction hazard in this area is high. 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).

2.4.2 Natural Resources

The City of San Diego has produced mineral resources that include salt, sand and gravel for decades. Sand and gravel used for building and construction materials are extracted primarily north of the project site in the Mission Valley, Carroll Canyon, and Mission Gorge areas. Some open pit mining operations for sand, gravel and rock do exist within the areas covered by the Multiple Species Conservation Program subarea plan. Salt production in San Diego is principally conducted in the South Bay Salt Works, located within the South San Diego Bay Unit of the Refuge. This area, which includes the Pond 15 Site, contains approximately 1,068 acres and has produced salt for over 130 years. The current operation uses solar evaporation in diked ponds to facilitate the concentration and precipitation of salt from the bay water (City of San Diego 2008). The approximately 90-acre Pond 15 Site is an active solar salt pond included within this operation which produces between 60,000 to 80,000 tons of salt per year (USFWS 2006a).

Mineral Resource Zones for the City of San Diego, which indicate the probability of an area having valuable mineral resources, are shown in Figure 4. Although Pond 15 Site is a part of the salt production at the Salt Works, the area is not classified as Mineral Resource Zone. The Otay River Floodplain Site is 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 for their presence (City of San Diego 2008). No mineral resources of value are expected to occur on the Otay River Floodplain Site.

Agricultural Resources

Both the County of San Diego and the City of San Diego have experienced a loss in available agriculture 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 in Figure 5. 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 over 30% of the land use (City of San Diego 2008). 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 able to sustain long-term production of agricultural crops (USFWS 2006a). However, in 2008 these portions of the Otay River floodplain were designated as Farmland of Local Importance, which is described as land that meets all the characteristics of Prime Farmland and Farmland of Statewide Importance, with the exception of irrigation. 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 (California Department of Conservation 2011).

As described in Section 2.4.1 above, the Otay River Floodplain Site is primarily comprised 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 based on the small range of season and diurnal temperature changes and high humidity (USFWS 2006a). The Otay River floodplain was utilized for agricultural purposes from the mid 1930’s until 1988 for production of various crops including bell peppers, beans, cucumbers, tomatoes, cabbage and celery, with tomatoes as the principal crop on the land. 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 2006a). 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. The Pond 15 Site is designated as “other land,” not specified for agricultural use (California Department of Conservation 2012).

AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 4

Mineral Resource Zones

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SOURCE: BING MAPPING SERVICE

FIGURE 5

Farmland Mapping and Monitoring Program Designations

Final Restoration Plan for the Otay River Estuary Restoration Project

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2.4.3 Landforms and Visual Quality

Otay River Floodplain Site

The Otay River Floodplain Site is located within the uplands of the Otay River floodplain at the south end of the San Diego Bay. The relatively flat floodplain gently slopes from southeast to northwest ranging in elevation from approximately 18.5 to 9.5 feet. The relatively flat elevation of the site and surrounding areas allows for direct views of the surrounding salt ponds and the San Diego Bay to the north. These two features are some of the most prominent landforms surrounding the project site. The levees that form the salt ponds at the south end of the bay are visible from around the bay and much of the developed upland areas that border to bay to the south (USFWS 2006a). Another prominent landform that is visible from to the east of the project site is the San Ysidro Mountain Range. Otay Mountain, which is the highest point in the mountain range, is located over 12 miles from the project site and is visible on the horizon from the site.

The Otay River Floodplain Site is distinct because almost all of the open land on the bayfront has been developed and there is little remaining Coastal Sage/Maritime Sage vegetation surrounding the bay (City of Imperial Beach 2010). Channelized water flows through the site along the northern boundary through Otay River, and through the center of the site in a north-south direction in Nestor Creek. The western portion of the site contains levees and basins that were constructed as part of the former solar salt evaporation system. Soils on-site, as outlined in Section 2.4.1 above, are excessively drained and rapidly permeable. Many areas are barren of vegetation or support scattered sycamores, coast live oaks, and sparse shrubs and forbs occur in patches (USFWS 2006a).

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, I-5 and State Route 75 (SR-75). The Bayshore Bikeway is located within the San Diego-Eastern Arizona Railroad right of way, which is a thin strip of land that passes along the northern border of the Otay River Floodplain Site. Looking south from the bike path the entire Otay River Floodplain Site is visible and unobstructed, except by a chain-link fence that borders the bike path. Portions of the Otay River channel are visible as well as the locations of standing water and wetlands on the project site. Variations in coastal vegetation are also highly visible from the bike path.

Less than half a mile south of the project site, SR-75 travels east/west, also known as Palm Avenue. This roadway segment is designated as an eligible state scenic highway at its closest vantage point of the Otay River Floodplain Site (Caltrans 2012). Views of the Otay River

Floodplain Site are completely obstructed along most of the road by buildings, trees and landscaping associated with development. A portion of open space exists at the location of Pond 20A between 16th Street and 13th Street in the City of Imperial Beach where it is possible to view the Otay River Floodplain Site from a distance. However, these views are limited because of the roadway and the project site are at the same relative elevation.

I-5 runs north/south and is located less than a quarter mile to the east of the project site boundary. Due to the slight elevation of I-5 in relation to the surrounding land, it is possible to view the Otay River Floodplain Site at a distance. However, views of the Otay River Floodplain Site are intermittent and often obstructed by trees and other vegetation that line the western side of the road. The most unobstructed views of the project site occur around Charles Avenue where the open space area of the project site is visible. It is possible to view vegetation on the project site at a distance and the overhead electrical transmission lines that run along the eastern border of the site are highly visible due to their height.

Pond 15 Site

The Pond 15 Site is relatively flat), directly on the edge of the San Diego Bay, with the Pacific Ocean approximately 1.5 miles west. The Otay River tidal channel flows north into San Diego Bay between Pond 11 and Pond 12. .The Palomar Street tidal channel flows north into San Diego Bay at the eastern boundary of the northern portion of the Pond 15 Site (USFWS 2006a). The prominent visual features from this portion of the Pond 15 Site as viewed from outside the Refuge include the levee barrier system to separate the pond from tidal circulation of the surrounding bay. The water filled pond has little to no vegetation due to the high salinity, and views of this area can often include periods of very low water levels.

Chula Vista Bayfront Park is located approximately half a mile north of the Pond 15 Site. This area also has an uninterrupted view of the Pond 15 Site, with only the waters of the bay and portions of the salt works operation between the two areas. The levees and salt ponds, including the Pond 15 Site, are visible from throughout the bay and much of the developed upland area that borders the south of the bay, including the industrially developed sites located east and northeast of the salt ponds. The Pond 15 Site is also visible between 1-2 miles across the Bay from the Bayshore Bikeway, the Silver Strand (State Route 75), and residential properties.

Visual Significance

Although the project site is not identified as a specific visual resource by the City of San Diego, it is one of the few remaining open space areas adjacent to the southern portion of the San Diego Bay. The portion of I-5 from the international border with Mexico to where it intersects with

State Route 75/Palm Avenue is designated as an eligible scenic highway (Caltrans 2012). Due to the roadway segment's distance from the project site as well as the obstruction from development and trees, it is not possible to view the project site along this location. SR-75 is also designated as an eligible scenic highway from the intersection with I-5 in Palm City, to its second intersection with I-5 in San Diego. Views of the project site are very distant from across the bay to the Pond 15 Site, or obstructed along this roadway segment from roadside development and trees, except for a views of the Otay River Floodplain Site from small open space area that occurs between 16th Street and 13th Street in the City of Imperial Beach.

2.5 Biology

This section describes the biological resources present within the project site both from a regional context and at the site-specific level. Descriptions are provided of the Refuge's vegetation communities, plants, wildlife, fish, and listed and sensitive species. The information presented is based on the results of field studies conducted by Dudek from February through July 2011 for the Otay River Floodplain Site, as documented in the Biological Technical Report (Dudek 2012), and in March 2013 for the Pond 15 Site (Dudek 2013), as well as biological resources data included in the CCP/EIS (USFWS 2006a).

2.5.1 Background

The natural wetlands included within the Sweetwater Marsh and South San Diego Bay Units represent two of the 23 coastal wetland systems remaining in San Diego County. Much of what remains of San Diego Bay's historical shallow subtidal, intertidal mudflat, and salt marsh habitats are preserved within the Refuge. In addition to these natural wetland habitats, the Refuge also includes a system of salt ponds and associated levees that provide roosting, foraging, and/or nesting opportunities for tens of thousands of migratory birds. As such, the Refuge protects habitats essential to the migratory birds of the Pacific Flyway. In recognition of the importance of the foraging and nesting habitats protected within this Refuge and the specific species these habitats support, the south bay has been designated a Western Hemisphere Shorebird Reserve Network Site and each Unit is recognized as a Globally Important Bird Area by the American Bird Conservancy (USFWS 2006a).

Additionally, these natural wetland systems are of regional significance as they are permanently open to tidal flushing. As a result, they support a high diversity of salt marsh plant species, including a number of low marsh species, such as cordgrass, annual pickleweed (*Salicornia bigelovii*), and saltwort (*Batis maritima*), which are generally absent from nontidal wetland systems. Today, approximately half of the coastal wetlands in the Southern California Bight are either frequently closed or always closed to tidal influence, primarily because of human disturbance. Such closures reduce the availability of nutrients and dramatically alter salinities in the water column and within 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 2006a).

Although now included within the Refuge, the majority of the San Diego Bay's remaining wetlands have not escaped the impacts of human disturbance. For example, the salt ponds within the South San Diego Bay Unit receive no benefit from tidal flushing. As a result, there are opportunities available within the Refuge for improving habitat values for wildlife and avian species in particular (USFWS 2006a).

Although spared the impact of extensive dredging, the South Bay has nevertheless experienced significant habitat loss. Changes to the habitats in the 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 utilized 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 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, significance portions of the intertidal mudflat and salt marsh habitat at the south end of the bay were eliminated (USFWS 2006a).

Some dredging, although limited, has occurred in the South Bay. In the late 1960s, dredging was conducted to create the Chula Vista Marina and the mooring areas around the Coronado Cays. Several boat navigation channels have also been created to provide access to the Chula Vista Marina and adjacent shipyard, as well as to the Coronado Cays. The last major dredging activity to occur in the South Bay took place in the late 1970s, when a channel was created in Emory Cove. Tidelands now filled to support development occurred along the bayfront in National City, between G and J Streets in Chula Vista, and at the site of the Chula Vista Wildlife Reserve. The native upland and wetland habitat of the Otay River floodplain was all but eliminated during the twentieth century because 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 salt works and the Otay River channel (USFWS 2006a).

2.5.2 Habitat and Vegetation

The Refuge provides protection and management of a large number of endangered, threatened, migratory, and native species and their habitats within the San Diego Bay region. 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 provide high quality habitat for fish, birds, and plants. Endangered species, such as, light-footed clapper rail occur within salt marsh areas. Suitable protected nesting areas, primarily the levees of the existing salt ponds, are used by the threatened western snowy plover, endangered California least tern, and a diverse number of ground nesting seabirds and shorebirds. Within the Otay River floodplain, non-native weeds and exotic grasses dominate the upland portions of the site. The freshwater wetland habitat of the Otay River includes components of southern willow scrub habitat, as well as a variety of exotic, invasive wetland species such as giant reed, salt cedar, and castor bean. This freshwater wetland habitat transitions into salt marsh habitat downstream of I-5, at which point the channel supports coastal salt marsh species (USFWS 2006a).

2.5.2.1 Vegetation Communities

Prior to the 1900s, San Diego Bay was a fertile, shallow flat-bottomed bay surrounded by extensive mudflats and salt marshes (USFWS 2006a). Over the past hundred years, significant portions of the bay, particularly the northern two-thirds of the bay, have been dredged to support ship movement or the bay has been filled to accommodate port development. At the southernmost end of the bay, much of the original salt marsh and intertidal mudflat habitat was diked to create solar evaporation ponds for producing salt. Today, a small percentage of the previous salt marsh and intertidal habitat remain. Most of this remaining native habitat is located within the Refuge boundary. The coastal wetlands that remain not only provide habitat for several federally listed endangered and threatened species, but also represent a vital link in the Pacific Flyway as noted above.

Otay River Floodplain Site

The Otay River Floodplain Site is approximately 78 acres, consisting of mostly of disturbed and native upland habitat and approximately 8.82 acres of wetland habitat. Historically, some of these upland areas within the Otay River Floodplain Site supported either freshwater or riparian habitat but appear to have predominantly been 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, construction of solar salt ponds, and past agricultural activity.

The Otay River Floodplain Site includes seven vegetation communities or land covers as listed in Table 1, Vegetation Communities and Land Cover Types for the Otay River Floodplain Site, and shown in Figure 6, Otay River Floodplain Site Vegetation Communities. Each vegetation community within the project site is described in greater detail below.

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

Vegetation Community/Land Cover Type	Acreage
Isocoma Scrub	11.97
Brackish Water Channel or Floodway	0.80
Cismontane Alkali Marsh	1.28
Mulefat Scrub	0.25
Southern Coastal Salt Marsh	2.35
Disturbed Habitat	50.21
Former Salt Pond Bottom and Borrow Area	10.82
Grand Total	**77.68**

Source: Dudek 2012, as revised January 2014.

Vegetation community classification for the Otay River Floodplain Site was 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* (referred to herein as the Holland/Oberbauer Classification System). The vegetation community descriptions provided in The *Preliminary Descriptions of the Terrestrial Natural Communities of California* (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).

Isocoma Scrub

Isocoma scrub is dominated by coast 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 0–3 feet and overall vegetation shrub cover is approximately 50%. There are a few patches of coast cholla (*Opuntia prolifera*) within the community, but the community lacks diversity, and is predominantly composed of a nearly monotypic stand of coast goldenbush in the shrub layer. The understory is predominantly composed of non-native annual weeds such as filaree (*Erodium* spp.), mustard (*Brassica nigra; Hirschfeldia incana*), tocalote (*Centaurea melitensis*), and annual grasses (*Bromus* spp., *Avena* spp.).

AERIAL SOURCE: BING MAPPING SERVICE

Figure 6

Otay River FloodplainSite Vegetation Communities

Final Restoration Plan for the Otay River Estuary Restoration Project

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Mulefat Scrub

Mulefat (*Baccharis salicifolia*) scrub is a tall, herbaceous riparian scrub strongly dominated by mulefat. It typically occurs along intermittent stream channels with generally sandy soils and a moderate depth to the water table. The community is maintained by frequent flooding, or succeeds to cottonwood (*Populus* sp.) or sycamore (*Platanus* sp.) dominated communities. Willows (*Salix* spp.), stinging nettle (*Urtica* sp.), and sedge may also be present (Holland 1986).

The mulefat scrub vegetation community on site is composed of fragmented patches of a continuous shrub layer where mulefat (*Baccharis salicifolia*) dominates.

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 alkaliheath (*Frankenia* sp.), sea blite (*Suaeda* sp.), and Parish's glasswort (*Arthrocnemum subterminale*) along the drier upper edges of the marshes; Pacific pickleweed (*Sarcocornia [Salicornia] pacifica*), Bigelow's pickleweedt (*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 channels of the Otay River that extend along the northern edge of the site, within Nestor Creek, at the convergence of the Otay River and Nestor Creek near the center of the site. The southern coastal salt marsh on site includes species of *Suaeda*, Pacific pickleweed, Parish's glasswort, and cordgrass.

Cismontane Alkali Marsh

Cismontane alkali marsh typically occurs in areas that are wet or inundated throughout most to all of the year (Holland 1986). Dominant species include rushes *(Juncus* spp.), salt grass (*Distichilis spicata*), sedges (*Carex* spp.), yerba mansa (*Anemopsis californica*), and alkali heath (*Frankenia grandifolia*). This community occurs at lake beds and flood plains below 1,000 feet, characterized by higher levels of salts than are found in the freshwater marsh habitat. It differs from coastal saltmarsh primarily in that it is not subject to tidal inundation. Cismontane alkali marsh supports many of the same wildlife species found in coastal and valley freshwater marsh.

The cismontane alkali marsh on site is dominated by Pacific pickleweed. This community occurs in a few distinct areas in the northeastern portion of the site.

Brackishwater Channel

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

The brackishwater channels on site receive water from the ocean with regular tidal inundation, as well as 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 through the center of the site (Nestor Creek). Within the Study Area, 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 tall levee that separates them from the adjacent tidal channels. The levee was constructed, in part, using soil excavated from within the basin (borrow area) which has resulted in a low-lying area that holds water from rain events occasionally. 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 in the western portion of the site.

Disturbed Habitat

Disturbed habitat refers to areas that are not developed yet lack vegetation, and generally are the result of severe or repeated mechanical perturbation. The disturbed habitat on site includes an area that was farmed in the past and is periodically mowed by the Refuge to control non-native weeds (specifically for garland chrysanthemum [*Glebionus coronaria*]) and for fire management purposes. The northwestern portion of this disturbed area was also the former site of a sewage treatment facility. The area is dominated by non-native forbs and was mowed during the time period that the surveys were conducted for this project.

Pond 15 Site

The Pond 15 Site consists of 90 acres of approximately 2.70 acres of disturbed and native upland habitat (levees) and approximately 86.41 acres of non-vegetated habitat including the brines contained in the salt ponds as well as areas mapped as bay, beach, and the jurisdictional portions of the salt pond levees. Prior to diking for salt production, the entire area within the Pond 15 Site was composed of intertidal mudflat.

The Pond 15 Site and is part of a larger salt works operation that currently produces salt for commercial purposes using solar radiation to evaporate water from seawater and concentrate 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 NAVD 88). The Pond 15 Site includes the four habitat types or land covers listed in Table 2, Vegetation Communities and Land Cover Types for the Pond 15 Site, and shown on Figure 7, Salt Pond 15 Site Communities. Each vegetation community within the project site is described in greater detail below.

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

Vegetation Community/Land Cover Type	Acreage
Bay	0.59
Beach	0.01
Disturbed Land	2.70
Open Water	82.24
Salt Pond Levee	3.57
Southern Coastal Salt Marsh	0.84
Disturbed Southern Coastal Salt Marsh	0.10
Grand Total	**90.05**

Source: Dudek 2013, revised January 2014

Vegetation community classification for the Pond 15 Site was 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* (referred to herein as the Holland/Oberbauer Classification System). The vegetation community descriptions provided in The *Preliminary Descriptions of the Terrestrial Natural Communities of California* (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).

Bay

Areas mapped as Bay refer to the open water located within the San Diego Bay. An area mapped as bay is located at the north of Pond 15.

Beach

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

Disturbed Land

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

Open Water

Open Water consists of concentrated brines and includes areas that are perennially inundated by brines within the Pond 15 Site. The salt pond brines are hypersaline and vary in salinity from pond to pond, depending on its position in the sequential evaporative water process. Overall salinities within the Salt Works varies from the salinity of the South San Diego Bay [32 parts per thousand (PPT)] to 356 ppt with the Pond 15 Site varying from 71.3 to 128.5 ppt (USFWS 2006a). As a matter of reference, ocean water salinity varies from 32 to 37 ppt (ONR 2014).

Salt Pond Levee

The salt pond levees separate the salt ponds for controlling the salinity as part of the salts works operation. The levees vary in the degree to which they are compacted with the lower and outer edges being less compacted, and the surfaces intended for vehicle access being more compacted. Areas with less compaction occasionally support disjunct patches of vegetation, while the compacted areas are devoid of vegetation. Areas intended for driving access that are devoid of vegetation were classified as disturbed habitat (see below) 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, seaheath, glasswort, and seepweed. Non-native species occurring on the levees consists of ice plant (*Mesembryanthemum* spp.), annual grasses (e.g., *Bromus*), as well as patches of Australian saltbrush (*Atriplex semibaccata*).

AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 7

Pond 15 Site Vegetation Communities

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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 seaheath, seepweed, and Parish's glasswort along the drier upper edges of the marshes; Virginia glasswort, dwarf saltwort, and turtleweed (also known as saltwort [*Batis maritima]*) at middle elevations; and cordgrass closest to the water.

On site, southern coastal salt marsh occurs as small patches of vegetation along the levee that surrounds the salt pond. It is classified as a disturbed form of the habitat in areas where there is overall low vegetative cover of the community. Salt marsh vegetation is also present off site along some of the internal levees of the Salt Works, on the river and bay side of the levee system, and along the Palomar ditch and channel east of Pond 15. In general, for the Pond 15 Site, the internal levees are lacking in vegetation. The southern coastal salt marsh on site includes seepweed species (*Suaeda* spp.), Virginia glasswort, Parish's glasswort, and cordgrass.

2.5.2.2 Jurisdictional Waters

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

U.S. Army Corps of Engineers

The ACOE regulates "discharge of dredged or fill material" into "waters of the U.S.," 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 U.S.," the use, degradation, or destruction of which could affect interstate or foreign commerce or which are tributaries to waters subject to the ebb and flow of the tide (33 CFR. 328.3(a)), pursuant to provisions of Section 404 of the Clean Water Act (CWA) and Section 10 of the RHA. The ACOE jurisdiction within rivers and streams extends to the "ordinary high water mark" (OHWM). The ACOE defines jurisdictional wetlands as areas supporting a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology, in accordance with the procedures established in the ACOE Wetland Delineation Manual (Environmental Laboratory 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 U.S.," are no longer regulated by the ACOE. However, some of these areas (e.g., isolated streams, lakes or ponds) may still be regulated by the CDFW under Section 1600 of the Fish and Game Code or the RWQCB under the Porter-Cologne 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 ACOE Regulatory program jurisdiction under the Section 10 authorities of the RHA in coastal areas extends to the line on the shore reached by the plane of the mean high water, which is 5 feet above MLLW (Mean Low Low Water (MLLW) = 0 datum). The shoreward limit for the Regulatory programs jurisdiction under the ACOE Section 404 authorities is based on the high tide line, or in the San Diego Bay 7.79 feet above MLLW. If there are wetlands meeting the ACOE criteria abutting or adjacent the high tide line, then the ACOE jurisdiction under section 404 would extend 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 which "will substantially divert, obstruct, or substantially change the natural flow or bed, channel or bank, of any river, stream, or lake designated by the Department 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, the predominant salinity of the waters, the composition of vegetation, and the 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 not by fluvial processes, vegetation is saline marsh and not brackish or freshwater vegetation, and marine fish and invertebrate communities are prevalent. In addition, CDFW does not have jurisdiction over activities on federally owned lands, including the current project sites. Pond 15 is on lands owned by the State of California and leased to the Refuge by the State Lands Commission. However, CDFW has and will continue to participate with the Service in development and review of wetland restoration proposals on the Refuge.

Regional Water Quality Control Board

The RWQCB regulates discharging waste, or proposing to discharge waste, within any region that could affect the "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 owned land, the RWQCB may still assert jurisdiction over qualifying aquatic resources on land owned by the US where the CWA Section 401 applies. Before the ACOE will issue a CWA Section 404 permit, applicants must receive a CWA Section 401 Water Quality Certification from the RWQCB.

California Coastal Commission

Under the California Coastal Act (CCA), the Coastal Commission regulates impacts to wetlands in the "coastal zone" and requires a coastal development permit for almost all development within this zone. From three miles seaward the coastal zone generally extends approximately 1,000 yards inland. In less developed areas, it can extend up to 5 miles inland from the mean high tide line, but can also be considerably less than 1,000 yards inland in developed areas. While the Coastal Zone Management Act (CZMA) excludes from its definition of the coastal zone "lands the use of which by law is subject solely to the discretion of or which is held in trust by the Federal Government" (15 U.S.C. 1453(1)).

The CCA also protects designated sensitive coastal areas by providing additional review and approvals for proposed actions in these areas. Section 30121 of the CCA 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…" and considers them to be Environmentally Sensitive Habitats (ESH). The CCA only allows impacts to occur to ESHs or wetlands for certain defined uses, one of which includes wetland restoration.

In contrast to the ACOE, which uses a three-parameter definition to delineate wetlands, the Coastal Commission essentially uses the Cowardin method of wetlands classification, which defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology) (Cowardin et al. 1979).

The Coastal Commission wetland definition is generally more encompassing than either the ACOE or CDFW definition in most respects. However, Section 13577(b) of the 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 Site

Biological surveys of the Otay River Floodplain Site were conducted by Dudek biologists in February 2011 with focused surveys conducted in spring and summer 2011. The surveys included vegetation mapping, jurisdictional delineation, and focused surveys 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 clapper rail (*Rallus longirostris levipes*), and rare plants (Dudek 2012). The jurisdictional delineation identified 8.82 acres of wetlands and non-wetland waters under the joint jurisdiction of the ACOE (under the Preliminary Jurisdictional Determination procedures), RWQCB, and Coastal Commission (Figure 8).

In general, the predominant native vegetation communities associated with the wetlands are adjacent to tidal channels and support southern coastal salt marsh and cismontane alkali marsh,. Soils in these areas are characterized by variable textures (including 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 include surface water, high water table, and saturation. Areas supporting all three wetland indicators were mapped as ACOE, RWQCB, and Coastal Commission wetlands. Additionally, in some locations along the tidal channels, there is 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, ACOE 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 supports two geographically distinct cismontane alkali marsh areas (1.28 acres) that, based on intensive field review, support greater than 50% hydrophytic vegetation and, in some instances, hydric soils but lack hydrology indicators (Table 3). A sewer treatment facility and settling ponds were formerly located in this area. For the purposes of the Preliminary Jurisdictional Delineation (PJD), the ACOE determined that although the areas are more than 700 feet from the hydrophytic vegetation associated with the tidal channel, that these areas were close enough to be considered adjacent wetlands under the ACOE's jurisdiction. These areas also meet the definition of wetland pursuant to Coastal Commission guidelines. However, because these areas are on federal land and because they are more than 700 feet from the tidal channels, CDFW jurisdiction is not presumed.

The western portion of 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 in section 3.3-1 of this document. The functions and values of these areas are considered degraded and low due to the extensive site disturbance, lack of vegetation, lack of surface water hydrologic connectivity, and excessive salinity.

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Figure 8

Otay River FloodplainSite Jurisdictional Delineation

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

While not physically connected to either tidal channels or freshwater channels due to the presence of perimeter berms, the ACOE classified them as jurisdictional for the purposes of the PJD. 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-wetlands Waters of the U.S.

Table 3
Otay River Floodplain Site Wetland Delineation Existing Acreage Summary

Vegetation Community	Jurisdiction
	ACOE, RWQCB, Coastal Commission
Brackish water	0.80
Cismontane Alkali Marsh	1.28
Former Salt Pond Bottom and Borrow Area	4.39
Southern Coastal Salt Marsh	2.35
Total	**8.82**

Source: Dudek 2012.

One area within the Otay River Floodplain Site was mapped by Dudek as mulefat scrub. The isolated patch of mulefat scrub in the eastern portion of the site did not meet any of the three criteria (i.e., hydric soils, hydrology, or hydrophytic vegetation). Hydrology indicators such as an OHWM via a bed and bank, surface cracks, drainage patterns, drift deposits, scour/erosion, saturation, permanence of surface water, and wetland vegetation were not present. A sewer treatment facility was formerly located in this area.

Because the mulefat scrub area lacked all three wetland parameters necessary to define an ACOE wetland, and lacked a single parameter needed to define a Coastal Commission wetland pursuant to the Cowardin method, this area does not meet the definition of a wetland and therefore is not jurisdictional by any regulating authority in the context of this analysis.

Pond 15 Site

Based on the Section 404 jurisdictional determination conducted by Dudek in March 2013, there are approximately 87.35 acres of wetland and non-wetland “Waters of the U.S.” under the joint jurisdiction of the ACOE, RWQCB, and Coastal Commission within the Pond 15 Site. The jurisdictional features identified on site are listed in Table 4, Pond 15 Site Draft Wetland Delineation Existing Acreage Summary and shown on Figure 9, Salt Pond 15 Site Jurisdictional Delineation. The jurisdictional features identified are primarily unvegetated, with the exception of one patch along the salt pond levee. Areas surrounding the Otay River and Palomar Street tidal channels, which are outside of the project area also contain patchy areas of vegetation. 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, alkali heath, Pacific pickleweed, turtleweed, sea lavender (*Limonium californica*), and Bigelow's pickleweed. Also observed in the southern coastal salt marsh habitat were coast weed (*Amblyopappus pusilus*), non-native iceplant (*Mesembryanthemum nodiflorum*; *M. crystalinum*), and arrow grass (*Triglochin maritima*).

The portions of the Pond 15 Site that met all three parameters were classified as wetlands, and the remaining areas containing salt brines below the high tide line (7.71 feet) were classified as non-wetlands "Waters of the U.S.". The top of the salt pond levees is above the high tide line and does not meet the three parameters. Therefore, these areas were mapped as disturbed habitat and were classified as non-jurisdictional.

Table 4
Pond 15 Site Wetland Delineation Existing Acreage Summary

Vegetation Community	Jurisdiction
	ACOE, RWQCB, Coastal Commission
Open Water (Brines)	82.24
Salt Pond Levee	3.57
Southern Coastal Salt Marsh	0.84
Disturbed Southern Coastal Salt Marsh	0.10
Bay	0.59
Beach	0.01
Total	**87.35**

Source: Dudek 2013.

AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 9

Pond 15 Site Jurisdictional Delineation

Final Restoration Plan for the Otay River Estuary Restoration Project

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2.5.3 Wildlife and Fisheries

Otay River Floodplain Site

The Otay River Floodplain Site offers moderate 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 habitat supports a number of upland species prevalent within disturbed and urbanized areas. The habitat within 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 four mammals) were observed on the project site (Dudek 2012). Typical species commonly observed on site include house finch (*Carpodacus mexicanus*) and lesser goldfinch (*Spinus tristis*). Several swallow species were observed over the survey period and many individuals were observed foraging over the site. A number of raptor species were observed foraging on small mammals within 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*), side-blotched lizard (*Uta stansburiana*), and gopher snake (*Pituophis melanoleucus*). Four common species of mammals were recorded in upland parts of the site including brush rabbit (*Sylvilagus bachmanii*), coyote (*Canis latrans*), and California ground squirrel (*Spermophilus beecheyi*). Other mammals adapted to living in areas near human disturbance, such as striped skunk (Mephitis mephitis), and Virginia opossum (*Didelphis virginica*), may also occur on the site. Special-status wildlife species observed on the Otay River Floodplain Site are discussed in Section 2.5.3.

Pond 15 Site

The Pond 15 Site offers moderate habitat value for wildlife species, primarily for migratory and water birds, with some support for common upland species that typically inhabit a wide range of sites. During a visit to the site, it was noted that while numbers of birds within the Pond 15 Site were high, the species richness was low. In comparison, immediately adjacent to the Pond 15 Site, within the San Diego Bay, species richness was very high as species responded to the tidal influence cycles and the foraging opportunities within the periodically exposed mudflat. The habitat within the project site consists of mostly open water, with a narrow upland perimeter formed by the levee system. A number of bird species use the salt ponds but there are a few species that dominate use of the salt ponds. Within the shorebird group, the most common species include red-necked phalarope (*Phalaropus*), Wilson's phalarope (*P. tricolor*), western sandpiper (*Calidris mauri*), marbled godwit (*Limosa fedoa*), willet (*Tringa semipalmatus*), and black-necked stilt (*Himantopus mexicanus*). Eared grebes (*Podiceps nigricollis*) represent the largest population of any species occurring within the Pond 15 Site. California brown pelican

(*Pelecanus occidentalis*), California gull (*Larus californicus*), double-crested cormorant (*Phalacrocorax auritus*), and elegant terns (*Thalasseus elegans*) also show a large population size at the salt ponds. Various levees within the salt works provide nesting habitat for a diverse and abundant array of colonial nesting seabirds, including the federally endangered California least tern (*Sternula antillarum browni*), Caspian tern (*Hydroprogne caspia*), elegant tern, royal tern (*Thalasseus maximus*), gull-billed tern (*Gelochelidon nilotica vanrossemi*), Forster's tern (*Sterna forsteri*), and black skimmer (*Rynchops niger*).

2.5.4 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. Special-status species are of relatively limited distribution and 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 (FESA) or California Endangered Species Act (CESA); 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 CNPS to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1A, 1B, and 2, as well as CRPR 3 and 4[1] plant species); a plant listed as rare under the California Native Plant Protection Act[2]; or a plant considered a locally significant species, that is, 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 Program (MSCP).

2.5.4.1 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 Federal or State listed plant species were observed on the Otay River Floodplain Site. Four special-status plant species were observed within the Otay River Floodplain Site, as listed in Table 5 Special-Status Plants Detected on the

[1] List 3 and 4 plants are included in the CNDDB's *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.] Data on Lists 3 and 4 plants should be submitted to CNDDB. Such data aids in determining or revising priority ranking (CDFW 2014).

[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 2014).

Otay River Floodplain Site. The locations of these plants are shown on Figure 10, Otay River Floodplain Site Special-Status Plant Species.

Table 5
Special-Status Plant Species Detected on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/State/MSCP	Rare Plant Rank	Primary Habitat Associations/ Life Form/Blooming Period/Elevation Range	Status on Site or Potential to Occur
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/<3000 feet	Observed during focused plant survey (Figure 10).
Lycium californicum	California box-thorn	None/None/None	4.2	Costal bluff scrub, coastal scrub/perennial shrub/December–August/15–590 feet	Observed during focused plant survey (Figure 10).
Suaeda esteroa	Estuary seablite	None/None/None	1B.2	Coastal salt marshes and swamps/perennial herb/May–October (Jan)/< 20 feet	Observed during focused plant survey (Figure 10).
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 feet	Observed during focused plant survey (Figure 11).

Source: Dudek 2012.

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 Federal or State listed plant species were observed on the Pond 15 Site. One special-status plant species was observed within the Pond 15 Site, as listed in Table 6 Special-Status Plant Species Detected on the Pond 15 Site. The locations of the plant species are shown on Figure 10, Salt Pond 15 Site Special-Status Plant Species.

Table 6
Special-Status Plant Species Detected on the Pond 15 Site

Scientific Name	Common Name	Status Federal/State/ MSCP	Rare Plant Rank	Primary Habitat Associations/Life Form/Blooming Period/Elevation Range	Status on Site or Potential to Occur
Suaeda esteroa	Estuary seablite	None/None/None	1B.2	Coastal salt marshes and swamps/perennial herb/May–October (Jan)/< 20 feet	Observed during focused plant survey (Figure 11).

Source: Dudek 2013.

2.5.4.2 Wildlife

Otay River Floodplain Site

Dudek biologists Anita Hayworth, Ph.D., Stuart Fraser, Kevin Shaw, Thomas Liddicoat and subconsultant John Konecny surveyed the Otay River Floodplain Site for special-status wildlife species in February through July 2011 (Dudek 2012). A total of 23 visits were made to the site to conduct protocol surveys for various species including Belding's savannah sparrow, burrowing owl, least Bell's vireo, California gnatcatcher, northern harrier, and light-footed clapper rail. During these visits, two Federal or State listed species were observed on site, light-footed clapper rail and Belding's savannah sparrow. Additionally, nine special status wildlife species were observed on the site (Table 7). Figure 12, Otay River Floodplain Site Special-Status Wildlife Species, indicates where the nine special status wildlife species were observed on the site. Observations of special status species previously recorded on the site are also included in this analysis (Table 8; USFWS 2006a).

A brief discussion of the natural history of the Federal or State listed species is provided below.

California Least Tern **(Sternula antillarum browni)**

The California Least Tern is a migratory tern species known to travel along the Pacific and Gulf coasts, summering in California from April through August in order to breed (Thompson et al. 1997). They are the smallest of the tern species and are known primarily to be a predators of fish and rely on a number of fish species in a variety of sizes as their primary food source (USFWS 2006a, USFWS 2006b). When they are juveniles, the terns require a source of smaller fish as they learn to hunt for themselves. Many scientists agree that this need for a smaller prey source is met by freshwater systems, such as lagoons and estuaries, which often occur near the nesting sites. This is why it is crucial to preserve such habitats for breeding terns (USFWS 2006a). The terns are known to nest along sand banks, dried mudflats, gravel and 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 pair but varying widely from a low of 3 to a high of 64 pair (USFWS 2006b). Because of the movements of the individual birds, the actual colony size is somewhat arbitrary and difficult to define and thus the nesting sites are described in terms of geographic clusters of sites (USFWS 2006b). They require both secure nesting habitat and open foraging habitat for juveniles and adults to congregate and disperse (USFWS 2006b).

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Figure 10

Otay River Floodplain Site Special-Status Plant Species

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FIGURE 11
Pond 15 Site Special-Status Plant Species

Final Restoration Plan for the Otay River Estuary Restoration Project

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Figure 12

Otay River Floodplain Site Special Status Wildlife Species

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Historically, the species is known to have nested discontinuously throughout the California coastal zone, including relatively undisturbed sandy beaches near estuaries, bays, and inlets, with majority of the numbers occurring between Santa Barbara and San Diego Counties (USFWS 2006a). Statewide, numbers were in the tens of thousands before the 1960's. San Diego Bay and the Tijuana Estuary complex annually hosts about one-fourth of the entire statewide breeding population (Collins pers. comm.). Within the Salt Works levee area of the Refuge, there were 60 recorded pairs recorded during surveys conducted in 1968. However, when surveyed again in 1970, only two breeding pairs were seen. These numbers have fluctuated over the years but there have never been more than 60 pairs at the Salt Works since 1968 (USFWS 2006a).

The Western Salt Pond Restoration Project began construction in February 2011 and was completed in December 2011. This project is in the process of changing the previous commercial salt ponds to restored wetlands. It takes place within the three western-most ponds (Ponds 10a, 10, and 11) and includes creation of subtidal, intertidal mudflat, intertidal salt marsh and transition habitats. The project has restored, created, and enhanced habitats that support the California least tern, light-footed clapper rail, western snowy plover, Belding's savannah sparrow, and eastern Pacific green sea turtle. In addition, the restoration will benefit tens of thousands of migratory birds that stop over at San Diego Bay as well as various species of fish, and other marine organisms (USFWS 2012).

The California least tern was greatly affected by the development and recreational use of California's coastline and beaches. They have also suffered from increase in predation from feral dogs and cats as well as from predatory birds, such as peregrine falcons (*Falco peregrinus*) and owls that prey on breeding adults. In 1970, when California least tern' numbers statewide plummeted to only a few hundred, the least tern was added to the Federal Endangered Species List as an endangered subspecies. It is also listed as endangered by the State of California and is a covered species under the San Diego Multiple Species Conservation Program (MSCP).Today, the species is known to occur in limited areas along the Central and Southern California coastline. Within San Diego County, beaches that are still known to support nesting least terns (from April – August) include the South San Diego Bay Unit, Tijuana Estuary, Naval Amphibious Base Coronado, and Naval Base Coronado as well as a section of Ocean Beach near the San Diego River mouth (Thompson et al. 1997, USFWS 2006a).

Around San Diego Bay, least terns are known to nest in six locations, including the salt works levees within the South San Diego Bay and the D Street Fill, which is located north of the project site in the Sweetwater Marsh Unit.

***Western Snowy Plover* (Charadrius nivosus nivosus)**

The western snowy plover breeds and winters along the California coast. Its breeding season can generally be described as occurring from March 1 to September 15 in any given year. They nest in shallow, generally unvegetated coastal areas, crafting depressed nests which are dug out in sandy or saline soils. 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 the adult(s).

Historically known to breed and winter throughout beach strand habitats along the California coast, western snowy plovers have been steadily declining over the last several decades, leading to the coastal population to being federally listed as threatened in 1993 and remaining listed today as both federally threatened and a State Species of Special Concern (SSC) (Shuford et al. 2008). The western snowy plover is also a covered species under the San Diego MSCP.

Today, there are very few known breeding snowy plover populations in Southern California within the Salt Works levees onthe Refuge representing one site where nesting generally occurs on an annual basis but in low numbers. as summarized below (USFWS 2006a). This species is threatened by disturbance of its natural habitat by humans, predation by domestic cats, dogs, and other terrestrial and avian predators, and from inadequate access to open foraging areas that it relies on for survival (USFWS 2006c).

Summaries of western snowy plover breeding sites through 2013 are provided for all the known nesting areas in the San Diego Bay region including: the Refuge inclusive of the Salt Works, Cardiff State Beach and San Elijo Lagoon, Tijuana Slough National Wildlife Refuge, and Border Field State Park Sites (Collins pers. comm.).

South San Diego Bay Refuge – Salt Works. Numbers of western snowy plovers and nests have steadily increased over the past few years A maximum of nine nests in any one year was recorded for 1999-2010, 25 nests by at least eight females and 12 males was recorded in 2011, 37 nests by at least 13 females and 16 males was recorded in 2012. Based on the maximum number of concurrently active nests and broods, at least 14 female and 24 male snowy plovers bred within the 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, where 16 nests were established. The color, pattern, and texture of this substrate made eggs and chicks exceedingly difficult to detect and likely contributed to this 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 due to predation based on either direct or indirect observation or sign such as coyote tracks. The maximum numbers of plovers observed early in the season before nests were established were seven on 22 March and late season at least 46 to 49 with nine fledglings on 17 July.

Cardiff State Beach and San Elijo Lagoon. Snowy plovers were observed from January to early May and from late July through October. No breeding activity was documented, most observations were of roosting and/or foraging birds along the beach, and foraging on mudflats in the lagoon was noted on two dates.

Tijuana Estuary. Although nest numbers were lower than in 2012, numbers of plovers and nests remained relatively high with at least 13 female and 22 male snowy plovers breeding along the upper beach of Tijuana Slough Nation Wildlife Refuge and Border Field State Park in 2013.

***Light-footed clapper rail* (Rallus longirostris levipes)**

Light-footed clapper rails inhabit coastal salt marshes from Santa Barbara County south to Baja California, Mexico. They rely on Southern California's coastal salt marshes, lagoons and estuaries for nesting and foraging habitat year round. They prefer nesting habitats located in the zone below the high water mark that have thick cordgrass that can be used for cover and rarely travel more than a few miles from their home territory (USFWS 2009). They are also known to nest in coastal marshland dominated by pickleweed. 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 do not stray far from their nesting territories (USFWS 2006a, USFWS 2009). There is one population in the upper Newport Bay in Orange County that has been successfully reproducing since 1980, however, other subpopulations, such as the one in Refuge, have shown more fluctuation in population numbers in response to variable environmental conditions.

It is thought that in the past light-footed clapper rails inhabited virtually all the salt marshes along their Southern California coastal range. However, current data tells us that only 50% of the coastal wetland areas formerly occupied by the species, are being used by light-footed clapper rails today. As a result, the species was listed as federally endangered in 1970 and was also listed as a State endangered species in 1971 due largely to the destruction and development of coastal wetlands. This rail is also a covered species under the San Diego MSCP. This loss and fragmentation of habitat combined with impacts from degradation or modification of habitat due to dredging actions and changes to tidal influences or siltation, contaminants as well as predation from the non-native red fox, some predatory bird species and domestic cats, have had significant impacts on historic clapper rail populations in California (USFWS 2009). The number of pairs has increased from 203 in 1980 to more than 500 pairs in 2013. The Tijuana Marsh National Wildlife Refuge was at its third highest recorded level with 105 breeding pairs, an increase of 4% over the 2012 breeding season but 26% lower than the record high of 142 pairs in 2007 (Zembal et al. 2013). There is also a breeding population in the South Bay Biological Study area adjacent to the South San Diego Bay Unit (typically 2–5 breeding pairs were identified each year from 1999–2004) (USFWS 2006a). However the Service rank it as a species with low recovery potential that is facing a high degree of threat because of the limited number of salt marshes remaining in California and the even more limited number of marshes actually inhabited by clapper rails (USFWS 2009).

The five-year review of this species conducted by the Service in 2009 indicated that progress has been made to increase the number of light-footed clapper rails since listing, and regulatory mechanisms have been successful for stopping destruction and adverse modification of marsh lands. 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. Unfortunately, in its best year since listing, the light-footed clapper rail population was only half way to the 800 pairs suggested by the species recovery plan for downlisting, Therefore, despite conservation efforts, the light-footed clapper rail continues to meet the definition of endangered (USFWS 2009),

***Belding's Savannah Sparrow* (Passerculus sandwichensis beldingi)**

The Belding's savannah sparrow is a ground dwelling sparrow subspecies that is unique from other sparrow species because of its year-round reliance on the marine riparian habitat provided by California's coastal salt marshes for breeding and foraging. These State endangered songbirds primarily nest from late March through early July within stands of pickleweed where they are known to group together semi-colonially in dense patches of their preferred habitat (Hoffman 2010, USFWS 2006a).

The species has been known to occur from Santa Barbara County south through Baja California. Statewide, the sparrow's population numbers have been rising since 1973 from 1,610 breeding pairs to as high as 2,902 pairs according to 2011 surveys (Citation TBP). However, these numbers have fluctuated dramatically over that time period leading it to be listed as a State endangered species in 1974. This species currently has no federal listing status, but is a covered species under the San Diego MSCP. A statewide survey ranked Tijuana Slough National Wildlife Refuge subpopulation as third largest in California in 2010. There were 109 Belding's territories in the Oneonta Lagoon section north of the river and 208 territories to the south of the river (Zembal and Hoffman 2010). The survey identified about 169 territories in the Salt Works levees and Otay River mouth in 2010. The survey total represents a 141% increase over the 2006 count, and places the Salt Works as the seventh largest subpopulation in 2010. The Belding's Savannah sparrows were concentrated along the outer Otay River Channel and in a thick patch of Salicornia on the northeastern corner of the Salt Works (Zembal and Hoffman 2010).

Based upon the 2010 observations in 32 coastal wetlands, the most critical management issues for Belding's savannah sparrow include maintenance or enhancement of tidal flushing and the control of sediment, people, their pets, and exotic predators (Zembal and Hoffman 2010. However, because of conservation measures such as securing, restoring, and managing coastal wetlands, the overall population trend has been positive, with more than three times as many breeding Belding's in 2010 as were documented in 1973.

***Eastern Pacific Green Sea Turtle* (Chelonia mydas)**

The eastern Pacific green sea turtle is one of six species of sea turtles that inhabit the waters of the United States. These turtles rely on the shallow waters of bays, reefs, inlets and undisturbed sandy beaches for egg laying. The hatchlings have been known to feed on a variety of plants and animals, however, the adult turtles feed primarily on sea grasses and marine algae, however, it has been recently found that, when in the open ocean, adults sometimes forage on sea invertebrates such as jelly fish and sea pens (USFWS 2007). They are known to be widely migratory, often traveling between several different feeding and nesting sites, while showing fidelity to these sites over time (USFWS 2007). The easternPacific green sea turtle was listed as federally endangered in 1978 as a result of a number of threats, including human removal of eggs and adult turtles. Direct take combined with modern development of areas near beach nesting sites make up the primary threats to this species today (USFWS 2006a).

There has been a consistent population of turtles that reside in south San Diego Bay, although it is thought that individuals migrate in and out of the bayat different times. Researchers believe that these individuals return to this location due to the abundance of eel-grass available in the south Bay, as well as the relief from predation and poaching that the Bay provides (USFWS 2006a).

Table 7
Special-Status Wildlife Detected on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/State/MSCP[1]	Primary Habitat Associations	Status on Site or Potential to Occur
Birds				
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 Cos., San Francisco Bay Delta, northeastern Modoc plateau, east side of Sierra from Lake Tahoe south to Inyo Co., 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. It was observed resting under a shrub in March. It was only observed the one time.
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. There are numerous holes for their use. Soils are sandy. However, vegetation grows so tall that there is little vantage point for them to use. One owl was observed once at the beginning of the breeding season. It did not stay to breed. 3 were observed nearby in off-site surveys conducted in 2011 (SWIA data_Citation TBP).
Circus cyaneus (nesting)	Northern harrier	None/SSC/MSCP	Open wetlands (nesting), pasture, old 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 3 harriers were detected during almost every site visit. They were observed foraging. In surveys conducted nearby, west of the site from 2010 to 2012, a total of 42 observations were recorded (SWIA data_Citation TBP). No nesting was detected however a nesting attempt was observed in 2012 off site near the dirt access road for the sewer pump station.

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Scientific Name	Common Name	Status Federal/State/MSCP[1]	Primary Habitat Associations	Status on Site or Potential to Occur
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 adjacent to the site. Kites were detected during a number of the site visits and in nearby areas as well. They were observed foraging. No nesting was detected.
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.	Observed. Detected within the eucalyptus on site and within the willow habitat off site.
Gelochelidon nilotica vanrossemi	Western Gull-billed tern	BCC/SSC/Not covered	Nest on protected spits, berms, and islands composed of sand or other small material. Forage 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.
Passerculus sandwichensis beldingi	Belding's savannah sparrow	None/SE/MSCP	Saltmarsh, pickleweed.	Observed. Approximately 18 birds were observed on site and over many were observed nearby off site within the San Diego Bay National Wildlife Refuge from 2010 to 2012 (SWIA data_Citation TBP).
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 for the area. There are salt pans present. The species was observed flying over the site a number of times but did not forage on site.

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Special-Status Wildlife Detected on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/State/MSCP[1]	Primary Habitat Associations	Status on Site or Potential to Occur
Mammals				
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.

[1] The federal and state status of species primarily is based on the Special Animals List (CDFG 2011).

Federal Designations:
BCC Fish and Wildlife Service: Birds of Conservation Concern
(FD) Federally delisted; monitored for five years
FE Federally listed Endangered
FT Federally listed as Threatened

State Designations:
CSC California Species of Special Concern
FP California Department of Fish and Game Protected and Fully Protected Species
(SD) State-delisted
SE State-listed as Endangered
ST State-listed as Threatened
WL California Department of Fish and Game Watch List

MSCP:
MSCP Covered by the MSCP
Not Covered Not covered by the MSCP

Source: Dudek 2013.

Table 8
Special-Status Wildlife Potentially Occurring but Not Detected 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.	DUDEK 2012
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 however there are no rocky areas within the habitat.	DUDEK 2012
Phrynosoma coronatum (blainvillei population)	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.	DUDEK 2012
Eumeces 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 however there are no rocky areas within the habitat. The disturbed habitat areas are regularly mowed.	DUDEK 2012
Crotalus ruber 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 however there are no rocky areas within the habitat.	DUDEK 2012
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.	DUDEK 2012
Thamnophis hammondii	Two-striped garter snake	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.	DUDEK 2012

Table 8
Special-Status Wildlife Potentially Occurring but Not Detected 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
Birds					
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.	11 individuals were 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.	DUDEK 2012
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 state below 1500m.	The species was observed perched just off site on a post at the western end of the site. It was only observed once.	DUDEK 2012
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 and adjacent to the Otay River Floodplain Site.	DUDEK 2012
Rallus longirostris levipes	Light-footed clapper rail	FE/SE, P/ MSCP	Coastal saltmarsh.	There is 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.	DUDEK 2012
Falco peregrinus anatum	American peregrine falcon	BCC/DL/ MSCP	Nests on cliffs, buildings, bridges; forages in wetlands, riparian, meadows, croplands, especially where waterfowl are present.	High potential to occur on site for foraging. The species is well known to forage on shorebirds during the winter.	DUDEK 2012, USFWS 2006a

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Scientific Name	Common Name	Status Federal/State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
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 fresh water habitat and the site's proximity to urbanization.	USFWS 2006a
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 there in 2013 (Collins pers. Comm)	DUDEK 2012
Amphispiza belli bell (nesting)	Bell's sage sparrow	BCC/WL/ Not covered	Coastal sage scrub and dry chaparral along coastal lowlands and inland valleys.	Low potential due to small amount of habitat. *Isocoma* scrub is marginal and appears artificially planted.	DUDEK 2012
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 off site during 2010 to 2012 surveys and suitable marsh nesting areas occur on the west side of the project area.	USFWS 2006a; SWIA data _Citation TBP
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 (SWIA). Limited foraging habitat on the project site.	SWIA data_Citation TBP

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Scientific Name	Common Name	Status Federal/State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
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 off site during surveys conducted from 2010 to 2012. Limited habitat occurs on site.	USFWS 200a6; SWIA data_Citation TBP
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. The species was recorded in the region but is assumed to be extirpated.	DUDEK 2012
*Pelecanus occidentalis californicus (*nesting colony and communal roosts)	California brown pelican	FE (DL)/DL/ MSCP	Open sea, large water bodies, coastal bays and harbors.	Low potential due to lack of extensive open water. The species could perch on posts located within the site or could occur within the Otay River channel however the channel is relatively narrow. The species does occur within the region. Species was observed nearby off-site in surveys conducted in 2011 and 2012.	DUDEK 2012, USFWS 2006a; SWIA data_Citation TBP
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. The species was also observed during surveys conducted nearby off site in 2011 and 2012.	USFWS 2006a; SWIA data_Citation TBP
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.	DUDEK 2012, USFWS 2006a

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Scientific Name	Common Name	Status Federal/State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
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 for the area. There are salt pans present.	DUDEK 2012, USFWS 2006a; SWIA
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 Western portions of the site. Was observed nearby off site during surveys in 2011 and 2012.	USFWS 2006a; SWIA
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. In addition, focused survey conducted nearby in 2006 was negative. The 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.	DUDEK 2012
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 months, but lacks habitat on the project site.	USFWS 2006a

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Special-Status Wildlife Potentially Occurring but Not Detected 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 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. They frequently roost and forage in neighboring suburban areas (Collins pers.comm) High potential to forage on site and nest in adjacent riparian areas to the east. One Cooper's hawk 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.	DUDEK 2012, 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. However, there is limited suitable habitat on site.	USFWS 2006a; SWIA
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. Would not breed in the region.	DUDEK 2012
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.	DUDEK 2012
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.	DUDEK 2012

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Scientific Name	Common Name	Status Federal/State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
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.	DUDEK 2012
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 however this habitat is limited. Focused surveys were negative.	DUDEK 2012
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
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 or the former agriculture field.	DUDEK 2012, 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. Not know for the region. Does not nest within the region but may forage on site during winter.	DUDEK 2012

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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 ft) permanent or semi-permanent wetlands of at least one acre, with about 75% open water and emergent tules, bulrushes (Scirpus spp.) and cattails (Typha spp.) up to about three 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.	USFWS 2006a; SWIA
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.	No potential to occur due to lack of suitable habitat on the project site or nearby areas.	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.	DUDEK 2012
Buteo swainsoni (nesting)	Swainson's hawk	BCC/ST/ MSCP	Open grassland, shrublands, croplands.	May forage on site during migration. Would not breed in the region.	DUDEK 2012
Agelaius tricolor (nesting colony)	Tricolored blackbird	BCC/SSC/MSCP	Nests near fresh water, emergent wetland with cattails or tules; forages in grasslands, woodland, agriculture.	Low potential. Small amount of suitable habitat is present.	DUDEK 2012
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 for the area. There are salt pans present.	DUDEK 2012, USFWS 2006a

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Special-Status Wildlife Potentially Occurring but Not Detected 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
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 marsh areas or the former agriculture field.	DUDEK 2012, 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.	DUDEK 2012
Nyctinomops macroti	Big free-tailed bat	None/SSC/Not covered	Rugged, rocky canyons.	No roost habitat is present but could forage on site or overhead.	DUDEK 2012
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.	DUDEK 2012
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.	DUDEK 2012
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.	DUDEK 2012
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..	DUDEK 2012

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Scientific Name	Common Name	Status Federal/State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
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. However known locations of the species are a long distance away (Camp Pendleton and southern Orange County).	DUDEK 2012
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.	DUDEK 2012
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.	DUDEK 2012
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..	DUDEK 2012
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.	DUDEK 2012
Eumops perotis californicus	Western mastiff bat	None/SSC/Not covered	Roosts in small colonies in cracks and small holes, seeming to prefer man-made structures.	No roost habitat is present but could forage on site or overhead.	DUDEK 2012
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.	DUDEK 2012

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Scientific Name	Common Name	Status Federal/State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
Invertebrates					
Branchinecta sandiegonensis	San Diego fairy shrimp	FE/None/ Not covered	Small, shallow vernal pools, occasionally ditches and road ruts.	No potential due to lack of suitable habitat.	DUDEK 2012
Euphydryas editha quino	Quino checkerspot butterfly	FE/None/ Not covered	Sparsely vegetated hilltops, ridgelines, occasionally rocky outcrops; host plant *Plantago erecta* and nectar plants must be present.	No potential due to lack of suitable habitat. Project is outside of current survey area for the species.	DUDEK 2012
Streptocephalus woottoni	Riverside fairy shrimp	FE/None/ Not covered	Deep, long-lived vernal pools, vernal pool-like seasonal ponds, stock ponds; warm water pools that have low to moderate dissolved solids.	No potential due to lack of suitable habitat.	DUDEK 2012

Pond 15 Site

Due to limited accessibility of the site, focused wildlife surveys were not conducted by Dudek staff. However, observation data was available through State and Federal agencies (2010–2012 CDFW) as well as through CNDDB records. Three Federal or State listed species have been observed within the Pond 15 Site boundary: California Least Tern, western snowy plover, and Belding's savannah sparrow. Additionally, nine special status wildlife species were observed on the site during the surveys conducted in 2010 – 2012 as listed in Table 9 Special Status Wildlife Detected on the Pond 15 Site. Special status species documented for the salt pond area and that have high potential to occur within the Pond 15 Site include: American peregrine falcon (*Falco peregrinus anatum*), black skimmer , California brown pelican, California gull (*Larus californicus*), California horned lark (*Eremophila alpestris*), Caspian tern (*Hydroprogne caspia*), double-crested cormorant (*Phalacrocorax auritus*), elegant tern (*Thalasseus elegans*), long-billed curlew (*Numenius americanus*).

Table 9
Special-Status Wildlife Potentially Occurring on Pond 15 Site

Scientific Name	Common Name	Status Federal/State/MSHCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
		Birds			
Falco peregrinus anatum	American peregrine falcon	BCC/DL/ MSCP	Nests on cliffs, buildings, bridges; forages in wetlands, riparian, meadows, croplands, especially where waterfowl are present.	High potential to occur on site for foraging. The species is well known to forage on shorebirds during the winter. Individuals observed during surveys conducted from 2010 to 2012 (SWIA data_Citation TBP).	USFWS 2006a, SWIA data_ Citation To Be Provided
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 fresh water habitat and the site's proximity to urbanization.	USFWS 2006a
Passerculus sandwichensis beldingi	Belding's Savannah Sparrow	None/SE/ MSCP	Nests and forages in coastal salt marsh dominated by pickleweed.	Documented as occurring within the Pond 15 Site. Suitable salt marsh habitat occurs in a small area on the site. Was observed during surveys conducted from 2010 to 2012 (SWIA data_Citation To Be Provided). A total of 211 birds were recorded in 2012.	USFWS 2006a, SWIA data_Citation To Be Provided

Table 9
Special-Status Wildlife Potentially Occurring on Pond 15 Site

Scientific Name	Common Name	Status Federal/State/MSHCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
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. Was observed during surveys conducted from 2010 to 2012 (SWIA data_Citation TBP) surveys and some suitable marsh nesting areas occur on the south western end of the project area and open water for foraging occurs over the salt works ponds.	USFWS 2006a, SWIA data_Citation To Be Provided
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 during 2012 (Dudek 2012) focused surveys and were recorded off site of the Otay River Floodplain Site. Some foraging habitat occurs on the project site. Was not recorded during surveys of the site in 2010 – 2012 (SWIA data_Citation TBP)	USFWS 2006a, SWIA data_ Citation To Be Provided
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 adjacent to Salt ponds during surveys conducted from 2010 to 2012 (SWIA data_Citation To Be Provided). Suitable migratory habitat does occur within project boundaries.	USFWS 2006a, SWIA data_ Citation To Be Provided

Table 9
Special-Status Wildlife Potentially Occurring on Pond 15 Site

Scientific Name	Common Name	Status Federal/State/MSHCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
Pelecanus occidentalis californicus (nesting colony and communal roosts)	California brown pelican	FE (DL)/DL/ MSCP	Open sea, large water bodies, coastal bays and harbors.	High potential to occur over open water areas on project site. The species does occur within the region. Species was observed during surveys conducted from 2010 to 2012 (SWIA data. Citation To Be Provided).	USFWS 2006a, SWIA data Citation To Be Provided
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. The species was observed during surveys conducted from 2010 to 2012 (SWIA data_Citation To Be Provided).	USFWS 2006a, SWIA data_ Citation To Be Provided
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 were observed during surveys conducted from 2010 to 2012 (SWIA data_Citation To Be Provided).	USFWS 2006a, SWIA data_Citation To Be Provided
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 for the area. There are salt pans present. Individuals have been known to occur within the salt pond area according to CNDDB reports. Individuals were observed during surveys conducted from 2010 to 2012 (SWIA data_Citation To Be Provided).	USFWS 2006a, CDFW 2014, SWIA data_Citation To Be Provided

Table 9
Special-Status Wildlife Potentially Occurring on Pond 15 Site

Scientific Name	Common Name	Status Federal/State/MSHCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
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 Western portions of the site. Was observed nearby off site during surveys in 2011 and 2012 (SWIA data_Citation To Be Provided).	USFWS 2006a, SWIA data_Citation To Be Provided
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.	No potential to occur due to lack of suitable habitat.	DUDEK 2012
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 months, 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.	Low potential to occur on the project site. Could forage on site and nest in nearby woodland areas to the east.	USFWS 2006a, SWIA data_Citation To Be Provided
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 (SWIA data_Citation To Be Provided) and there is suitable habitat on the project site.	USFWS 2006a, SWIA data_Citation To Be Provided

Table 9
Special-Status Wildlife Potentially Occurring on Pond 15 Site

Scientific Name	Common Name	Status Federal/State/MSHCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
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 (SWIA data_Citation To Be Provided) and there is suitable habitat on the project site.	USFWS 2006a, SWIA data_Citation To Be Provided
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.	SWIA data_Citation To Be Provided
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.	No potential due to lack of suitable habitat.	DUDEK 2012
Lanius ludovicianus	Loggerhead Shrike	BCC/SSC	Nests and forages in open habitats with scattered shrubs, trees, or other perches.	No potential to occur due to lack of suitable habitat and foraging structures on the project site (SWIA data_Citation To Be Provided).	USFWS 2006a; SWIA data_Citation To Be Provided
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. Individuals were observed during focused surveys conducted from 2010 to 2012 (SWIA data_Citation To Be Provided).	USFWS 2006a, SWIA data_Citation To Be Provided

Table 9
Special-Status Wildlife Potentially Occurring on Pond 15 Site

Scientific Name	Common Name	Status Federal/State/MSHCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
Aythya americana	Redhead	None/SSC/ Not covered	Breeds in relatively deep (>3 ft) permanent or semi-permanent wetlands of at least one acre, with about 75% open water and emergent tules, bulrushes (Scirpus spp.) and cattails (Typha spp.) up to about three 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 the site. Seven individuals were observed during surveys conducted in 2012 (SWIA data_Citation To Be Provided), but none were detected in surveys covering the same area in 2010.	USFWS 2006a, SWIA data_Citation To Be Provided
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 over the site.	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 for the area. Has not been recorded on the site.	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 for foraging. Was not observed during surveys conducted from 2010 to 2012 (SWIA data_Citation To Be Provided).	USFWS 2006a, SWIA data_Citation To Be Provided

2.6 Hydrology and Hydraulics

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 in Figure 13. The Otay River originates in the Cleveland National Forest along Dulzera Creek, with several tributaries including Hollenbeck Canyon Creek, Jamul Creek, and Proctor Valley Creek. Watershed flows are cutoff by two reservoirs that are a part of the City of San Diego Water Supply System: the Upper Otay Reservoir and the Lower Otay Reservoir. Formed by the Savage Dam, the Lower Otay Reservoir captures 68% of the watershed. The Otay River 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 (Everest 2014).

The Otay River conveys flows from the I-5 bridge through the Otay River floodplain and estuarine portion of the Otay River. From the floodplain, the river channel turns northwest towards Ponds 50 and 51, and turns westward along the perimeter of the salt ponds adjacent to Ponds 48, 20, and 22 specifically, as shown in Figure 2. After confluence with Nestor Creek, the Otay River continues along Pond 23 and then north along the Western Salt Pond Restoration until discharging into the San Diego Bay (Everest 2014).

Hydraulic conditions along the Otay River are affected by a combination of tidal exchanges with San Diego Bay and watershed flows from the Otay River. Tidal influence extends from San Diego Bay toward the floodplain near Ponds 48 and 50.

2.6.1 Otay River Runoff

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, as summarized in Table 10. Monthly average temperatures range from 56.4 degrees Fahrenheit in January to 71.0 degrees Fahrenheit in August with an average annual temperature is 63.2 degrees Fahrenheit. Precipitation typically occurs during winter months (December through February) with little to no rainfall during summer months (June through August).

Table 10
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
March	58.9	1.63

Table 10
Monthly Average Temperature and Precipitation for San Diego

Month	Monthly Average Temperature (˚F)	Monthly Average Precipitation (inches)
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: Western Regional Climate Center, San Diego WSO Airport (1914-2012)

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 thunder storms 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).

The average annual precipitation across the Otay River Watershed is illustrated in Figure 14. 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 the San Miguel Mountain, Jamul Mountains, Otay Mountain, and Lyons Peak (see Figure 14).

Differences in monthly and annual precipitation across the Otay River Watershed are shown in Table 11 for three regions: coastal, inland, and mountain. Based on gage 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 gage at the San Diego WSO Airport (COOP 047740), Inland precipitation in the central portion of the watershed was characterized by the gage at the Lower Otay Reservoir (COOP 045162), and precipitation in the mountain region was classified using Barrett Dam (COOP 040514). Elevations of these stations are approximately 10 feet, 520 feet, and 1,620 feet, respectively.

Table 11
Monthly Precipitation by Region

Month	Coastal Precipitation* (in)	Inland Precipitation* (in)	Mountain Precipitation* (in)
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
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: Western Regional Climate Center
*San Diego WSO Airport – COOP 047740 (1914-2012)
**Lower Otay Reservoir – COOP 045162 (1940-1956)
***Barrett Dam – COOP 040514 (1913-1980)

2.6.2 Otay River Flooding

Flood hazards are identified by the Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS). The most recent FIS for San Diego County (FEMA 2012) documents return period peak flows for Otay River, as summarized in Table 12. The initial hydrologic and hydraulic analyses for the Otay River were conducted by the California Department of Water Resources for FEMA (completed in 1981). Hydrologic and hydraulic analyses for the Otay River between Nestor Creek and San Diego Bay were updated by the USACE, Los Angeles District in December 1989. There are no major flooding problems along the Otay River, although some areas downstream of Broadway Avenue 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 12
FEMA Return Period Peak Discharges for Otay River

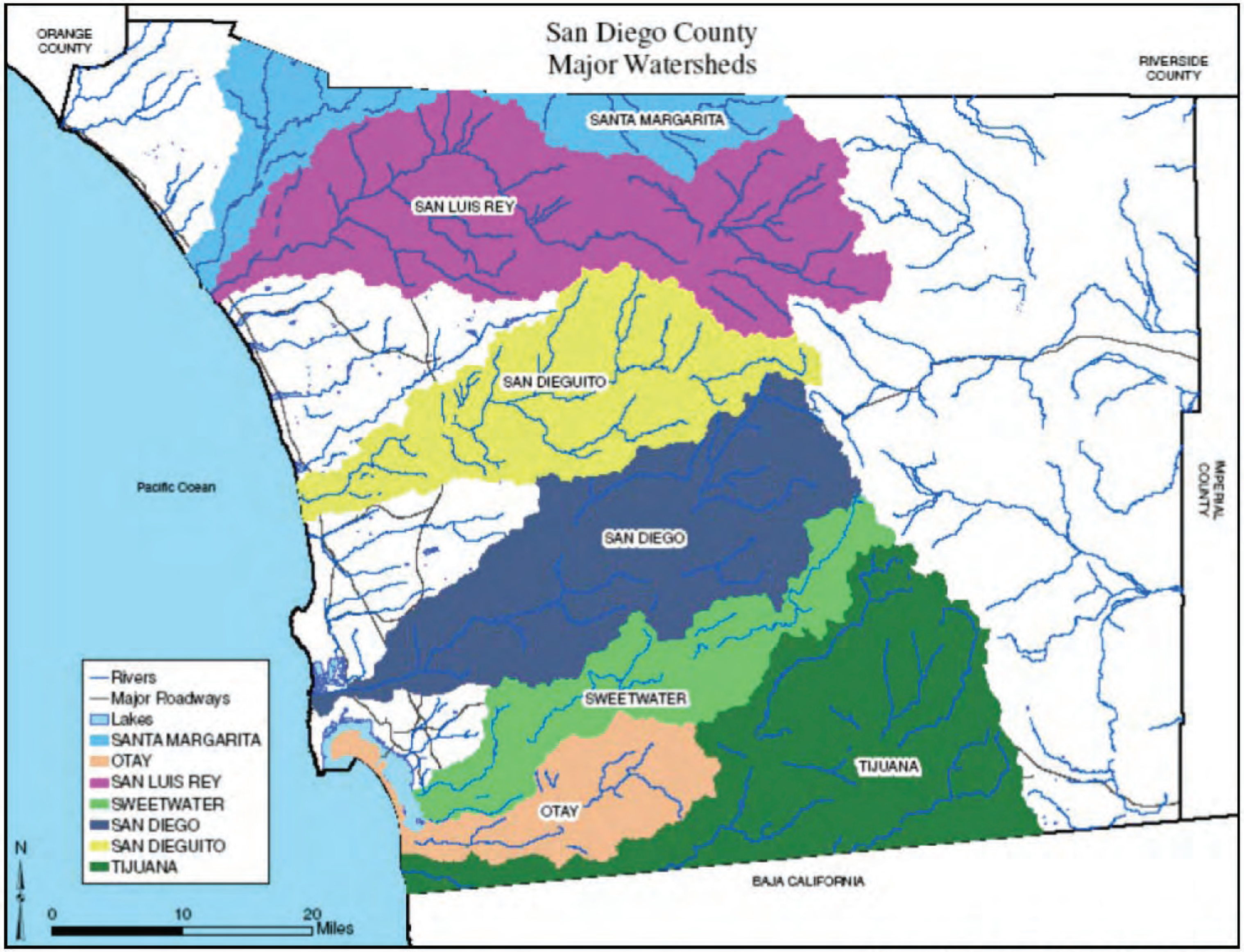
Otay River	Drainage Area (mi^2)	Return Peak Discharges (cfs)			
		10-Year	*50-Year*	*100-Year*	*500-Year*
at Otay Valley Road	122.7	1,200	12,000	22,000	50,000

Source: FEMA 2012

2.6.3 San Diego Bay Circulation

Currents in San Diego Bay are predominately produced by tides (Wang et al. 1998). This tidal exchange between the ocean and the bay is a result of a phenomenon called “tidal pumping” (Chadwick, et al.. 1997). The “pumping” of water is due to the flow difference between the ebb and the flood flows. Being located at mid-latitude, tides and currents within the San Diego Bay are dominated by a mixed diurnal-semidiurnal component (Peeling 1975). Typical tidal current speeds range between 0.3-0.5 m/s near the inlet and 0.1 m/s to 0.2 m/s in the southern region of the bay. The phase propagation suggests that the tides behave almost as standing waves with typical lags between the mouth and the back portion of the bay of 10 min and an increase in tidal amplitude in the inner bay compared to the outer bay.

The overall tidal prism for the bay is 5.5×10^7 m^3 and the tidal excursion is larger than the mouth with a value of 4.4 km (Chadwick and Largier 1996). Chu, et al. (2012) measured mass exchange between San Diego Bay and the Pacific Ocean using a combination of flow measurements by acoustic Doppler current profiling and tracer measurements using a naturally occurring ultraviolet fluorescence tracer. They found that variations in exchange with tidal range could be isolated by separately evaluating the ebb and flood tidal transport budgets. The tracer transport during the ebb increased rapidly with tidal range, while during the flood tide, the transport increased more gradually. The resulting difference in tidal transport between the ebb and flood accounts for the exchange between the bay and ocean. For weak tides, the exchange tends to increase rapidly with increasing tidal range, while for stronger tides, the exchange is more constant.



Source: County of San Diego 2007

SOURCE:

FIGURE 13
Otay River Watershed

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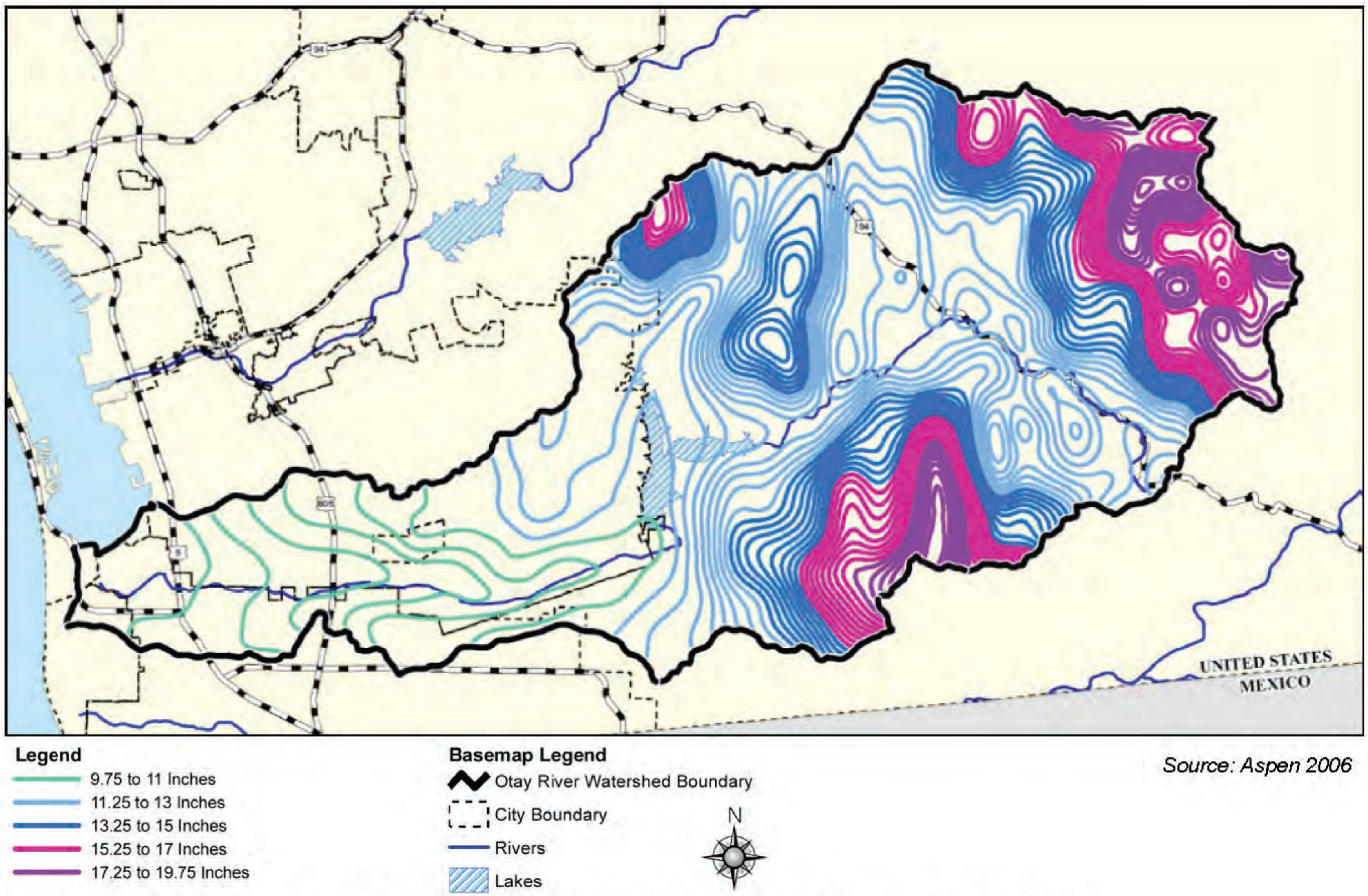

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FIGURE 14

Otay River Watershed Aveage Annual Precipitation

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2.6.4 San Diego Bay Sea Level and Tidal Regimes

The flow of sea water into and out of the Otay River Channel, the South Bay salt ponds and the proposed restoration tidal basins are driven by the time variation in San Diego Bay water level. The nearest NOAA tide gage to the Otay River and South Bay salt ponds is located at the Navy Pier in San Diego Bay. This tide gage (NOAA #941-0170) was last leveled using the 1983-2001 tidal epoch. Elevations of tidal datums referred to NAVD 88 are given in Table 13 below.

Table 13
Tidal Datums for San Diego Bay at NOAA #941-0170 Navy Pier

Category	Range
Highest Water Level (01/27/1983)	7.71 ft NAVD (8.1402 ft MLLW)
Mean Higher High Water	5.292 ft NAVD (5.7253 ft MLLW)
Mean High Water	4.5507 ft NAVD (4.9838 ft MLLW)
Mean Tide Level	2.5264 ft NAVD (2.9595 ft MLLW)
Mean Sea Level	2.5067 ft NAVD (2.9398 ft MLLW)
Mean Low Water	0.5020 ft NAVD (0.9351 ft MLLW)
North American Vertical Datum	0.00 ft NAVD (0.4331 ft MLLW)
Mean Lower Low Water	-0.4331 ft NAVD (0.000 ft MLLW)
Lowest Water Level (12/17/1937)	-3.5238 ft NAVD (-3.0907 MLLW ft)

Tidal data in Table 13 indicates that tidal ranges in San Diego Bay are greater than those found on the open coast. Mean diurnal tidal ranges are 5.72 ft as compared to 5.33 ft on the open coast, an increase of 0.39 ft of diurnal range in San Diego Bay. The extreme water level range is 11.23 ft in San Diego Bay as compared to 10.51 ft on the open coast, an increase of 0.72 ft of extreme range in the bay. All high water datum in the bay exceed those on the open coast and all the low water level datum are lower in the bay than on the open coast. This occurs because San Diego Bay is a resonant tidal system where higher harmonics of the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent are bathymetrical trapped in the bay, leading to a build-up in tidal amplitude. The tidal resonance of San Diego Bay provides additional tidal energy for forcing tidal inundation of the proposed tidal basins in the Otay River Floodplain Site and in Pond 15 Site, and is an attribute of this site that increases the chance of achieving a sustainable functioning wetland restoration.

2.7 Soil Characterization

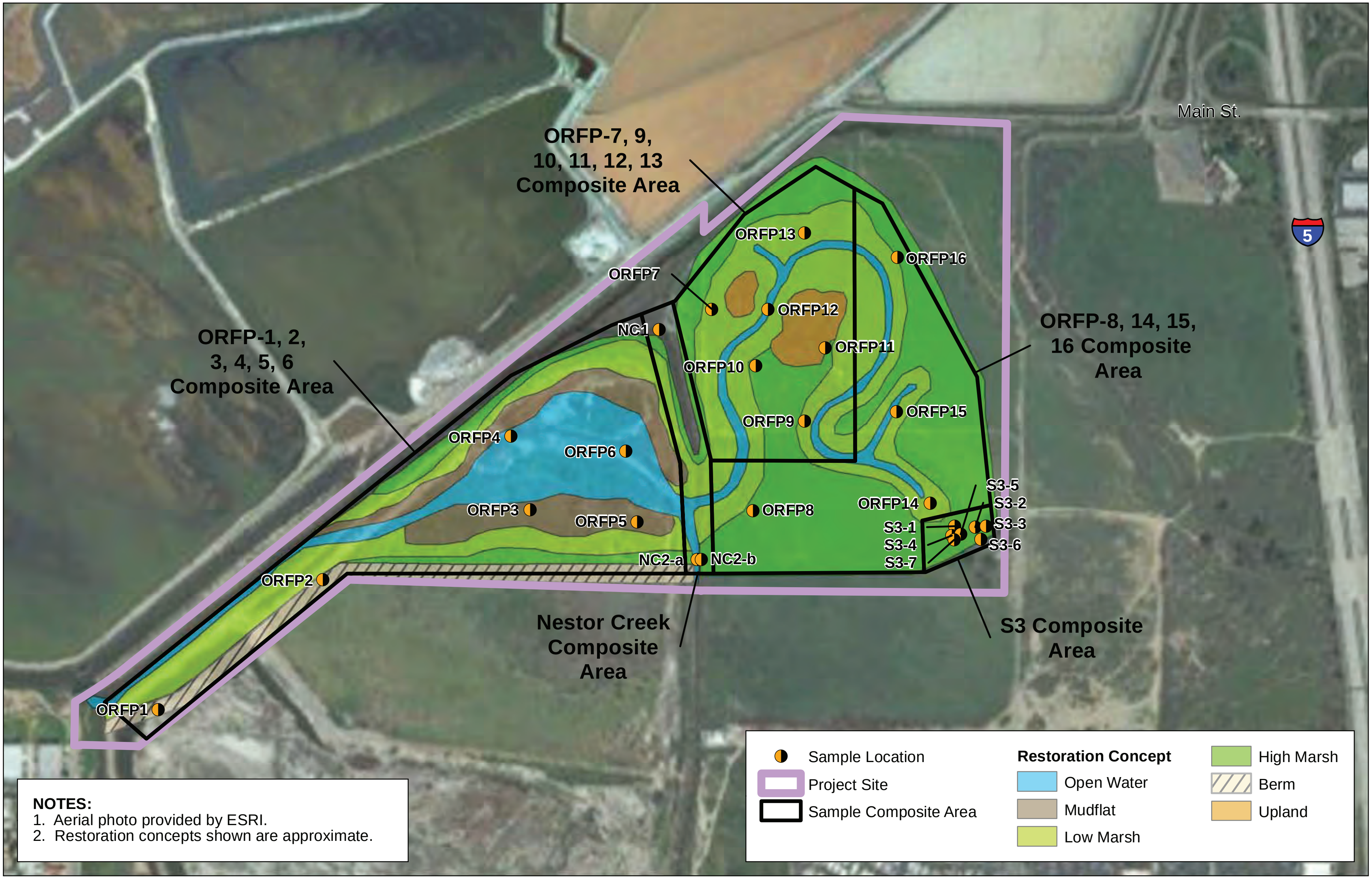
The soil characterization program was performed and managed by Anchor QEA, L.P., who worked with a team of subcontractors. Sampling locations were pre-selected based on the current conceptual plan for ORERP. The sampling program was subdivided into four areas: the Otay

River Floodplain (the majority of the ORERP site), Subarea 3 (the former agricultural equipment storage and supply area [subjected to a higher density of sampling]), Nestor Creek, and the Otay River. Sampling areas are presented on Figures 14 and 15. All sampling points were located and advanced in compliance with the Sampling and Analysis Plan (SAP) (Anchor QEA, L.P. 2012), with a few exceptions and deviations needed to avoid biological and Native American resources.

A total of 31 stations were identified to characterize Salt Ponds 12, 13, 14, and 15. Station density was based on the previous sediment characterization of Salt Ponds 10, 10a, and 11, with approximately one station per 10 acres (Everest and Anchor QEA, L.P. 2009). As previously described, an additional station was placed within the Pond 15 Site, resulting in a slightly higher station density in this pond. Sediments in Salt Ponds 12, 13, 14, and 15 may be excavated to a depth of -2 feet NAVD88, plus 1 foot of allowable overdepth (i.e., -3 feet NAVD88). Sediment cores targeted this layer plus an additional 1 foot beyond this depth (i.e., -4 feet NAVD88) to allow for the evaluation of the newly exposed surface layer. For each core, sediment from the surface to -3 feet NAVD88 was submitted for analysis to evaluate sediment that may be disturbed during restoration activities. Each 1-foot interval from the entire sediment core, including the new surface layer, was archived for potential future analysis.

Soil and sediment composite samples were analyzed for grain size, total solids, TOC, pesticides, metals, TPHs, PCBs, and SVOCs in accordance with test methods provided in the SAP (Anchor QEA, L.P. 2012). Results of physical and chemical analyses on composite samples are discussed above in Section 2.4.1.

Soil and sediment were predominately found to consist of silts and clays, with pockets of fine to medium sand. Metals were detected in all surface and subsurface composite samples. Metal concentrations in surface and subsurface soils are similar across all areas sampled, with the exception of composite samples from ORFP-7,9,10,11,12,13. Samples from this area contained elevated concentrations of metals, including copper, lead, and zinc. PCBs were detected in the surface composite samples from ORFP-7,9,10,11,12,13 and Subarea 3. No detections were observed for TPHs and polycyclic aromatic hydrocarbons (PAHs); phenols were generally not detected in most composite samples analyzed. Phthalates were detected; however, many samples were B qualified, indicating these results may be biased high due to chemicals being present in the laboratory's analytical blank samples.



SOURCE: Anchor QEA, L.P., 2013

FIGURE 15

Soil Sampling Locations–Otay River Floodplain Site

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Pesticides—DDT compounds, toxaphene, and dieldrin—were detected in the surface and/or subsurface samples of composites from the majority of samples. In the Otay River floodplain, DDTs were detected in composite samples from ORFP-7,9,10,11,12,13 in the surface (top 1 foot) and second depth interval (extending down to 0 feet NAVD88). For composite samples from ORFP-8,14,15,16, detections were observed in the surface, and in the second and third depth intervals (extending down to -6 feet NAVD88). Toxaphene was detected in the surface from ORFP-7,9,10,11,12,13 and in the surface and second depth interval (extending down to 0 feet NAVD88) from ORFP-8,14,15,16. No pesticides were detected within composite samples from ORFP-1,2,3,4,5,6. In Subarea 3, DDTs, dieldrin, and toxaphene were detected in the surface and second depth interval (extending to +6 feet NAVD88). In Nestor Creek, DDT compounds were detected in the surface and second depth interval (extending to -6 feet NAVD88). Dieldrin and toxaphene were detected in the surface. In the Otay River, DDT compounds were detected in the lower depth interval (from -4 to -6 feet mean lower low water [MLLW]) for composite samples from OR-1,2,3. For composite samples from OR-7,8,9, similar detections were observed in the upper depth interval (from mudline to -4 feet MLLW).

Salt pond sediments were predominantly fine-grained materials, consisting of 78.9 to 100% fines (silt and clay). TOC concentrations ranged from 0.53 to 6.5%.

All metals were detected in salt pond sediments. Chromium, selenium, silver, and zinc concentrations were less than screening levels in all samples. Arsenic, cadmium, copper, lead, mercury, and nickel were measured at concentrations greater than screening levels in at least one sample (Table 13). A summary of results is provided below.

- Arsenic concentrations were greater than both Residential and Commercial/Industrial CHHSLs and RSLs at all stations. Stations 13-03 and 13-04 also exceeded the ERL value and Zeeman risk-based screening level for benthic invertebrates. However, all concentrations of arsenic were less than the southern California regional background level of 12 milligrams per kilogram (mg/kg; Chernoff et al. 2008).
- Cadmium concentrations were relatively low, with the exception of Station 1. This station exceeded the Zeeman screening levels for fish and tern.
- Copper concentrations were greater than Zeeman screening levels at 12 stations, which included one station in each of Ponds 12 and 14 and approximately 60% of stations in Ponds 13 and 15. All stations exceeded the Zeeman screening level for benthic invertebrates, five stations exceeded the screening level for benthic vegetation, and two stations (15-01 and 15-10) exceeded the screening level for wigeon, scooter, and tern. Stations 15-01 and 15-10 also exceeded the ERL value.

- Lead concentrations were greater than Zeeman screening levels at all stations. All stations exceeded the screening level for wigeon, scooter, tern, grebe, and skimmer. Nineteen stations exceeded the screening level for pelican. Stations 15-01 and 15-10 exceeded the screening level for turtle.
- Mercury concentrations were greater than Zeeman screening levels at six stations, which included four stations within Pond 12 and two stations within the Pond 15 Site. All stations exceeded the screening level for tern. Station 15-10 exceeded the screening level for skimmer.
- Nickel concentrations were relatively low, with the exception of Stations 15-01 and 15-10. Both stations exceeded the ERL value and Zeeman screening level for benthic invertebrates. Station 15-01 also exceeded Zeeman screening levels for sea lion and tern.

PAHs and pesticides were detected in salt pond sediments. PAHs were measured at low concentrations in approximately half of the samples from Ponds 12 and 13 and all of the samples from Ponds 14 and 15. Station 15-01 exceeded the ERL value for total low molecular weight PAHs, while Station 12-09 exceeded the Residential RSL for benzo(a)pyrene.

DDTs and dieldrin were the only pesticides detected in salt pond sediments. DDTs were measured at four stations (13-07, 14-04A, 15-01, and 15-10). Station 15-01 exceeded the ERL values for 4,4’-DDE and total DDTs. Dieldrin was measured at four stations (12-10, 13-02, 13-07, and 14-04A). All concentrations were greater than the ERL value. PCB congeners were not detected in salt pond sediment.

2.8 Water Quality

Water Quality within the project site is regulated by the Regional Water Quality Control Board, through the Water Quality Control Plan for the San Diego Basin (Basin Plan). This plan designates beneficial uses for water bodies in the San Diego Region, established water quality objectives, and implementation plans to protect those beneficial uses. The proposed project is located within the Otay Hydrologic Unit, and specifically within the Otay Valley Hydrologic Area, designated 910.2 (RWQCB 2004).

2.8.1 Groundwater

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 tidal influence of the Otay River Floodplain Site, groundwater is slightly brackish limiting vegetation to species with salt tolerance.

2.8.2 Surface Waters

Nestor Creek bisects the Otay River Floodplain Site from the southern edge, and outlets into the Otay River. The Otay River flows along the eastern edge, and continues along the northern and western boundary of the Otay River Floodplain Site, before bisecting Pond 11 and Pond 12 to outletinto San Diego Bay. In addition to the Basin Plan's water quality objectives, the Clean Water Act 303(d) list highlights any impaired surface water bodies within the region. Both of these freshwater inputs are not listed within the Clean Water Act Section 303(d) List 2010 Integrated report as impaired water bodies.

2.8.3 San Diego Bay

Historically, water quality within San Diego Bay suffered serious degradation due to discharge of untreated municipal sewage and industrial wastes. Due to the plethora of different surrounding jurisdictions as well as the number of separate agencies discharging to the bay, the San Diego Bay Interagency Water Quality Panel was established in 1988 to address the Bay's 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 the value and resources within the bay. Also in 1998, the San Diego Bay was included within the California Section 303(d) list as an impaired water body by the California State Water Resources Control Board (SWRCB) due to benthic community degradation and toxicity. San Diego Bay is still currently listed on the 303(d) list, but only for PCBs (Polychlorinated biphenyls).

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3 SITE OPPORTUNITIES AND CONSTRAINTS

The opportunities and constraints that have significant influence on the wetlands restoration of the Otay River Floodplain Site and the Pond 15 Site are summarized in Table 14. The opportunities and constraints presented in Table 14 are similar to those presented in the Preliminary Restoration Plan submitted to the Coastal Commission. This table is general in scope related to the overall project. Detailed mitigation measures for potential impacts associated with the project are provided in the FEIS.

Table 14
Site Opportunities and Constraints Related to the Development of the Final Restoration Plan

Category	Specific Issue	Design Consideration
Opportunities		
Hydrology	Location suitable for tidal habitat restoration	Open and continuous tidal connection is required for both the Otay River Floodplain Site and the Pond 15 Site. Detailed hydrologic studies were undertaken by Poseidon to determine if any muting or restriction of tidal flows would occur at these sites and design changes were made to promote full tidal exchange. The hydrologic modeling shows some muting at the lower end of the tidal range for the floodplain portion of the project due to some deposition within the Otay River channel; however, this is not expected to present any problem in water quality or establishment of a mix of subtidal or intertidal habitats. The inlets to the Pond 15 Site have been designed to allow for a full tidal exchange.
Elevation	Higher elevations can lead to the need for excessive amounts of material to be excavated and trucked off site	Both sites are within the boundary of historic tidal marsh and transitional habitat in San Diego Bay and therefore are close to the elevations associated with tidal marsh habitats. Some excavation and subsidence has occurred within the Pond 15 Site. The project has been designed to minimize the amount of material that will be trucked off site. Excess materials excavated from the Otay River Floodplain Site will be transported to the Pond 15 Site to raise elevations suitable to create vegetated tidal marsh and nesting sites. The project is generally balanced overall in terms of cut and fill.
Existing Conditions	Minimal development exists in the surrounding area and existing conditions are largely degraded due to past or current uses	The past and current use of the restoration areas is for solar salt production through evaporation in sequential ponds that lead to crystallizer beds. As a result, high levels of salinity are present either in the soils or in the brines within the Pond 15 Site. This has minimized the presence of sensitive biological resources and the occurrence of high value habitats. While the Pond 15 Site is used by migratory birds, including the California least tern, and the Otay River channel is occupied by the light footed clapper rail, the project construction windows and buffers can be designed to minimize impacts to these species. Project design will result in substantial restoration of habitat for tidal wetland species, a net increase in wetland area, and minimal impact to sensitive habitats or species. In addition, the restoration areas are either surrounded or abut open space areas and there is substantial undeveloped buffer around the restoration sites to assure that wetland habitat and sensitive species will remain undisturbed.
Accessibility	Constructability is feasible without new construction access	Both sites have suitable access for construction access, staging, and transport of materials and workers. Alternative access routes are possible as are construction methods.

Table 14
Site Opportunities and Constraints Related to the Development of the Final Restoration Plan

Category	Specific Issue	Design Consideration
Long term maintenance and management	Site is located within the Refuge	Management will be provided by the Service in conjunction with other lands owned by the Service once the performance standards are met.
Constraints		
Flooding	100 year flood conditions could change as a result of the project	The excavation and change in land configuration could have an effect on the 100 year flood elevations. The project design has been evaluated for any changes in the 100 year flood elevations based on standard FEMA modeling and adjustments have been made in the project design to eliminate any change in 100 year flood elevations as a result of land change.
Soil contamination	Soil contamination could result in substantial amount of soil being trucked to off-site locations	Soil sampling was conducted in both the Otay River floodplain and the Pond 15 Site. Some elevated levels of DDT, DDE, and its degradation products, as well as toxaphene, were found in the Otay River floodplain. It was determined that if these areas were disturbed, the soils could not be reused for restoration purposes and would need to be disposed of within an approved landfill. This would have made the project infeasible. Therefore, the project footprint was changed to avoid impacting or disturbing these areas. Additional soil sampling will be conducted during the excavation process to assure that contaminated soils are not used in any portion of the restoration site.
Air Quality	Truck traffic could contribute to exceedance of air pollution standards	The project has been designed to minimize truck traffic, either to haul materials off-site or to transport materials within the project footprint. Alternative means of transporting excavated sediment have and will be considered to further reduce truck traffic, including the use of slurry transport through pipes. Appropriate mitigation will be adopted to reduce air quality impacts during construction.
Sensitive Species	Sensitive species may be disturbed or killed during project construction	Light footed clapper rail, western snowy plover, and the California least tern are known to occur in the area and may occur in the construction area. The project will require permitting from the US Fish and Wildlife Service through a Federal Endangered Species Act Section 7 consultation with the U.S. Army Corps of Engineers and appropriate pre-construction surveys, construction best management practices, and environmental work windows will be established to protect these species. The project will have beneficial effects for these species after construction.
Existing wetlands	Existing wetlands within the footprint of the project	There are some existing degraded wetlands within the Otay River floodplain footprint. The project will not receive any credit towards the requirements of the MLMP for any wetland area converted to tidal wetland and will need to provide 4:1 mitigation for any existing wetland converted to upland (for flood control levees). The project has been designed to accommodate these impacts and will still meet the MLMP requirements. 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 California Coastal Commission. It was determined that for each acre that was restored to tidal habitat within the Pond 15 Site, only 0.75 acres would be applied towards the MLMP requirements.

4 RESTORATION PROJECT DESCRIPTION

4.1 Introduction/Background

This restoration plan focuses on the restoration activities, which are planned to accomplish a set of site-specific and regional goals. The goals are listed in Section 5.2 of this FRP, as well as explanation of compliance of each goal.

As discussed in Section 1.0, the Intertidal Alternative addressed in the Draft EIS is the preferred alternative. This restoration plan is a reflection of the Intertidal Alternative, which is shown in Figures 16, 17, 18, and 19 below. Figures 16 and 17, Otay River Floodplain Site Restoration Year 2018 and Pond 15 Site Restoration Year 2018, respectively, show the two sites upon completion of restoration, while Figures 18 and 19, Otay River Floodplain Site Restoration Year 2050 and Pond 15 Site Restoration Year 2050, respectively, show the two sites under a 2050 mean sea level rise assumption of 1.17 feet. Restoration activities will occur at two separate non-contiguous locations within the Refuge: (i) the Otay River Floodplain Site and (ii) the Pond 15 Site. The approximately 78-acre Otay River Floodplain Site is located west of Interstate 5 (I-5) between Main Street to the north and Palm Avenue to the south. The Pond 15 Site consists of an approximately 90-acre solar salt pond located in the northeast portion of the Refuge, to the northwest of the intersection of Bay Boulevard and Palomar Street in Chula Vista.

The ORERP will involve excavation of a portion of the Otay River Floodplain Site and fill of the Pond 15 Site to create elevations suitable for subtidal, intertidal mudflat, intertidal coastal salt marsh, and transitional habitats as well as associated uplands. Restoration conducted in the Otay River Floodplain Site will be limited to the portion of the floodplain located west of Nestor Creek, as shown in Figures 16. This is due in part to presence of contaminated soils on the eastern portions of Refuge from past agricultural uses. Within this portion of the Otay River Floodplain Site the ground will be lowered to elevations suitable to support the target wetland habitats and wetland-associated upland habitats. In addition, the existing dike running through Pond 20A will be removed and the flood protection functionality of this feature will be replaced through construction of a levee along the southern boundary of this portion of the Otay River Floodplain Site. No restoration activities will be conducted in the former agricultural areas east of Nestor Creek, but this area will be available and used for staging associated with construction. In addition to the work in the Otay River Floodplain Site and Pond 15 Site, a portion of the existing dike between Salt Ponds 21 and 22 will be raised two feet to offset potential project-induced flood impacts. Besides earthwork, the restoration project might include slope armoring (e.g., riprap) to protect the Bayshore Bikeway Bridge and a railroad bridge located just under the Bayshore Bikeway Bridge. The need for this slope protection will be evaluated as part of final design and permitting.

The restoration plan is composed of approximately 20% intertidal mudflat and 80% intertidal salt marsh as shown in Figures 16 and 17. Both the Otay River Floodplain Site and the Pond 15 Site will be planted with a mix of native wetland vegetation that will mature into low marsh, mid marsh, and high marsh vegetative communities. The intertidal areas and unvegetated mudflat will provide foraging habitat for adult and juvenile fish. Specific details regarding each habitat type are discussed in Section 4.2 below.

4.2 Detailed Description of Project Components

4.2.1 Subtidal Habitat

All of the approximately 9.5 acres of subtidal habitat will be located within the Pond 15 Site upon completion of restoration. Under the 2050 sea level rise assumptions, the Otay River Floodplain Site is anticipated to still have no subtidal habitat, while the Pond 15 Site is anticipated to increase to 13.5 acres of subtidal habitat.

4.2.2 Intertidal Mudflat Habitat

Upon completion of restoration, approximately 5.2 acres of intertidal mudflat habitat will be located within the Otay River Floodplain Site and approximately 17.9 acres will be located within the Pond 15 Site. Under the 2050 sea level rise assumptions, both intertidal mudflat habitats would increase to 16.6 acres and 31.4 acres within the Otay River Floodplain Site and the Pond 15 Site, respectively.

4.2.3 Intertidal Coastal Salt Marsh Habitat

Upon completion of restoration, approximately 24.6 acres of intertidal coastal salt marsh habitat will be located within the Otay River Floodplain Site and approximately 55.8 acres will be located within the Pond 15 Site. Under the 2050 sea level rise assumptions, the salt marsh habitat within the Otay River Floodplain Site is anticipated to increase to approximately 48.4 acres, while the habitat in the Pond 15 Site is anticipated to decrease to 39.8 acres. The salt marsh habitats will be planted with species that include California cordgrass, Salt marsh daisy, Sea lavender, and saltgrass. Detailed discussion of plantings is found in Section 4.3 below.

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

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SOURCE: Anchor QEA, L.P., 2013

FIGURE 16
Soil Sampling Locations - Pond 15 Site

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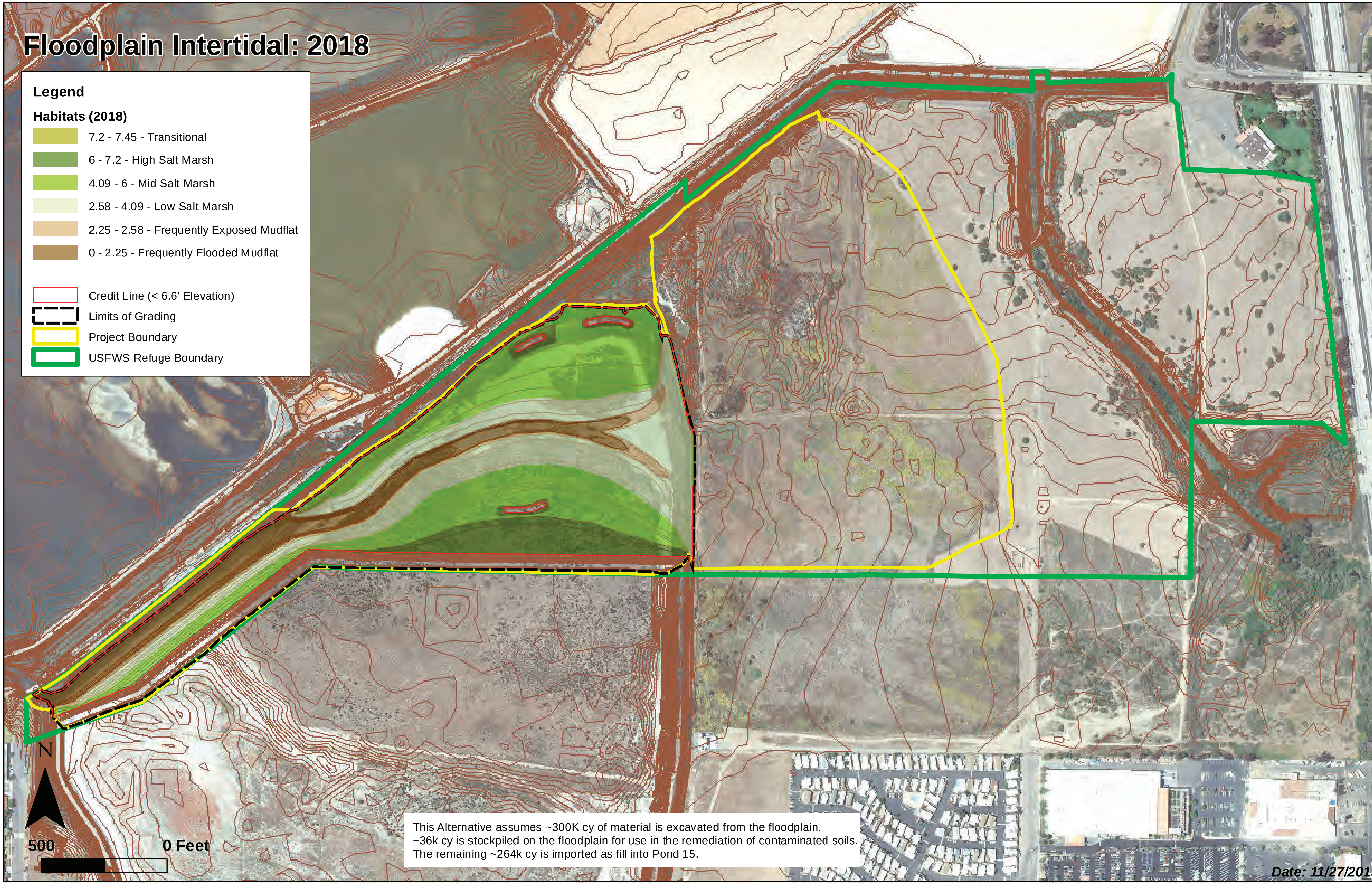

SOURCE: USFWS

FIGURE 17

Otay River Floodplain Site Restoration Year 2018

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SOURCE: USFWS

FIGURE 18

Pond 15 Site Restoration Year 2018

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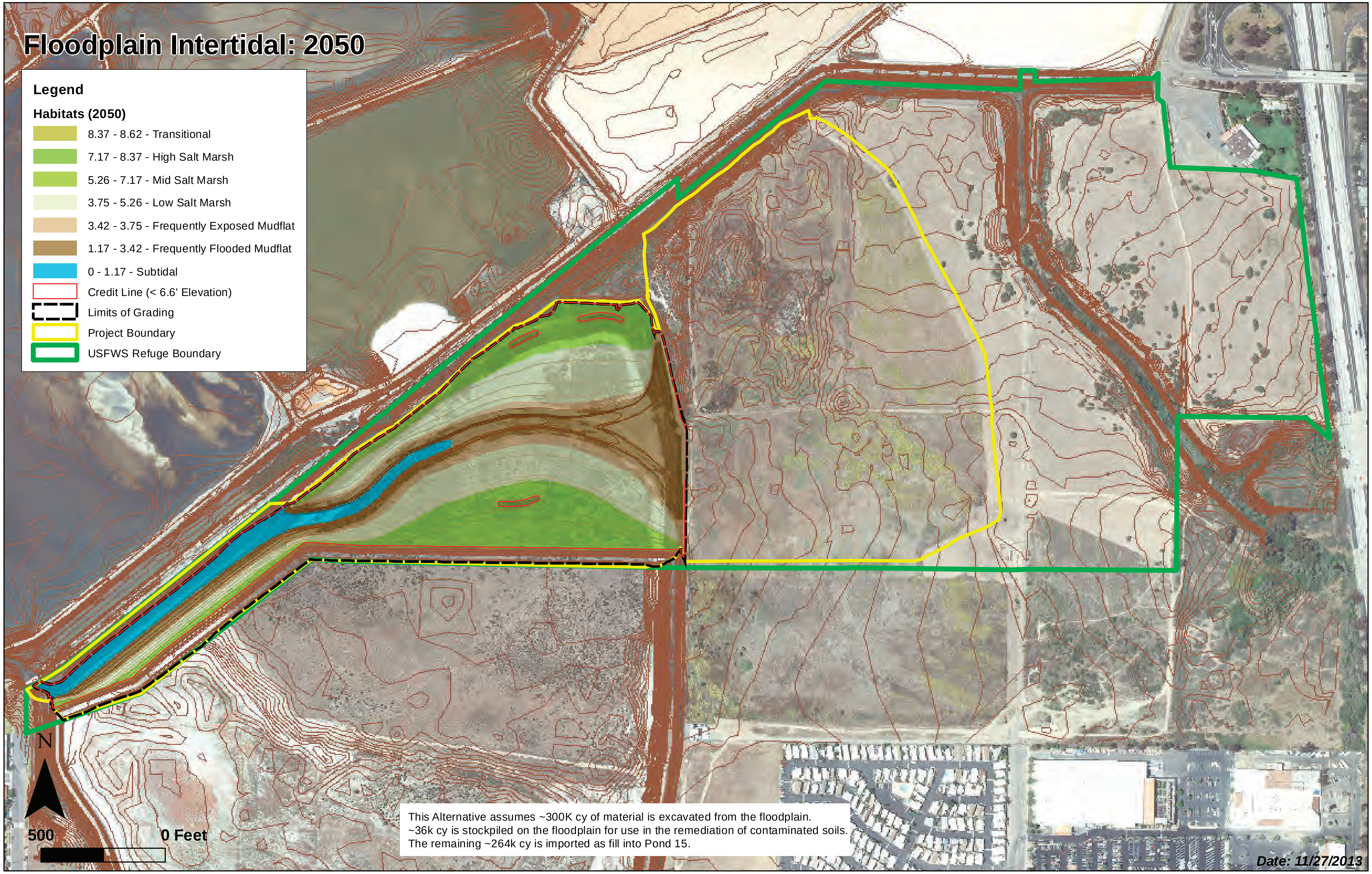

SOURCE: USFWS

FIGURE 19

Otay River Floodplain Site Restoration Year 2050

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4.2.4 Transitional Habitats

A relatively small portion of the upland habitats will be restored as transitional habitats. Approximately 0.7 acres and 0.4 acres will be located within the Otay River Floodplain Site and the Pond 15 Site, respectively. Under the 2050 sea level rise assumptions, the transitional habitat located within the Otay River Floodplain Site is anticipated to increase slightly to 0.8 acres, while the Pond 15 Site transitional habitat is anticipated to decrease slightly to 0.4 acres. The transitional habitats will be planted with species that include alkali weed, saltgrass, and boxthorn. Detailed discussion of plantings is found in Section 4.3 below.

4.2.5 Nesting Sites

Nesting sites will be created to increase suitable habitat for birds that include the California least tern, the light-footed clapper rail, the western snowy plover, and colonial nesting seabirds.

4.2.6 Tidal Inlet at Pond 15 Site

In order to allow for tidal influence at the restored Pond 15 Site, an approximately 200 foot wide portion of the levee separating the Pond 15 Site from San Diego Bay will be removed.

4.2.7 Stockpile Sites

All suitable excavated material from the Otay River Floodplain Site will be placed within the Pond 15 Site, as well as fill for levees and berms as described below. The remainder of the material will be stockpiled within the Otay River Floodplain Site, but outside the restoration area and where there is no existing soil contamination. The stockpiled soils will be spread and compacted using conventional earthmoving equipment, watered during construction to mitigate for dust generation, and seeded with temporary vegetation once construction is complete to control wind and water-related erosion until the stockpile material can be reused. The Service anticipates that the stockpiled soils can be used to fill the eastern portion of the site, once the contaminated soils are properly removed. The stockpiled material will remain upon completion of restoration for use by the Service on future projects within the Refuge.

4.3 Hydrologic Modeling

4.3.1 Tidal Modeling Results

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was also used to calibrate tidal the hydraulics model. San Dieguito Lagoon was selected as a proxy for the restoration alternatives because of morphologic similarities: in particular, both restoration sites have a long “goose-neck” feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the restoration alternatives. Calculations of habitat creation were based on long-term tidal hydraulics simulations using tidal forcing at the mouth of the Otay River, derived from a spectral correction applied to the NOAA tide gage #941-0170 located at the Navy Pier.

Figure 21, Intertidal Plan Spring Flood Tide Progressive Vector Flow Simulation, gives the flow trajectories and depth averaged tidal currents computed by the calibrated TIDE_FEM model during spring flooding tides on 18 September 2009. Velocities of tidal currents are portrayed according to the color coded velocity scale appearing in the lower left corner of the figure. Maximum flooding spring tidal currents in the deeper sections of the inlet channel to the proposed Otay River Floodplain Site basin (north/south reach of the Otay River near its mouth) are about 0.10 m/sec (0.33 ft/sec), and then accelerate in the narrower east/west reach to 0.2 m/sec (0.66 ft/sec) before entering the Otay River Floodplain Site tidal basin. Flood tide currents entering the tidal basin initially form a well-defined jet at the west bank with speeds of about 0.08 m/s (0.26 ft/sec). This entry jet quickly diverges into a complex set of clockwise rotating eddies that populate the interior of the tidal basin. Eddy speeds in the tidal basin are on the order of 0.02 m/sec (0.07 ft/sec), insufficient to transport fine sand but 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. Maximum flooding spring tidal currents in the inlet channel to the Pond 15 Site are about 0.07 m/sec (0.22 ft/sec), and then decelerate as a weak entry jet with speeds of about 0.05 m/s (0.16 ft/sec). This entry jet also quickly diverges into a complex set of counter rotating eddies that populate the interior of the tidal basin. Eddy speeds in the Pond 15 Site tidal basin are on the order of 0.01 m/sec (0.03 ft/sec), again insufficient to transport fine sand or cohesive silts, but also 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.

Figure 22, Ebb Tide Progressive Vector Flow Simulation at Mean Low Water, gives the flow trajectories and depth averaged tidal currents computed by the TIDE_FEM model during spring ebbing tides on 18 September 2009. The wetted area of the Otay River Floodplain Site tidal basin is significantly reduced relative to the flood tide area in Figure 21, due to the fact that the grading plan allows for almost complete drainage at mean low water tidal stages. In Figure 22 creeping flow drains from the remnant dendritic channel on the north side of the Otay River Floodplain Site basin, forming a feeder current in the upper river channel with speeds on the order of -0.01 m/sec (-0.03 ft/sec). This feeder current evacuates the tidal basin and then accelerates to -0.1 m/sec (-0.32 ft/sec) as it passes through the pinch point under the railroad bridge in the narrow east/west reach of channel. (We adopt the convention of negative velocities for ebb tide flows and positive velocities for flood tide flows.) Ebb flow in the channel then decelerates to -0.08 m/sec (-0.26 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. In the Pond 15 Site during ebb tide flow at mean low water level, the eastern half of the basin is completely drained and exposed, while a week feeder current evacuates the western half with ebb flow of about -0.02 m/sec (-0.07 ft/sec). This feeder current accelerates to about 0.08 m/sec as it flows out the inlet of Pond 15 Site, and is far below the threshold scour speed of the sediments along the bank of the Chula Vista Wildlife Reserve.

Comparing the standard Hjulstrom Curve against the median grain sizes from the project borings reported in Section 2.7 indicates that native sediments in the lower Otay River Channel and near the inlet to Pond 15 Site have a threshold of motion of 0.72 ft/sec (0.22 m/s). Tidal current speeds between 0.35 ft/ sec (0.1 m/sec) and 0.72 ft/sec (0.22) would lead to bed load transport but not erosion. Erosion and scour would only occur for tidal currents that exceed 0.72 ft/sec, while currents less 0.35 ft/sec would yield deposition. Comparing these sediment thresholds to the tidal currents predicted for maximum range spring tides in Figures 21 and 22, it can be concluded that the only potentially problematic areas are at the two pinch points in the east/west reach of Otay River channel during flooding tides (Figure 20). Scour is a non-factor in the inlet to Pond 15 Site due to the very low current speeds through that relatively wide inlet. Some spot channel hardening may be advisable at the Otay River pinch points, but otherwise there are no apparent tidal current scour or erosion concerns with the restoration plan during either flood or ebb flow, not even during maximum range spring tides such as occurred on 18 September 2009.

The hydroperiod function (used to calculate the habitat acreage creation of the restoration plan) is calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. By the California State CAT-OPC guidance, sea level rise projections range between 4.68 and 24 inches (12 to 61 cm) by 2050. To calculate the hydroperiod function for these potential future sea levels, it is necessary to anticipate the tidal response inside San Diego Bay to these ranges of sea level rise on the open coastline. Two approaches are used. The first is linear superposition of the open ocean sea level rise on to the present 30 year time series of south San Diego Bay tides developed from spectral corrections to the NOAA Navy Pier tides detailed in Section 2.6.4. The second is to apply a spectral correction derived from the Navy's Bay tide model for sea level rise (ICLEI, 2012). Figure 23, Comparison of South San Diego Bay tides for Present Sea Level versus South Bay Tidal Response on 2050, shows a data snippet comparing tides at the mouth of the Otay River at present sea level (gray) versus the South Bay tidal response predicted for 2050 by the linear superposition method (red) and by the spectral correction method (blue). Obviously the higher-high and lower-low water levels will all be higher in 2050 based on the maximum CAT OPC guidance for sea level rise of 24 inches. The decisive issue is what will the South Bay tidal range be at these higher sea levels. The linear superposition method predicts the exact same tidal range as present, only oscillating around a 2 ft. higher sea level. The spectral correction method predicts the exact same higher high water levels as the linear superposition method, but yields a larger tidal range. This is due to the fact that the 2050 tidal spectra derived from the Navy's Bay tide model predicts principal spectral peaks with a diminished second harmonic of the K1 lunar-solar diurnal tidal constituent at the mouth of the Otay River, (Figure 24), indicating diminished bottom friction over the South Bay Shelf due to two feet of additional water depth at higher sea level. Also there is further enhancement of resonant triad sub-harmonic (difference frequency) between the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent measured at the mouth of the Otay River, (Figure 23), indicating bathymetrically trapped tidal oscillations on the South Bay Shelf has intensified in the presence of deeper water and diminished bottom friction.

Using these various methods for providing long-term, locally relevant tidal forcing for the model, the hydroperiod functions are calculated at present and future sea levels for the Otay River Floodplain Site basin in Figure 25, Hydroperiod Function of Restoration Plan on Otay River Floodplain Site, and for the Pond 15 Site basin in Figure 26, Hydroperiod Function for the Restoration Plan - Pond 15 Site Tidal Basin. The elevation breaks (zonation) between the different wetland habitat types from the hydroperiod curves are summarized in Tables 15 and 16. The elevations for the habitat breaks in these figures and tables are applied to the KTUA grading designs and yield the acreages of habitat creation discussed in Section 4.7. For all possible sea level scenarios, the elevation limit of subtidal habitat in the Otay River Floodplain Site basin is limited by existing bars and channel bottom features at the inlet and inside the branch channel into this basin that create an inlet sill at 0.0 ft NAVD 88. The restoration plan calls for no construction dredging of the existing Otay River channel so as not to disrupt existing habitat residing down-river from the inlet to the Otay River Floodplain Site basin. That existing down-river habitat consist of additional mud flat residing below – 0.0 ft NAVD 88 and subtidal habitat below -1.01 ft NAVD 88. Low tide drainage of the Pond 15 Site is constrained by the tidal muting of the South Bay Shelf, which varies with sea level. At present sea level, Pond 15 Site will not drain below – 1.65 ft. NAVD 88. However, with a moderate amount of sea level rise, the linear SLR = 4.68 in. solution indicates a moderate improvement in drainage to – 1.70 ft NAVD

88. If sea level were to rise by 2 ft. according to the maximum sea level rise prediction in 2050, the available tidal range is not sufficient to prevent a rise in subtidal elevations in Pond 15 Site. This amount of sea level rise will raise the elevations of the zonation of all habitat types (Figure 25). This upward displacement of wetland zonation is largest for the linear superposition scenario, because the spectral correction scenario predicts a larger tidal range of about 1.0 ft. Under the 24 in. spectral sea level rise scenario at 2050, intertidal wetland habitat would begin at an elevation 0f -0.25 ft NAVD, and the mud flat habitat would reside about 0.4 ft - .0.5 ft. lower than under the linear super-position scenario; while the low marsh habitat would reside about 0.25 ft. lower than under the linear super-position scenario. Therefore there is some apparent differences between the habitat mix predictions of these two sea-level rise prediction methods; although both give the same estimate of the maximum elevation of high salt marsh wetland zonation in both of the propose basins of the restoration plan.

Table 15
Elevations of Habitat Breaks in the Otay River Floodplain Site Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.40 ft.	3.40 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.55 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.05 ft.	9.85 ft.	9.85 ft.

Table 16
Habitat Breaks in the Pond 15 Site Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.25 ft.
Frequently Flooded Mud Flat	2.40 ft.	2.50 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.85 ft.	9.85 ft.

Figure 27, Residence Time of South Bay Water in the Tidal Basin on Otay River Floodplain Site, presents the model results of residence time of South Bay water in the tidal basins of the restoration plan for the Otay River Floodplain Site basin (blue) and the Pond 15 Site basin (red). Residence time of South Bay water is 2 days in the floodplain basin and 3 days in the Pond15 Site basin. Residence time is less in the Otay River Floodplain Site basin because its maximum storage volume at higher-high water level is only 4.4 million cubic ft. and nearly completely drains at mean lower low water levels; whereas the maximum storage volume of the Pond 15 Site basin is 3.6 times greater at 15.9 million cubic ft., and about 700 hundred thousand cubic ft. of water fail to drain after one diurnal tidal cycle. Regardless, the residence time numbers for the restoration are rather good for marginalizing potential dissolve oxygen depletion, although the DO of South water can become quite low during evaporative summer time conditions. Maximum diurnal tidal prisms at present sea levels are 4.3 million cubic ft. for the proposed Otay River Floodplain Site basin; and 15.2 million cubic ft. for the proposed Pond 15 Site basin.

4.3.2 Flood Modeling Results

Using the TUFLOW model, flood modeling was conducted to establish the flow pattern and water elevations during flood events. The flood impact analysis conducted for the 100-year flood includes the Otay River, Poggi Canyon Creek, and Nestor Creek. Flood conditions were analyzed in the existing condition and after restoration, and then compared to evaluate changes in flow pattern and maximum water elevations. In the existing condition, floods inundate the Otay River floodplain and then enter the salt pond area through Ponds 51, 20, and 22, as shown in Figure 28. The salt ponds fill from the west and east sides before overtopping the levees into San Diego Bay. Through restoration, flood flows would be redistributed through the project area and enter the salt ponds through Ponds 51 and 22. A greater amount of flooding would occur from the west side of the salt ponds compared to the east side inundating all the ponds except for the Pond 15 Site, which would be isolated from flood flows. Higher flood elevations in the northern portion of the salt ponds would result in greater flows overtopping into San Diego Bay along Ponds 12 and 14 as well as greater flows into Ponds 28 and 29.

SOURCE: USFWS

FIGURE 20

Pond 15 Site Restoration Year 2050

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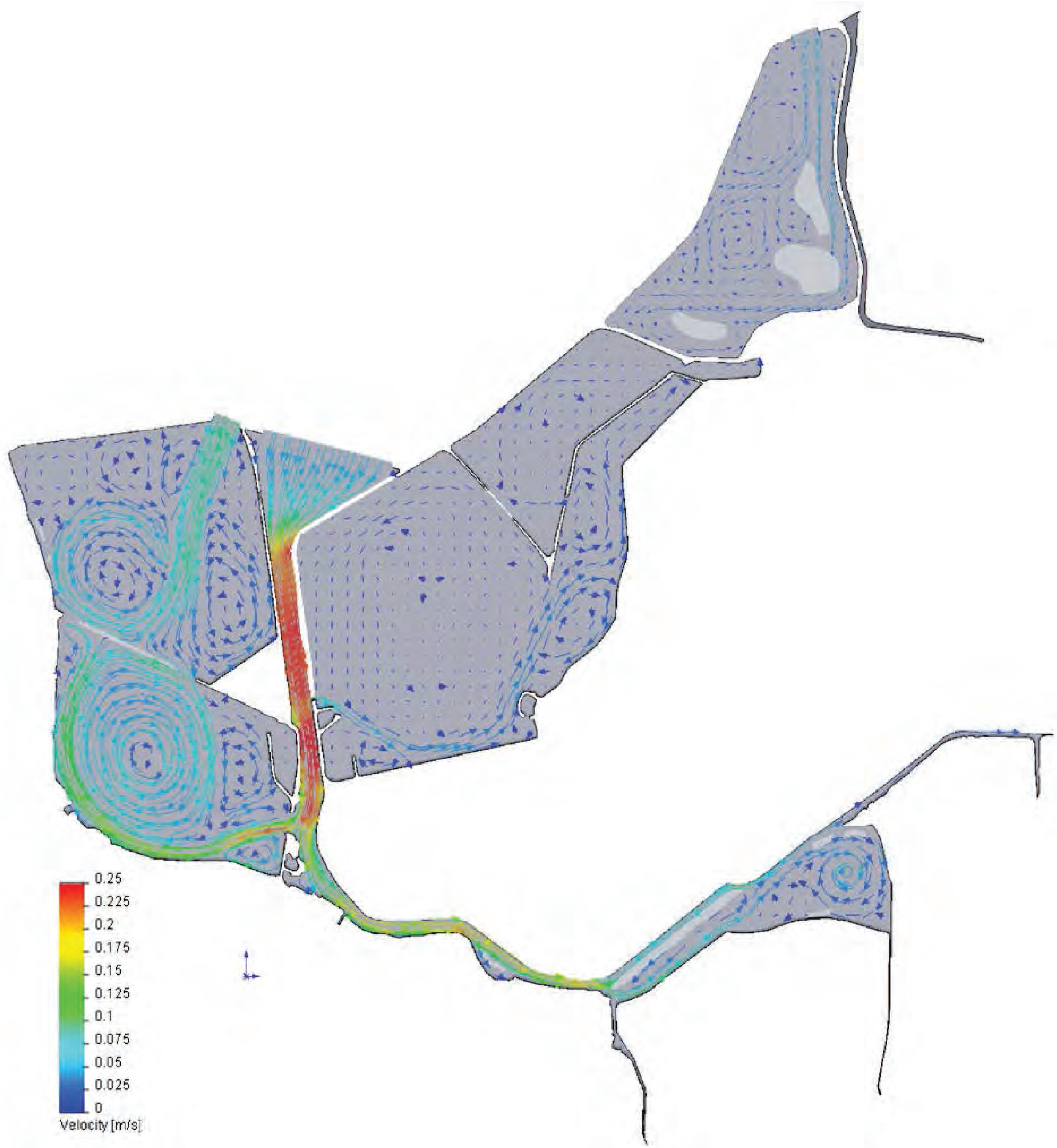

Intertidal Plan Spring Flood Tide Progressive Vector Flow Simulation (30 min time integration).

SOURCE:

FIGURE 21

Intertidal Plan Spring Flood Tide Progressive Vector Flow Simulation

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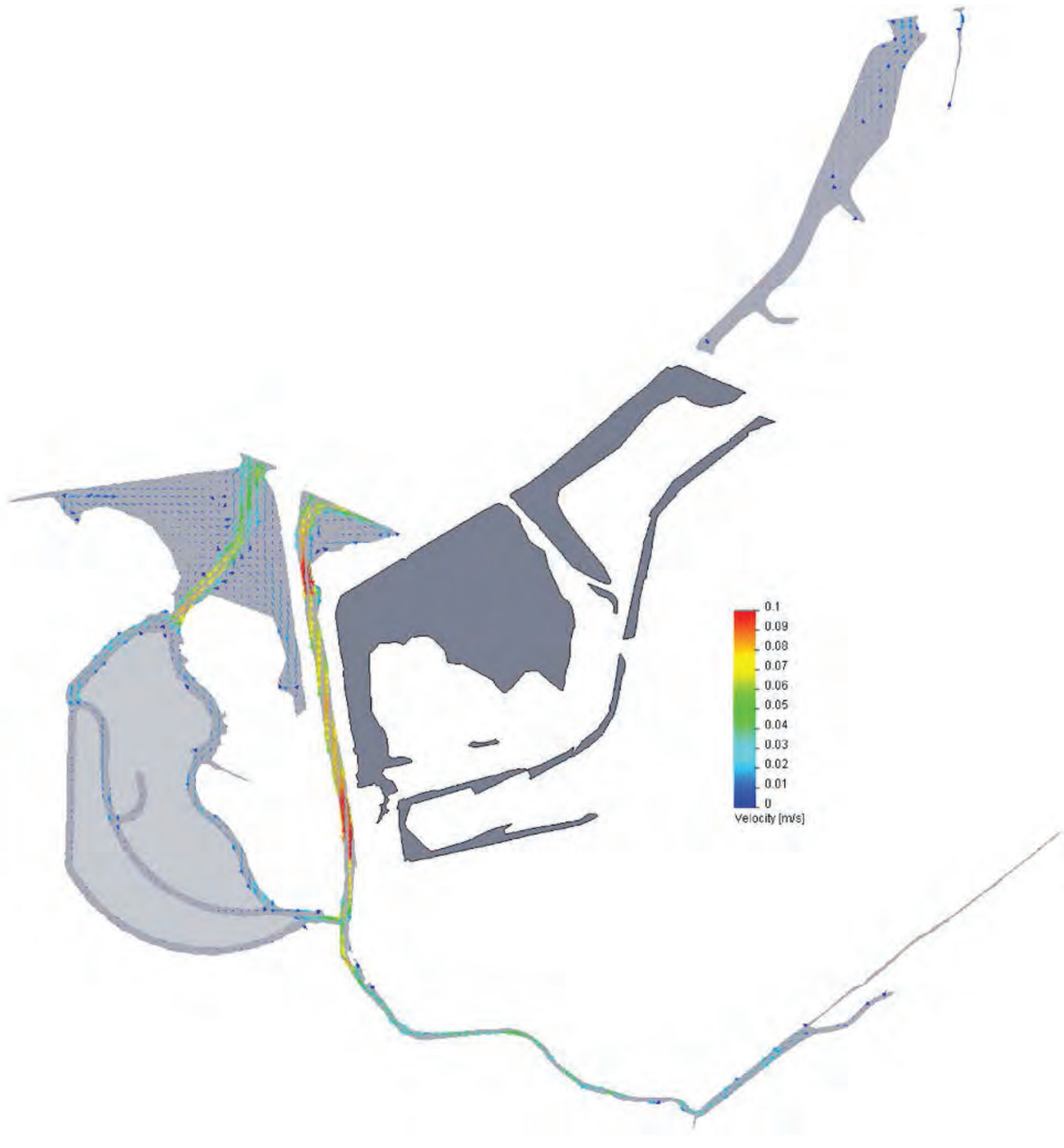

Intertidal Plan Ebb Tide Progressive Vector Flow Simulation at Mean Low Water (30 min time integration)

SOURCE:

FIGURE 22

Ebb Tide Progressive Vector Flow Simulation at Mean Low Water

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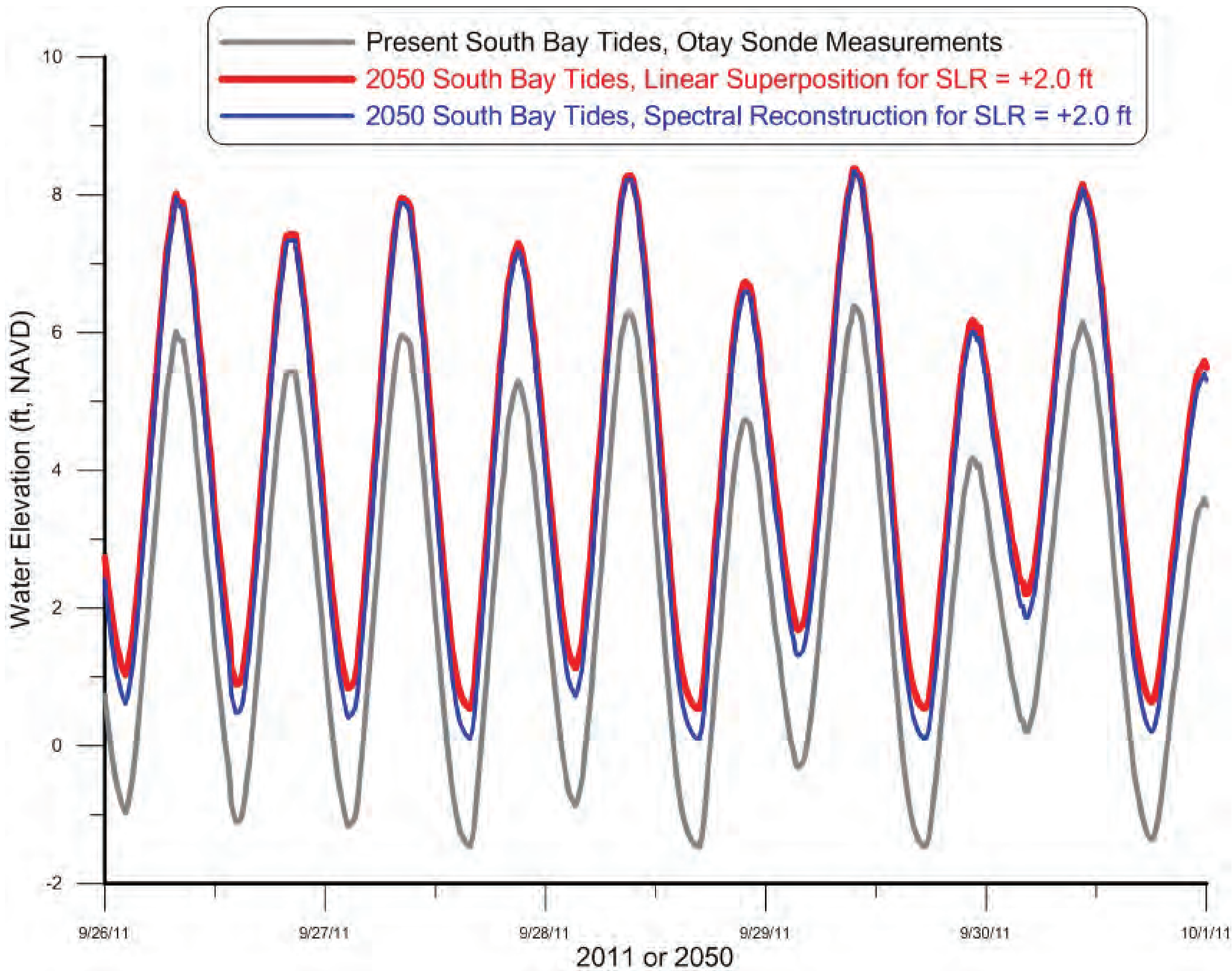

Comparison of South San Diego Bay tides for present sea level (gray) versus South Bay tidal response on 2050 by the linear superposition method (red) and the spectral correction method (blue).

SOURCE:

FIGURE 23

Comparison of South San Diego Bay Tides with Sea Level and 2050 South Bay Tidal Response

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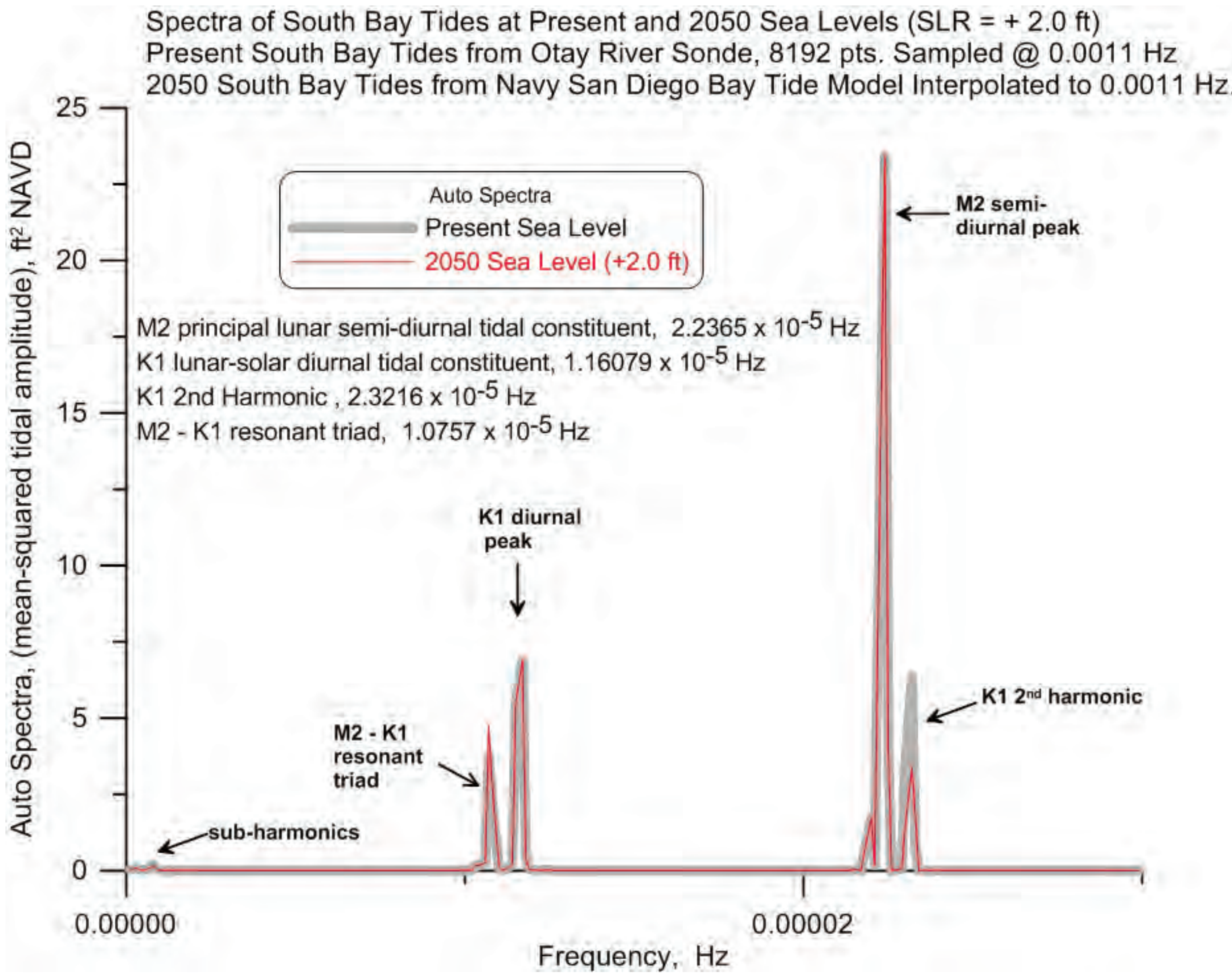

Comparison of spectra South San Diego Bay tides for present sea level (gray) versus South Bay tidal response for maximum estimated sea level rise in 2050 (red).

SOURCE:

FIGURE 24

Comparison of Spectra South San Diego Bay Tides and 2050 South Bay Tidal Response

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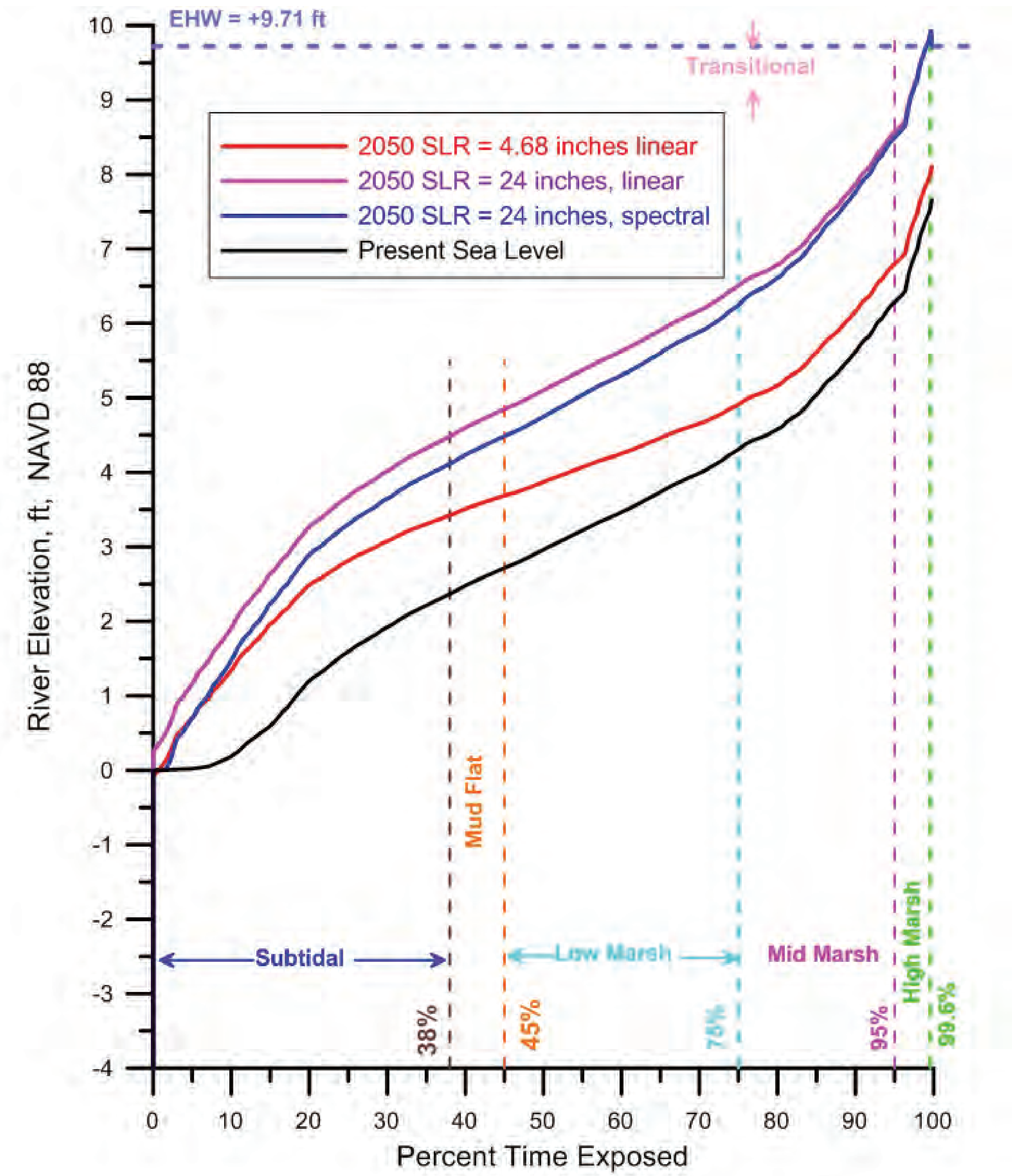

Hydroperiod Function for Intertidal Plan, Otay Floodplain Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261

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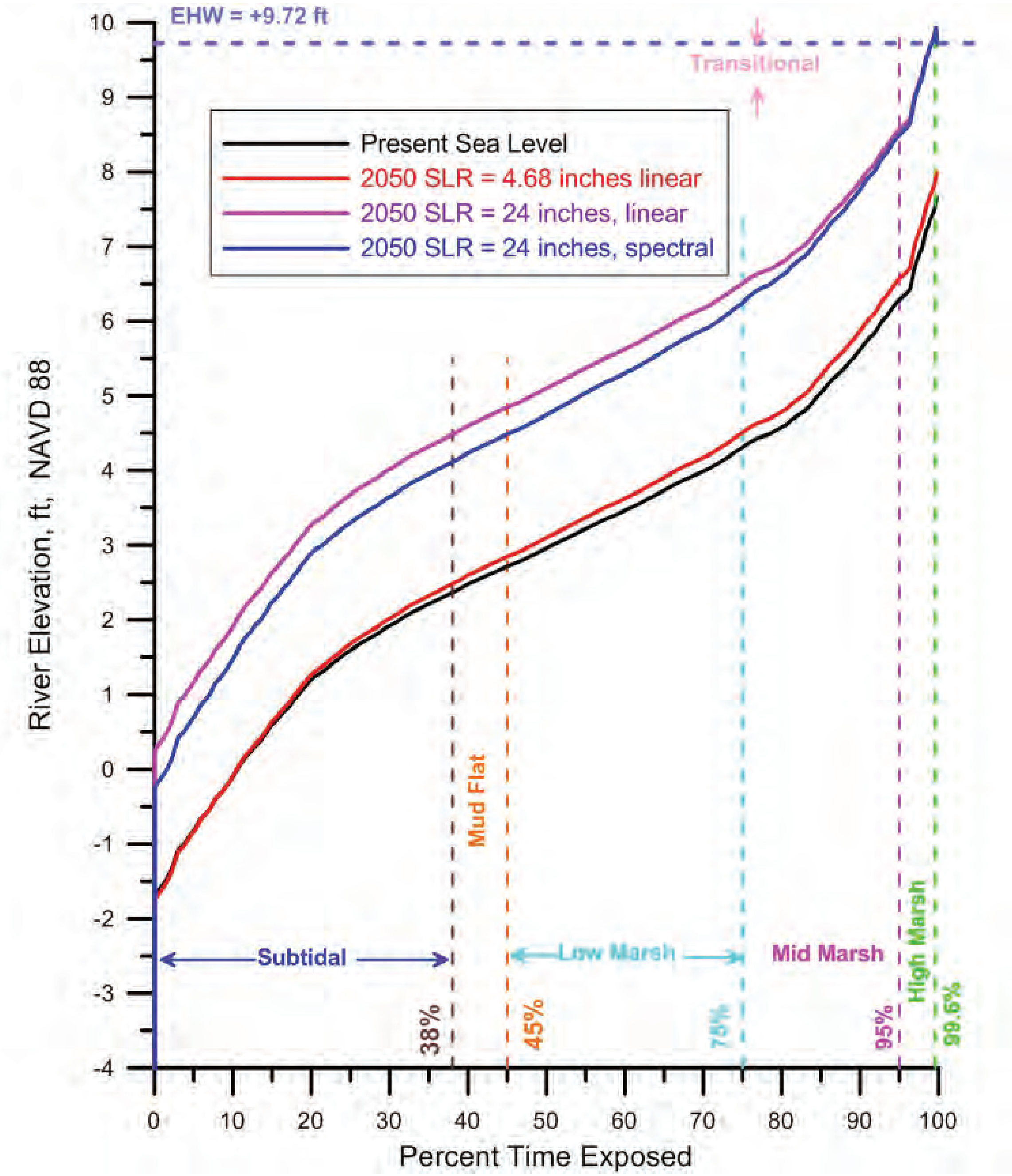

Hydroperiod Function for the Intertidal Plan Pond #15 Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261.

SOURCE:

FIGURE 26

Hydroperiod Function for Restoration Plan on Pond 15 Site

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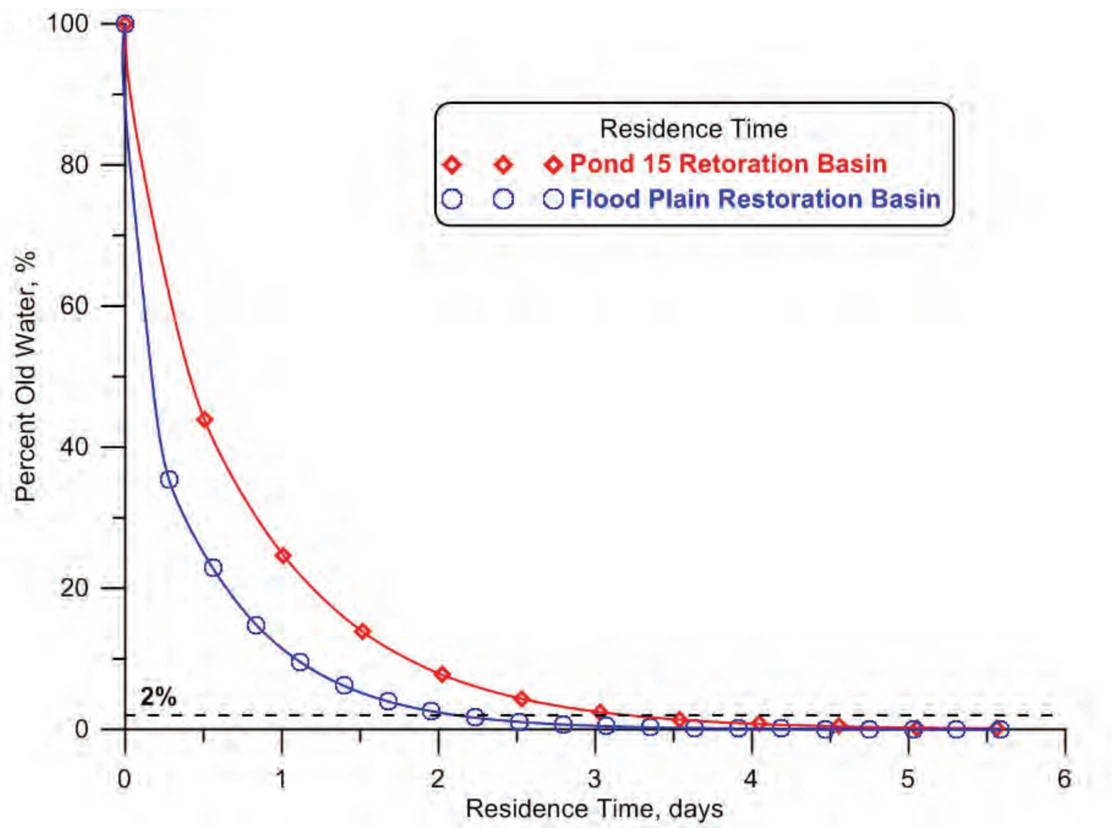

Residence time of South Bay water in the tidal basins of the Intertidal Plan: Otay River floodplain basin (blue); Pond #15 basin (red).

SOURCE:

FIGURE 27

Residence Time of South Bay Water in Tidal Basin on Otay River Floodplain Site

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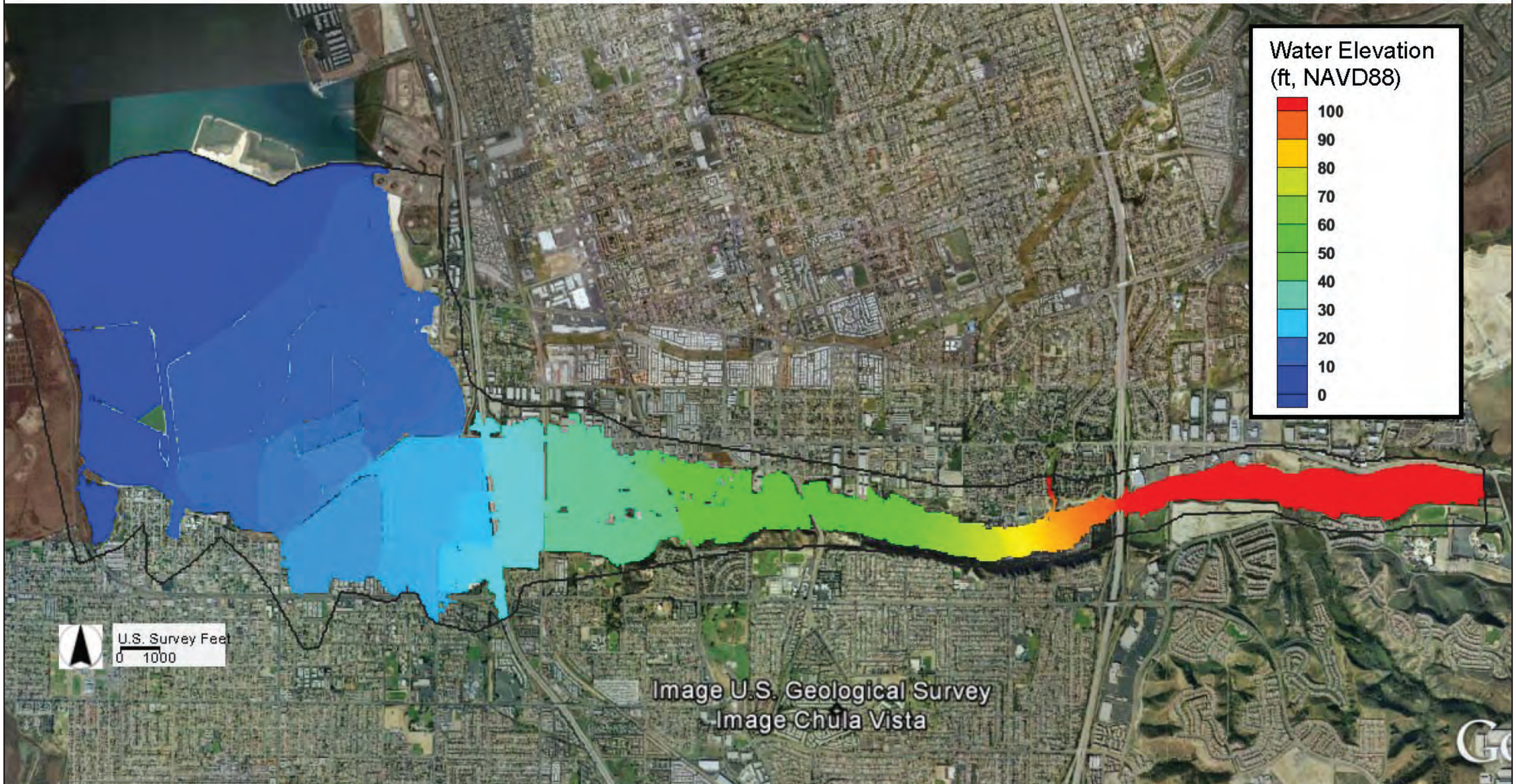

SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2013

FIGURE 28

100 Year Flood Water Elevations for Existing Conditions

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The differences in area flooding between the existing condition and proposed restoration are shown in Figure 29. Reductions in flood elevations primarily occur in the Otay River floodplain, Pond 20A, Pond 15 and Pond 20 through restoration of the Otay River Floodplain Site and Pond 15 Site. In addition, proposed restoration would reduce flood elevations at the north end of the bike path adjacent to Pond 48. In general, the proposed restoration would not change flood elevations in tidally influence areas, including the Western Salt Pond Restoration area (formerly Ponds 10A, 10, and 11). Stockpile areas, the Pond 15 Site, and the residential area near Palm Avenue are susceptible to flooding in the existing condition, but would no longer be flooded after restoration. Increases in 100-year flood elevations were found for the south end of the bike path along Pond 22, Pond 12, 13, 14, 28, and 29. The proposed restoration would not alleviate existing potential flooding of the bike path for extreme flood events (e.g., 100-year flood), but would prevent flooding of the bike path for smaller flood events (e.g., 15-year flood).

4.4 Construction Methods

This chapter describes a range of construction methods and equipment that could be used for the construction of the ORERP. Similar to other coastal wetland restoration projects, the major construction activity of this restoration plan is earthwork.

Construction involves lowering the existing ground elevations in the Otay River Floodplain Site to form subtidal, mudflat, salt marsh, and upland habitats; and filling the Pond 15 Site with excavated material to restore wetland habitats. Specifically, the restoration plan requires the excavation (cut) of approximately 376,000 cubic yards of soil within the Otay River Floodplain Site. Most of the excavated material would be transported to the Pond 15 Site. A small portion of the excavated material would be used to construct a new berm along the southern edge of the Otay River Floodplain Site.

These methods, equipment, and schedules have been developed based on restoration plan requirements and constraints, in combination with experience from past projects of a similar nature. The construction methodology ultimately used would be determined by the contractor selected for 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 than those considered herein then additional environmental review may be needed to verify that the restoration plan would not result in substantial environmental impacts beyond those already considered. Figure 30 provides locational information referred to as it relates to construction methods.

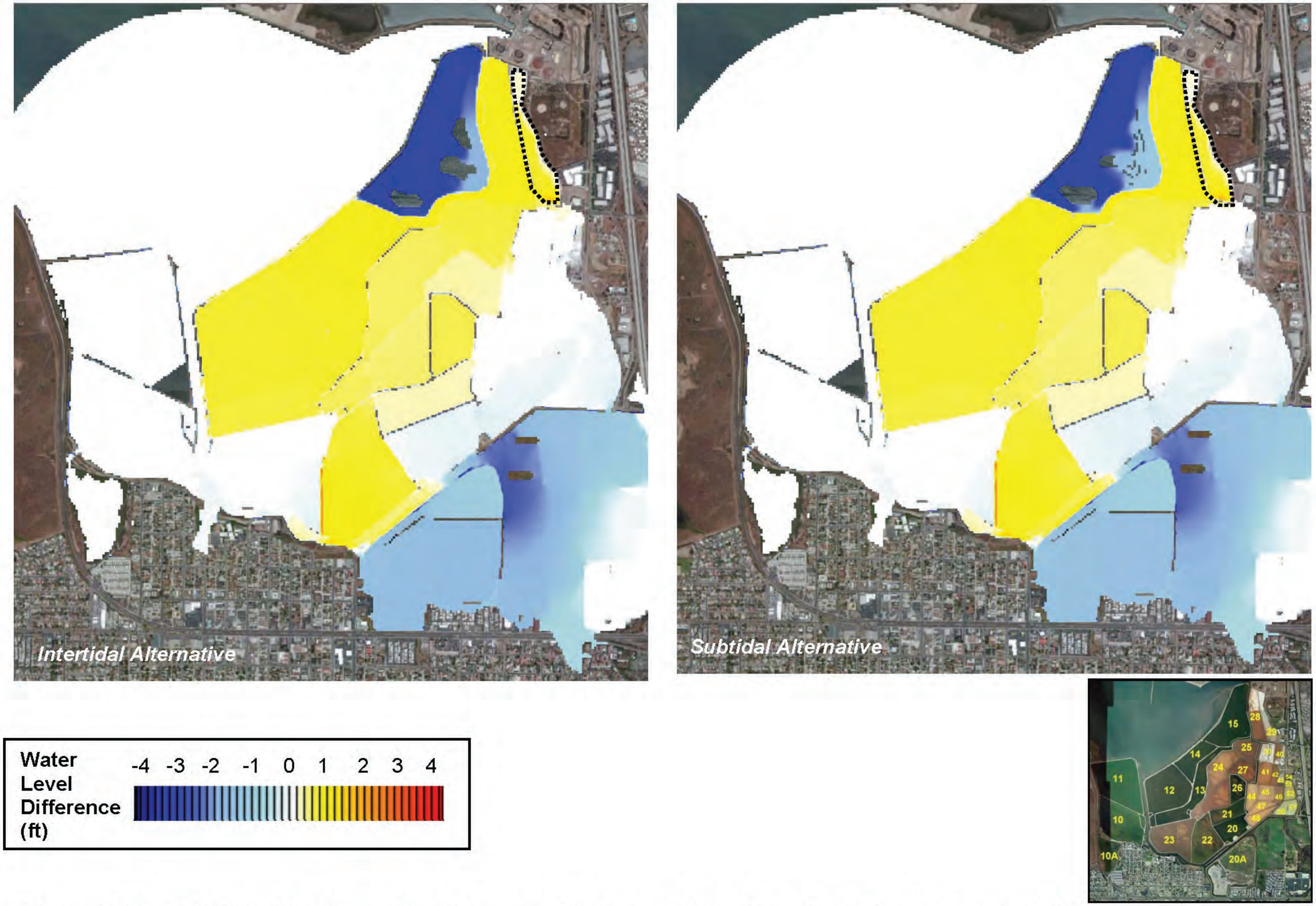
4.4.1 General Construction Methodology

4.4.1.1 Mobilization and Vegetation Removal

Heavy construction equipment may be brought to the both restoration sites either by land or water. Equipment transported by land would likely be trucked to the restoration sites via Main Street. Large and heavy equipment would be transported during off-peak traffic so as to minimize traffic congestion. The site entrance/exit points are discussed in Section 3 above. If transported by water then the construction equipment would likely be brought into the site via San Diego Bay and the Otay River. Some large equipment may be brought into the restoration sites in several pieces and then be assembled on site. Regardless of whether construction equipment is mobilized to the restoration sites from land, sea, or both the potential environmental impacts should be assessed as part of environmental review under NEPA and CEQA. The EIS for the project, prepared concurrently with this FRP, addresses and analyzes the worst-case environmental impacts associated these different options.

Prior to construction, all areas to be graded will be cleared and grubbed with the resulting brush, trash and debris disposed of in a safe and legal manner. Existing southern coastal salt marsh will be avoided to the extent possible; however, there may be minor impacts where the proposed grading daylights at Nestor Creek. Other native vegetation communities on portions of the Otay River Floodplain Site include Isocoma scrub and southern coastal salt marsh. Unvegetated land forms include non-vegetated channels and disturbed habitat. Isocoma scrub comprises the majority of the site with southern coastal salt marsh occurring along the Otay River channel and Nestor Creek channel. These will be impacted during clearing, grubbing and grading but will be replaced with ESHA after completion of the wetland restoration plan.

At the end of construction, the equipment would be demobilized. Demobilization of equipment would use the same route as mobilization. Staging areas, access routes, and other disturbed areas would be uncompacted, revegetated, and restored to preconstruction conditions or as specified in the construction documents. Any temporary equipment, structures, or utilities (e.g., water and power) installed at both the Otay River Floodplain Site and Pond 15 Site would be removed at the completion of construction.



SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2013

FIGURE 29

100 Year Flood Impacts –Change in Maximum Water Elevations when compared with existing conditions

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SOURCE:

FIGURE 30
Project Construction Areas

Final Restoration Plan for the Otay River Estuary Restoration Project

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4.4.1.2 Access Routes

Roads that can be used for construction access routes in the vicinity of the restoration sites are shown in Figure 30. Saturn Boulevard is the north-south running road located along the eastern edge of the restoration plan area. The other major roads in the vicinity are Palm Avenue (State Route 75) to the south, Main Street to the north of the Otay River Floodplain Site, and Interstate 5 to the east. There are interchanges to Interstate 5 at Main Street and Palm Avenue. Using one of these interchanges, construction equipment would access the Otay River Floodplain Site via the north-eastern corner of the restoration sites where West Frontage Road, Main Street, and the Bayshore Bikeway intersect. Construction equipment would access the Pond 15 Site via a Service easement located off Bay Boulevard just north of the entrance to the Salt Works operational facility. To complete the construction work on the dike between Ponds 22 and 23, construction equipment would access the site via the main entrance to the Salt Pond Complex located off Bay Boulevard and then wind around the southern boundary of the Salt Pond Complex.

Within the restoration sites, temporary dirt roads would be established to provide access for construction equipment between the excavation, staging, beneficial use, disposal, and fill 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 have to install temporary crossings across Nestor Creek and Otay River. Access to the construction site would be controlled through the use of gates, fencing, and/or site security services.

Construction equipment transporting material to the Pond 15 Site would utilize some of the existing salt pond dikes. Since the existing dikes were not built to accommodate this use, temporary improvements (e.g., widening and resurfacing) may be necessary depending on the method used to haul material between the excavation site (Otay River Floodplain Site), beneficial use/disposal site (the Pond 15 Site), and fill site (dike between Ponds 22 and 23). Three possible methods for material hauling and disposal are described in Section 4 below.

Staging areas would be located upland away from construction activities. The area east of Nestor Creek in the Otay River Floodplain Site would be used for staging (Figure 30). Stockpiling of excavated material for dewatering and sorting may also be carried out at this location. This area is also near the entrance/exit to/from the excavation site (Otay River Floodplain Site). Any permits and/or approvals required to conduct the dewatering activities would need to be obtained prior to commencing with this activity.

4.4.1.3 Earthwork

Earthwork is the major construction activity of the restoration plan. The restoration plan requires the excavation of approximately 376,000 cubic yards of soil (material) within the Otay River Floodplain Site and from the Pond 15 Site. The majority of the 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. The excavated material would also be disposed of on-site as fill for dikes, levees, and upland habitat creation. The remainder of the material would be stockpiled within the Otay River Floodplain Site for use on future projects within the Refuge.

If the contractor decides to use land-based equipment to complete the earthwork under dry conditions then it is likely that the work would be done using an approach similar to the one described here. Excavation would most likely be done with land-based equipment for areas above groundwater. Soil within two feet below the groundwater elevation may be wet, but excavation with land-based equipment would likely still be feasible without dewatering. In locations where groundwater is present, dewatering would likely be necessary to conduct work under dry conditions.

Land-based excavation would be conducted with a combination of bulldozers, front loaders, backhoes, graders, scrapers, excavators, and trucks. Excavated material would either be loaded directly onto trucks and conveyor belts or it would be stockpiled temporarily near the excavation site. The stockpiled material would then be loaded onto trucks for hauling to the placement sites (Pond 15 and Pond 22/23 dike).

If excavation is conducted using land-based equipment below +3 feet, NAVD88, dewatering may be necessary. Dewatering may be achieved by blocking off the excavation site and then pumping water out of the excavation site. Alternatively, wet material may be excavated by a long-reach excavator and then dewatered on site before being hauled to the placement sites.

If the contractor decides to use a combination of land-based and water-based equipment to complete the earthwork under wet conditions then it is likely that the work would be done using an approach similar to the one described here. The contractor would use land-based equipment to excavate material from the Otay River Floodplain Site in matter as described in Section 4.1.1.3. Material excavated from the Otay River Floodplain Site would be dumped into a pit and mixed with water taken from the Otay River to form a slurry. The slurry would then be pumped to the Pond 15 Site via a pipeline. The pit would be hydraulically isolated from the Otay River until project completion at which time it would be opened and connected to the Otay River to restore tidal exchange to the restored area. To minimize impacts to water quality in San Diego Bay, a two-way pipeline system would be installed between the Otay River Floodplain Site and the Pond 15 Site to convey slurried material to the Pond 15 Site while bringing water back to the Otay River Floodplain Site for subsequent use. Water would occasionally be pumped from the Otay River to supplement water lost to groundwater and evaporation during operations.

4.4.2 Disposal Methods

Material disposal involves the transportation of excavated material to the final placement sites. The restoration plan calls for most of the excavated material from Otay River Floodplain Site (approximately 258,000 cubic yards) to be transported to the Pond 15 Site, with only a small volume (approximately 21,100 cubic) to be used on-site in the Otay River Floodplain Site for levee construction and upland restoration. About 30,000 cubic yards to 40,000 cubic yards would be stockpiled in the Otay River Floodplain Site to the east of Nestor Creek for future Service projects in the Refuge. The stockpiled material would be watered during construction to mitigate for dust generation. Upon completion of project construction, suitable and appropriate upland vegetation would be planted to control wind and water-related erosion until the stockpile material is reused by the Service for future Refuge projects.

Approximately 53,000 cubic yards to 55,400 cubic yards would be excavated from the Pond 15 Site. Based on soil sampling and testing, the majority of this material is expected to be free of contaminants; however, it is anticipated that a small portion of soil (<5,000 cubic yards) in the vicinity of the dike that would be breached would contain elevated levels of heavy metals. This contaminated material would be buried inside the Pond 15 Site under clean fill from the Otay River Floodplain Site such that the contaminants would not be available to ecological receptors (e.g., capped under fill material). Excavated material would be disposed of using some combination of scrapers, trucks, bulldozers, loaders, graders, conveyor belts, or pipelines.

If dump trucks are used to transport material from the Otay River Floodplain Site to the Pond 15 Site then a system of haul roads and access points would need to be established and maintained. A few possible hauling configurations are discussed in Section 4.2.1. Dry material would be loaded onto trucks using front loaders or backhoes or it would be excavated and hauled directly using scrapers. Wet material would be dewatered and then transported via trucks equipped with a lining to retain water that remains in the soil. Bulldozers may be used to move excavated material to stockpile areas, which may be necessary for dewatering or staging before being transported by truck. Bulldozers may also be used to move material to on-site upland area or for berm construction.

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 15 Site, or all the way from the Otay River Floodplain Site to the Pond 15 Site. Within the Otay River Floodplain Site, conveyor belts could be used to transport material from the excavation area to the stockpile area. A conveyor belt system could be used to move excavated material across the Otay River and Bayshore Bikeway. Once across (under) the Bayshore Bikeway, and within the Salt Pond Complex, the conveyor belt would transport material to the Pond 15 Site.

Three methods for moving excavated material from the Otay River Floodplain Site to the Pond 15 Site were identified for consideration in evaluating potential environmental impacts. The three methods are described below.

- Truck
- Conveyor Belt
- Pipeline

These three methods represent a range that would likely be considered by a contractor given the site conditions, quantity of material, construction schedule, and likely mitigation measures to minimize environmental impacts. The three methods are described in more detail below.

4.4.2.1 Truck

Under this method, the contractor would use dump trucks to transport material from the Otay River Floodplain Site to the Pond 15 Site. The most likely truck haul route is shown in Figure 31. Temporary crossings would be necessary for the trucks to cross Nestor Creek and Otay River. Truck traffic on this route would interfere with the Bayshore Bikeway and City of San Diego bike path where the trucks exit the Otay River Floodplain Site onto West Frontage Road. Traffic flow at this intersection would be maintained by a flagman in order to ensure public safety. From West Frontage Road, the trucks would turn onto Anita Street and then to Bay Boulevard. The trucks would enter the Salt Ponds Complex via the Service easement located just north of the Salt Works operational facility off Bay Boulevard. The dikes within the salt ponds that would be used by construction traffic would be improved and widened to 30 feet to allow for two-way traffic, an exception is the dike around the Pond 15 Site where one-way traffic in a loop can be established. The dike improvements would likely require the placement of small amounts of fill into the ponds. Any such fill would be removed upon the completion of construction activities thus returning the ponded area to pre-project conditions. The round trip distance of the truck route shown in Figure 31 is about 5 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 28,000-34,000 trips.

SOURCE:

FIGURE 31

Truck Haul Routes

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4.4.2.2 Conveyor Belt

Under this method, the contractor would use a system of conveyor belts to transport material from Otay River Floodplain Site to the Pond 15 Site. Two possible routes are shown in Figure 32 and the length would be approximately 1.5 miles. The conveyor belt would be installed over the Otay River and under the existing eastern Bayshore Bikeway crossing. After crossing the Otay River and Bayshore Bikeway, the conveyor belt would continue northward using the existing dikes for support. One end of the conveyor belt would be near the Otay River Floodplain Site excavation site and the other end would end 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.

If the Otay River Floodplain Site excavated material is transported to the Pond 15 Site via dump truck or conveyor belt then it would be dried before being hauled from the Otay River Floodplain Site. In order to place this dry material effectively, the Pond 15 Site would be dewatered prior to material placement. Dewatering of the Pond 15 Site would be one of the first tasks the contractor would complete during construction. This would be done by first modifying the dikes within and around Ponds 12, 13, and 14 (Figure 2 for pond locations) to bypass the brine water around the Pond 15 Site to the rest of the active salt-producing salt ponds. Next, the dikes around the Pond 15 Site would be modified to hydraulically isolate the Pond 15 Site from the rest of the salt pond system. At that point, the isolated brine water remaining in the Pond 15 Site would be pumped into the active salt-producing salt ponds. The Pond 15 Site is about 90 acres in area with an average water depth of about 5 feet so the volume of water in the Pond 15 Site is estimated to be about 140 million gallons. Pumping this volume of water into the active salt-producing salt ponds would take about a month using several heavy duty water pumps. After the initial pumping to drain the Pond 15 Site, dewatering would continue during construction in order to keep the placement area relatively dry.

When the Pond 15 Site is dewatered and ready for receiving fill material, material brought to the Pond 15 Site by trucks or conveyor belts would be placed in the pond. Distribution of material would be carried out with land-based equipment, such as bulldozers, scrapers, and/or long-reach backhoes. To avoid sinking in the wet and soft sediment in the pond, the bulldozers would initially push and spread the Otay River Floodplain Site fill material outward into the pond from the dikes. The newly formed fill area extending from the dike would provide the working area for the trucks and bulldozers to reach farther into the pond.

4.4.2.3 Pipeline

Under this method, the contractor would use a pipeline to hydraulically transport material from Otay River Floodplain Site to the Pond 15 Site. Two possible pipeline routes are shown in Figure 33. The pipeline would be installed over the Otay River and under the existing eastern Bayshore

Bikeway crossing. After crossing the Otay River and Bayshore Bikeway, the pipeline would continue northward. One option of the pipeline route considers using the existing dikes for support, while the other option assumes a more direct path, with some sections floating on the salt ponds. One end of the pipeline would be located in a pit within the Otay River Floodplain Site excavation site and the other end would end directly into the Pond 15 Site. The pipeline would be approximately 1.1 to 1.5 miles in length depending on whether the pipeline remains on the dikes or if it takes a more direct route across (floating) the salt ponds.

If the Otay River Floodplain Site excavated material is transported to the Pond 15 Site via pipeline then it would arrive at the Pond 15 Site as a slurry mixture of water and soil. the Pond 15 Site would be dewatered prior to material placement as described above. When the Pond 15 Site is dewatered and ready for receiving fill material, material brought to the Pond 15 Site by pipeline would be pumped into the pond. The material would be distributed throughout the pond by periodic relocation of the dredge pipeline discharge location. It is anticipated that it would take a relatively long period of time for the material to achieve a level of consolidation that would allow the safe use of land-based equipment. Consequently, 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 is currently estimated at one to five years. After final consolidation has been achieved construction equipment would be mobilized to the site to complete final grading within the Pond 15 Site.

Final grading would be conducted in the Otay River Floodplain Site to achieve final elevations 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 also be conducted in the Pond 15 Site to achieve final elevations in the fill area. When the fill reaches the approximate finished ground elevations, land-based or amphibious construction equipment would be used to grade the site to the designed contours and slope variations.

The restoration construction would include removal of the southern levee of the Otay River within the project site, restoration of upland habitat, construction of a new levee along the southern border of the restored wetland, and modification of the Pond 22/23 dike. These construction activities would be conducted with land-based equipment. At this time, it is assumed that suitable fill material for the levee construction, upland restoration, and dike modification would be available on-site via project excavation. If suitable material is not available on site then such material would be imported to the project site. Suitable material would be compacted to a density recommended by the project geotechnical engineer.

SOURCE:

FIGURE 32

Conveyor Belt Haul Routes

Final Restoration Plan for the Otay River Estuary Restoration Project

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SOURCE:

FIGURE 33

Pipeline Haul Routes

Final Restoration Plan for the Otay River Estuary Restoration Project

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4.4.3 Construction Windows and Environmental Constraints

The timing and phasing of the various construction activities are important considerations in restoration planning. Dewatering of the Pond 15 Site would be a critical path task that would be started right after the brine water is bypassed around the Pond 15 Site. Other mobilization and staging area construction would follow. The access/truck routes would be strengthened and widened as necessary and conveyor belts would be installed, if applicable. The site would be cleared and grubbed to begin excavation. Excavation and disposal of excavated materials would occur simultaneously; otherwise excavated material would be stockpiled while waiting for transport to the fill area. Planting would begin upon completion of earthwork. The final step would be to open the restored areas to tidal exchange and demobilize the remaining construction equipment and material from the site.

The existing levee along the southern bank of the Otay River helps to keep tidal and fluvial water from entering the excavation site. In order to maintain a water barrier between the Otay River Floodplain Site and Otay River during excavation, the existing levee would remain in place until excavation is complete. To maintain flood protection, a new levee along the southern edge of the restored wetland would be constructed prior to removing the existing levee along the southern bank of the Otay River. In addition, there would be several operations maintained throughout most of the construction period, including the Pond 15 Site dewatering, access/haul road resurfacing, bike and pedestrian safety, and pollution and dust control.

The contractor would follow local jurisdiction time restrictions for construction equipment operation. It is anticipated that construction would take place Monday through Friday from 7 AM to 6 PM. Work may or may not occur on holidays, depending on the contractor and local jurisdiction restrictions. In addition, construction activities would be scheduled around the bird nesting season, which generally runs from February 15 to September 30. The construction windows for specific site locations would be determined by the Service Refuge Manager during final restoration design. In addition, the construction window schedule may change during construction depending on actual nesting activities at the time of construction. For the purpose of assessing environmental impacts, a preliminary construction schedule was developed for the restoration plan based on the assumptions and information above. The schedule, presented in Table 17, is based on hauling the excavated material to the Pond 15 Site via truck and/or conveyor belt. If the contractor opts to slurry the material and use a pipeline to transport the material from the Otay River Floodplain Site to the Pond 15 Site then an additional one to five years would be needed to complete the construction operation.

Table 17
Preliminary Construction Schedule

Activity	Start Date	Finish Date	Duration
Mobilization	8/1/2016	9/30/2016	2 months
Earthwork	10/1/2016	1/31/2017	4 months
* Shut Down	2/1/2017	2/28/2017	1 month
Core Nesting Season	3/1/2017	7/31/2017	5 months
* Remobilization	8/1/2017	8/31/2017	1 month
Earthwork	9/1/2017	12/31/2017	4 months
Demobilization	1/1/2018	2/28/2018	2 months

* Denotes periods when field activities may occur in specifically delineated areas. Delineation of operations zones is dependent on variation of wildlife community and individual species or species groups' activities in a given season. Areas of avoidance will be determined on a case by case basis by the Service Refuge Manager.

** Assumes selection of the project alternative by the Service by 11/30/14 and receipt of permits needed to start construction within 21 months of the decision by the Service.

The type of equipment used to construct the restoration plan 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. The type and number of major construction equipment used to construct the restoration plan are presented in Table 18 below. The type of fuel for each type of construction equipment is also provided to allow evaluation of impacts to air quality and greenhouse gas emissions.

Table 18
Construction Equipment Summary

Equipment	Fuel Type	Equipment Quantity		
		Truck Haul	*Conveyor Belt Haul*	*Pipeline Haul*
Backhoe	Diesel	4	4	4
Loader	Diesel	4	4	4
Scraper	Diesel	4	4	4
Bulldozer	Diesel	4	4	4
Dump Truck	Diesel	28	4	4
Conveyor Belt	Electric	None	1.5 to 2.0 miles	None
Pipeline	Electric	None	None	1.1 to 1.5 miles

4.4.4 Erosion Control and Water Quality Protection

The contractor would be required to comply with National Pollutant Discharge Elimination System (NPDES) stormwater permit conditions as well as other local, state, and federal permit/approval requirements. A stormwater pollution prevention plan (SWPPP) would be prepared and implemented by the contractor to achieve NPDES permit compliance. The contractor would identify and implement best management practices (BMPs) to protect water quality, air quality, and sensitive biological/wildlife resources as well as to reduce construction related noise.

As discussed in the previous section, construction activities would be scheduled around the bird nesting season. The construction windows for specific site locations as well as the noise and pollution restrictions of the construction equipment would be assessed and determined in the EIS and implemented by the Service Refuge Manager during final restoration design.

The Bayshore Bikeway runs along the northern bank of the Otay River along the perimeter of the Otay River Floodplain Site. Transport of excavated material to the salt ponds through the use of a temporary bridge would likely interfere with bikeway users. The extent and types of interruption to the Bayshore Bikeway would be discussed with local authorities during the final design phase such that best management practices and safety measures are developed prior to construction and then implemented during construction.

Utilities have been identified along the extension of Saturn Boulevard east of the Otay River Floodplain Site, including overhead electric lines and poles, high pressure gas line, sewers, and storm drains. A few manholes were also found east of Saturn Boulevard. These utilities would not need to be relocated, but the contractor would need to maintain and protect them during construction.

The operation of the Salt Works may be impacted by the conveyor belt operation and truck traffic. Coordination with the Salt Works operators should occur during the final design and construction phases. The removal of water from the Pond 15 Site would also require the cooperation of the Salt Works operators. The Salt Pond dikes would be used for access by construction vehicles and/or conveyors transporting and disposing material to the Salt Ponds. These dikes would need to be improved and maintained during construction. When construction is complete, the dikes would be restored to preconstruction conditions.

4.4.5 Cost Estimates for Construction

Most of the cost associated with the restoration construction is earthwork. More than 300,000 cubic yards (CY) will be excavated from the Otay River Floodplain Site, and moved to the Pond 15 Site. Due to the fact that construction method for transporting the cut and fill material from the has not yet been finalized, there is still some ambiguity in the total cost of construction. Three hauling options were considered in the preparation of the cost estimate. The cost estimate of the first option (Conveyor Belt) is based on the use of a conveyor system which will move excavated material across the Otay River and under the bikeway, then the conveyor extends all the way to

Pond 15, with a total distance of about 1.5 miles long. If the conveyor belt option is implemented, costs will range from $16,832,000 to $17,353,000. The cost estimate of the second option (Truck) is based on using only trucks to haul materials between the floodplain and Pond 15. The truck route will require 4 temporary bridge crossings.If the truck only option is implemented, costs will range from $12,697,000 to $14,028,000. The cost estimate of the third option (Pipeline) is based on the use of a pipeline to hydraulically transport material from the Otay River floodplain to Pond 15. For this option, it is assumed that the fill material in Pond 15 will require at least one year to consolidate before grading and planting. If this pipeline method is implemented, costs will range from $11,816,000 to $12,954,000.

Table 19
Construction Cost Estimate

Item	Estimated Cost Range*	
	Low	*High*
Permitting	$3,507,000	$3,507,000
Site Access, Mobilization, Demolition	$1,447,200	$7,213,700
Earthwork	$4,656,510	$5,238,235
Planting	$902,790	$990,565
Contingencies	$2,302,800	$3,831,900
Construction/Project Management	$710,000	$760,000
Environmental Monitoring During Construction	$300,000	$320,000
Engineering/Design	$1,220,000	$1,330,330
Monitoring Oversight SAP and CCC (through construction)	$560,000	$560,000
Total	**$15,606,300**	**$23,751,730**

Range estimated for the potential restoration alternatives and three construction methods.

4.5 Planting Program

4.5.1 Goal and Objectives

The overall goal of the planting program is to create self-sustaining intertidal wetland that meets the mitigation requirements described in the MLMP.

MLMPconditions that relate to vegetation within the wetland portion of the mitigation site include:

- **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.
- **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.
- **Reproductive Success.** Certain plant species, as specified in the work program, shall have demonstrated reproduction (i.e., seed set) at least once every three years.
- **Exotics.** The important functions of the wetland shall not be impaired by exotic species.

4.5.2 Habitats Considered for Planting

Implementation of the restoration plan will create three types of wetland habitats, as well as transition zone and upland habitats not subject to Coastal Commission permit conditions, (Figures 16 and 17) and return regular diurnal tidal flushing to both project components (Otay River Floodplain Site and Pond 15 Site) within the Refuge. Restoration targets for the establishment of native vegetation within the project area are presented in detail below.

Low marsh in southern California salt marshes is dominated by California cordgrass (*Spartina foliosa*), which forms a thick canopy approximately three feet in height. This is the preferred nesting habitat of the light-footed clapper rail (*Rallus longirostris levipes*), a federal-listed and state-listed endangered bird. Creation of cordgrass habitat is critical to the recovery of this species. Based on local conditions, the target for low marsh is approximately +2.6 to +4.0 feet NAVD88 at the Otay River Floodplain Site and +2.73 to +4.31 NAVD88 at the Pond 15 Site. Approximately 10 acres of low marsh habitat will restored at the Otay River Floodplain Site component and approximately 15.7 acres will be restored in the Pond 15 Site.

Mid-elevation salt marsh overlaps in elevation with the cordgrass-dominated low marsh and with high marsh typified by grasses and succulents tolerant of desiccation and hypersalinity. Based on local conditions, the target for mid-marsh is approximately +4.0 to + 6.0 feet NAVD88 at the Otay River Floodplain Site and +4.31 to +6.33 feet NAVD88 at the Pond 15 Site. This marsh zone is dominated by Pacific pickleweed and a mosaic of several other plant species. In past restoration projects in the region, the natural recruitment of pickleweed has been highly successful and this species may even become excessively dominant if planted. Therefore, this species will not be planted, but allowed to colonize the restoration site naturally. Approximately 11 acres of mid-marsh habitat will restored at the Otay River Floodplain Site component and approximately 35 acres will be restored in the Pond 15 Site.

High elevation salt marsh is typified by perennial grasses and succulents tolerant of high salinities and infrequent inundation. Typical dominant species include saltgrass (*Distichlis spicata*) shoregrass (*Monanthochloe littoralis*) and Parish's pickleweed (*Arthrocnemum subterminale*). The endangered salt marsh bird's beak (*Cordylanthus maritimus* ssp. *maritimus*) is restricted to the high marsh zone. The target elevation for high marsh in the project is +6.0 to +7.1 feet NAVD88 at the Otay River Floodplain Site and +6.33 to +7.4 feet NAVD88 at the Pond 15 Site, based on site-specific tidal conditions. Approximately 3 acres of high marsh habitat will be restored at the Otay River Floodplain Site component and approximately 6 acres will be restored in the Pond 15 Site.

Transition zone habitat is defined as the elevation where habitat transitions from wetland to upland. At south San Diego Bay, the transition zone is that area between the high marsh and the coastal sage scrub habitat that typifies the dominant upland habitat, where it exists. The target elevation range for transition zone in the western ponds project is +7.1 to +7.4 feet NAVD88 at the Otay River Floodplain Site and +7.4 to +7.7 feet NAVD88 at the Pond 15 Site. Approximately 1 acre of transition zone habitat will restored at the Otay River Floodplain Site component and approximately 0.5 acre will be restored in the Pond 15 Site. Although not subject to Coastal Commission permit requirements, transition zone has been included in this planting plan for the purpose of preparing a cost estimate for plant propagation and installation.

4.5.3 Planting Program Description

4.5.3.1 Low Salt Marsh

The restored low marsh areas will be planted exclusively with California cordgrass. All cordgrass will be obtained from plants at an existing donor site located along the Otay River near its confluence with San Diego Bay, pending approval by the Service. Cordgrass root divisions, referred to as "plugs" or ramets, are obtained by dividing existing stands of cordgrass into small divisions composed of two to five growing stems and attached rhizomes. Each cordgrass plug is approximately six inches in diameter including attached native soil, which buffers the plant from transplant shock. Plugs will be harvested by hand, transported to the transplant site, and replanted within a 24-hour period. All cordgrass plantings will be spaced at 6 feet on center (Table 20).

In south San Diego Bay, Bigelow's pickleweed often co-occurs with cordgrass in the low salt marsh. In previous restoration projects in south San Diego Bay, this annual species has established naturally from seed. It is anticipated that this species will recruit naturally at this restoration site.

Table 20
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 rosepots Cuttings in rosepots Cuttings in rosepots	6 feet
High Salt Marsh	Saltgrass Alkali heath Shoregrass Parish's pickleweed Sea lavender	*Distichlis spicata* *Frankenia salina* *Monathochloe littoralis* *Arthrocnemum subterminale* *Limonium californicum*	Cuttings in rosepots Cuttings in rosepots Cuttings in rosepots Seed in rosepots Cuttings in rosepots	6 feet
Transition Zone	Alkali weed Boxthorn Shoregrass Parish'spickleweed Palmer's frankenia	*Cressa truxillensis* *Lycium californicum* *Monathochloe littoralis* *Arthrocnemum subterminale* *Frankenia palmeri*	Seed in rosepots Cuttings in rosepots Cuttings in irosepots Seed in rosepots Cuttings in rosepots	6 feet

4.5.3.2 Mid-Salt Marsh

The mid-salt marsh zone will be planted with equal proportions of saltwort, salt marsh daisy, and sea blite (Table 20). All species will be propagated from seeds or cuttings harvested from the existing salt marshes in south San Diego Bay. Individual plants will be grown to suitable size in 2.25 inch wide, 3-inch deep, "rosepot" liners (Table 20). All rosepots will be planted at 6 feet on center. All propagated plants will be "hardened" prior to delivery to the site and planting. Hardening is a process whereby plants are watered with gradually increasing levels of salt until reaching the level of sea water (~ 35 parts per thousand). Hardening reduces transplant shock thereby enhancing survival. It is anticipated that Pacific pickleweed will colonize the mid-salt marsh through natural recruitment from seed.

4.5.3.3 High Salt Marsh

The high salt marsh zone will be planted with equal proportions of saltgrass (, alkali heath (*Frankenia salina*), shoregrass, (*Monathochloe littoralis*), Parish's pickleweed, and sea lavender. All species will be propagated from seeds or cuttings harvested from the existing salt marshes in south San Diego Bay. Individual plants will be grown to suitable size in 2.25 inch wide, 3 inch deep, rosepot liners (Table 20). All plants will be hardened prior to delivery and installation. All rosepots will be planted at 6 feet on center.

4.5.3.4 Transition Zone

The wetland/upland transition zone will be planted with equal proportions of alkali weed (*Cressus trexillensis*), saltgrass, boxthorn (*Lycium californicum*), shoregrass, Parish's pickleweed, coast goldenbush (*Isocoma menziesii*), and Palmer's frankenia (*Frankenia palmeri*) (Table 20). Palmer's frankenia occurs in the upland areas of Gunpowder Point in south San Diego Bay. This is the northernmost distribution of this species, which is more common in Baja California, Mexico. This species is considered threatened or rare in California but common elsewhere by the California Native Plant Society (CNPS 2001). It has been included in transition zone plantings for this project in an effort to increase its distribution within the bay.

All species will be propagated from cuttings or seed harvested from existing populations in south San Diego Bay. Individual plants will be grown to suitable size in rosepot liners (Table 20). High salt marsh species, including alkali weed, saltgrass, shoregrass, and Parish's pickleweed will be hardened prior to delivery and installation. All rosepots will be planted at 6 feet on center. Irrigation will be provided by a temporary overhead irrigation system or water truck as presented in Section 4.5.3.6.

4.5.3.5 Planting Layout

In an effort to ensure adequate establishment and balanced representation of each species within each habitat, plantings will occur in groupings. Specifically, each species will be planted in groupings of three-to-nine individuals in a reasonably random grouping pattern within the planting zone. To ensure that large monoculture plant groupings do not result in this design, each species grouping cannot occur immediately adjacent to another grouping of the same species. This method should result in a random patchwork of each species across each habitat zone. Initially, these plantings will appear sparse, but plantings are expected to establish quickly and naturalize within three to five years to form dense cover typical of the salt marsh habitats used by the Commission as reference sites.

The majority of plant material will be provided in rosepot liners, which have been successfully used before in salt marsh restoration projects. All plants will be planted in holes of sufficient depth to accommodate the root mass and any attached soil. Holes will then be back-filled with native soil. Care will be taken to ensure that the entire root mass is buried and not exposed to air and sunlight.

4.5.3.6 Irrigation

The proposed salt marsh restoration will 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.

Therefore, much of the site will not require irrigation. However, the transition zone will be less influenced by tides and supplemental watering will be required.

Irrigation will be provided by either a temporary overhead irrigation system or pressurized water truck, or a combination of both. Water is available at the Otay River Floodplain Site and is currently being used by River Partners and the Service to establish riparian habitats. Although water may be available in close proximity to the Pond 15 Site, installation of a temporary irrigation system may not be compatible with on-going salt operations. The irrigation system/water truck will be used to provide supplemental water to the restoration sites until plantings have become established. Irrigation will be phased out gradually depending on the local weather conditions during the establishment period (e.g., after the first one or two growing seasons).

All plants should be irrigated immediately after planting. The amount of water and duration of irrigation should be determined by the revegetation contractor and approved by the Project Biologist. Each watering episode should allow for deep penetration of the water into the soil. Deep soaking of the soil will promote good root development and will enhance survivorship of container stock. Irrigation will be provided on an as-needed basis for a minimum of the first year after planting. The need for irrigation to continue beyond the first year will be evaluated by the Project Biologist, based on the overall survival and vigor of the planted material. Local drought conditions should be considered when evaluating the need and time period for supplemental irrigation. The irrigation program will be designed to provide water necessary for the initial establishment of the plantings, but the goal of the restoration effort is to create self-sustaining habitats supported by natural weather conditions. However, irrigation of the site will be necessary until the plants are determined to be self-sufficient.

4.5.3.7 As-Built Conditions

Within 60 days of completion of mitigation site construction, a report will be submitted describing the as-built status of the restoration project. The report will include “as built” plans showing final grading, plant installation, hydrological features, and erosion control measures. In addition, topographic maps showing as-built contours of the restoration site, as well as locations of plantings, will be provided. Changes from original plans will be indicated in indelible red ink. Significant changes from the original planting plan will be coordinated with and approved by the appropriate agencies prior to implementation.

4.5.4 Cost estimates for planting

With all plants installed on 6 feet centers, a total of 1,397 plants would be required per acre. Under this restoration plan, 13,888 cordgrass plugs would be required to plant the 9.94 acres of low marsh at the Otay River Floodplain Site (Table 16). An additional 21,542 plugs would be required to plant the low salt marsh in the Pond 15 Site for a total of 34,430 plugs. At a unit cost of $15.50 per plug the cost to plant the low marsh under this alternative would be $549,161.

Using a similar formula, the cost to restore mid-salt marsh under the restoration plan would be $306,666, based on 6 feet centers and a unit cost of $4.50 per rosepot installed. High marsh and transition zone would cost $68,211 and $7,043, respectively for a total cost of $931,081.

Table 21
Estimated Cost - Restoration Plan

Habitat Type	Otay River Floodplain Site (acres)	# of Plugs or Rosepots	Pond 15 Site(acres)	# of Plugs or Rosepots	Total # Plugs or Rosepots	Unit Cost Installed	Subtotal Cost
Low Marsh (Plugs)	9.94	13,888	15.42	21,542	35,430	$15.50	$549,161
Mid Marsh (Rosepots)	14.00	19,558	34.78	48,588	68,146	$4.50	$306,666
High Marsh (Rosepots)	5.73	8,005	5.12	7,153	15,158	$4.50	$68,211
Transition (Rosepots)	0.68	950	0.44	615	1,565	$4.50	$7,043
Total	**30.25**		**55.76**				**$931,081**

4.6 Assessment of Significant Impacts

<<TO BE COMPLETED PENDING EIS ANALYSIS>>

4.6.1 Assessment of Created or Substantially Restored Wetland Habitat

4.6.1.1 Habitat Impacts and Net Acreage Created

The Otay River Floodplain Site and the Pond 15 Site both contain existing jurisdictional wetlands. The vast majority of the existing jurisdictional wetlands are being replaced by jurisdictional wetlands as part of the proposed restoration at a 1:1 ratio. For areas of existing wetlands that are converted to uplands and mitigation ration of 4:1 has been assumed. Table 3 documents the existing and proposed wetlands within the two project areas. Figure 8 shows the existing wetlands being impacted within the Otay River Floodplain Site and Figure 9 shows the existing wetlands being impacted within the Pond 15 Site, as well as upland areas being converted to wetlands.

4.6.1.1 Functional Lift Analysis for the Pond 15 Site

A portion of the proposed restoration will involve the restoration of existing solar evaporation ponds that are part of the industrial process of salt production. One of the ponds, the Pond 15 Site, will be restored to tidal marsh using material excavated from the Otay Floodplain and 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 Salt Works takes in bay water to supply the source of the salt, 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, do not support fish or invertebrates typical or similar to that found in San Diego Bay. The restoration of these basins to intertidal habitats will likely improve the diversity and productivity of these ponds and provide increased fish production to San Diego Bay. Because the Pond 15 Site does support some migratory birds and contains some plankton that are tolerant of high salinities; there are existing biological values. As a result, the Science Advisory Panel to the Commission recommended that an analysis be conducted to determine the functional lift associated with the restoration of the Pond 15 Site to determine the number of acreage credits that can be attributed to those activities.

A functional lift analysis was prepared in consultation with the Science Advisory Panel, the Coastal Commission staff, and the Service (WRA 2013). The analysis relied on the change expected in biological communities in the before and after condition. Four biological communities were considered: vegetation, fish, macro-invertebrates, and birds. These communities were selected for two reasons. First, they are associated with the performance standards required to be met by the restoration after completion. Therefore, these biological communities are directly relevant to determining the success of the restoration and the improvement in their condition following restoration will be used as a measure of the substantial restoration achieved by the project. Secondly, data is available on these communities for the Pond 15 Site (or nearby associated ponds) to determine the before conditions and, as a result of current monitoring being undertaken by the Coastal Commission for the San Dieguito Wetland restoration project, data were available on the expected condition following restoration. These data can then be combined into a fairly simple analysis that considers both species number and abundance as outlined below in Table 22.

Table 22
Functional Lift Index of Pond 15 Site Associated with Restoration

	Vegetation	Macro-invertebrates		Birds		Fish	
	Percent cover	*Species (# spp/m²)*	*Abundance (#/m²)*	*Species (# spp)*	*Abundance (#/m²)*	*Species (# spp/m²)*	*Abundance (#/m²)*
Before Pond 15	VA	MA	MC	BA	BC	FA	FC
After (Reference)	VB	MB	MD	BB	BD	FB	FD

The calculation of the change from the before condition to a project in compliance with the reference wetlands is described by the Functional Lift Index (FLI):

$$FLI = \frac{FLI_V + FLI_M + FLI_B + FLI_F}{4}$$

Where:

$$FLI_V = [(VB-VA)/VB]$$

$$FLI_M = \frac{[(MB-MA)/MB] + [(MD-MC)/MD]}{2}$$

$$FLI_B = \frac{[(BB-BA)/BB] + [(BD-BC)/BD]}{2}$$

$$FLI_F = \frac{[(FB-FA)/FB] + [(FD-FC)/FD]}{2}$$

Each of the four component FLI's is between 0 and 1 with 0 representing no improvement and 1 representing 100% improvement. The value of the composite FLI equally weighted between the four components is between 0 and 1 with 0 representing no improvement and 1 representing 100% improvement.

A full description of the data and the analysis is contained in WRA (2013). In the before condition, the high salinities of the brines contained in the Pond 15 Site preclude establishment of wetland vegetation and are above the salinity tolerance of either estuarine fish or invertebrates (with the notable exception of brine flies and brine shrimp). Therefore, the before values for vegetation, fish, and invertebrates is zero; whereas the expected improvements for the restoration must be at least the same as the tidal reference wetlands. Assuming that the Pond 15 Site does is similar to the tidal reference wetlands (which by definition it must be for the site to be determined successful, the functional lift for these variables is 1. On the other hand, there are a considerable number of migratory birds that use the solar evaporation ponds and therefore the before condition can be compared to the expected after condition as found in the reference tidal wetlands. The data on bird use was reviewed and converted to annual numbers to compare to the data generated by the Coastal Commission from the reference tidal wetlands. The functional lift for birds was determined to be 0.43.

When completed, the analysis determined that the functional lift was:

$$\text{FLI} = \frac{1.0 + 1.0 + 0.43 + 1.0}{4} = 0.86$$

Upon review by the Science Advisory Panel and the Commission, it was determined that this number should be adjusted based on several uncertainties associated with the analysis, specifically as it relates to birds. A number of case scenarios were reviewed by the Science Advisory Panel and the resultant recommendation was that the final FLI should be adjusted to 0.75.

Based on this recommendation and the assumption that the performance of the tidal marsh restoration in the Pond 15 Site must meet the performance requirements as set forth in the MLMP, the total credit associated with the Pond 15 Site is 87.35 acres x 0.75 or 65.51 acres.

4.6.1.3 Analysis of Sea Level Rise on Change in Habitats

The design of the restoration project has considered potential sea level rise. Figures 19 and 20 characterize the predicted effects of sea level rise within the Otay River floodplain and Pond 15 Site consistent with the Coastal Commission Draft Sea-Level Rise Policy Guidance from October 2013. 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 towards I-5 within the Refuge.

The Otay River floodplain site is more sensitive to sea level rise than the Pond 15 Site as shown by the predicted amount of vegetated marsh that shifts to mudflat under the lowest sea level rise prediction of 4.68 inches. Both sites are more dramatically affected by the higher 24” inch sea level rise where the mid and upper elevations of vegetated marsh are almost completely lost.

4.7 Evaluation of Steps for Implementation

The next step in the implementation process for the restoration project is to complete permitting. There are many agreements that will be needed in addition to the required permits and construction documents. The necessary permits, agreements, and approvals that will be required to move forward with project implementation are summarized below. A preliminary schedule for project implementation is presented in Table 17. Permit time frames are given in relation to the time required following decision by the US Fish and Wildlife Service on the final selected alternative. It may be possible to submit some applications prior to that decision, but most permits can only be issued after the Record of Decision and the FEIS.

Federal

- Section 404 Permit-NWP 27 (USACOE)
- Section 7 Consultation (The Service)
- Conditional Letter of Map Revision (FEMA)

State

- Section 401 Water Quality Certification (RWQCB)
- National Pollutant Discharge Elimination System (RWQCB)
- Streambed Alteration Agreement (CDFW)
- Coastal Development Permit (Coastal Commission)

Local

- Grading Permit (San Diego)
- Site Development Permit (San Diego)
- Floodplain Development Permit (San Diego)

Other permits may be required as needed for specific activities within easements or encroachments on private or public property.

It is expected that the federal agencies will utilize the EIS document or, in the case of the Corps of Engineers, rely on the EA prepared for the Section 404 Permit-NWP 27 for processing of their permits. For the state permits issued by the RWQCB, CDFW, and California Coastal Commission, it is expected that the Commission, in its consideration of the CDP, will prepare a

CEQA compliant review for the restoration project and that will suffice for the other agencies as well. Otherwise, either the RWQCB or the CDFW may rely on the NEPA environmental review for their initial study and determine that the project qualifies as a categorical exemption, a Negative Declaration or a Mitigated Negative Declaration as part of their permitting process.

Consistent with and following the permit authorizations, final engineering design, contracting, and bidding will be necessary before determining the start date of construction. Permit compliance items will also need to be submitted and approved by the appropriate agencies. Environmental working windows may also affect the start date of construction.

Table 23
Estimated Permit Timeframe Following Selection of Project Alternative by the Service*

Permit	Time in Quarters of a Year Following Approval of Project Alternative							
	Year 2015				*Year 2016*			
	1	*2*	*3*	*4*	*1*	*2*	*3*	*4*
Section 404 Nationwide Permit 27 (ACOE)								
Section 7 Endangered Species Consultation								
Section 106 Historic and Cultural Resources								
CLOMAR Map Revision (FEMA)								
Coastal Development Permit (Coastal Commission)								
401 Water Quality Certification (RWQCB)								
Streambed Alteration Agreement (CDFW)								
Various Local Permits/Encroachment								
Engineering Design								
Bidding, Contractor Selection								
Notice to Proceed								
Mobilization								

* Assumes selection of project alternative by the Service by 11/30/14

4.8 Management and Maintenance Requirements

4.8.1 Tidal Wetland Habitat

The tidally influenced wetland habitats restored under the restoration plan are designed to be self-sustaining and are expected to require little maintenance except during initial establishment. Initial maintenance will be limited to ensuring that native plant species installed within low, mid- and high marsh elevations become established so that they can spread vegetatively and from seed. Some species, such as *Salicornia bigelovii* and *S. pacific*a are expected to colonize naturally and have not been included in the plant palette. There are few invasive plant species that can invade the hypersaline soils of southern California salt marshes; however, future introductions may warrant monitoring and control as necessary. Algerian sea lavender has invaded the mid- and high salt marshes of several regional wetlands. Should this noxious weed species become established at the ORERP, measures for its control and eradication would be undertaken as needed. No invasive plant species have been noted in the Western Salt Ponds Restoration located nearby the proposed ORERP in south San Diego Bay now approximately 2.5 years after construction.

4.8.2 Invasives

Control of invasive plant species is species-specific and dependent upon the level of invasiveness. Poseidon contractors will conduct regular site inspections to determine if species that are included in the California Exotic Pest Plant Council listings have become established. Poseidon will cooperate with the Service Refuges Division regarding appropriate eradication measures.

4.8.3 Inlets to the Pond 15 Site

Protective Berms and Raised Berm Between Ponds 22 and 23

The berm along the south boundary of the Otay River Floodplain Site and the berm between Ponds 22 and 23 that will be raised to provide flood protection for low lying areas of Imperial Beach will be inspected annually and after major storm events (greater than 10 year flood). Any damage judged to result in a loss of structural integrity will be repaired through minor construction activities, such as import of rock or soil for reinforcement.

Bayshore Bikeway Bridge Slope Protection

The proposed project has the potential to increase water velocities under the two Bayshore Bikeway Bridges that cross the Otay River. The tidal and fluvial hydraulic modeling analyses suggested that the proposed project may increase velocities at the bridge located along the western project boundary to the point where slope protection is required to maintain the integrity of the bridge structures. Consequently, the proposed project includes slope protection at this location, although additional engineering analyses to be conducted during final design might reveal that such protection is not needed.

The proposed slope protection would consist of a stone revetment to armor the side slopes on both sides of the channel under the Bayshore Bikeway Bridge. The slope protection would be placed at a 2:1 (horizontal to vertical) slope and it would extend deep enough (e.g., 1 foot to 10 feet) to provide adequate protection for scour. The slope protection would extend 10 to 30 feet upstream and downstream to provide adequate protection. Directly under the Bayshore Bikeway

Bridge, the bottom might be armored to protect the remains of the existing railroad bridge that has been designated as a cultural resource.

Maintenance for the slope protection would consist of annual (pre-storm season) condition monitoring to assess the integrity of the structure. The above water portion of the structure would be monitored for signs of toe undermining as well as degradation, slumping, and settling of the stones. In addition to annual monitoring, monitoring should be conducted following a major storm event (e.g., >25-year event) to assess the condition of the slope protection such that any remedial actions can be implemented prior to the next storm event. Based on the results of the monitoring program, maintenance activities would be implemented to remediate any problems identified from the monitoring. Maintenance activities would include slope repair via relocation of existing stones and/or addition of new stone or replacement of damaged stone.

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5 COMPLIANCE OF PROJECT TO FULFILL POSEIDON MLMP PERMIT REQUIREMENTS

5.1 Poseidon Permit Requirements

According to the MLMP, the wetland restoration project site(s) and preliminary plan(s) must meet the following minimum standards:

a. Location within Southern California Bight;

The selection of the Otay River Floodplain Site and Pond 15 Site of the Refuge satisfies the requirement that the mitigation site be located within the southern California bight.

b. Potential for restoration as tidal wetland, with extensive intertidal and subtidal areas;

The Otay River Floodplain Site and Pond 15 Site will result in restoration of tidal action to areas that have been leveed and isolated from San Diego Bay for over 80 years. Historic maps indicate that the area proposed for restoration was formerly 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 restoration of establishment, through excavation, placement of fill materials, and grading of a mixture of subtidal, intertidal and transitional wetland areas that will support a full array of estuarine and intertidal organisms.

c. Creates or substantially restores a minimum of 37 acres and up to at least 66.4 acres [all locations] acres of habitat similar to the affected habitats in Agua Hedionda Lagoon, excluding buffer zone and upland transition area;

The requirement of restoration of up to 66.4 acres of habitat similar to that affected at Aqua Hedionda Lagoon will be achieved through the restoration approximately 29 acres of subtidal and intertidal habitat (below 6.6 feet NAVD) in the Otay River Floodplain Site and approximately 81 acres of subtidal and intertidal habitat in the Pond 15 Site. The Otay River floodplain contains some existing wetlands as defined by the Coastal Commission and the placement of necessary flood control levees will impact some wetlands. No credit towards substantial restoration will be given for the conversion of existing wetlands to tidal wetlands and a 4:1 mitigation requirement has been placed on any wetlands converted to upland levees. Therefore, the amount of acreage credit that will be achieved within the Floodplain area is approximately 21 acres. According to the agreed functional lift associated with the substantial restoration of the Pond 15 Site, the total credited acreage will be approximately 57 acres (after subtracting the area that is converted to nesting areas). Therefore the total credited acreage is approximately 78 acres.

d. 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.

The proposed restoration of the Otay River Floodplain Site and the Pond 15 Site will provide buffer zones in excess of 100 feet in all directions.

e. Any existing site contamination problems would be controlled or remediated and would not hinder restoration;

A field sampling program was conducted that detected Dichlorodiphenyltrichloroethane (DDT) and metabolites (dichlorodiphenyldichlor-oethylene [DDE] and dichlorodiphenyldichloroethane [DDD]) and toxaphene in the samples collected in portions of the initially proposed Otay River Floodplain Site. The source of DDT is directly related to the historic use of this property for agricultural production, primarily tomatoes and other truck crops. A sewer treatment plant that operated within the Otay River floodplain between the mid-1950s and the early 1960s is considered the source of the various metals detected in some of soil samples. Although former agricultural activities have resulted in high levels of DDT and derivatives on a portion of the floodplain, the project was redesigned to avoid disturbance of these areas and therefore will not result in any redistribution of these contaminants. A soil sampling program will be part of the restoration project and all material excavated from the Otay River Floodplain Site that is suitable for use for restoration will be placed in Pond 15 Site.

f. 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;

The Otay River Floodplain Site, east of Nestor Creek, was purchased by the Coastal Conservancy, conveyed to SWIA, who then conveyed ownership to the Service for the purpose of restoration. The portion of the Otay River Floodplain Site west of Nestor Creek and the Pond 15 Site of the Refuge is owned by the California State Lands Commission and leased to the Service exclusively for restoration of coastal wetlands and associated uplands.

g. Feasible methods are available to protect the long-term wetland values on the site(s), in perpetuity;

The Refuge is managed by the Service. The Service will provide management of the restored wetlands to protect its ecological value in perpetuity.

h. Does not result in a net loss of existing wetlands; and

The proposed restoration entails the conversion of a former salt evaporation pond and current salt evaporation pond to intertidal salt marsh, mudflats and subtidal habitats. The former salt evaporation pond contains highly saline soils and has no value to fish or invertebrates. The existing solar evaporation pond contains highly saline brines as part of the industrial process for producing salt and does not support wetland vegetation, fish or invertebrates. Some bird use does occur. The Commission established a process by which credits could be determined for both sites that recognizes that conversion of existing wetlands within the Otay River Floodplain Site will not receive any credit towards meeting the acreage requirement and, for the Pond 15 Site, a method to determine functional lift based on a comparison to reference tidal wetlands. Any conversion of existing wetlands to uplands as needed to address flood control in the Otay River Floodplain Site will have a 4:1 replacement requirement. As a result of these measures, there will be a net increase in existing wetlands as a result of the project.

i. Does not result in an adverse impact on endangered animal species or an adverse unmitigated impact on endangered plant species.

The CCP and EIS prepared for the project identified all endangered plant and animal species in the project location and the potential impacts associated from implementation of the preferred alternative. In general, the document presents the potential effects to endangered species associated with construction of the habitat restoration and the long-term effects of the habitat restoration. The document concludes that the potential for adverse effects to the Refuge's endangered and threatened species during restoration-related grading activities would be minimized by controlling the level of construction activity permitted in the vicinity of active nest areas, including restricting some activities to the non-breeding season; establishing construction boundaries that minimize impacts to native vegetation and sensitive habitat areas; and monitoring sensitive habitat areas during construction to assess actual disturbance levels and, where necessary, developing and implementing additional protective measures.

The long-term effects on threatened and endangered species of the restored habitats are considered beneficial.

5.2 Compliance with Site-Specific and Regional Restoration Goals

The following objectives represent the factors that will contribute to the overall value of the wetland. The selected site(s) shall be determined to achieve these objectives. These objectives shall also guide preparation of the restoration plan.

a. Provides maximum overall ecosystem benefits, e.g., maximum upland buffer, enhancement of downstream fish values, provides regionally scarce habitat, potential for local ecosystem diversity;

   The proposed restoration of the Otay River Floodplain Site and the Pond 15 Site entails the conversion of a former and existing solar evaporation ponds to intertidal salt marsh and mudflats and subtidal habitats. Intertidal salt marsh, intertidal mudflat, and subtidal habitats are regionally scarce habitats targeted for restoration/creation in the southern California Bight. Located just upstream of San Diego Bay, the fisheries of the bay would be considered the downstream fishery. The fisheries of South San Diego Bay are recognized as a valuable resource that will be enhanced by the restoration process. The extensive shallow water habitat and eelgrass beds of the South Bay provide important habitat for these and a variety of fish, including midwater, schooling fishes, such as northern anchovies, slough anchovies, and topsmelt. These species, in turn, represent a major forage resource for predatory fish and avian species. The warmer, hypersaline waters of the South Bay also offer shelter for a number of fish species commonly encountered further south in the Eastern Subtropical and Tropical Pacific. The south end of San Diego Bay also functions as an important nursery area for juvenile California halibut and young spotted and barred sand bass.

   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 scoters, Caspian terns and western snowy plovers. The entire southern end of San Diego Bay has been recognized as a Western Hemisphere Shorebird Reserve Network Site. The proposed restoration has been designed to preserve and enhance this biological diversity.

b. Provides substantial fish habitat compatible with other wetland values at the site(s);

   The conversion of the former and existing evaporation ponds to intertidal salt marsh, mudflats and subtidal habitat will provide substantial fish habitat where none exists today. The role of unvegetated tidal creeks and sloughs as breeding areas and nurseries for estuarine-dependent fishes has been well studied. The transient use of the intertidal salt marsh by species such as California killifish has likewise been demonstrated. These values will all be enhanced by the proposed project. Furthermore, the intertidal mudflats created by the project will provide breeding habitat for the goby species that are prevalent in Agua Hedionda Lagoon.

c. 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.

The Otay River Floodplain Site is located in an isolated corner of South San Diego Bay with buffers on all sides, including the restoration of a riparian and brackish marsh area to the east. The nearest human habitation from the entrance channel to the floodplain restoration is 100 feet; however, it is generally greater than 700 feet. The existing pedestrian trail is from 75 to 125 feet from the restoration, but will be separated by a flood control levee along the Otay River. The Pond 15 Site is further isolated from human habitation or use and will meet the requirements set forth.

d. Provides maximum upland transition areas (in addition to buffer zones);

A gradual transitional area is being provided to allow for sea-level rise and this zone will provide a substantial area of transitional wetland habitat around the perimeter of the Otay River Floodplain.

Restoration involves minimum adverse impacts on existing functioning wetlands and other sensitive habitats;

e. The proposed restoration entails the conversion of a former and existing salt evaporation ponds to intertidal salt marsh, mudflats and subtidal habitats. The former and existing salt evaporation ponds do not contain highly functioning wetlands or other sensitive habitats due to human alteration, high salinities, and continuing industrial use. Mitigation is being provided for any project impact to existing wetlands. Thus, the project will have minimal adverse impacts to existing wetlands and other sensitive habitats.

Site selection and restoration plan reflect a consideration of site specific and regional wetland restoration goals;

f. The following goals provided the guiding principles for the South San Diego Bay Unit. They are consistent with Refuge purposes, National Wildlife Refuge System goals, the National Wildlife Refuge System Improvement Act, Service policies, and international treaties. These goals apply to all of the management alternatives evaluated for this Refuge Unit.

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.

In addition, the CCP was prepared using the following documents as guidance:

- All applicable Service threatened and endangered species recovery plans;
- Ecoregion Planning, as defined by the Service;
- Shorebird Conservation Planning, as defined by the U.S. Shorebird Conservation Plan;
- Waterbird Conservation, as defined by the North American Waterbird Conservation Plan;
- National Strategy for Coastal Restoration, as defined by Restore America's Estuaries and the National Oceanic and Atmospheric Administration
- Marine Protected Areas, as defined by Executive Order 13158;
- California Wildlife: Conservation Challenges, California's Wildlife Action Plan, as defined by the California department of Fish and Game; and, Regional restoration needs

g. Restoration design is that most likely to produce and support wetland-dependent resources;

As stated above, the major goals of the proposed restoration is to protect, manage, enhance and restore open water, coastal wetlands and native upland to benefit native fish, wildlife and plant species supported within the Refuge unit and to provide habitat for salt-marsh dependent species. The project has been designed to achieve the objective of producing and supporting wetland-dependent species.

h. Provides rare or endangered species habitat;

Goal 2, stated above, addresses the 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. The over-arching reason for the establishment of the South Bay unit was the preservation and recovery of threatened and endangered species, including the light-footed clapper rail, the California least tern and salt marsh bird's beak. The preferred restoration plan provides a diverse assemblage of wetland habitats, including cordgrass-dominated salt marsh – the preferred nesting and foraging habitat of the light-footed clapper rail - fishery resources that support the California least tern, and shallow subtidal habitat that provides nursery grounds for California halibut**.**

The design of the project includes provision of nesting islands for use by California least tern and other sensitive shorebirds.

i. Provides for restoration of reproductively isolated populations of native California species;

As stated above, one of the primary reasons for acquiring the South San Diego Bay Unit was to preserve and restore habitat for the endangered light-footed clapper rail. Although these birds can fly, they rarely do so and migrate locally usually by walking or, occasionally, swimming. Thus, a clapper rail population within South San Diego Bay is essentially isolated from other southern California populations. As stated previously, restoration of the South San Diego Bay Unit will benefit the clapper rail and other threatened and endangered species. The restoration provides the opportunity to establish a population or populations of the endangered salt marsh bird's beak, a hemiparasitic plant that occurs in the upper elevations of salt marsh habitats. Populations of salt marsh bird's beak at other southern California wetlands are reproductively isolated from one another.

j. Results in an increase in the aggregate acreage of wetland in the Southern California Bight;

The proposed restoration of the Otay River Floodplain Site and Pond 15 Site will increase the aggregate acreage of tidal wetland in the Southern California Bight.

k. Requires minimum maintenance;

The proposed restoration of the former and existing solar evaporation ponds would be accomplished be creating elevations suitable for tidal wetland habitat. There are no hard structures needed, such as jetties, as the site is not subject to coastal erosion or deposition by wave action. The Otay River is dammed upstream of the Otay River Floodplain Site, and does not convey a sediment load that would be potentially damaging to a subtidal-intertidal wetland. Thus, maintenance dredging is not anticipated. Once vegetation has become established, there is no anticipated need for planting or maintenance of exotic weed species.

l. Restoration project can be accomplished in a reasonably timely fashion; and,

It is anticipated that restoration of the Otay River Floodplain Site and the Pond 15 Site can be accomplished within the timeframes set forth in the MLMP.

m. Site(s) in proximity to the Carlsbad desalination facility.

The Refuge is located approximately 35 miles south of Aqua Hedionda Lagoon, the site of the Carlsbad Desalination Plant.

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APPENDIX D

Planting Plan for Uplands

Planting Plan for Uplands
Associated with the Poseidon Wetland Mitigation Project
San Diego Bay National Wildlife Refuge
April 7, 2015

1.0 INTRODUCTION

The proposed Poseidon Otay River Estuary Restoration Plan (ORERP) would restore approximately 37 acres on the Otay River floodplain to intertidal wetland under the Intertidal Alternative. Approximately 320,000 to 370,000 yd^3 of material would be excavated from the floodplain with 36,000 yd^3 placed within the floodplain east of Nestor Creek and the remaining transported to Pond 15 to restore wetland habitat there. The portion of the floodplain east of Nestor Creek, comprising approximately 40 acres, was eliminated from the restoration plan due to the presence of contaminated soils. The 36,000 yd^3 of soil place at the site are for futureuse by the U.S. Fish and Wildlife Service (USFWS). This area is primarily disturbed habitat, supporting crown daisy and non-native grasses and is mowed each year for fire prevention. The purpose of this planting plan is to revegetate the existing floodplain east of Nestor Creek, including the stockpiled soils, with a native hydroseed mix that will provide functional habitat and soil stability while not disturbing the soil profile.

During discussions with the USFWS, owners of the Otay River floodplain site, it was determined that a low-growing shrub community would provide the desired soil stability, provide habitat for wildlife and compliment the adjacent riparian restoration undertaken by the USFWS and River Partners. Accordingly, this plan presents a plant palette composed of Diegan coastal sage scrub species (DCSS). DCSS is characterized by low, woody subshrubs that grow to approximately 1 meter in height (Holland 1986). Common dominant species include coastal sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*) and white sage (*Salvia apiana*).

2.0 PLANT PALETTE AND APPLICATION

Two methods are presented for revegetating the approximately 40 acres east of Nestor Creek. 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 pre-made DCSS seed mix from a commercial seed supplier.

Typically, for smaller scale revegetation projects, it is specified that all seeds should be collected from existing DCSS 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 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. Seed collection and testing adds substantially to the overall cost of the project, as presented in detail below.

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 will be applied as slurry to the entire surface area of the disturbed portion of the approximately 40-acre site. The hydroseed slurry will consist of the required seed species and quantities and an inert wood pulp matrix. Hydroseed will be applied as an even coating over all surfaces. Care will be taken to avoid impacting or hydroseeding the existing alkali marsh and coastal salt marsh within the 40-acre area.

Table 1. Plant Palette for Poseidon Upland Revegetation Plan – Option 1

Species	% Purity/% Germination	Lbs/acre
Artemisia californica/coastal sagebrush	15/50	2
Encelia Californica/California encelia	40/60	3
Eschsholzia californica/California poppy	98/75	2
Eriogonum fascilculatum/California buckwheat	10/65	12
Isocoma menziesii/coastal goldenbush	20/40	4
Acmispon glaber/deerweed	90/60	8
Lupinus succulentus/arroyo lupine	98/85	4
Salvia apiana/white sage	70/50	2
Total		**39 lbs/acre**

Option 1. Collect and Test Seed. The proposed plant palette for Option 1 is presented in Table 1. This plant palette includes species common to southern California DCSS, both coastal and inland. These species are drought tolerant and have low water requirements. As stated above, seeds of these species would be collected in the south San Diego Bay area and tested for germination and purity. Cost associated with Option 1are presented In Section 4.0 Estimated Cost.

Option 2. Pre-made Seed Mix. S&S Seeds, a respected seed supplier in the region, offers a pre-made DCSS mix presented in Table 2. This plant palette, like that in Option1, includes species common to southern California DCSS, both coastal and inland, that are drought tolerant and have low water requirements. S&S states that the mix is intended for non-irrigated areas but establishment and growth is enhanced with irrigation. They do not specify purity/germination but do provide number of live seed/lb by species. While this option includes more species, all are native to California and many were included in Option 1.

Table 2. Plant Palette for Poseidon Upland Revegetation Plan – Option 2	
Scientific Name	**Common Name**
Acmispon glaber	deerweed
Artemisia californica	coastal sagebrush
Camissoniopsis cheiranthifolia	beach evening primrose
Collinsia heterophylla	Chinese houses
Encelia californica	California encelia
Eriogonum fascilculatum	California buckwheat
Eriophyllum confertifolium	golden yarrow
Eschscholzia californica	California poppy
Lupinus succulentus	arroyo lupine
Festuca microstachys	small fescue
Lasthenia californica	dwarf goldfields
Mimulus aurantiacus puniceus	mission red monkeyflower
Salivia apiana	white sage
Salvia mellifera	black sage
Sysyrinchium bellum	blue-eyed grass
Stipa pulchra	purple needlegrass
Total lbs/acre	**51**

3.0 IRRIGATION

Irrigation will be provided by a temporary overhead irrigation system that does not disturb the soil profile. Water is available at the Otay River Floodplain and is currently being used by River Partners and the USFWS to establish riparian habitats. This water is being delivered via a well and pipeline from Terra Bella Nursery, located just east of I-5 on the Otay River at a cost of $2,500/month for their approximately 60-acre riparian restoration. This is considerably less expensive than using City of San Diego potable water, which would likely be an order of magnitude grater. River Partners has agreed to provide additional as-needed services for the well and pump and recently replaced the pressure regulator at the well at no charge to the nursery. Poseidon may be required to provide similar services. It is anticipated that irrigation will be required for at least the first year of the project. Irrigation will be phased out gradually depending on the local weather conditions during the establishment period.

4.0 SUCCESS CRITERIA

Because the proposed revegetation is not mitigation for impacts to other resources, strict success criteria, such as percent cover, are not applicable. However, a goal of at least 50% cover by the end three years is proposed. In order to achieve this goal, initial germination of the hydroseed mix will be estimated and survival and growth will be estimated periodically. It is proposed that germination be estimated through visual analysis supplemented with randomly placed 0.25 m^2 quadrats. Depending on the timing of hydroseed application, germination could be assessed 1 to 3 months after application and irrigation. The Project Biologist will determine whether sufficient germination has occurred. Should germination fail to exceed 25 -30%, re-seeding may be required. Should plants that germinate fail to survive, re-seeding may be required.

The Project Biologist will conduct periodic site visits throughout the first three years to assess plant growth and survival. Cover will be estimated visually and supplemented with point intercept transects to quantify cover. Should cover fail to reach 50% after the third year, re-seeding may be required.

5.0 ESTIMATED COST

Option 1. The estimated cost to collect, test, apply and irrigate hydroseed under Option 1 is presented in Table 3. The rationale for this estimate is based on: 1) past seed collection and testing for similar, but smaller scale projects; 2) commercial hydroseed application rates; and 3) irrigation with water supplied by the same entity that is currently supplying water to River Partners on the Otay River floodplain.

In 2000, S&S Seeds was contracted to collect and test seed for a 4.3-acre maritime succulent scrub restoration in the Tijuana River Valley. Thirteen species were collected in quantities similar to those presented in Table 1. Total cost was approximately $12,000. Accounting for inflation it is estimated that cost today for 13 species would be approximately $15,000. Given that Option 1 proposes only 8 species, it is estimated that the cost to collect 8 species for a 4.3-acre restoration would be approximately $9,230. Assuming no economy of scale, the cost to collect and test seed for a 40-acre site would be about $369,230.

Commercial hydroseed companies reviewed on the internet advertise rule-of-thumb application costs of approximately $3,500/acre. Using this cost per acre, it is estimated that the cost to apply 39 lbs of seed per acre under Option 1 would be $140,000.

Should Poseidon procure the same arrangement with Terra Bella Nursery for water, the cost to irrigate for one year, based on $2,500/month would be $30,000. Because the River Partners project is riparian habitat which requires substantial watering and is 60 acres in size, a conservative estimate for 40 acres of more drought resistant DCSS is $1,700/month. Adding a contingency for maintenance of the well and pipeline it is estimated that water would cost $2,000/month or $24,000/year. For the purpose of estimating cost, it is assumed that one year for irrigation will be sufficient to establish the hydroseeded plants.

Total cost under Option 1 would be approximately $533,320. That cost could increase to around $749,230 if City water is provided at s rate of $20,000/month.

Table 3. Estimated Cost – Option 1	
Item	**Cost**
Collect and Test Seed	$369,230
Apply Hydroseed	$140,000
Irrigate	$24,000
Total	**$533,230**

Option 2. The estimated cost to purchase pre-made DCSS from S&S Seeds, apply and irrigate, is presented in Table 4. S&S recommends 51 lbs/acre of DSCC mix at $45/lb for a cost of $91,800 to procure seed for 40 acres, a considerable savings over collecting a custom seed mix. The cost for application and irrigation would be the same as Option 1 resulting in a total cost of $255,800. That cost could increase to around $471,800 should City water be used at a rate of $20,000/month.

Table 4. Estimated Cost – Option 2	
Purchase Pre-made Seed Mix ($45 X 40 acres)	$91,800
Apply Hydroseed	$140,000
Irrigate	$24,000
Total	**$255,800**

Based solely on cost, Option 2 provides a reasonable method for accomplishing the goal of revegetating the Otay River floodplain. However, the USFWS must concur that the use of seed collected from sites other than south San Diego Bay is appropriate for this portion of the San Diego Bay National Wildlife Refuge.

APPENDIX E

ORERP Construction Methodology

OTAY RIVER ESTUARY RESTORATION PROJECT

CONSTRUCTION METHODOLOGY

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August 2016

Everest# P2164

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1. INTRODUCTION

This document describes a range of construction methods and equipment that could be used for the construction of the Otay River Estuary Restoration Project (Project). Figure 1 shows the Project site and its vicinity. The Project site consists of two major areas denoted by orange lines in Figure 1: (i) Otay River Floodplain (ORF) to the south, and (ii) Salt Pond 15 (Pond 15) in the San Diego National Wildlife Refuge Complex to the north.

Similar to other coastal wetland restoration projects, the major construction activity of this Project is earthwork. Project construction involves lowering the existing ground elevations in the ORF to form subtidal, mudflat, salt marsh, and upland habitats; and filling Pond 15 with excavated material to restore wetland habitats. Specifically, the Project requires the excavation (cut) of approximately 320,000 to 370,000 cubic yards (CY) of soil within the ORF. Most of the excavated material would be transported to Pond 15. A small portion of the excavated material would be used to construct a new berm along the southern edge of the ORF. The construction methods, equipment, and schedule for this Project are described below. These methods, equipment, and schedules have been developed based on Project requirements and constraints, in combination with experience from past projects of a similar nature. The construction methodology ultimately used would be determined 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 than those considered herein then additional environmental review may be needed to verify that the Project would not result in substantial environmental impacts beyond those already considered.

Image: Google Earth Pro

Figure 1. Project Site and Vicinity

2. MOBILIZATION AND DEMOBILIZATION

Heavy construction equipment may be brought to the Project site either by land or water. Equipment transported by land would likely be trucked to the Project site via Main Street.

Large and heavy equipment would be transported during off-peak traffic so as to minimize traffic congestion. The site entrance/exit points are discussed in Section 3. If transported by water then the construction equipment would likely be brought into the site via San Diego Bay and the Otay River. Some large equipment may be brought into the Project site in several pieces and then be assembled on site. Regardless of whether construction equipment is mobilized to the site from land, sea, or both the potential environmental impacts should be assessed as part of environmental review under NEPA and CEQA.

At the end of construction, the equipment would be demobilized. Demobilization of equipment would use the same route as mobilization. Staging areas, access routes, and other disturbed areas would be uncompacted, revegetated, and restored to preconstruction conditions or as specified in the construction documents. Any temporary equipment, structures, or utilities (*e.g.,* water and power) installed at the Project site would be removed at the completion of construction.

3. Construction Access and Staging Areas

3.1 Construction Access

Roads that can be used for construction access routes in the vicinity of the Project site are shown in Figure 1. Saturn Boulevard is the north-south running road located along the eastern edge of the Project site. The other major roads in the Project vicinity are Palm Avenue (State Route 75) to the south, Main Street to the north of the ORF, and Interstate 5 to the east. There are interchanges to Interstate 5 at Main Street and Palm Avenue. Using one of these interchanges, construction equipment would access the ORF via the north-eastern corner of the Project site where West Frontage Road, Main Street, and the Bayshore Bikeway intersect. Construction equipment would access Pond 15 via a USFWS easement located off Bay Boulevard just north of the entrance to the Salt Works operational facility. To complete the construction work on the dike between Ponds 22 and 23, construction equipment would access the site via the main entrance to the Salt Pond Complex located off Bay Boulevard and then wind around the southern boundary of the Salt Pond Complex.

Within the Project site, temporary dirt roads would be established to provide access for construction equipment between the excavation, staging, beneficial use, disposal, and fill 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 ORF from the construction area, the contractor would have to install temporary crossings across Nestor Creek and Otay River. Access to the construction site would be controlled through the use of gates, fencing, and/or site security services.

Construction equipment transporting material to Pond 15 would utilize some of the existing salt pond dikes. Since the existing dikes were not built to accommodate this use, temporary improvements (*e.g.,* widening and resurfacing) may be necessary depending on the method used to haul material between the excavation site (ORF), beneficial use/disposal site (Pond 15), and fill site (dike between Ponds 22 and 23). Three possible methods for material hauling and disposal are described in Section 4 below.

3.2 Staging Areas

Staging areas would be located upland away from construction activities. The area east of Nestor Creek in the ORF would be used for staging (see Figure 2). Drying and sorting of excavated material may also be carried out at this location. The staging area to the south of the stockpiles would be utilized first. Additional area for staging would the land to the west of the stockpiles as depicted in Figure 2. The staging area is near the entrance/exit to/from the excavation site (ORF). Any permits and/or approvals required to conduct the drying activities would need to be obtained prior to commencing with this activity.

To protect the sensitive habitat in the vicinity, the contractor should install temporary fences so as to limit the construction activities in the designated staging area and minimize disturbance of the neighboring area. Figure 2 shows the proposed layout of the temporary construction fencing within the staging area.

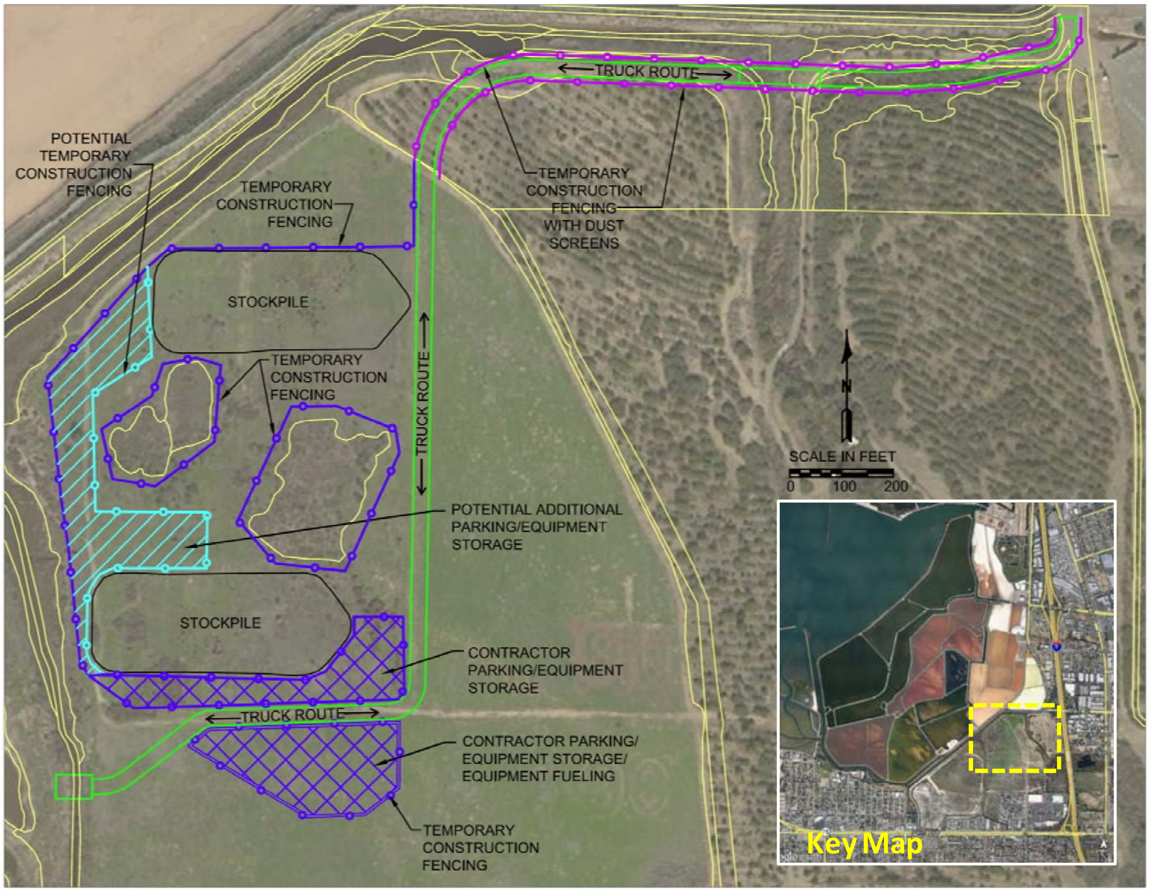

Figure 2. Staging Area Layout

4. EARTHWORK

Earthwork is the major construction activity of the Project. The Project requires the excavation of approximately 320,000 cubic yards (yd^3) of soil (material) within the ORF for the Intertidal Alternative and 370,000 yd^3 for the Subtidal Alternative. Between 50,000 to 60,000 yd^3 of soil would also be excavated from Pond 15. The majority of the 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, levees, and upland habitat creation. The remainder of the material would be stockpiled within the ORF for use on future projects within the Refuge.

The success of wetland restoration depends greatly on the accuracy of the final grading in achieving the desired elevations for different wetland habitats. To meet this requirement, the contractor may decide to use land-based equipment to complete the earthwork under dry conditions or a combination of land-based and water-based equipment to complete the earthwork under wet conditions. Excavated material would be transported to the fill sites by truck, conveyor belt, pipelines, or a combination of these methods. Bulldozers and loaders might also be used to move material short distances within the ORF.

4.1 Excavation

4.1.1 Land-Based Excavation

If the contractor decides to use land-based equipment to complete the earthwork under dry conditions then it is likely that the work would be done using an approach similar to the one described here. Excavation would most likely be done with land-based equipment for areas above groundwater. Soil within two feet below the groundwater elevation may be wet, but excavation with land-based equipment would likely still be feasible without dewatering. In locations where groundwater is present, dewatering would likely be necessary to conduct work under dry conditions.

Based on the results of soil sampling conducted by Anchor QEA (Anchor QEA 2010), the average groundwater elevation in the ORF is approximately 5 ft above the North American Vertical Datum of 1988 (NAVD88). Therefore, it is likely that water would be ponded in excavated areas below +3 ft, NAVD88. The estimated volume of excavated material below +3 ft, NAVD88 in ORF is 20,000 yd^3 for the Intertidal Alternative and 50,000 yd^3 for the Subtidal Alternative. In Pond 15, the entire area is very low in elevation; therefore, the small volume of material excavated in this pond would be wet.

Land-based excavation would be conducted with a combination of bulldozers, front loaders, backhoes, graders, scrapers, excavators, and trucks. Excavated material would either be loaded directly onto trucks and conveyor belts or it would be stockpiled temporarily near the excavation site. The stockpiled material would then be loaded onto trucks for hauling to the placement sites (Pond 15 and Pond 22/23 dike).

If excavation is conducted using land-based equipment below +3 ft, NAVD88, dewatering may be necessary. Dewatering may be achieved by blocking off the excavation site and then pumping water out of the excavation site. Alternatively, wet material may be excavated by a long-reach excavator and then dewatered on site before being hauled to the placement sites.

4.1.2 Combination of Land-Based and Water-Based Excavation

If the contractor decides to use a combination of land-based and water-based equipment to complete the earthwork under wet conditions then it is likely that the work would be done using an approach similar to the one described here. The contractor would use land-based equipment to excavate material from ORF in matter as described in Section 4.1.1. Material excavated from the ORF would be dumped into a pit and mixed with water taken from the

Otay River to form a slurry. The slurry would then be pumped to Pond 15 via a pipeline. The pit would be hydraulically isolated from the Otay River until project completion at which time it would be opened and connected to the Otay River to restore tidal exchange to the restored area. To minimize impacts to water quality in San Diego Bay, a two-way pipeline system would be installed between the ORF and Pond 15 to convey slurried material to Pond 15 while bringing water back to the ORF for subsequent use. Water would occasionally be pumped from the Otay River to supplement water lost to groundwater and evaporation during operations.

4.2 Material Transport and Placement

Material placement involves the transportation of excavated material to the final placement sites. The Project calls for most of the excavated material from ORF (approximately 260,000 yd^3 for the Intertidal Alternative and 310,000 yd^3 for the Subtidal Alternative) to be transported to Pond 15, with only a small volume (approximately 20,000 yd^3) to be used on-site in the ORF for levee construction and upland restoration. About 30,000 yd^3 to 40,000 yd^3 would be stockpiled in the ORF to the east of Nestor Creek for future USFWS Refuge projects. The stockpiled material would be watered during construction to mitigate for dust generation. Upon completion of project construction, suitable and appropriate upland vegetation would be planted to control wind and water-related erosion until the stockpile material is reused for future USFWS Refuge projects.

Approximately 50,000 yd^3 to 60,000 yd^3 would be excavated from Pond 15. Based on soil sampling and testing, the majority of this material is expected to be free of contaminants; however, it is anticipated that a small portion of soil (<5,000 yd^3) in the vicinity of the dike that would be breached would contain elevated levels of heavy metals. This contaminated material would be buried inside Pond 15 under clean fill from the ORF such that the contaminants would not be available to ecological receptors (*e.g.,* capped under fill material). Excavated material would be disposed of using some combination of scrapers, trucks, bulldozers, loaders, graders, conveyor belts, or pipelines.

If dump trucks are used to transport material from the ORF to Pond 15 then a system of haul roads and access points would need to be established and maintained. A few possible hauling configurations are discussed in Section 4.2.1. Dry material would be loaded onto trucks using front loaders or backhoes or it would be excavated and hauled directly using scrapers. Wet material would be dried and then transported via trucks equipped with a lining to retain water that remains in the soil. Bulldozers may be used to move excavated material to stockpile areas, which may be necessary for drying or staging before being transported by truck. Bulldozers may also be used to move material to on-site upland area or for berm construction.

Conveyor belts may be used to move excavated material within the ORF, part of the distance between the ORF and Pond 15, or all the way from the ORF to Pond 15. Within the ORF, conveyor belts could be used to transport material from the excavation area to the stockpile area. A conveyor belt system could be used to move excavated material across the Otay River and Bayshore Bikeway. Once across (under) the Bayshore Bikeway, and within the Salt Pond Complex, the conveyor belt would transport material to Pond 15.

4.3 Haul Methods and Routes to Pond 15

Three methods for moving excavated material from the ORF to Pond 15 were identified for consideration in evaluating potential environmental impacts. The three methods are described below.

- Truck
- Conveyor Belt
- Pipeline

These three methods represent a range that would likely be considered by a contractor given the site conditions, quantity of material, construction schedule, and likely mitigation measures to minimize environmental impacts. The three methods are described in more detail below.

4.3.1 Truck

Under this method, the contractor would use dump trucks to transport material from the ORF to Pond 15. The most likely truck haul route is shown in Figure 3. The truck route in the vicinity of Pond 15 is shown in Figure 4. Temporary crossings would be necessary for the trucks to cross Nestor Creek, Otay River and Palomar Creek (near Pond 15). These temporary structures are described at the end of this section.

Truck traffic on this route would interfere with the Bayshore Bikeway and City of San Diego bike path where the trucks exit the ORF onto West Frontage Road. Traffic flow at this intersection would be maintained by a flagman in order to ensure public safety. From West Frontage Road, the trucks would turn onto Anita Street and then to Bay Boulevard. The trucks would enter the Salt Ponds Complex via the USFWS easement located just north of the Salt Works operational facility off Bay Boulevard. The dikes within the salt ponds that would be used by construction traffic would be improved and widened to 30 feet to allow for two-way traffic, an exception is the dike around Pond 15 where one-way traffic in a loop can be established. The dike improvements would likely require the placement of small amounts of fill into the ponds. Any such fill would be removed upon the completion of construction activities thus returning the ponded area to pre-project conditions. The round trip distance of the truck route shown in Figure 3 is about 5 miles. A round trip, including loading and dumping, would likely take about 36 minutes. Assuming a bulking factor of 1.3 due to volume expansion after material is removed from the ground, a contractor using 12-yd^3 trucks would have to make about 28,000 trips and 34,000 round trips, respectively, for the Intertidal Alternative and Subtidal Alternative.

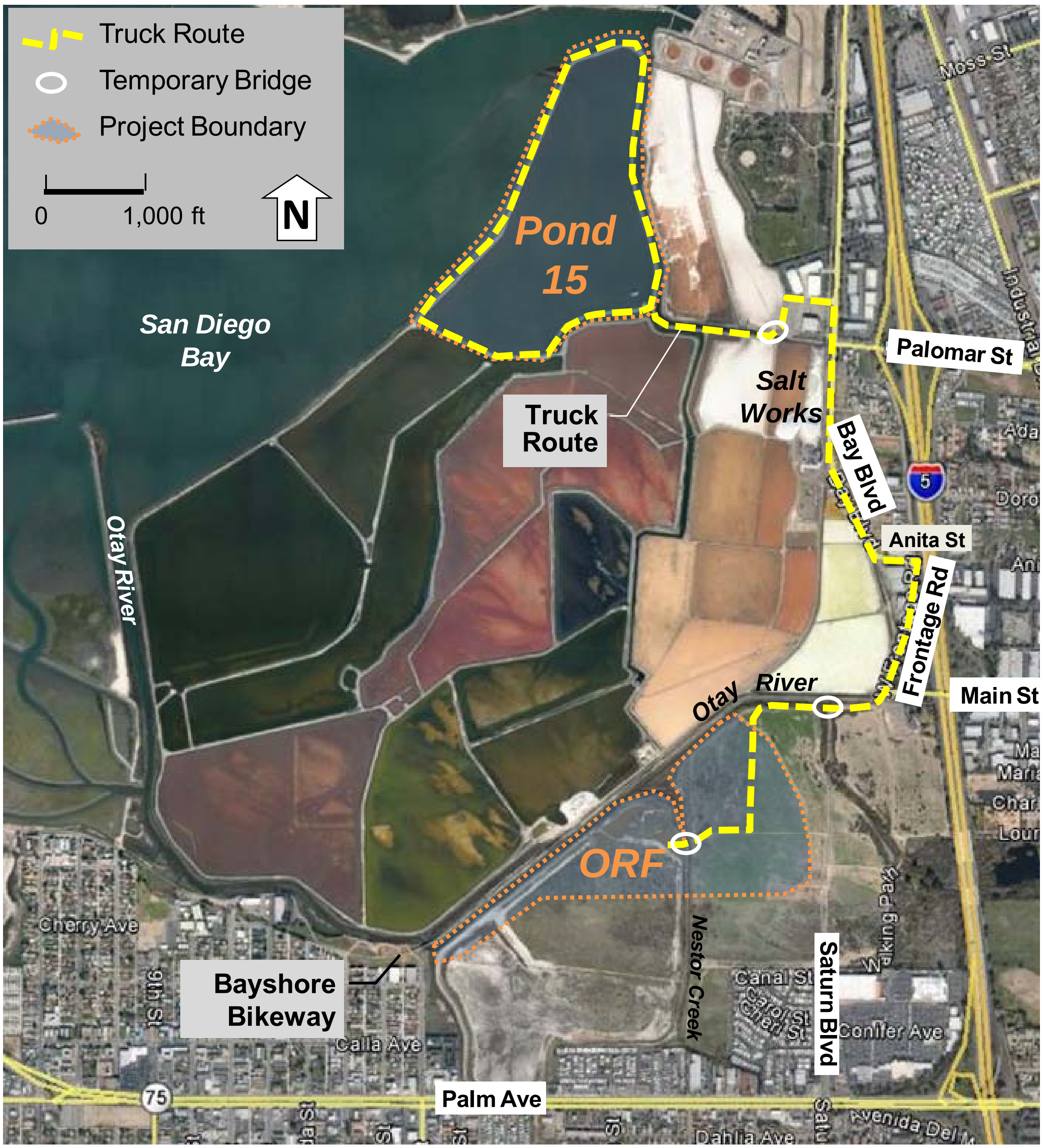

Image: Google Earth Pro

Figure 3. Truck Haul Routes

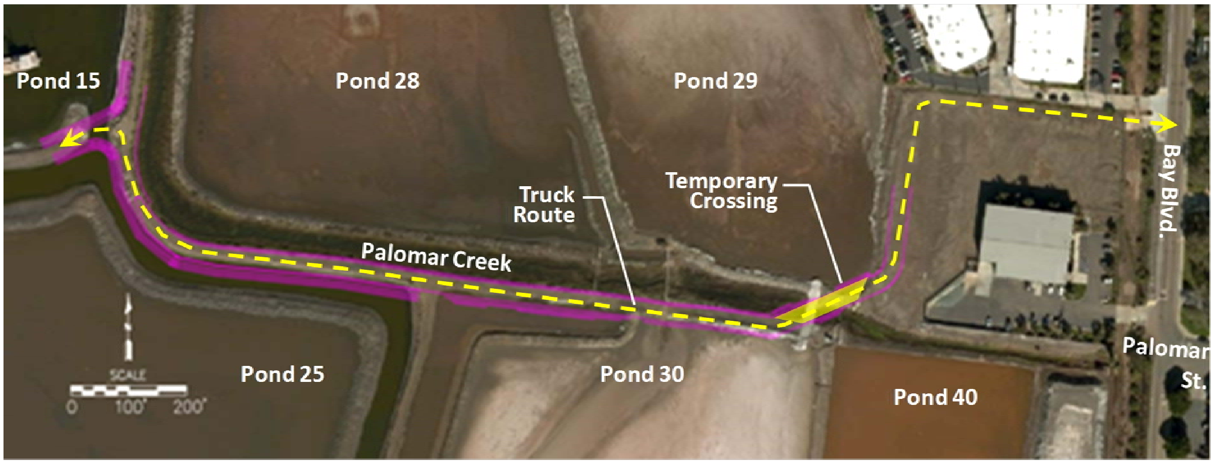

Figure 4. Truck Route to Pond 15

Temporary Crossings for the Truck Route

<u>Nestor Creek Temporary Crossing:</u> In order to access the western portion of the Otay River Floodplain Site from the staging and stockpiling areas east of Nestor Creek, the contractor would have to install a temporary crossing across Nestor Creek. The temporary structure would likely be a bridge structure or a culvert that could maintain a hydraulic connection to Nestor Creek. This crossing would be removed at the completion of the project and the area would be restored to the existing condition.

<u>Otay River Temporary Crossing:</u> To access the western portion of the Otay River Floodplain Site from the staging and stockpiling areas east of Nestor Creek, the contractor would install temporary crossings across the Otay River. This crossing would be removed at the completion of construction and restored to their existing condition.

<u>Palomar Creek Temporary Crossing:</u> Trucks and other construction vehicles accessing the Pond 15 Site from Bay Boulevard would enter the site via the property easement east of Pond 29 (Figure 3). At the southern east corner of Pond 29, the vehicles would cross the Palomar Creek and then travel along the levee on the southern bank of the Palomar Creek towards Pond 15. The temporary crossing would be constructed of fill material. The flow of Palomar Creek would be maintained by installing culverts at the bottom of the temporary crossing. This crossing would be removed at the completion of the project and the area would be restored to the existing condition. The flow of brine between salt ponds would be maintained by installing open channels or pipes across Palomar Creek.

4.3.2 Conveyor Belt

Under this method, the contractor would use a system of conveyor belts to transport material from ORF to Pond 15. Two possible routes are shown in Figure 5 and the length would be approximately 1.5 miles. The conveyor belt would be installed over the Otay River and under the existing eastern Bayshore Bikeway crossing. After crossing the Otay River and Bayshore Bikeway, the conveyor belt would continue northward using the existing dikes for support. One end of the conveyor belt would be near the ORP excavation site and the other end would end either directly into Pond 15 or into awaiting trucks in Pond 15, which would move the material a short distance within the pond.

4.3.3 Pipeline

Under this method, the contractor would use a pipeline to hydraulically transport material from ORF to Pond 15. Two possible pipeline routes are shown in Figure 6. The pipeline would be installed over the Otay River and under the existing eastern Bayshore Bikeway crossing. After crossing the Otay River and Bayshore Bikeway, the pipeline would continue northward. One option of the pipeline route considers using the existing dikes for support, while the other option assumes a more direct path, with some sections floating on the salt ponds. One end of the pipeline would be located in a pit within the ORP excavation site and the other end would end directly into Pond 15. The pipeline would be approximately 1.1 to 1.5 miles in length depending on whether the pipeline remains on the dikes or if it takes a more direct route across (floating) the salt ponds.

Image: Google Earth Pro

Figure 5. Conveyor Belt Haul Routes

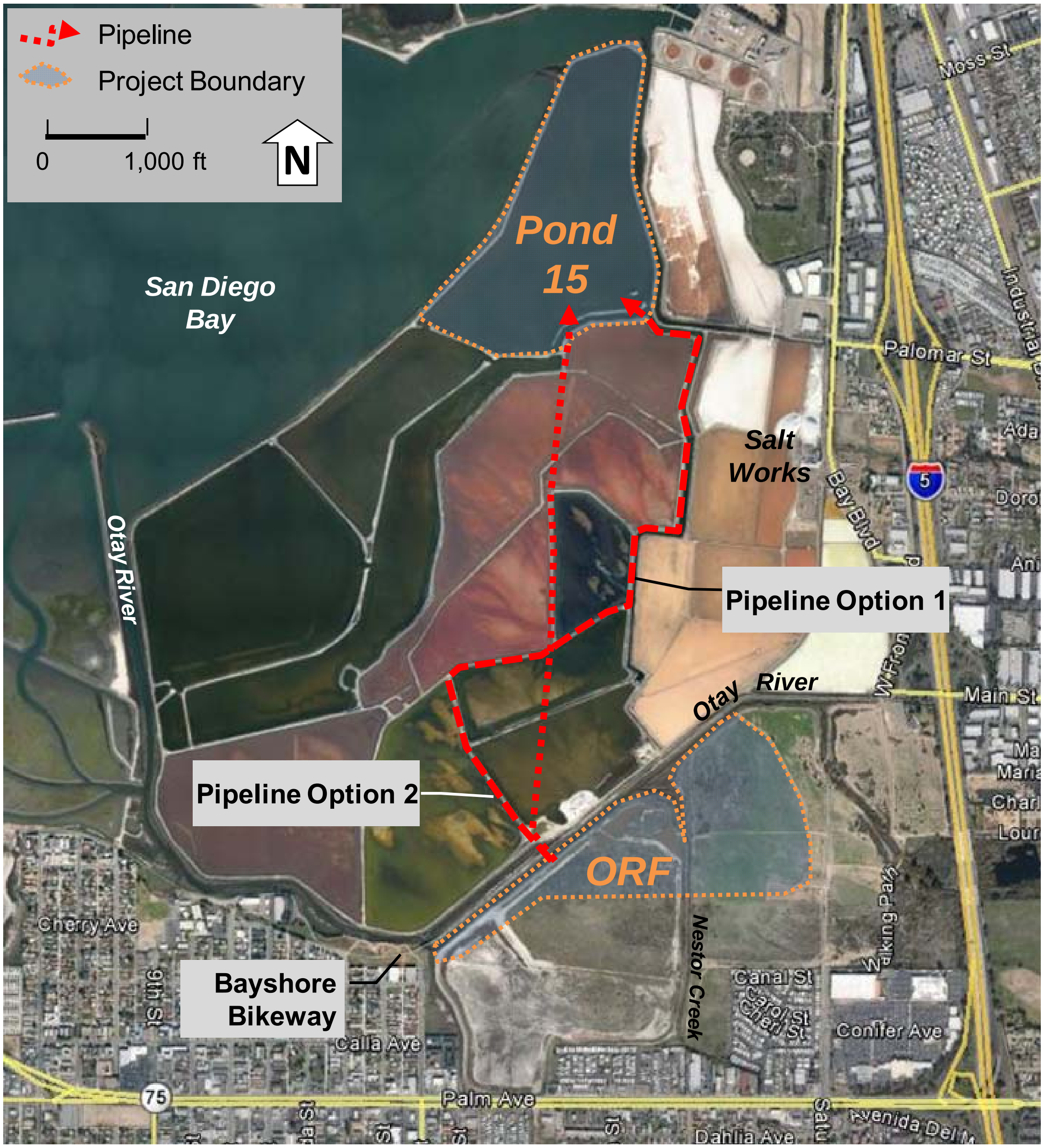

Image: Google Earth Pro

Figure 6. Pipeline Haul Routes

4.3.4 Material Placement in Pond 15

If the ORF excavated material is transported to Pond 15 via dump truck or conveyor belt then it would be dried before being hauled from the ORF. In order to place this dry material effectively, Pond 15 would be dewatered prior to material placement. Dewatering of Pond 15 would be one of the first tasks the contractor would complete during construction. This would be done by first modifying the dikes within and around Ponds 12, 13, and 14 (see Figure 1 for pond locations) to bypass the brine water around Pond 15 to the rest of the active salt-producing salt ponds. Next, the dikes around Pond 15 would be modified to hydraulically isolate Pond 15 from the rest of the salt pond system. At that point, the isolated brine water remaining in Pond 15 would be pumped into the active salt-producing salt ponds. Pond 15 is about 87 acres in area with an average water depth of about 5 feet so the volume of water in Pond 15 is estimated to be about 140 million gallons. Pumping this volume of water into the active salt-producing salt ponds would take about a month using several heavy duty water pumps. After the initial pumping to drain Pond 15, dewatering would continue during construction in order to keep the placement area relatively dry.

When Pond 15 is dewatered and ready for receiving fill material, material brought to Pond 15 by trucks or conveyor belts would be placed in the pond. Distribution of material would be carried out with land-based equipment, such as bulldozers, scrapers, and/or long-reach backhoes. To avoid sinking in the wet and soft sediment in the pond, the bulldozers would initially push and spread the ORF fill material outward into the pond from the dikes. The newly formed fill area extending from the dike would provide the working area for the trucks and bulldozers to reach farther into the pond.

If the ORF excavated material is transported to Pond 15 via pipeline then it would arrive at Pond 15 as a slurry mixture of water and soil. Pond 15 would be dewatered prior to material placement as described above. When Pond 15 is dewatered and ready for receiving fill material, material brought to Pond 15 by pipeline would be pumped into the pond. The material would be distributed throughout the pond by periodic relocation of the dredge pipeline discharge location. It is anticipated that it would take a relatively long period of time for the material to achieve a level of consolidation that would allow the safe use of land-based equipment. Consequently, once all the material from the ORF has been pumped to Pond 15 the material would be left in place until final consolidation has been achieved, which is currently estimated at one to five years. After final consolidation has been achieved construction equipment would be mobilized to the site to complete final grading within Pond 15.

4.4 Final Grading and Other Earthwork

Final grading would be conducted in the ORF to achieve final elevations 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 also be conducted in Pond 15 to achieve final elevations in the fill area. When the fill reaches the approximate finished ground elevations, land-based or amphibious construction equipment would be used to grade the site to the designed contours and slope variations.

The restoration construction would include removal of the southern levee of the Otay River within the Project site, restoration of upland habitat, construction of a new levee along the southern border of the restored wetland, and modification of the Pond 22/23 dike. There would be several levee modifications (levee fill or breach) in Ponds 13 and 14 necessary to rechannelize the flow of brine after Pond 15 is decommissioned. These construction activities would be conducted with land-based equipment. At this time, it is assumed that suitable fill material for the levee construction, upland restoration, and dike modification would be available on-site via project excavation. If suitable material is not available on site then such material would be imported to the project site. Suitable material would be compacted to a density recommended by the project geotechnical engineer.

4.5 Pond 15 Ocean Inlet/Outlet

Breaching of the levee at Pond 15 will be done after all earthwork within 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. 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. This construction may be completed with about 45 equipment hours using a 2 to 3-cy capacity bucket with an average yield of 200 cy per hour.

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 construction, an analysis of the breaching was conducted before it was implemented to determine if such breaching would likely result in substantial erosion of material and associated transport into San Diego Bay 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. To minimize sediment plumes entering San Diego Bay, the levee breach should be excavated only when turbidity levels are within 20% of ambient conditions. If necessary, the contractor could install a silt curtain across the breach to minimize the short-term (< 24 hours) distribution of fine-grained material and associated turbidity.

5. CONSTRUCTION TIMING, PHASING, AND EQUIPMENT

The timing and phasing of the various construction activities are important considerations in project planning. Dewatering of Pond 15 would be a critical path task that would be started right after the brine water bypassing of Pond 15. Other mobilization and staging area construction would follow. The access/truck routes would be strengthened and widened as necessary and conveyor belts would be installed, if applicable. The site would be cleared and grubbed to begin excavation. Excavation and disposal of excavated materials would occur simultaneously; otherwise excavated material would be stockpiled while waiting for transport to the fill area. Planting would begin upon completion of earthwork within the ORF and Pond 15. The final step would be to open the restored areas to tidal exchange and demobilize the remaining construction equipment and material from the site.

The existing levee along the southern bank of the Otay River helps to keep tidal and fluvial water from entering the excavation site. In order to maintain a water barrier between the Project site and Otay River during excavation, the existing levee would remain in place until excavation is complete. To maintain flood protection, a new levee along the southern edge of the restored wetland would be constructed prior to removing the existing levee along the southern bank of the Otay River. In addition, there would be several operations maintained throughout most of the construction period, including Pond 15 dewatering, access/haul road resurfacing, bike and pedestrian safety, pollution control, and dust abatement.

The contractor would follow local jurisdiction time restrictions for construction equipment operation. It is anticipated that construction would take place Monday through Friday from 7 a.m. to 6 p.m. Work may or may not occur on holidays, depending on the contractor and local jurisdiction restrictions. In addition, construction activities would be scheduled around the bird nesting season, which generally runs from February 15 to September 30. The construction windows for specific site locations would be determined by the U.S. Fish and Wildlife Refuge Manager during final Project design. In addition, the construction window schedule may change during construction depending on actual nesting activities at the time of construction. For the purpose of assessing environmental impacts, a preliminary construction schedule was developed for the Project based on the assumptions and information above. The schedule, presented in Table 1, is based on hauling the excavated material to Pond 15 via truck and/or conveyor belt. If the contractor opts to slurry the material and use a pipeline to transport the material from the ORF to Pond 15 then an additional one to five years would be needed to complete the construction operation. This is indicated by the last two lines in Table 1 that show the final grading operation in Pond 15 that would occur in any one year between 2020 and 2024 starting in the month of September and running through the month of December.

Table 1. Preliminary Construction Schedule

ACTIVITY	START DATE	FINISH DATE	DURATION
Mobilization	8/1/2017	9/30/2017	2 months
Earthwork	10/1/2017	1/31/2018	4 months
Shut Down*	2/1/2018	2/28/2018	1 month
Core Nesting Season	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
Demobilization	1/1/2019	2/28/2019	2 months
Pond 15 Grading (Early Estimate)+	9/1/2020	12/31/2020	4 months
Pond 15 Grading (Late Estimate)+	9/1/2024	12/31/2024	4 months

** Denotes periods when field activities may occur in specifically delineated areas. Delineation of operations zones is dependent on variation of wildlife community and individual species or species groups' activities in a given season. Areas of avoidance will be determined on a case by case basis by the U.S. Fish and Wildlife Refuge Manager.*

+Pond 15 grading shown for the slurry option to indicate grading operations in Pond 15 that would be conducted after consolidation of placed slurried material.

The type 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. The type and number of major construction equipment used to construct the Project are presented in the table below. The type of fuel 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 ORF to Pond 15 then 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 the area. It is anticipated that up to four bulldozers, four loaders, and four scrapers would be needed during the four-month final grading operation that would occur between 2020 and 2024.

Table 2. Construction Equipment Summary

EQUIPMENT	FUEL TYPE	EQUIPMENT QUANTITY		
		TRUCK HAUL	CONVEYOR BELT HAUL	PIPELINE HAUL
Backhoe	Diesel	4	4	4
Loader	Diesel	4	4	4
Scraper	Diesel	4	4	4
Bulldozer	Diesel	4	4	4
Dump Truck	Diesel	28	4	4
Conveyor Belt	Electric	None	1.5 to 2.0 miles	None
Pipeline	Electric	None	None	1.1 to 1.5 miles

6. SITE PROTECTION AND EROSION CONTROL

6.1 Environmental Protection

The contractor would be required to comply with National Pollutant Discharge Elimination System (NPDES) stormwater permit conditions as well as other local, state, and federal permit/approval requirements. A stormwater pollution prevention plan (SWPPP) would be prepared and implemented by the contractor to achieve NPDES permit compliance. The contractor would identify and implement best management practices (BMPs) to protect water quality, air quality, and sensitive biological/wildlife resources as well as to reduce construction related noise.

As discussed in the previous section, construction activities would be scheduled around the bird nesting season. The construction windows for specific site locations as well as the noise and pollution restrictions of the construction equipment would be assessed and determined in the EIS and implemented by the U.S. Fish and Wildlife Refuge Manager during final Project design.

6.2 Protection of Existing Facilities and Infrastructure

The Bayshore Bikeway runs along the northern bank of the Otay River outside the Project site. Transport of excavated material to the salt ponds through the use of a temporary bridge would likely interfere with bikeway users. The extent and types of interruption to the Bayshore Bikeway would be discussed with local authorities during the final design phase such that best management practices and safety measures are developed prior to construction and then implemented during construction.

Utilities have been identified along the extension of Saturn Boulevard east of the ORF, including overhead electric lines and poles, high pressure gas line, sewers, and storm drains. A few manholes were also found east of Saturn Boulevard. These utilities would not need to be relocated, but the contractor would need to maintain and protect them during construction.

The operation of the Salt Works may be impacted by the conveyor belt operation and truck traffic. Coordination with the Salt Works operators should occur during the final design and construction phases. The removal of water from Pond 15 would also require the cooperation of the Salt Works operators. The Salt Pond dikes would be used for access by construction vehicles and/or conveyors transporting and disposing material to the Salt Ponds. These dikes would need to be improved and maintained during construction. When construction is complete, the dikes would be restored to preconstruction conditions.

7. REFERENCE

Anchor QEA, 2010. *Otay River Restoration Screening Assessment Report*. Prepared for Poseidon Resources.

APPENDIX F1

Sediment Characterization Sampling and Analysis Report

SEDIMENT CHARACTERIZATION SAMPLING AND ANALYSIS REPORT SOUTH SAN DIEGO SALT PONDS 12, 13, 14, AND 15

Prepared for

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Mission Viejo, California 92691

April 2013

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LIST OF ACRONYMS AND ABBREVIATIONS

CalEPA	California Environmental Protection Agency
CCP	Comprehensive Conservation Plan
CHHSL	California Human Health Screening Level
COC	contaminant of concern
EIS	Environmental Impact Statement
ERL	effects range low
ERM	effects range median
kg	kilogram
MDL	method detection limit
mg	milligram
MS	matrix spike
MSD	matrix spike duplicate
NAVD88	North American Vertical Datum of 1988
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QA	quality assurance
QC	quality control
RL	reporting limit
RPD	relative percent difference
RSL	Regional Screening Levels
SAP	Sampling and Analysis Plan
SAR	Sampling and Analysis Report
TOC	total organic carbon
USFW	U.S. Fish and Wildlife Service
USEPA	U.S. Environmental Protection Agency

1 INTRODUCTION

In 2006, the U.S. Fish and Wildlife Service (USFWS) completed and published the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS) for management and restoration of the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge. The refuge consists of 2,324 acres, including portions of San Diego Bay, more than 1,000 acres of solar salt ponds, and upland and wetland habitats associated with the Otay River Floodplain. Completion of the CCP provided the basis for the USFWS and other partner agencies to implement the South San Diego Bay Salt Pond restoration project. The site is located on the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge at the south end of San Diego Bay (Figure 1).

The goals of the San Diego Bay National Wildlife Refuge include the following:

- Increase availability of coastal salt marsh habitat to support federally listed endangered and threatened species and various species of migratory birds.
- Enhance and restore other native habitats (such as riparian and upland habitats) in support of native wildlife and plant species diversity.

To attain these goals, several conceptual alternatives for site restoration were presented and evaluated in the CCP and EIS, and a preferred alternative was selected that includes a mix of intertidal and upland habitats.

Poseidon Water, LLC plans to implement part of the preferred alternative in coordination with the USFWS in order to obtain mitigation credits for the Carlsbad seawater desalination project. Restoration is proposed within Salt Ponds 12, 13, 14, and 15. An initial step in the restoration process required sediment sampling and analysis to be conducted within these ponds to characterize the nature and extent of potential contamination in pond sediments. This Sampling and Analysis Report (SAR) summarizes sampling activities and evaluates sediment chemistry results for Salt Ponds 12, 13, 14, and 15 (Figure 2).

AERIAL SOURCE: Bing maps.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.

0 2
Scale in Miles

ANCHOR QEA

Figure 1
Vicinity Map
South San Diego Bay Salt Ponds 12, 13, 14, and 15

L:\AutoCAD Project Files_Projects\0648-Poseidon\Otay River Estuary\SAP\0648-RP-002.dwg FIG 2

Apr 05, 2013 8:34am mpratschner

AERIAL SOURCE: Bing maps.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.

0 1,200
Scale in Feet

ANCHOR QEA

Figure 2
Study Area
South San Diego Bay Salt Ponds 12, 13, 14, and 15

1.1 Targeted Restoration Plan

The proposed restoration plan for the salt ponds was conceived to enhance opportunities for seabird nesting, restore native habitat in the Otay River Floodplain, and restore tidal circulation within the majority of the salt ponds. Levees holding Salt Ponds 12, 13, 14, and 15 will be breached to restore tidal influence to approximately 300 acres of salt ponds. Portions of levees not affected by the breach will be maintained to provide roosting and nesting habitat for various avian species.

As currently envisioned, restoration of Salt Ponds 12, 13, 14, and 15 will include dredging, excavating, recontouring, and/or filling of areas to create avifauna nesting, coastal salt marsh, intertidal mudflat, and shallow subtidal habitats. Sediment removal may be performed within all four ponds and may extend to a depth of -2 feet North American Vertical Datum of 1988 (NAVD88), plus 1 foot of allowable overdepth (Everest 2012). As such, this study was designed to characterize this layer.

After recontouring and/or filling are completed, Salt Ponds 12, 13, 14, and 15 will be opened to San Diego Bay by breaching the levee along the Otay River channel or the levee along San Diego Bay.

1.2 Purpose

The objective of this project was to fully characterize the nature and extent of potential contamination in pond sediments to ensure that: 1) restored habitat is high quality and poses no unacceptable contaminant risk to species for which the habitat is intended; and 2) opening the salt ponds to the San Diego Bay will not have an adverse effect on the bay and its inhabitants. The overall sampling approach considered the following:

- Impacts to sediments from on-site and off-site sources
- Risks to aquatic receptors for sediments left intact
- Risks to terrestrial receptors for sediments excavated and used to create upland habitats
- Physical (geotechnical) suitability of pond surface and subsurface sediments for meeting restoration objectives

1.3 Sampling Approach

A broad-based, stratified-random sampling approach was used to characterize the area, similar to the previous sediment characterization of Salt Ponds 10, 10a, and 11 (Everest and Anchor QEA 2009). As described in the Sampling and Analysis Plan (SAP; Anchor QEA 2013), water from the South Bay Power Plant was historically discharged into the northeast corner of Pond 15, indicating a potential source of contamination. Based on this potential point source, an additional station (Station 15-10) was intentionally placed in the northeast corner of Pond 15, as requested by the USFWS.

A total of 31 stations were identified to characterize Salt Ponds 12, 13, 14, and 15. Station density was based on the previous sediment characterization of Salt Ponds 10, 10a, and 11, with approximately one station per 10 acres (Everest and Anchor QEA 2009). As previously described, an additional station was placed within Pond 15, resulting in a slightly higher station density in this pond. Table 1 presents an overview of the sampling density of each pond. Stations were placed following a stratified-random sampling approach, with the exception of Station 15-10. Figure 3 shows the actual sampling locations within each pond.

Table 1
Sediment Sampling Strategy by Pond

Pond Number	Pond Acreage	Number of Sampling Locations	Sample Interval[1]
12	97	10	Sediment surface to -3 feet NAVD88
13	68	7	Sediment surface to -3 feet NAVD88
14	42	4	Sediment surface to -3 feet NAVD88
15	90	10	Sediment surface to -3 feet NAVD88
Total	**297**	**31**	-

Notes:
1 Excavation depth of -2 feet NAVD88, plus 1 foot of allowable overdepth.

Sediments in Salt Ponds 12, 13, 14, and 15 may be excavated to a depth of -2 feet NAVD88, plus 1 foot of allowable overdepth (i.e., -3 feet NAVD88). Sediment cores targeted this layer plus an additional 1 foot beyond this depth (i.e., -4 feet NAVD88) to allow for the evaluation of the newly exposed surface layer. For each core, sediment from the surface to -3 feet

NAVD88 was submitted for analysis to evaluate sediment that may be disturbed during restoration activities. Each 1-foot interval from the entire sediment core, including the new surface layer, was archived for potential future analysis.

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

ANCHOR QEA

Figure 3
Actual Sediment Sampling Locations
South San Diego Bay Salt Ponds 12, 13, 14, and 15

2 METHODS

All methods and procedures for the characterization of sediment from Salt Ponds 12, 13, 14, and 15 were implemented in accordance with the SAP (Anchor QEA 2013).

2.1 Sediment Collection and Handling

Sediment cores were collected at 31 stations within Salt Ponds 12, 13, 14, and 15 using a small electrically powered vibracore fitted with a 3-inch polycarbonate tube. Sampling was performed from a small pontoon barge equipped with a tripod, moonpool, and hand winch for sample collection (Figure 4). The vibracore was deployed and recovered through the moonpool. Sediment cores were collected to a target depth of -4 feet NAVD88 (excavation depth, plus overdepth, plus new surface layer). If station depths were confirmed in the field to be at or below the proposed excavation depth of -2 feet NAVD88 (not including overdepth), surface sediment was collected using a petite Ponar grab sampler and archived for potential analysis. The station was then moved to an alternative randomly selected location above the proposed excavation depth, and a sediment core was collected.

Sediment core samples were processed at a mobile processing station positioned on top of the levees. The physical characteristics of each core were documented on the sediment core collection form and then photographed (Appendix A). For each core, a continuous vertical composite was created by collecting a proportionate volume of sediment from the sediment surface to -3 feet NAVD88. Each 1-foot interval of the entire length of the sediment core, including the new surface layer, was archived for potential analysis. Samples were temporarily stored in coolers with ice and picked up for analysis by Calscience Environmental Laboratories, Inc., located in Garden Grove, California. Appropriate chain-of-custody procedures were followed. All sample collection, handling, and processing procedures were implemented as described in the SAP (Anchor QEA 2013).

Figure 4
Photograph of Vibracore Sampling from Pontoon Barge
South San Diego Bay Salt Ponds 12, 13, 14 and 15

2.2 Physical and Chemical Analyses

Vertical composite samples from each station were submitted for analysis of total solids, total organic carbon (TOC), grain size, bulk density, trace metals, organochlorine pesticides, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). Analytical methods and target method detection limits (MDLs) and reporting limits (RLs) for this evaluation are presented in Table 5 of the SAP (Anchor QEA 2013).

Results of chemical analyses were compared to effects range low (ERL) and effects range median (ERM) sediment quality guidelines and Zeeman risk-based screening levels. Effects range values are helpful in assessing the potential significance of elevated sediment-associated contaminants of concern (COCs) in conjunction with biological testing (Long et al. 1995).[1] Zeeman risk-based screening levels were used to evaluate potential risks to aquatic-dependent wildlife from bioaccumulative COCs. Zeeman risk-based screening levels have been developed for multiple ecological receptors, including benthic invertebrates, benthic vegetation, fish, bottom feeding birds (scoter), consumers of small fish (grebe, tern, and skimmer), consumers of medium size fish (pelican and sea lion), and herbivores (wigeon and turtle; Zeeman 2004). Results were also compared to soil screening criteria, including California Human Health Screening Levels (CHHSLs; CalEPA 2005, 2009) and Regional Screening Levels (RSLs; USEPA 2010) because of the potential for sediments to be beneficially used in the upland environment.

2.2.1 Quality Assurance/Quality Control

All quality assurance/quality control (QA/QC) procedures were implemented in accordance with the SAP (Anchor QEA 2013).

Laboratory QA/QC samples included duplicates, matrix spike (MS) and matrix spike duplicate (MSD) samples, method blanks, and laboratory control samples. Surrogates were

[1] Briefly, these values were developed from a large dataset where results of both benthic organism effects (e.g., toxicity tests and benthic assessments) and chemical concentrations were available for individual samples. To derive these guidelines, chemical values for paired data demonstrating benthic impairment were sorted by ascending chemical concentration. The 10th percentile of this rank order distribution was identified as the ERL and the 50th percentile as the ERM.

included for all organic methods. QC objectives and the frequency of analysis for QA/QC samples are provided in the SAP (Anchor QEA 2013). All laboratory data were reviewed and verified to determine whether QC objectives were met. A U.S. Environmental Protection Agency (USEPA) Stage 2A (2009) data completeness check was performed by Anchor QEA, in accordance with USEPA National Functional Guidelines (2004, 2008).

Field QA/QC samples included duplicates, split samples, and rinsate blanks. Field duplicates and split samples were collected from Stations 12-09 and 15-01. Field duplicates were collected to evaluate the natural variability within the sampling area, while split samples were collected from homogenized sediment to evaluate overall sampling precision. Rinsate blanks were collected from the sample processing equipment (stainless-steel spoon and bowl) and a polycarbonate core tube to assess potential contamination.

3 RESULTS

3.1 Sample Collection and Handling

Sediment cores and surface grabs were collected from January 29 to February 2, 2013. The weather was warm with predominantly clear skies and a light wind. Sediment cores were collected from 31 stations using a vibracore (Figure 3). One core was required from each station to obtain sufficient volume for the required analysis. At two stations (12-09 and 15-01), a duplicate core was collected for QA/QC samples. Sediment cores were collected to -4 feet NAVD88, or to refusal depth. If refusal was encountered prior to the target sampling depth, the station was moved slightly, and collection was attempted again. After multiple attempts, the longest core was retained for analysis. Refusal was encountered at the majority of stations due to stiff clay or dense sand, which was present in all ponds.

Within Pond 12, all cores were collected to the target depth, with the exception of Station 12-05. This station captured the full excavation depth and overdepth, and a portion (0.5 foot) of the new surface layer. Within Pond 13, refusal was encountered at all stations. After multiple sampling attempts, sediment cores were accepted at less than the target depth at four stations (13-02, 13-03, 13-04, and 13-5). Within Pond 14, all cores were collected to the target depth, with the exception of Station 14-01. Within Pond 15, refusal was encountered at all stations. Stations within the southern portion of Pond 15 (15-01 to 15-05) were collected to the target depth, while stations in the northern portion of Pond 15 (15-06 to 15-10) were accepted at less than the target depth after multiple sampling attempts. Station 15-08 captured the full excavation depth and overdepth as well as the majority (0.7 foot) of the new surface layer. Station coordinates, mudline elevation, estimated penetration, and retrieved core lengths for each sediment core are summarized in Table 2.

Mudline elevations of Stations 12-08, 14-03, and 14-04 were below the proposed excavation depth. Surface sediment grab samples were collected and archived, and the stations were moved to alternative randomly selected locations (Stations 12-08A, 14-03A, and 14-04A) above the proposed excavation depth. Station coordinates, mudline elevation, and recovery depths for each sediment grab are summarized in Table 3.

Field logs and sampling photographs are provided in Appendix A. A summary of composite, archive, and QA/QC samples collected from each sediment core and grab sample are presented in Table 4.

Table 2
Station Coordinates, Mudline Elevation, Estimated Penetration, and Retrieved Core Lengths for Each Sediment Core Sample

Station ID	Attempt	Latitude (NAD83) (Degrees, Dec. Minutes)	Longitude (NAD83) (Degrees, Dec. Minutes)	Mudline Elevation (feet NAVD88)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Elevation Achieved (feet NAVD88)
SSDBSP-12-01	1 of 1	N32° 35.663'	W117° 06.833'	2.4	7.5	7.0	-4.6
SSDBSP-12-02	1 of 1	N32° 35.742'	W117° 06.767'	2.1	7.5	7.0	-4.9
SSDBSP-12-03	1 of 1	N32° 35.809'	W117° 06.638'	2.0	6.2	6.0	-4.0
SSDBSP-12-04	1 of 1	N32° 35.885'	W117° 06.504'	2.0	6.8	6.8	-4.8
SSDBSP-12-05	2 of 2	N32° 35.840'	W117° 06.849'	-0.1	5.3	3.5	-3.6
SSDBSP-12-06	1 of 1	N32° 35.908'	W117° 06.682'	1.4	6.0	6.0	-4.6
SSDBSP-12-07	1 of 1	N32° 35.969'	W117° 06.595'	1.2	6.0	6.0	-4.8
SSDBSP-12-08A	2 of 2	N32° 35.944'	W117° 06.798'	1.5	6.7	6.5	-5.0
SSDBSP-12-09	1 of 2	N32° 35.977'	W117° 06.713'	1.2	5.7	5.5	-4.3
SSDBSP-12-09[1]	2 of 2	N32° 35.977'	W117° 06.713'	1.2	5.9	5.8	-4.6
SSDBSP-12-10	1 of 1	N32° 36.082'	W117° 06.631'	0.2	5.4	5.2	-5.0
SSDBSP-13-01	1 of 1	N32° 35.662'	W117° 06.740'	2.8	7.0	7.0	-4.2
SSDBSP-13-02	1 of 1	N32° 35.744'	W117° 06.529'	3.7	6.6	6.3	-2.6
SSDBSP-13-03	4 of 4	N32° 35.821'	W117° 06.436'	3.2	5.6	5.2	-2.0
SSDBSP-13-04	2 of 2	N32° 35.880'	W117° 06.346'	3.4	4.3	4.0	-0.6
SSDBSP-13-05	2 of 2	N32° 35.984'	W117° 06.326'	3.3	4.9	4.6	-1.3
SSDBSP-13-06	1 of 1	N32° 36.140'	W117° 06.340'	-0.1	4.8	4.8	-4.9
SSDBSP-13-07	1 of 1	N32° 36.239'	W117° 06.117'	-0.5	4.8	4.5	-5.0
SSDBSP-14-01	2 of 2	N32° 36.010'	W117° 06.461'	1.6	4.6	4.5	-2.9
SSDBSP-14-02	1 of 1	N32° 36.111'	W117° 06.556'	1.9	7.0	6.8	-4.9
SSDBSP-14-03A	1 of 1	N32° 36.164'	W117° 06.404'	2.2	6.5	6.4	-4.2
SSDBSP-14-04A	1 of 1	N32° 36.262'	W117° 06.272'	-0.1	5.5	5.5	-5.6
SSDBSP-15-01	1 of 2	N32° 36.372'	W117° 06.231'	-1.8	3.2	3.0	-4.8
SSDBSP-15-01[1]	2 of 2	N32° 36.372'	W117° 06.231'	-1.8	3.5	3.0	-4.8
SSDBSP-15-02	1 of 1	N32° 36.305'	W117° 06.185'	2.3	7.5	7.0	-4.7
SSDBSP-15-03	1 of 1	N32° 36.430'	W117° 06.161'	1.6	6.8	6.0	-4.4

Station ID	Attempt	Latitude (NAD83) (Degrees, Dec. Minutes)	Longitude (NAD83) (Degrees, Dec. Minutes)	Mudline Elevation (feet NAVD88)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Elevation Achieved (feet NAVD88)
SSDBSP-15-04	1 of 1	N32° 36.335'	W117° 06.048'	2.5	7.7	7.7	-5.2
SSDBSP-15-05	1 of 1	N32° 36.384'	W117° 05.981'	2.4	6.7	6.5	-4.1
SSDBSP-15-06	1 of 3	N32° 36.560'	W117° 06.071'	1.4	1.8	1.5	-0.1
SSDBSP-15-07	2 of 2	N32° 36.499'	W117° 05.979'	1.9	4.3	4.0	-2.1
SSDBSP-15-08	2 of 2	N32° 36.638'	W117° 06.059'	0.1	4.0	3.8	-3.7
SSDBSP-15-09	1 of 2	N32° 36.600'	W117° 05.964'	2.1	5.0	5.0	-2.9
SSDBSP-15-10	5 of 5	N32° 36.737'	W117° 05.939'	0.6	2.2	2.0	-1.4

Note:
NAD83 = North American Datum 1983
1 Duplicate core collected from station for QA/QC.

Table 3
Station Coordinates, Mudline Elevation, and Recovery Depth for Each Sediment Grab Sample

Station ID	Attempt	Latitude (NAD83) (Degrees, Dec. Minutes)	Longitude (NAD83) (Degrees, Dec. Minutes)	Mudline Elevation (feet NAVD88)	Recovery Depth (cm)
SSDBSP-12-08	2 of 2	N32° 35.960'	W117° 06.879'	-7.1	10.0
SSDBSP-14-03	2 of 2	N32° 36.240'	W117° 06.415'	-2.3	10.0
SSDBSP-14-04	1 of 1	N32° 36.288'	W117° 06.340'	-4.8	10.0

Note:
NAD83 = North American Datum 1983
cm = centimeters

Table 4
Summary of Samples Collected from Each Sediment Core and Grab Sample

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-12-01	Vertical composite to -3 feet NAVD88	SSDBSP-12-01_0.0-5.4	0.0 to 5.4	X		
	1-foot interval	SSDBSP-12-01_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-01_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-01_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-01_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-01_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-01_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-12-01_6.0-7.0	6.0 to 7.0		X	
SSDBSP-12-02	Vertical composite to -3 feet NAVD88	SSDBSP-12-02_0.0-6.1	0.0 to 6.1	X		
	1-foot interval	SSDBSP-12-02_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-02_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-02_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-02_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-02_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-02_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-12-02_6.0-7.0	6.0 to 7.0		X	
SSDBSP-12-03	Vertical composite to -3 feet NAVD88	SSDBSP-12-03_0.0-5.0	0.0 to 5.0	X		
	1-foot interval	SSDBSP-12-03_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-03_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-03_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-03_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-03_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-03_5.0-6.0	5.0 to 6.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-12-04	Vertical composite to -3 feet NAVD88	SSDBSP-12-04_0.0-5.0	0.0 to 5.0	X		MS/MSD
	1-foot interval	SSDBSP-12-04_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-04_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-04_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-04_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-04_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-04_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-12-04_6.0-6.8	6.0 to 6.8		X	
SSDBSP-12-05	Vertical composite to -3 feet NAVD88	SSDBSP-12-05_0.0-2.9	0.0 to 2.9	X		
	1-foot interval	SSDBSP-12-05_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-05_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-05_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-05_3.0-3.5	3.0 to 3.5		X	
SSDBSP-12-06	Vertical composite to -3 feet NAVD88	SSDBSP-12-06_0.0-4.4	0.0 to 4.4	X		
	1-foot interval	SSDBSP-12-06_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-06_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-06_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-06_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-06_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-06_5.0-6.0	5.0 to 6.0		X	
SSDBSP-12-07	Vertical composite to -3 feet NAVD88	SSDBSP-12-07_0.0-4.2	0.0 to 4.2	X		
	1-foot interval	SSDBSP-12-07_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-07_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-07_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-07_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-07_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-07_5.0-6.0	5.0 to 6.0		X	
SSDBSP-12-08	Sediment grab	SSDBSP-12-08_SG	0 to 10 cm		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-12-08A	Vertical composite to -3 feet NAVD88	SSDBSP-12-08A_0.0-4.5	0.0 to 4.5	X		
	1-foot interval	SSDBSP-12-08A_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-08A_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-08A_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-08A_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-08A_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-08A_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-12-08A_6.0-6.5	6.0 to 6.5		X	
SSDBSP-12-09	Vertical composite to -3 feet NAVD88	SSDBSP-12-09_0.0-4.2	0.0 to 4.2	X		
	1-foot interval	SSDBSP-12-09_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-09_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-09_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-09_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-09_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-09_5.0-5.5	5.0 to 5.5		X	
SSDBSP-12-09	Vertical composite to -3 feet NAVD88	SSDBSP-12-109_0.0-4.2	0.0 to 4.2	X		FD/FS
	1-foot interval	SSDBSP-12-109_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-109_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-109_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-109_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-109_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-109_5.0-5.8	5.0 to 5.8		X	
SSDBSP-12-10	Vertical composite to -3 feet NAVD88	SSDBSP-12-0_0.0-3.2	0.0 to 3.2	X		
	1-foot interval	SSDBSP-12-10_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-10_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-10_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-10_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-10_4.0-5.0	4.0 to 5.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-13-01	Vertical composite to -3 feet NAVD88	SSDBSP-13-01_0.0-5.8	0.0 to 5.8	X		
	1-foot interval	SSDBSP-13-01_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-01_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-01_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-01_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-01_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-13-01_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-13-01_6.0-7.0	6.0 to 7.0		X	
SSDBSP-13-02	Vertical composite to -3 feet NAVD88	SSDBSP-13-02_0.0-6.3	0.0 to 6.3	X		MS/MSD
	1-foot interval	SSDBSP-13-02_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-02_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-02_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-02_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-02_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-13-02_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-13-02_6.0-6.3	6.0 to 6.3		X	
SSDBSP-13-03	Vertical composite to -3 feet NAVD88	SSDBSP-13-03_0.0-5.2	0.0 to 5.2	X		
	1-foot interval	SSDBSP-13-03_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-03_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-03_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-03_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-03_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-13-03_5.0-5.2	5.0 to 5.2		X	
SSDBSP-13-04	Vertical composite to -3 feet NAVD88	SSDBSP-13-04_0.0-4.0	0.0 to 4.0	X		
	1-foot interval	SSDBSP-13-04_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-04_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-04_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-04_3.0-4.0	3.0 to 4.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-13-05	Vertical composite to -3 feet NAVD88	SSDBSP-13-05_0.0-4.6	0.0 to 4.6	X		
	1-foot interval	SSDBSP-13-05_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-05_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-05_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-05_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-05_4.0-4.6	4.0 to 4.6		X	
SSDBSP-13-06	Vertical composite to -3 feet NAVD88	SSDBSP-13-06_0.0-2.9	0.0 to 2.9	X		
	1-foot interval	SSDBSP-13-06_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-06_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-06_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-06_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-06_4.0-4.8	4.0 to 4.8		X	
SSDBSP-13-07	Vertical composite to -3 feet NAVD88	SSDBSP-13-07_0.0-2.5	0.0 to 2.5	X		
	1-foot interval	SSDBSP-13-07_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-07_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-07_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-07_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-07_4.0-4.5	4.0 to 4.5		X	
SSDBSP-14-01	Vertical composite to -3 feet NAVD88	SSDBSP-14-01_0.0-4.5	0.0 to 4.5	X		
	1-foot interval	SSDBSP-14-01_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-14-01_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-14-01_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-14-01_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-14-01_4.0-4.5	4.0 to 4.5		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-14-02	Vertical composite to -3 feet NAVD88	SSDBSP-14-02_0.0-4.9	0.0 to 4.9	X		
	1-foot interval	SSDBSP-14-02_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-14-02_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-14-02_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-14-02_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-14-02_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-14-02_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-14-02_6.0-6.8	6.0 to 6.8		X	
SSDBSP-14-03	Sediment grab	SSDBSP-14-03_SG	0 to 10 cm		X	
SSDBSP-14-03A	Vertical composite to -3 feet NAVD88	SSDBSP-14-03A_0.0-5.2	0.0 to 5.2	X		
	1-foot interval	SSDBSP-14-03A_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-14-03A_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-14-03A_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-14-03A_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-14-03A_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-14-03A_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-14-03A_6.0-6.4	6.0 to 6.4		X	
SSDBSP-14-04	Sediment grab	SSDBSP-14-04_SG	0 to 10 cm		X	
SSDBSP-14-04A	Vertical composite to -3 feet NAVD88	SSDBSP-14-04A_0.0-2.9	0.0 to 2.9	X		
	1-foot interval	SSDBSP-14-04A_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-14-04A_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-14-04A_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-14-04A_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-14-04A_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-14-04A_5.0-5.5	5.0 to 5.5		X	
SSDBSP-15-01	Vertical composite to -3 feet NAVD88	SSDBSP-15-01_0.0-1.2	0.0 to 1.2	X		FD/FS
	1-foot interval	SSDBSP-15-01_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-01_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-01_2.0-3.0	2.0 to 3.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-15-02	Vertical composite to -3 feet NAVD88	SSDBSP-15-02_0.0-5.3	0.0 to 5.3	X		
	1-foot interval	SSDBSP-15-02_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-02_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-02_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-02_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-02_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-15-02_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-15-02_6.0-7.0	6.0 to 7.0		X	
SSDBSP-15-03	Vertical composite to -3 feet NAVD88	SSDBSP-15-03_0.0-4.6	0.0 to 4.6	X		
	1-foot interval	SSDBSP-15-03_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-03_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-03_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-03_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-03_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-15-03_5.0-6.0	5.0 to 6.0		X	
SSDBSP-15-04	Vertical composite to -3 feet NAVD88	SSDBSP-15-04_0.0-5.5	0.0 to 5.5	X		
	1-foot interval	SSDBSP-15-04_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-04_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-04_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-04_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-04_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-15-04_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-15-04_6.0-7.0	6.0 to 7.0		X	
		SSDBSP-15-04_7.0-7.7	7.0 to 7.7		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-15-05	Vertical composite to -3 feet NAVD88	SSDBSP-15-05_0.0-5.4	0.0 to 5.4	X		
	1-foot interval	SSDBSP-15-05_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-05_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-05_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-05_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-05_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-15-05_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-15-05_6.0-6.5	6.0 to 6.5		X	
SSDBSP-15-06	Vertical composite to -3 feet NAVD88	SSDBSP-15-06_0.0-1.5	0.0 to 1.5	X		
	1-foot interval	SSDBSP-15-06_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-06_1.0-1.5	1.0 to 1.5		X	
SSDBSP-15-07	Vertical composite to -3 feet NAVD88	SSDBSP-15-07_0.0-4.0	0.0 to 4.0	X		MS/MSD
	1-foot interval	SSDBSP-15-07_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-07_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-07_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-07_3.0-3.5	3.0 to 3.5		X	
		SSDBSP-15-07_3.5-4.0	3.5 to 4.0		X	
SSDBSP-15-08	Vertical composite to -3 feet NAVD88	SSDBSP-15-08_0.0-3.1	0.0 to 3.1	X		
	1-foot interval	SSDBSP-15-08_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-08_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-08_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-08_3.0-3.8	3.0 to 3.8		X	
SSDBSP-15-09	Vertical composite to -3 feet NAVD88	SSDBSP-15-09_0.0-5.0	0.0 to 5.0	X		
	1-foot interval	SSDBSP-15-09_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-09_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-09_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-09_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-09_4.0-5.0	4.0 to 5.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-15-10	Vertical composite to -3 feet NAVD88	SSDBSP-15-10_0.0-2.0	0.0 to 2.0	X		
	1-foot interval	SSDBSP-15-10_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-10_1.0-2.0	1.0 to 2.0		X	

Notes:
FD = Field duplicate
FS = Field split

3.2 Results of Physical and Chemical Analyses of Sediment

Results of physical and chemical analyses of sediment from Salt Ponds 12, 13, 14, and 15 are presented in Table 5. All results are expressed in dry weight unless otherwise indicated. Results were compared to ERL and ERM sediment quality guidelines (Long et al. 1995), the minimum Zeeman risk-based screening level (2004), and CHHSL (CalEPA 2005, 2009) and RSL (USEPA 2010) soil screening criteria. Samples exceeding the minimum Zeeman screening level were further compared to the other risk-based screening levels in subsequent figures. Target MDLs and RLs were provided in the SAP (Anchor QEA 2013). Actual MDLs and RLs, and raw data for the analyses, are provided in Appendix B.

3.2.1 Grain Size and Total Organic Carbon

Salt pond sediments were predominantly fine-grained materials, consisting of 78.9 to 100 percent fines (silt and clay). TOC concentrations ranged from 0.53 to 6.5 percent. The highest TOC concentration was measured at Station 15-01.

Table 5

Results of Physical and Chemical Analyses of Sediment from Salt Ponds 12, 13, 14, and 15

Parameter	ERL	ERM	Residential CHHSL	Commercial/ Industrial CHHSL	Residential RSL	Industrial RSL	Zeeman 2004 (minimum)	Salt Pond 12												Salt Pond 13				
								SSDBSP-12-01_0.0-5.4	SSDBSP-12-02_0.0-6.1	SSDBSP-12-03_0.0-5.0	SSDBSP-12-04_0.0-5.0	SSDBSP-12-05_0.0-2.9	SSDBSP-12-06_0.0-4.4	SSDBSP-12-07_0.0-4.2	SSDBSP-12-08A_0.0-4.5	SSDBSP-12-09_0.0-4.2	SSDBSP-12-109_0.0-4.2 (Field Duplicate)	SSDBSP-12-209_0.0-4.2 (Field Split)	SSDBSP-12-10_0.0-3.2	SSDBSP-13-01_0.0-5.8	SSDBSP-13-02_0.0-6.3	SSDBSP-13-03_0.0-5.2	SSDBSP-13-04_0.0-4.0	SSDBSP-13-05_0.0-4.6
								2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/1/2013	2/2/2013	2/1/2013	2/1/2013	2/1/2013	2/2/2013	2/1/2013	2/1/2013	2/1/2013	2/1/2013	2/1/2013
Conventional Parameters (%)																								
Total organic carbon								**1.2**	**1.5**	**1.1**	**1**	**0.81**	**1.2**	**1.5**	**0.72**	**1.2**	**1.5**	**1.2**	**1.7**	**0.72**	**0.97**	**1.4**	**1.4**	**0.98**
Total solids								**65**	**55.6**	**63.3**	**66**	**65.8**	**62.5**	**65.4**	**65.2**	**55.4**	**61.4**	**56.7**	**49.8**	**64.3**	**64.7**	**54.9**	**57.3**	**66.6**
Clay (less than 0.00391mm)								**38.38**	**46.88**	**46.48**	**41.26**	**49.22**	**47.21**	**36.81**	**44.16**	**26.5**	**36.12**	**29.12**	**39.69**	**21.77**	**32.2**	**30.07**	**32.28**	**29.49**
Coarse Sand (0.5 to 1mm)								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fine Sand (0.125 to 0.25mm)								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	**3.6**	< 0.01	**0.79**	**0.01**	**8.8**	< 0.01	**4.42**	< 0.01	**0.51**
Gravel (greater than 2mm)								**0.4**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Medium Sand (0.25 to 0.5mm)								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	**0.01**	< 0.01	< 0.01	< 0.01	**2.56**	< 0.01	**2.11**	< 0.01	< 0.01
Silt (0.00391 to 0.0625mm)								**60.95**	**53.12**	**53.48**	**55.93**	**50.77**	**52.79**	**56.52**	**55.83**	**61.61**	**60.92**	**62.55**	**54.72**	**57.12**	**64.67**	**59.02**	**64.53**	**65.51**
Total Silt and Clay (0 to 0.0625mm)								**99.33**	**100**	**99.96**	**97.19**	**100**	**100**	**93.34**	**100**	**88.11**	**97.04**	**91.67**	**94.41**	**78.89**	**96.87**	**89.1**	**96.81**	**95**
Very Coarse Sand (1 to 2mm)								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Very Fine Sand (0.0625 to 0.125mm)								**0.27**	< 0.01	**0.04**	**2.81**	< 0.01	< 0.01	**6.66**	< 0.01	**8.28**	**2.96**	**7.54**	**5.58**	**9.74**	**3.13**	**4.37**	**3.19**	**4.49**
Metals (mg/kg)																								
Arsenic	8.2	70	0.07	0.24	0.39	1.6	7.2	5.36	6.01	5.24	4.12	4.18	5.07	4.92	5.18	6.07	5.94	6.15	4.98	5.1	5.22	8.85	9.7	5.47
Cadmium	1.2	9.6	1.7	7.5	70	800	0.43	**0.173**	**0.208**	**0.151 J**	**0.136 J**	**0.143 J**	**0.183**	**0.189**	**0.152 J**	**0.223**	**0.182**	**0.26**	**0.202**	**0.154 J**	**0.219**	**0.25**	**0.237**	**0.19**
Chromium	81	370					52	**19.3**	**19.4**	**16.9**	**12.9**	**13.2**	**17.9**	**17**	**15**	**20.7**	**19.4**	**20.9**	**17.5**	**17.3**	**21.5**	**30.7**	**25.9**	**18.3**
Copper	34	270	3000	38000	3100	41000	19	**13.2**	**20.1**	**14.3**	**11.8**	**12.4**	**15**	**13.7**	**12.5**	**18.5**	**15.8**	**18.2**	**17**	**11.8**	**16**	**20.6**	**19.4**	**12.8**
Lead	46.7	218	80	320	400	800	1.03	**4.8**	**7.75**	**6.09**	**4.37**	**6.21**	**5.64**	**4.54**	**4.72**	**6.65**	**5.71**	**6.99**	**8.37**	**4.28**	**5.23**	**7.56**	**7.51**	**4.75**
Mercury	0.15	0.71	18	180	5.6	34	0.05	**0.0223 J**	**0.0615**	**0.0342**	**0.0319**	**0.0558**	**0.05**	**0.0261 J**	**0.0324**	**0.0361 J**	**0.0543**	**0.0245 J**	**0.0536**	< 0.0092	< 0.0091	< 0.0107	< 0.0103	< 0.0088
Nickel	20.9	51.6	1600	16000			16	**7.41**	**9.31**	**7.64**	**5.52**	**6.33**	**7.52**	**7.12**	**6.55**	**8.86**	**8.14**	**9.25**	**8.95**	**6.27**	**8.69**	**11.8**	**10.6**	**6.77**
Selenium			380	4800	390	5100	2.5	**0.171**	**0.245**	**0.327**	**0.234**	**0.185**	**0.169**	**0.255**	< 0.112	**0.179 J**	**0.211**	**0.42**	**0.406**	< 0.114	**0.26**	**0.3**	**0.177**	< 0.11
Silver	1	3.7	380	4800	390	5100	0.73	< 0.0482	< 0.0563	< 0.0494	< 0.0474	< 0.0476	< 0.0501	< 0.0479	< 0.048	**0.0705 J**	< 0.051	**0.0824 J**	< 0.0628	< 0.0487	**0.0528 J**	**0.0755 J**	**0.0687 J**	**0.0608 J**
Zinc	150	410	23000	100000	23000	310000	124	**47.1**	**76.7**	**46**	**36.5**	**40.1**	**45.3**	**45.1**	**41.2**	**60**	**48.7**	**56.5**	**47.7**	**41.8**	**49**	**67.1**	**60.3**	**42.3**
Pesticides (µg/kg)																								
2,4'-DDD			2300	9000	2000	7200		< 0.52	< 0.61	< 0.54	< 0.51	< 0.51	< 0.54	< 0.52	< 0.52	< 0.61	< 0.55	< 0.6	< 0.68	< 0.53	< 0.52	< 0.62	< 0.59	< 0.51
2,4'-DDE			1600	6300				< 0.47	< 0.55	< 0.48	< 0.46	< 0.46	< 0.49	< 0.47	< 0.47	< 0.55	< 0.5	< 0.54	< 0.61	< 0.47	< 0.47	< 0.56	< 0.53	< 0.46
2,4'-DDT			1600	6300	1700	7000		< 0.46	< 0.54	< 0.47	< 0.46	< 0.46	< 0.48	< 0.46	< 0.46	< 0.54	< 0.49	< 0.53	< 0.6	< 0.47	< 0.46	< 0.55	< 0.52	< 0.45
4,4'-DDD	2	20	2300	9000	2000	7200		< 0.49	< 0.57	< 0.5	< 0.48	< 0.48	< 0.51	< 0.48	< 0.48	< 0.57	< 0.51	< 0.56	< 0.63	< 0.49	< 0.49	< 0.58	< 0.55	< 0.47
4,4'-DDE	2.2	27	1600	6300	1400	5100		< 0.46	< 0.54	< 0.47	< 0.45	< 0.45	< 0.48	< 0.46	< 0.46	< 0.54	< 0.49	< 0.53	< 0.6	< 0.47	< 0.46	< 0.54	< 0.52	< 0.45
4,4'-DDT	1	7	1600	6300	1700	7000		< 0.51	< 0.6	< 0.53	< 0.51	< 0.51	< 0.54	< 0.51	< 0.51	< 0.6	< 0.54	< 0.59	< 0.67	< 0.52	< 0.52	< 0.61	< 0.58	< 0.5
Total DDTs (ND = 0) [1,4]	1.58	46.1						< 0.52	< 0.61	< 0.54	< 0.51	< 0.51	< 0.54	< 0.52	< 0.52	< 0.61	< 0.55	< 0.6	< 0.68	< 0.53	< 0.52	< 0.62	< 0.59	< 0.51
Aldrin			33	130	29	100		< 0.48	< 0.57	< 0.5	< 0.48	< 0.48	< 0.5	< 0.48	< 0.48	< 0.57	< 0.51	< 0.56	< 0.63	< 0.49	< 0.49	< 0.57	< 0.55	< 0.47
Alpha Chlordane								< 0.49	< 0.58	< 0.51	< 0.49	< 0.49	< 0.51	< 0.49	< 0.49	< 0.58	< 0.52	< 0.57	< 0.64	< 0.5	< 0.5	< 0.58	< 0.56	< 0.48
alpha-BHC								< 0.5	< 0.58	< 0.51	< 0.49	< 0.49	< 0.52	< 0.5	< 0.5	< 0.58	< 0.53	< 0.57	< 0.65	< 0.5	< 0.5	< 0.59	< 0.57	< 0.49
beta-BHC								< 0.41	< 0.48	< 0.42	< 0.4	< 0.4	< 0.42	< 0.4	< 0.41	< 0.48	< 0.43	< 0.47	< 0.53	< 0.41	< 0.41	< 0.48	< 0.46	< 0.4
Chlordane								< 5	< 5.9	< 5.2	< 4.9	< 5	< 5.2	< 5	< 5	< 5.9	< 5.3	< 5.8	< 6.6	< 5.1	< 5	< 6	< 5.7	< 4.9
Cis-nonachlor								< 0.45	< 0.53	< 0.46	< 0.44	< 0.45	< 0.47	< 0.45	< 0.45	< 0.53	< 0.48	< 0.52	< 0.59	< 0.46	< 0.45	< 0.53	< 0.51	< 0.44
delta-BHC								< 0.39	< 0.46	< 0.4	< 0.39	< 0.39	< 0.41	< 0.39	< 0.39	< 0.46	< 0.42	< 0.45	< 0.51	< 0.4	< 0.4	< 0.47	< 0.45	< 0.38
Dieldrin	0.02	8	35	130	30	110		< 0.51	< 0.59	< 0.52	< 0.5	< 0.5	< 0.53	< 0.5	< 0.51	< 0.6	< 0.54	< 0.58	**0.72 J**	< 0.51	**0.79 J**	< 0.6	< 0.58	< 0.5
Endosulfan sulfate					370000	3700000		< 0.52	< 0.61	< 0.53	< 0.51	< 0.51	< 0.54	< 0.52	< 0.52	< 0.61	< 0.55	< 0.6	< 0.68	< 0.53	< 0.52	< 0.62	< 0.59	< 0.51
Endosulfan-alpha (I)								< 0.4	< 0.47	< 0.41	< 0.4	< 0.4	< 0.42	< 0.4	< 0.4	< 0.47	< 0.43	< 0.46	< 0.53	< 0.41	< 0.41	< 0.48	< 0.46	< 0.39
Endosulfan-beta (II)								< 0.43	< 0.5	< 0.44	< 0.42	< 0.42	< 0.45	< 0.43	< 0.43	< 0.5	< 0.46	< 0.49	< 0.56	< 0.43	< 0.43	< 0.51	< 0.49	< 0.42
Endrin			21000	230000	18000	180000		< 0.55	< 0.64	< 0.57	< 0.54	< 0.54	< 0.57	< 0.55	< 0.55	< 0.65	< 0.58	< 0.63	< 0.72	< 0.56	< 0.55	< 0.65	< 0.63	< 0.54
Endrin aldehyde								< 0.38	< 0.44	< 0.39	< 0.37	< 0.37	< 0.39	< 0.37	< 0.37	< 0.44	< 0.4	< 0.43	< 0.49	< 0.38	< 0.38	< 0.44	< 0.43	< 0.37
Endrin ketone								< 0.53	< 0.62	< 0.55	< 0.53	< 0.53	< 0.56	< 0.53	< 0.53	< 0.63	< 0.57	< 0.61	< 0.7	< 0.54	< 0.54	< 0.63	< 0.61	< 0.52
Gamma Chlordane								< 0.49	< 0.57	< 0.5	< 0.48	< 0.48	< 0.51	< 0.49	< 0.49	< 0.57	< 0.52	< 0.56	< 0.64	< 0.49	< 0.49	< 0.58	< 0.55	< 0.48
gamma-BHC (Lindane)			500	2000				< 0.53	< 0.62	< 0.55	< 0.52	< 0.53	< 0.55	< 0.53	< 0.53	< 0.62	< 0.56	< 0.61	< 0.7	< 0.54	< 0.54	< 0.63	< 0.6	< 0.52
Heptachlor			130	520	110	380		< 0.49	< 0.58	< 0.51	< 0.49	< 0.49	< 0.51	< 0.49	< 0.49	< 0.58	< 0.52	< 0.57	< 0.65	< 0.5	< 0.5	< 0.59	< 0.56	< 0.48
Heptachlor epoxide					53	190		< 0.55	< 0.64	< 0.56	< 0.54	< 0.54	< 0.57	< 0.54	< 0.55	< 0.64	< 0.58	< 0.63	< 0.71	< 0.55	< 0.55	< 0.65	< 0.62	< 0.53
Methoxychlor			340000	3800000	310000	3100000		< 0.5	< 0.58	< 0.51	< 0.49	< 0.49	< 0.52	< 0.5	< 0.5	< 0.59	< 0.53	< 0.57	< 0.65	< 0.5	< 0.5	< 0.59	< 0.57	< 0.49
Oxychlordane								< 0.43	< 0.51	< 0.44	< 0.43	< 0.43	< 0.45	< 0.43	< 0.43	< 0.51	< 0.46	< 0.5	< 0.56	< 0.44	< 0.43	< 0.51	< 0.49	< 0.42
Total Chlordanes (ND = 0) [1,3]	0.5	6	430	1700	1600	6500		< 0.49	< 0.58	< 0.51	< 0.49	< 0.49	< 0.51	< 0.49	< 0.49	< 0.58	< 0.52	< 0.57	< 0.64	< 0.5	< 0.5	< 0.58	< 0.56	< 0.48
Toxaphene			460	1800	440	1600		< 9.7	< 11	< 10	< 9.6	< 9.6	< 10	< 9.7	< 9.7	< 11	< 10	< 11	< 13	< 9.9	< 9.8	< 12	< 11	< 9.5
Trans-nonachlor								< 0.44	< 0.52	< 0.45	< 0.44	< 0.44	< 0.46	< 0.44	< 0.44	< 0.52	< 0.47	< 0.51	< 0.58	< 0.45	< 0.45	< 0.52	< 0.5	< 0.43
PAH (µg/kg)																								
1-Methylnaphthalene					22000	99000		< 3.1	< 3.6	< 3.2	< 3	< 3	< 3.2	< 3.1	< 3.1	< 3.6	< 3.3	< 3.5	< 4	< 3.1	< 3.1	< 3.6	< 3.5	< 3
2-Methylnaphthalene	70	670			310000	4100000		< 2.8	< 3.2	< 2.9	< 2.7	< 2.7	< 2.9	< 2.8	< 2.8	< 3.3	< 2.9	< 3.2	< 3.6	< 2.8	< 2.8	< 3.3	< 3.1	< 2.7
Acenaphthene	16	500			3400000	33000000		< 2.8	< 3.2	< 2.8	< 2.7	< 2.7	< 2.9	< 2.8	< 2.8	< 3.2	< 2.9	< 3.2	< 3.6	< 2.8	< 2.8	< 3.3	< 3.1	< 2.7
Acenaphthylene	44	640						< 2.3	< 2.7	< 2.4	< 2.3	< 2.3	< 2.4	< 2.3	< 2.3	< 2.7	< 2.5	< 2.7	< 3	< 2.4	< 2.3	< 2.8	< 2.6	< 2.3
Anthracene	85.3	1100			17000000	1.70E+08		< 1.2	< 1.4	< 1.3	< 1.2	< 1.2	< 1.3	< 1.2	< 1.2	< 1.5	< 1.3	< 1.4	< 1.6	< 1.3	< 1.2	< 1.5	< 1.4	< 1.2
Benzo (a) Anthracene	261	1600			150	2100		< 2.4	< 2.8	< 2.5	< 2.4	< 2.4	< 2.5	< 2.4	< 2.4	**10 J**	< 2.5	< 2.7	< 3.1	< 2.4	< 2.4	< 2.8	< 2.7	< 2.3
Benzo (a) Pyrene	430	1600	38	130	15	210		< 1.6	< 1.8	< 1.6	< 1.5	**1.7 J**	< 1.6	< 1.6	< 1.6	**19**	< 1.7	< 1.8	< 2	< 1.6	< 1.6	< 1.9	< 1.8	< 1.5
Benzo (b) Fluoranthene					150	2100		< 1.6	< 1.8	< 1.6	< 1.5	< 1.5	< 1.6	< 1.6	< 1.6	**11 J**	< 1.7	< 1.8	< 2	< 1.6	< 1.6	< 1.9	< 1.8	< 1.5
Benzo (e) Pyrene								< 2.3	< 2.7	< 2.4	< 2.3	< 2.3	< 2.4	< 2.3	< 2.3	**16 J**	< 2.4	< 2.7	< 3	< 2.3	< 2.3	< 2.7	< 2.6	< 2.3
Benzo (g,h,i) Perylene								< 1.5	< 1.7	< 1.5	< 1.4	< 1.4	< 1.5	< 1.4	< 1.4	**20**	< 1.5	< 1.7	< 1.9	< 1.5	< 1.5	< 1.7	< 1.6	< 1.4
Benzo (k) Fluoranthene					1500	21000		< 2.1	< 2.5	< 2.2	< 2.1	< 2.1	< 2.2	< 2.1	< 2.1	**9.1 J**	< 2.3	< 2.5	< 2.8	< 2.2	< 2.2	< 2.5	< 2.4	< 2.1
Chrysene	384	2800			15000	210000		< 1.8	< 2.1	< 1.8	< 1.8	< 1.8	< 1.9	< 1.8	< 1.8	**10 J**	< 1.9	< 2.1	< 2.3	< 1.8	< 1.8	< 2.1	< 2	< 1.8
Dibenz (a,h) Anthracene	63.4	260			15	210		< 1.6	< 1.9	< 1.6	< 1.6	< 1.6	< 1.7	< 1.6	< 1.6	**3.3 J**	< 1.7	< 1.8	< 2.1	< 1.6	< 1.6	< 1.9	< 1.8	< 1.6
Fluoranthene	600	5100			2300000	22000000		< 1.5	< 1.8	< 1.6	< 1.5	**1.9 J**	< 1.6	< 1.5	< 1.5	**9 J**	< 1.6	**2.1 J**	< 2	< 1.5	< 1.5	< 1.8	< 1.7	< 1.5
Fluorene	19	540			2300000	22000000		< 2.3	< 2.6	< 2.3	< 2.2	< 2.2	< 2.3	< 2.2	< 2.2	< 2.6	< 2.4	< 2.6	< 2.9	< 2.3	< 2.3	< 2.7	< 2.6	< 2.2
Indeno (1,2,3-c,d) Pyrene					150	2100		< 1.6	< 1.9	< 1.7	< 1.6	< 1.6	< 1.7	< 1.6	< 1.6	**13 J**	< 1.7	< 1.9	< 2.1	< 1.7	< 1.6	< 1.9	< 1.9	< 1.6
Naphthalene	160	2100			3600	18000		< 4.6	< 5.4	< 4.7	< 4.6	< 4.6	< 4.8	< 4.6	< 4.6	< 5.4	< 4.9	**16 J**	< 6	**12 J**	< 4.6	< 5.5	< 5.2	< 4.5
Phenanthrene	240	1500						< 1.6	< 1.8	< 1.6	< 1.5	< 1.5	< 1.6	< 1.5	< 1.5	**4.6 J**	< 1.6	< 1.8	< 2	< 1.6	< 1.6	< 1.8	< 1.8	< 1.5
Pyrene	665	2600			1700000	17000000		< 1.5	**3.1 J**	< 1.6	**3.1 J**	**3.2 J**	< 1.6	< 1.5	< 1.5	**15 J**	< 1.6	**3.6 J**	**3.9 J**	< 1.5	< 1.5	< 1.8	< 1.7	< 1.5
Perylene								< 2.7	< 3.1	< 2.7	< 2.6	< 2.6	< 2.8	< 2.7	< 2.7	**7.1 J**	< 2.8	< 3.1	< 3.5	< 2.7	< 2.7	< 3.2	< 3	< 2.6
Biphenyl								< 2.1	< 2.5	< 2.2	< 2.1	< 2.1	< 2.2	< 2.1	< 2.1	< 2.5	< 2.3	< 2.4	< 2.8	< 2.2	< 2.1	< 2.5	< 2.4	< 2.1
1-Methylphenanthrene								< 2.5	< 2.9	< 2.6	< 2.5	< 2.5	< 2.6	< 2.5	< 2.5	< 2.9	< 2.6	< 2.9	< 3.3	< 2.5	< 2.5	< 3	< 2.8	< 2.4
2,6-Dimethylnaphthalene								< 2.6	< 3	< 2.6	< 2.5	< 2.5	< 2.7	< 2.5	< 2.5	**6.6 J**	< 2.7	< 2.9	**7.6 J**	< 2.6	< 2.6	< 3	< 2.9	< 2.5
1,6,7-Trimethylnaphthalene								< 2.2	< 2.5	< 2.2	< 2.1	< 2.1	< 2.3	< 2.2	< 2.2	< 2.5	< 2.3	< 2.5	< 2.8	< 2.2	< 2.2	< 2.6	< 2.5	< 2.1
Total HMW PAHs (ND = 0) [1,5]	1700	9600						< 2.7	**3.1**	< 2.7	**3.1**	**6.8**	< 2.8	< 2.7	< 2.7	**142.5**	< 2.8	**5.7**	**3.9**	< 2.7	< 2.7	< 3.2	< 3	< 2.6
Total LMW PAHs (ND = 0) [1,6]	552	3160						< 4.6	< 5.4	< 4.7	< 4.6	< 4.6	< 4.8	< 4.6	< 4.6	**11.2**	< 4.9	**16**	**7.6**	**12**	< 4.6	< 5.5	< 5.2	< 4.5
Total PAHs (ND = 0) [1,7]	4022	44792						< 4.6	**3.1**	< 4.7	**3.1**	**6.8**	< 4.8	< 4.6	< 4.6	**153.7**	< 4.9	**21.7**	**11.5**	**12**	< 4.6	< 5.5	< 5.2	< 4.5
Total PAHs (ND = 1/2 MDL) [2,7]							1000	< 4.6	**32.55**	< 4.7	**27.95**	**30.15**	< 4.8	< 4.6	< 4.6	**168.8**	< 4.9	**47.3**	**42.7**	**36.1**	< 4.6	< 5.5	< 5.2	< 4.5
PCB Congeners (µg/kg)																								
PCB018								< 0.24	< 0.28	< 0.25	< 0.24	< 0.24	< 0.25	< 0.24	< 0.24	< 0.28	< 0.26	< 0.28	< 0.32	< 0.24	< 0.24	< 0.29	< 0.27	< 0.24
PCB028								< 0.15	< 0.18	< 0.16	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.18	< 0.2	< 0.15	< 0.15	< 0.18	< 0.17	< 0.15
PCB037								< 0.2	< 0.24	< 0.21	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	< 0.24	< 0.21	< 0.23	< 0.26	< 0.2	< 0.2	< 0.24	< 0.23	< 0.2
PCB044								< 0.2	< 0.24	< 0.21	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	< 0.24	< 0.21	< 0.23	< 0.26	< 0.2	< 0.2	< 0.24	< 0.23	< 0.2
PCB049								< 0.18	< 0.21	< 0.19	< 0.18	< 0.18	< 0.19	< 0.18	< 0.18	< 0.21	< 0.19	< 0.21	< 0.24	< 0.18	< 0.18	< 0.21	< 0.21	< 0.18

Table 5
Results of Physical and Chemical Analyses of Sediment from Salt Ponds 12, 13, 14, and 15

Parameter	ERL	ERM	Residential CHHSL	Commercial/ Industrial CHHSL	Residential RSL	Industrial RSL	Zeeman 2004 (minimum)	Salt Pond 12												Salt Pond 13				
								SSDBSP-12-01_0.0-5.4	SSDBSP-12-02_0.0-6.1	SSDBSP-12-03_0.0-5.0	SSDBSP-12-04_0.0-5.0	SSDBSP-12-05_0.0-2.9	SSDBSP-12-06_0.0-4.4	SSDBSP-12-07_0.0-4.2	SSDBSP-12-08A_0.0-4.5	SSDBSP-12-09_0.0-4.2	SSDBSP-12-109_0.0-4.2 (Field Duplicate)	SSDBSP-12-209_0.0-4.2 (Field Split)	SSDBSP-12-10_0.0-3.2	SSDBSP-13-01_0.0-5.8	SSDBSP-13-02_0.0-6.3	SSDBSP-13-03_0.0-5.2	SSDBSP-13-04_0.0-4.0	SSDBSP-13-05_0.0-4.6
								2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/1/2013	2/2/2013	2/1/2013	2/1/2013	2/1/2013	2/2/2013	2/1/2013	2/1/2013	2/1/2013	2/1/2013	2/1/2013
PCB052								< 0.15	< 0.17	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.17	< 0.16	< 0.17	< 0.19	< 0.15	< 0.15	< 0.18	< 0.17	< 0.15
PCB066								< 0.14	< 0.16	< 0.14	< 0.14	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16	< 0.15	< 0.16	< 0.18	< 0.14	< 0.14	< 0.17	< 0.16	< 0.14
PCB070								< 0.13	< 0.15	< 0.13	< 0.12	< 0.12	< 0.13	< 0.13	< 0.13	< 0.15	< 0.13	< 0.14	< 0.16	< 0.13	< 0.13	< 0.15	< 0.14	< 0.12
PCB074								< 0.15	< 0.17	< 0.15	< 0.14	< 0.14	< 0.15	< 0.14	< 0.14	< 0.17	< 0.15	< 0.17	< 0.19	< 0.15	< 0.15	< 0.17	< 0.16	< 0.14
PCB077								< 0.15	< 0.18	< 0.15	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.17	< 0.2	< 0.15	< 0.15	< 0.18	< 0.17	< 0.15
PCB081								< 0.19	< 0.22	< 0.19	< 0.19	< 0.19	< 0.2	< 0.19	< 0.19	< 0.22	< 0.2	< 0.22	< 0.25	< 0.19	< 0.19	< 0.22	< 0.21	< 0.18
PCB087								< 0.16	< 0.18	< 0.16	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.18	< 0.2	< 0.16	< 0.16	< 0.18	< 0.18	< 0.15
PCB099								< 0.13	< 0.15	< 0.13	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.15	< 0.14	< 0.15	< 0.17	< 0.13	< 0.13	< 0.16	< 0.15	< 0.13
PCB101								< 0.12	< 0.15	< 0.13	< 0.12	< 0.12	< 0.13	< 0.12	< 0.12	< 0.15	< 0.13	< 0.14	< 0.16	< 0.13	< 0.13	< 0.15	< 0.14	< 0.12
PCB105					34	110		< 0.16	< 0.19	< 0.17	< 0.16	< 0.16	< 0.17	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.16
PCB110								< 0.16	< 0.19	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.15
PCB114					0.68	2.3		< 0.15	< 0.18	< 0.16	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.18	< 0.2	< 0.16	< 0.15	< 0.18	< 0.17	< 0.15
PCB118					34	110		< 0.2	< 0.24	< 0.21	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	< 0.24	< 0.22	< 0.23	< 0.27	< 0.21	< 0.21	< 0.24	< 0.23	< 0.2
PCB119								< 0.13	< 0.16	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.16	< 0.14	< 0.15	< 0.17	< 0.13	< 0.13	< 0.16	< 0.15	< 0.13
PCB123					34	110		< 0.13	< 0.16	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.16	< 0.14	< 0.15	< 0.18	< 0.14	< 0.13	< 0.16	< 0.15	< 0.13
PCB126					0.034	0.11		< 0.21	< 0.25	< 0.22	< 0.21	< 0.21	< 0.22	< 0.21	< 0.21	< 0.25	< 0.22	< 0.24	< 0.28	< 0.21	< 0.21	< 0.25	< 0.24	< 0.21
PCB128								< 0.16	< 0.18	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.15
PCB138/158								< 0.31	< 0.37	< 0.32	< 0.31	< 0.31	< 0.32	< 0.31	< 0.31	< 0.37	< 0.33	< 0.36	< 0.41	< 0.32	< 0.31	< 0.37	< 0.35	< 0.3
PCB149								< 0.14	< 0.16	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.16	< 0.15	< 0.16	< 0.18	< 0.14	< 0.14	< 0.16	< 0.16	< 0.13
PCB151								< 0.16	< 0.19	< 0.16	< 0.16	< 0.16	< 0.17	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.16
PCB153								< 0.16	< 0.19	< 0.16	< 0.16	< 0.16	< 0.17	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.16
PCB156					6.8	23		< 0.15	< 0.18	< 0.15	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.17	< 0.2	< 0.15	< 0.15	< 0.18	< 0.17	< 0.15
PCB157					6.8	23		< 0.15	< 0.17	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.17	< 0.16	< 0.17	< 0.19	< 0.15	< 0.15	< 0.17	< 0.17	< 0.14
PCB167					340	1100		< 0.15	< 0.18	< 0.16	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.18	< 0.2	< 0.16	< 0.15	< 0.18	< 0.17	< 0.15
PCB168								< 0.13	< 0.15	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.16	< 0.14	< 0.15	< 0.17	< 0.13	< 0.13	< 0.16	< 0.15	< 0.13
PCB169								< 0.13	< 0.15	< 0.13	< 0.12	< 0.12	< 0.13	< 0.12	< 0.13	< 0.15	< 0.13	< 0.14	< 0.16	< 0.13	< 0.13	< 0.15	< 0.14	< 0.12
PCB170								< 0.14	< 0.17	< 0.15	< 0.14	< 0.14	< 0.15	< 0.14	< 0.14	< 0.17	< 0.15	< 0.16	< 0.19	< 0.14	< 0.14	< 0.17	< 0.16	< 0.14
PCB177								< 0.19	< 0.22	< 0.19	< 0.19	< 0.19	< 0.2	< 0.19	< 0.19	< 0.22	< 0.2	< 0.22	< 0.25	< 0.19	< 0.19	< 0.22	< 0.22	< 0.19
PCB180								< 0.094	< 0.11	< 0.097	< 0.093	< 0.093	< 0.098	< 0.094	< 0.094	< 0.11	< 0.1	< 0.11	< 0.12	< 0.095	< 0.095	< 0.11	< 0.11	< 0.092
PCB183								< 0.17	< 0.2	< 0.18	< 0.17	< 0.17	< 0.18	< 0.17	< 0.17	< 0.2	< 0.18	< 0.2	< 0.22	< 0.17	< 0.17	< 0.2	< 0.19	< 0.17
PCB187								< 0.16	< 0.19	< 0.17	< 0.16	< 0.16	< 0.17	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.16
PCB189					34	110		< 0.13	< 0.15	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.15	< 0.14	< 0.15	< 0.17	< 0.13	< 0.13	< 0.16	< 0.15	< 0.13
PCB194								< 0.15	< 0.17	< 0.15	< 0.14	< 0.15	< 0.15	< 0.15	< 0.15	< 0.17	< 0.16	< 0.17	< 0.19	< 0.15	< 0.15	< 0.17	< 0.17	< 0.14
PCB201								< 0.088	< 0.1	< 0.09	< 0.086	< 0.087	< 0.091	< 0.087	< 0.087	< 0.1	< 0.093	< 0.1	< 0.11	< 0.089	< 0.088	< 0.1	< 0.099	< 0.086
PCB206								< 0.13	< 0.15	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.15	< 0.13	< 0.15	< 0.17	< 0.13	< 0.13	< 0.15	< 0.14	< 0.12
Total PCB Congeners (ND = 0) [1,8]	22.7	180	89	300	220	740		< 0.31	< 0.37	< 0.32	< 0.31	< 0.31	< 0.32	< 0.31	< 0.31	< 0.37	< 0.33	< 0.36	< 0.41	< 0.32	< 0.31	< 0.37	< 0.35	< 0.3
Total PCB Congeners (ND = 1/2 MDL) [2,8]							6	< 0.31	< 0.37	< 0.32	< 0.31	< 0.31	< 0.32	< 0.31	< 0.31	< 0.37	< 0.33	< 0.36	< 0.41	< 0.32	< 0.31	< 0.37	< 0.35	< 0.3

Table 5

Results of Physical and Chemical Analyses of Sediment from Salt Ponds 12, 13, 14, and 15

	Pond 13		Salt Pond 14				Salt Pond 15											
	SSDBSP-13-06_0.0-2.9	SSDBSP-13-07_0.0-2.5	SSDBSP-14-01_0.0-4.5	SSDBSP-14-02_0.0-4.9	SSDBSP-14-03A_0.0-5.2	SSDBSP-14-04A_0.0-2.9	SSDBSP-15-01_0.0-1.2	SSDBSP-15-101_0.0-1.2 (Field Duplicate)	SSDBSP-15-201_0.0-1.2 (Field Split)	SSDBSP-15-02_0.0-5.3	SSDBSP-15-03_0.0-4.6	SSDBSP-15-04_0.0-5.5	SSDBSP-15-05_0.0-5.4	SSDBSP-15-06_0.0-1.5	SSDBSP-15-07_0-0-4.0	SSDBSP-15-08_0.0-3.1	SSDBSP-15-09_0.0-5.0	SSDBSP-15-10_0.0-2.0
Parameter	1/31/2013	1/31/2013	1/31/2013	1/31/2013	1/31/2013	1/31/2013	1/30/2013	1/30/2013	1/30/2013	1/30/2013	1/30/2013	1/31/2013	1/31/2013	1/30/2013	1/29/2013	1/29/2013	1/29/2013	1/29/2013
Conventional Parameters (%)																		
Total organic carbon	**1.9**	**1.8**	**0.54**	**0.53**	**0.55**	**3.3**	**6.5**	**5.2**	**6**	**0.76**	**0.73**	**0.58**	**1.2**	**1.2**	**2**	**3.5**	**1.8**	**2.7**
Total solids	**41.9**	**46.1**	**70**	**72.3**	**70.8**	**40.2**	**31.4**	**39.2**	**32.2**	**68.5**	**67.2**	**67.6**	**53.8**	**58.1**	**57.6**	**64.6**	**62.5**	**49.8**
Clay (less than 0.00391mm)	**27.24**	**26.36**	**26.85**	**23.43**	**25.91**	**19.68**	**21.02**	**10.2**	**18.38**	**22.84**	**29.29**	**23.17**	**32.65**	**39.47**	**36.91**	**33.04**	**35.77**	**28.38**
Coarse Sand (0.5 to 1mm)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	**3.95**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fine Sand (0.125 to 0.25mm)	**6.9**	**4.1**	**0.06**	**4.79**	**2.44**	**2.79**	**7.03**	**13.01**	**7.79**	**3.1**	< 0.01	**1.28**	< 0.01	**2.8**	**0.03**	**0.06**	**0.02**	**2.59**
Gravel (greater than 2mm)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Medium Sand (0.25 to 0.5mm)	**5.12**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	**1.71**	**9.49**	**0.26**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Silt (0.00391 to 0.0625mm)	**54.28**	**63.44**	**66.74**	**59.18**	**63.96**	**68.5**	**62.29**	**49.54**	**63.82**	**62.77**	**66.92**	**63.65**	**64.99**	**55.92**	**61.56**	**62**	**61.42**	**65.19**
Total Silt and Clay (0 to 0.0625mm)	**81.53**	**89.8**	**93.59**	**82.62**	**89.87**	**88.18**	**83.31**	**59.74**	**82.19**	**85.61**	**96.21**	**86.83**	**97.64**	**95.39**	**98.47**	**95.05**	**97.19**	**93.57**
Very Coarse Sand (1 to 2mm)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Very Fine Sand (0.0625 to 0.125mm)	**6.46**	**6.09**	**6.35**	**12.6**	**7.69**	**9.03**	**7.95**	**13.81**	**9.75**	**11.29**	**3.79**	**11.89**	**2.36**	**1.81**	**1.5**	**4.89**	**2.78**	**3.84**
Metals (mg/kg)																		
Arsenic	5.21	5.42	3.99	4.2	3.32	4.2	3.14	2.83	3.19	4.39	4.71	3.89	6.05	7.09	5.99	3.77	5.5	4.55
Cadmium	**0.313**	**0.313**	**0.156**	**0.13 J**	**0.128 J**	**0.394**	**0.474**	**0.233 J**	**0.312**	**0.198**	**0.175**	**0.148**	**0.378**	**0.311**	**0.251**	**0.192**	**0.205**	**0.365**
Chromium	**22.7**	**23.2**	**13.1**	**11.6**	**11.8**	**17.1**	**17.9**	**13.1**	**14.9**	**16.2**	**15.1**	**12.9**	**25.2**	**24.2**	**29.9**	**18.4**	**17.7**	**24**
Copper	**19.7**	**20.3**	**9.94**	**9.89**	**8.08**	**25.2**	**133**	**23.5**	**119**	**12.8**	**11.9**	**9.96**	**25.6**	**22.7**	**23**	**19.1**	**18.7**	**179**
Lead	**13.2**	**13.4**	**3.7**	**3.66**	**3.69**	**12.2**	**22.7**	**128**	**17.4**	**4.26**	**4.35**	**3.43**	**8.78**	**9.36**	**8.53**	**5.24**	**5.88**	**22.1**
Mercury	**0.0239 J**	**0.0215 J**	< 0.0084	< 0.0081	< 0.0083	**0.0458 J**	**0.0503 J**	< 0.015	**0.048 J**	< 0.0086	**0.0103 J**	< 0.0087	**0.0363 J**	**0.0416**	**0.0473**	**0.0306 J**	**0.0279 J**	**0.117**
Nickel	**11.4**	**10.7**	**5.11**	**4.83**	**4.29**	**9.9**	**34.4**	**10.2**	**28.9**	**6.54**	**6.07**	**5.33**	**11**	**12.4**	**13.3**	**8.71**	**8.83**	**26.5**
Selenium	**0.266**	< 0.158	**0.141 J**	**0.155**	< 0.103	**0.304**	**0.387**	**0.207 J**	**0.342**	**0.115 J**	**0.169**	**0.118 J**	**0.333**	**0.253**	**0.347**	**0.238**	**0.324**	**0.239**
Silver	< 0.0747	**0.0825 J**	< 0.0447	< 0.0433	< 0.0442	**0.177 J**	**0.14 J**	< 0.0798	< 0.0972	< 0.0457	< 0.0466	< 0.0463	**0.172 J**	**0.0937 J**	**0.076 J**	**0.056 J**	**0.064 J**	**0.121 J**
Zinc	**66.5**	**62.1**	**32.7**	**32.7**	**29.2**	**59.3**	**65.1**	**53.9**	**59**	**40.6**	**38**	**32.4**	**77.2**	**60.2**	**66.1**	**40.5**	**41.3**	**68.3**
Pesticides (µg/kg)																		
2,4'-DDD	< 0.81	< 0.73	< 0.48	< 0.47	< 0.48	< 0.84	< 1.1	< 0.86	< 1.1	< 0.49	< 0.5	< 0.5	< 0.63	< 0.58	< 0.59	< 0.52	< 0.54	< 0.68
2,4'-DDE	< 0.73	< 0.66	< 0.44	< 0.42	< 0.43	< 0.76	< 0.97	< 0.78	< 0.95	< 0.45	< 0.45	< 0.45	< 0.57	< 0.53	< 0.53	< 0.47	< 0.49	< 0.61
2,4'-DDT	< 0.72	< 0.65	< 0.43	< 0.42	< 0.42	< 0.75	**5.2**	**5.1**	**5.7**	< 0.44	< 0.45	< 0.44	< 0.56	< 0.52	< 0.52	< 0.47	< 0.48	< 0.6
4,4'-DDD	< 0.75	< 0.69	< 0.45	< 0.44	< 0.45	< 0.79	< 1	< 0.81	< 0.98	< 0.46	< 0.47	< 0.47	< 0.59	< 0.54	< 0.55	< 0.49	< 0.51	< 0.63
4,4'-DDE	< 0.71	**0.95 J**	< 0.43	< 0.41	< 0.42	**1 J**	**5.1**	**3.9**	**5.8**	< 0.44	< 0.45	< 0.44	< 0.56	< 0.51	< 0.52	< 0.46	< 0.48	**0.77 J**
4,4'-DDT	< 0.8	< 0.73	< 0.48	< 0.46	< 0.47	< 0.83	< 1.1	< 0.85	< 1	< 0.49	< 0.5	< 0.5	< 0.62	< 0.58	< 0.58	< 0.52	< 0.54	< 0.67
Total DDTs (ND = 0) [1,4]	< 0.81	**0.95**	< 0.48	< 0.47	< 0.48	**1**	**10.3**	**9**	**11.5**	< 0.49	< 0.5	< 0.5	< 0.63	< 0.58	< 0.59	< 0.52	< 0.54	**0.77**
Aldrin	< 0.75	< 0.68	< 0.45	< 0.44	< 0.44	< 0.78	< 1	< 0.8	< 0.98	< 0.46	< 0.47	< 0.47	< 0.58	< 0.54	< 0.55	< 0.49	< 0.5	< 0.63
Alpha Chlordane	< 0.77	< 0.7	< 0.46	< 0.44	< 0.45	< 0.8	< 1	< 0.82	< 1	< 0.47	< 0.48	< 0.47	< 0.6	< 0.55	< 0.56	< 0.5	< 0.51	< 0.64
alpha-BHC	< 0.77	< 0.7	< 0.46	< 0.45	< 0.46	< 0.81	< 1	< 0.83	< 1	< 0.47	< 0.48	< 0.48	< 0.6	< 0.56	< 0.56	< 0.5	< 0.52	< 0.65
beta-BHC	< 0.63	< 0.57	< 0.38	< 0.37	< 0.37	< 0.66	< 0.84	< 0.67	< 0.82	< 0.39	< 0.39	< 0.39	< 0.49	< 0.45	< 0.46	< 0.41	< 0.42	< 0.53
Chlordane	< 7.8	< 7.1	< 4.7	< 4.5	< 4.6	< 8.1	< 10	< 8.3	< 10	< 4.8	< 4.9	< 4.8	< 6.1	< 5.6	< 5.7	< 5.1	< 5.2	< 6.6
Cis-nonachlor	< 0.7	< 0.64	< 0.42	< 0.41	< 0.41	< 0.73	< 0.94	< 0.75	< 0.91	< 0.43	< 0.44	< 0.43	< 0.55	< 0.51	< 0.51	< 0.45	< 0.47	< 0.59
delta-BHC	< 0.61	< 0.56	< 0.37	< 0.35	< 0.36	< 0.64	< 0.81	< 0.65	< 0.79	< 0.37	< 0.38	< 0.38	< 0.48	< 0.44	< 0.44	< 0.4	< 0.41	< 0.51
Dieldrin	< 0.79	**1.9 J**	< 0.47	< 0.46	< 0.47	**2.6**	< 1	< 0.84	< 1	< 0.48	< 0.49	< 0.49	< 0.61	< 0.57	< 0.57	< 0.51	< 0.53	< 0.66
Endosulfan sulfate	< 0.81	< 0.73	< 0.48	< 0.47	< 0.48	< 0.84	< 1.1	**3.3**	< 1	< 0.49	< 0.5	< 0.5	< 0.63	< 0.58	< 0.59	< 0.52	< 0.54	< 0.68
Endosulfan-alpha (I)	< 0.63	< 0.57	< 0.37	< 0.36	< 0.37	< 0.65	< 0.83	< 0.67	< 0.81	< 0.38	< 0.39	< 0.39	< 0.49	< 0.45	< 0.45	< 0.41	< 0.42	< 0.53
Endosulfan-beta (II)	< 0.67	< 0.61	< 0.4	< 0.39	< 0.39	< 0.7	< 0.89	< 0.71	< 0.87	< 0.41	< 0.42	< 0.41	< 0.52	< 0.48	< 0.49	< 0.43	< 0.45	< 0.56
Endrin	< 0.86	< 0.78	< 0.51	< 0.5	< 0.51	< 0.89	< 1.1	< 0.91	< 1.1	< 0.52	< 0.53	< 0.53	< 0.67	< 0.62	< 0.62	< 0.55	< 0.57	< 0.72
Endrin aldehyde	< 0.58	< 0.53	< 0.35	< 0.34	< 0.34	< 0.61	< 0.78	< 0.62	< 0.76	< 0.36	< 0.36	< 0.36	< 0.45	< 0.42	< 0.42	< 0.38	< 0.39	< 0.49
Endrin ketone	< 0.83	< 0.75	< 0.5	< 0.48	< 0.49	< 0.86	< 1.1	< 0.89	< 1.1	< 0.51	< 0.52	< 0.51	< 0.65	< 0.6	< 0.6	< 0.54	< 0.56	< 0.7
Gamma Chlordane	< 0.76	< 0.69	< 0.45	< 0.44	< 0.45	< 0.79	< 1	< 0.81	< 0.99	< 0.46	< 0.47	< 0.47	< 0.59	< 0.55	< 0.55	< 0.49	< 0.51	< 0.64
gamma-BHC (Lindane)	< 0.83	< 0.75	< 0.49	< 0.48	< 0.49	< 0.86	< 1.1	< 0.88	< 1.1	< 0.51	< 0.52	< 0.51	< 0.64	< 0.6	< 0.6	< 0.54	< 0.55	< 0.7
Heptachlor	< 0.77	< 0.7	< 0.46	< 0.44	< 0.45	< 0.8	< 1	< 0.82	< 1	< 0.47	< 0.48	< 0.48	< 0.6	< 0.55	< 0.56	< 0.5	< 0.51	< 0.65
Heptachlor epoxide	< 0.85	< 0.77	< 0.51	< 0.49	< 0.5	< 0.88	< 1.1	< 0.91	< 1.1	< 0.52	< 0.53	< 0.53	< 0.66	< 0.61	< 0.62	< 0.55	< 0.57	< 0.71
Methoxychlor	< 0.77	< 0.7	< 0.46	< 0.45	< 0.46	< 0.81	< 1	< 0.83	< 1	< 0.47	< 0.48	< 0.48	< 0.6	< 0.56	< 0.56	< 0.5	< 0.52	< 0.65
Oxychlordane	< 0.67	< 0.61	< 0.4	< 0.39	< 0.4	< 0.7	< 0.9	< 0.72	< 0.87	< 0.41	< 0.42	< 0.42	< 0.52	< 0.48	< 0.49	< 0.44	< 0.45	< 0.56
Total Chlordanes (ND = 0) [1,3]	< 0.77	< 0.7	< 0.46	< 0.44	< 0.45	< 0.8	< 1	< 0.82	< 1	< 0.47	< 0.48	< 0.47	< 0.6	< 0.55	< 0.56	< 0.5	< 0.51	< 0.64
Toxaphene	< 15	< 14	< 9.1	< 8.8	< 8.9	< 16	< 20	< 16	< 20	< 9.3	< 9.4	< 9.4	< 12	< 11	< 11	< 9.8	< 10	< 13
Trans-nonachlor	< 0.69	< 0.62	< 0.41	< 0.4	< 0.41	< 0.72	< 0.92	< 0.73	< 0.89	< 0.42	< 0.43	< 0.43	< 0.54	< 0.5	< 0.5	< 0.45	< 0.46	< 0.58
PAH (µg/kg)																		
1-Methylnaphthalene	< 4.8	< 4.3	< 2.9	< 2.8	< 2.8	< 5	< 6.4	< 5.1	< 6.2	< 2.9	< 3	< 3	< 3.7	< 3.4	< 3.5	< 3.1	< 3.2	**21**
2-Methylnaphthalene	< 4.3	< 3.9	< 2.6	< 2.5	< 2.5	< 4.5	**7.3 J**	< 4.6	< 5.6	< 2.6	< 2.7	< 2.7	< 3.4	< 3.1	< 3.1	< 2.8	< 2.9	**34**
Acenaphthene	< 4.3	< 3.9	< 2.6	< 2.5	**2.7 J**	**6.3 J**	< 5.7	< 4.6	< 5.6	< 2.6	< 2.7	< 2.7	< 3.3	< 3.1	< 3.1	< 2.8	< 2.9	< 3.6
Acenaphthylene	< 3.6	< 3.3	< 2.2	< 2.1	**2.4 J**	**5.9 J**	< 4.8	< 3.9	< 4.7	< 2.2	< 2.3	< 2.2	< 2.8	< 2.6	< 2.6	< 2.3	< 2.4	< 3
Anthracene	< 1.9	< 1.7	< 1.2	< 1.1	< 1.1	< 2	< 2.6	< 2.1	< 2.5	< 1.2	< 1.2	< 1.2	< 1.5	< 1.4	< 1.4	< 1.2	< 1.3	< 1.6
Benzo (a) Anthracene	< 3.7	**11 J**	< 2.2	< 2.2	< 2.2	< 3.9	< 5	< 4	< 4.8	< 2.3	< 2.3	< 2.3	< 2.9	**11 J**	< 2.7	< 2.4	**4 J**	**3.7 J**
Benzo (a) Pyrene	< 2.4	**11 J**	< 1.5	**2.1 J**	< 1.4	**3.6 J**	**6.2 J**	**3 J**	**4.8 J**	**1.7 J**	**2.3 J**	< 1.5	**4.4 J**	**11 J**	**3.5 J**	< 1.6	**5.1 J**	**6.1 J**
Benzo (b) Fluoranthene	< 2.4	**8.5 J**	< 1.5	**2.6 J**	< 1.4	< 2.5	< 3.2	< 2.6	< 3.2	< 1.5	**2.1 J**	< 1.5	**3.6 J**	**6.6 J**	**2.9 J**	< 1.6	**3.9 J**	**4.5 J**
Benzo (e) Pyrene	< 3.6	< 3.3	< 2.1	< 2.1	< 2.1	< 3.7	**5.7 J**	< 3.8	**5.5 J**	< 2.2	< 2.2	< 2.2	**3.9 J**	**6.9 J**	**3.7 J**	< 2.3	**3.8 J**	**5.7 J**
Benzo (g,h,i) Perylene	< 2.3	**8.2 J**	< 1.3	**2.6 J**	< 1.3	**4 J**	< 3	< 2.4	< 2.9	**2.1 J**	**2.7 J**	< 1.4	**4.9 J**	**7.1 J**	**4.9 J**	< 1.5	**4.6 J**	**5.4 J**
Benzo (k) Fluoranthene	< 3.3	**8.3 J**	< 2	< 1.9	< 2	< 3.5	< 4.4	< 3.6	< 4.3	< 2	< 2.1	< 2.1	**3.2 J**	**9.4 J**	< 2.4	< 2.2	**4.4 J**	**5.6 J**
Chrysene	< 2.8	**9.7 J**	< 1.7	**1.6 J**	< 1.6	< 2.9	**6.8 J**	**3.2 J**	**4.5 J**	< 1.7	< 1.7	< 1.7	**2.7 J**	**9.5 J**	**2.7 J**	< 1.8	**3.7 J**	**6.9 J**
Dibenz (a,h) Anthracene	< 2.5	< 2.2	< 1.5	< 1.4	< 1.5	< 2.6	< 3.3	< 2.6	< 3.2	< 1.5	< 1.5	< 1.5	< 1.9	< 1.8	< 1.8	< 1.6	< 1.7	< 2.1
Fluoranthene	< 2.3	**11 J**	< 1.4	**2.5 J**	< 1.4	**4.3 J**	**7.8 J**	**4.1 J**	**7.3 J**	**2.4 J**	**2.5 J**	**1.6 J**	**5.3 J**	**13 J**	**4.1 J**	**1.7 J**	**4.4 J**	**8.6 J**
Fluorene	< 3.5	< 3.2	< 2.1	< 2	**3 J**	**8.1 J**	**5.6 J**	< 3.7	**4.8 J**	< 2.1	< 2.2	< 2.2	**3 J**	< 2.5	< 2.5	< 2.3	< 2.3	**5.7 J**
Indeno (1,2,3-c,d) Pyrene	< 2.5	**6.8 J**	< 1.5	**1.6 J**	< 1.5	< 2.6	< 3.4	< 2.7	< 3.3	< 1.6	**1.6 J**	< 1.6	**3.3 J**	**5.2 J**	**2.8 J**	< 1.6	**3.3 J**	**5.1 J**
Naphthalene	< 7.2	< 6.5	< 4.3	< 4.2	**4.7 J**	< 7.5	< 9.6	< 7.7	**20 J**	< 4.4	< 4.5	< 4.4	< 5.6	**9.2 J**	< 5.2	< 4.7	**7.3 J**	**22**
Phenanthrene	< 2.4	**5.2 J**	< 1.4	< 1.4	< 1.4	< 2.5	**8.8 J**	**6.1 J**	**10 J**	**1.5 J**	< 1.5	< 1.5	**2.2 J**	**4.8 J**	**2.5 J**	< 1.6	**3.3 J**	**7.5 J**
Pyrene	**2.6 J**	**14 J**	**1.5 J**	**4.6 J**	**6.5 J**	**16 J**	**12 J**	**6.9 J**	**12 J**	**3.5 J**	**4.1 J**	**2.6 J**	**16 J**	**21**	**6.8 J**	**2.8 J**	**7.7 J**	**14 J**
Perylene	< 4.2	< 3.8	< 2.5	**3.1 J**	< 2.5	< 4.3	< 5.5	< 4.4	< 5.4	**4.1 J**	< 2.6	< 2.6	< 3.2	**3.5 J**	< 3	< 2.7	< 2.8	**4.1 J**
Biphenyl	< 3.3	< 3	< 2	< 1.9	< 2	< 3.4	**9.8 J**	**6.4 J**	**6.6 J**	< 2	< 2.1	< 2.1	< 2.6	< 2.4	< 2.4	< 2.1	< 2.2	**13 J**
1-Methylphenanthrene	< 3.9	< 3.5	< 2.3	< 2.2	< 2.3	< 4	< 5.2	< 4.1	< 5	< 2.4	< 2.4	< 2.4	< 3	< 2.8	< 2.8	< 2.5	< 2.6	< 3.3
2,6-Dimethylnaphthalene	**8.1 J**	**49**	**3.7 J**	**4.6 J**	**5.4 J**	**130**	**540**	**420**	**440**	**11 J**	**2.5 J**	**2.9 J**	< 3.1	**11 J**	**7.1 J**	**19**	< 2.7	**120**
1,6,7-Trimethylnaphthalene	< 3.4	< 3.1	< 2	< 1.9	< 2	< 3.5	**11 J**	< 3.6	**5.6 J**	< 2.1	< 2.1	< 2.1	< 2.6	< 2.4	< 2.4	< 2.2	< 2.3	**9.6 J**
Total HMW PAHs (ND = 0) [1,5]	**2.6**	**88.5**	**1.5**	**20.7**	**6.5**	**27.9**	**38.5**	**17.2**	**34.1**	**13.8**	**15.3**	**4.2**	**47.3**	**104.2**	**31.4**	**4.5**	**44.9**	**69.7**
Total LMW PAHs (ND = 0) [1,6]	**8.1**	**54.2**	**3.7**	**4.6**	**18.2**	**150.3**	**582.5**	**432.5**	**487**	**12.5**	**2.5**	**2.9**	**5.2**	**25**	**9.6**	**19**	**10.6**	**232.8**
Total PAHs (ND = 0) [1,7]	**10.7**	**142.7**	**5.2**	**25.3**	**24.7**	**178.2**	**621**	**449.7**	**521.1**	**26.3**	**17.8**	**7.1**	**52.5**	**129.2**	**41**	**23.5**	**55.5**	**302.5**
Total PAHs (ND = 1/2 MDL) [2,7]	**48**	**165.55**	**27.6**	**41.4**	**41.2**	**207.4**	**652.05**	**482.45**	**549.45**	**44.95**	**37.35**	**29.55**	**72.3**	**141.95**	**60.45**	**46.95**	**70.15**	**309.3**
PCB Congeners (µg/kg)																		
PCB018	< 0.38	< 0.34	< 0.22	< 0.22	< 0.22	< 0.39	< 0.5	< 0.4	< 0.49	< 0.23	< 0.23	< 0.23	< 0.29	< 0.27	< 0.27	< 0.24	< 0.25	< 0.32
PCB028	< 0.24	< 0.22	< 0.14	< 0.14	< 0.14	< 0.25	< 0.32	< 0.25	< 0.31	< 0.15	< 0.15	< 0.15	< 0.18	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB037	< 0.31	< 0.28	< 0.19	< 0.18	< 0.18	< 0.33	< 0.42	< 0.33	< 0.41	< 0.19	< 0.19	< 0.19	< 0.24	< 0.23	< 0.23	< 0.2	< 0.21	< 0.26
PCB044	< 0.31	< 0.29	< 0.19	< 0.18	< 0.19	< 0.33	< 0.42	< 0.34	< 0.41	< 0.19	< 0.2	< 0.19	< 0.24	< 0.23	< 0.23	< 0.2	< 0.21	< 0.26
PCB049	< 0.28	< 0.26	< 0.17	< 0.16	< 0.17	< 0.29	< 0.38	< 0.3	< 0.37	< 0.17	< 0.18	< 0.17	< 0.22	< 0.2	< 0.2	< 0.18	< 0.19	< 0.24

Table 5

Results of Physical and Chemical Analyses of Sediment from Salt Ponds 12, 13, 14, and 15

Parameter	Pond 13		Salt Pond 14				Salt Pond 15											
	SSDBSP-13-06_0.0-2.9	SSDBSP-13-07_0.0-2.5	SSDBSP-14-01_0.0-4.5	SSDBSP-14-02_0.0-4.9	SSDBSP-14-03A_0.0-5.2	SSDBSP-14-04A_0.0-2.9	SSDBSP-15-01_0.0-1.2	SSDBSP-15-101_0.0-1.2 (Field Duplicate)	SSDBSP-15-201_0.0-1.2 (Field Split)	SSDBSP-15-02_0.0-5.3	SSDBSP-15-03_0.0-4.6	SSDBSP-15-04_0.0-5.5	SSDBSP-15-05_0.0-5.4	SSDBSP-15-06_0.0-1.5	SSDBSP-15-07_0-0-4.0	SSDBSP-15-08_0.0-3.1	SSDBSP-15-09_0.0-5.0	SSDBSP-15-10_0.0-2.0
	1/31/2013	1/31/2013	1/31/2013	1/31/2013	1/31/2013	1/31/2013	1/30/2013	1/30/2013	1/30/2013	1/30/2013	1/30/2013	1/31/2013	1/31/2013	1/30/2013	1/29/2013	1/29/2013	1/29/2013	1/29/2013
PCB052	< 0.23	< 0.21	< 0.14	< 0.13	< 0.14	< 0.24	< 0.31	< 0.25	< 0.3	< 0.14	< 0.14	< 0.14	< 0.18	< 0.17	< 0.17	< 0.15	< 0.15	< 0.19
PCB066	< 0.22	< 0.2	< 0.13	< 0.13	< 0.13	< 0.23	< 0.29	< 0.23	< 0.28	< 0.13	< 0.14	< 0.14	< 0.17	< 0.16	< 0.16	< 0.14	< 0.15	< 0.18
PCB070	< 0.2	< 0.18	< 0.12	< 0.11	< 0.12	< 0.2	< 0.26	< 0.21	< 0.25	< 0.12	< 0.12	< 0.12	< 0.15	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16
PCB074	< 0.23	< 0.2	< 0.13	< 0.13	< 0.13	< 0.24	< 0.3	< 0.24	< 0.29	< 0.14	< 0.14	< 0.14	< 0.18	< 0.16	< 0.16	< 0.15	< 0.15	< 0.19
PCB077	< 0.23	< 0.21	< 0.14	< 0.13	< 0.14	< 0.24	< 0.31	< 0.25	< 0.3	< 0.14	< 0.15	< 0.14	< 0.18	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB081	< 0.29	< 0.27	< 0.17	< 0.17	< 0.17	< 0.3	< 0.39	< 0.31	< 0.38	< 0.18	< 0.18	< 0.18	< 0.23	< 0.21	< 0.21	< 0.19	< 0.2	< 0.25
PCB087	< 0.24	< 0.22	< 0.14	< 0.14	< 0.14	< 0.25	< 0.32	< 0.26	< 0.31	< 0.15	< 0.15	< 0.15	< 0.19	< 0.17	< 0.18	< 0.16	< 0.16	< 0.2
PCB099	< 0.2	< 0.18	< 0.12	< 0.12	< 0.12	< 0.21	< 0.27	< 0.22	< 0.26	< 0.12	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.13	< 0.14	< 0.17
PCB101	< 0.19	< 0.18	< 0.12	< 0.11	< 0.11	< 0.2	< 0.26	< 0.21	< 0.25	< 0.12	< 0.12	< 0.12	< 0.15	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16
PCB105	< 0.25	< 0.23	< 0.15	< 0.15	< 0.15	< 0.26	< 0.33	< 0.27	< 0.33	< 0.15	< 0.16	< 0.16	< 0.19	< 0.18	< 0.18	< 0.16	< 0.17	< 0.21
PCB110	< 0.25	< 0.22	< 0.15	< 0.14	< 0.15	< 0.26	< 0.33	< 0.26	< 0.32	< 0.15	< 0.15	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.16	< 0.21
PCB114	< 0.24	< 0.22	< 0.14	< 0.14	< 0.14	< 0.25	< 0.32	< 0.25	< 0.31	< 0.15	< 0.15	< 0.15	< 0.19	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB118	< 0.32	< 0.29	< 0.19	< 0.18	< 0.19	< 0.33	< 0.42	< 0.34	< 0.41	< 0.19	< 0.2	< 0.2	< 0.25	< 0.23	< 0.23	< 0.21	< 0.21	< 0.27
PCB119	< 0.21	< 0.19	< 0.12	< 0.12	< 0.12	< 0.22	< 0.28	< 0.22	< 0.27	< 0.13	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.13	< 0.14	< 0.17
PCB123	< 0.21	< 0.19	< 0.12	< 0.12	< 0.12	< 0.22	< 0.28	< 0.22	< 0.27	< 0.13	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.14	< 0.14	< 0.18
PCB126	< 0.33	< 0.3	< 0.2	< 0.19	< 0.2	< 0.34	< 0.44	< 0.35	< 0.43	< 0.2	< 0.21	< 0.2	< 0.26	< 0.24	< 0.24	< 0.21	< 0.22	< 0.28
PCB128	< 0.24	< 0.22	< 0.15	< 0.14	< 0.14	< 0.26	< 0.33	< 0.26	< 0.32	< 0.15	< 0.15	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.16	< 0.21
PCB138/158	< 0.48	< 0.44	< 0.29	< 0.28	< 0.29	< 0.5	< 0.65	< 0.52	< 0.63	< 0.3	< 0.3	< 0.3	< 0.38	< 0.35	< 0.35	< 0.31	< 0.32	< 0.41
PCB149	< 0.21	< 0.19	< 0.13	< 0.12	< 0.13	< 0.22	< 0.28	< 0.23	< 0.28	< 0.13	< 0.13	< 0.13	< 0.17	< 0.15	< 0.16	< 0.14	< 0.14	< 0.18
PCB151	< 0.25	< 0.22	< 0.15	< 0.14	< 0.15	< 0.26	< 0.33	< 0.26	< 0.32	< 0.15	< 0.15	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.17	< 0.21
PCB153	< 0.25	< 0.23	< 0.15	< 0.14	< 0.15	< 0.26	< 0.33	< 0.27	< 0.32	< 0.15	< 0.15	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.17	< 0.21
PCB156	< 0.23	< 0.21	< 0.14	< 0.14	< 0.14	< 0.24	< 0.31	< 0.25	< 0.3	< 0.14	< 0.15	< 0.14	< 0.18	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB157	< 0.23	< 0.21	< 0.14	< 0.13	< 0.14	< 0.24	< 0.31	< 0.24	< 0.3	< 0.14	< 0.14	< 0.14	< 0.18	< 0.16	< 0.17	< 0.15	< 0.15	< 0.19
PCB167	< 0.24	< 0.22	< 0.14	< 0.14	< 0.14	< 0.25	< 0.32	< 0.25	< 0.31	< 0.15	< 0.15	< 0.15	< 0.19	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB168	< 0.21	< 0.19	< 0.12	< 0.12	< 0.12	< 0.21	< 0.27	< 0.22	< 0.27	< 0.13	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.13	< 0.14	< 0.17
PCB169	< 0.19	< 0.18	< 0.12	< 0.11	< 0.12	< 0.2	< 0.26	< 0.21	< 0.25	< 0.12	< 0.12	< 0.12	< 0.15	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16
PCB170	< 0.22	< 0.2	< 0.13	< 0.13	< 0.13	< 0.23	< 0.29	< 0.24	< 0.29	< 0.14	< 0.14	< 0.14	< 0.17	< 0.16	< 0.16	< 0.14	< 0.15	< 0.19
PCB177	< 0.29	< 0.27	< 0.18	< 0.17	< 0.17	< 0.31	< 0.39	< 0.31	< 0.38	< 0.18	< 0.18	< 0.18	< 0.23	< 0.21	< 0.21	< 0.19	< 0.2	< 0.25
PCB180	< 0.15	< 0.13	< 0.087	< 0.085	< 0.086	< 0.15	< 0.19	< 0.16	< 0.19	< 0.089	< 0.091	< 0.09	< 0.11	< 0.11	< 0.11	< 0.095	< 0.098	< 0.12
PCB183	< 0.27	< 0.24	< 0.16	< 0.15	< 0.16	< 0.28	< 0.36	< 0.28	< 0.35	< 0.16	< 0.17	< 0.16	< 0.21	< 0.19	< 0.19	< 0.17	< 0.18	< 0.22
PCB187	< 0.25	< 0.23	< 0.15	< 0.14	< 0.15	< 0.26	< 0.33	< 0.27	< 0.33	< 0.15	< 0.16	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.17	< 0.21
PCB189	< 0.2	< 0.19	< 0.12	< 0.12	< 0.12	< 0.21	< 0.27	< 0.22	< 0.27	< 0.12	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.13	< 0.14	< 0.17
PCB194	< 0.23	< 0.21	< 0.14	< 0.13	< 0.13	< 0.24	< 0.3	< 0.24	< 0.3	< 0.14	< 0.14	< 0.14	< 0.18	< 0.16	< 0.17	< 0.15	< 0.15	< 0.19
PCB201	< 0.14	< 0.12	< 0.081	< 0.079	< 0.08	< 0.14	< 0.18	< 0.15	< 0.18	< 0.083	< 0.085	< 0.084	< 0.11	< 0.098	< 0.099	< 0.088	< 0.091	< 0.11
PCB206	< 0.2	< 0.18	< 0.12	< 0.11	< 0.12	< 0.21	< 0.26	< 0.21	< 0.26	< 0.12	< 0.12	< 0.12	< 0.15	< 0.14	< 0.14	< 0.13	< 0.13	< 0.17
Total PCB Congeners (ND = 0) [1,8]	< 0.48	< 0.44	< 0.29	< 0.28	< 0.29	< 0.5	< 0.65	< 0.52	< 0.63	< 0.3	< 0.3	< 0.3	< 0.38	< 0.35	< 0.35	< 0.31	< 0.32	< 0.41
Total PCB Congeners (ND = 1/2 MDL) [2,8]	< 0.48	< 0.44	< 0.29	< 0.28	< 0.29	< 0.5	< 0.65	< 0.52	< 0.63	< 0.3	< 0.3	< 0.3	< 0.38	< 0.35	< 0.35	< 0.31	< 0.32	< 0.41

Notes:

Detected result exceeds ERL but is less than ERM.

Detected result exceeds the minimum Zeeman 2004 level.

Detected result exceeds ERL and the minimum Zeeman 2004 level.

Detected result exceeds Residential CHHSL but is less than Commercial/Industrial CHHSL.

Detected result exceeds Commercial/Industrial CHHSL and Residential CHHSL.

Underline = Detected result exceeds Residential RSL but is less than Industrial RSL.

Underline = Detected result exceeds Industrial RSL and Residential RSL.

Bold = Detected result

J = Estimated value

µg/kg = micrograms per kilogram

CHHSL = California Human Health Screening Level (CalEPA 2005 and 2009)

ERL = effects range low (Long et al. 1995)

ERM = effects range median (Long et al. 1995)

MDL = method detection limit

mg/kg = milligrams per kilogram

mm = millimeters

ND = non-detect

RSL = Regional Screening Level (USEPA 2010). The lesser (more protective) of the cancerous and noncancerous screening levels were used.

PAHs = polycyclic aromatic hydrocarbons

PCBs = polycyclic biphenyls

Non-detects were reported as < MDL.

1 For comparison to ERL, ERM, CHHSLs, and RSLs, zeros were used for non-detect samples for summing. If all samples were non-detect, the total is reported as < the highest MDL of all samples.

2 For comparison to Zeeman 2004 screening levels, 1/2 MDLs were used for non-detect samples for summing. If all samples were non-detect, the total is reported as < the highest MDL of all samples.

3 Total Chlordanes calculated as the sum of alpha Chlordane, gamma Chlordane, cis-Nonachlor, Oxychlordane, and trans-Nonachlor.

4 Total DDTs calculated as the sum of 2,4'-DDD, 2,4'-DDE, 2,4'-DDT, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT.

5 Total HMW PAHs calculated as the sum of Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (e) pyrene, Benzo (g,h,i) perylene, Benzo (k) fluoranthene, Chrysene, Dibenz (a,h) anthracene, Fluoranthene, Indeno (1,2,3-c,d) pyrene, Perylene, and Pyrene.

6 Total LMW PAHs calculated as the sum of 1-Methylnaphthalene, 1-Methylphenanthrene, 1,6,7-Trimethylnaphthalene, 2,6-Dimethylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Biphenyl, Fluorene, Naphthalene, and Phenanthrene.

7 Total PAHs calculated as the sum of HMW and LMW PAHs.

8 Total PCB Congeners calculated as the sum of all PCB congeners.

3.2.2 Metals

All metals were detected in salt pond sediments. Chromium, selenium, silver, and zinc concentrations were less than screening levels in all samples. Arsenic, cadmium, copper, lead, mercury, and nickel were measured at concentrations greater than screening levels in at least one sample (Table 5). A summary of results is provided below.

- Arsenic concentrations were greater than both Residential and Commercial/Industrial CHHSLs and RSLs at all stations. Stations 13-03 and 13-04 also exceeded the ERL value and Zeeman risk-based screening level for benthic invertebrates (Figure 5). However, all concentrations of arsenic were less than the southern California regional background level of 12 milligrams per kilogram (mg/kg; Chernoff et al. 2008).
- Cadmium concentrations were relatively low, with the exception of Station 15-01. This station exceeded the Zeeman screening levels for fish and tern (Figure 6).
- Copper concentrations were greater than Zeeman screening levels at 12 stations (Figure 7), which included one station in each of Ponds 12 and 14 and approximately 60 percent of stations in Ponds 13 and 15. All stations exceeded the Zeeman screening level for benthic invertebrates, five stations exceeded the screening level for benthic vegetation, and two stations (15-01 and 15-10) exceeded the screening level for wigeon, scooter, and tern. Stations 15-01 and 15-10 also exceeded the ERL value.
- Lead concentrations were greater than Zeeman screening levels at all stations (Figure 8). All stations exceeded the screening level for wigeon, scooter, tern, grebe, and skimmer. Nineteen stations exceeded the screening level for pelican. Stations 15-01 and 15-10 exceeded the screening level for turtle.
- Mercury concentrations were greater than Zeeman screening levels at six stations (Figure 9), which included four stations within Pond 12 and two stations within Pond 15. All stations exceeded the screening level for tern. Station 15-10 exceeded the screening level for skimmer.
- Nickel concentrations were relatively low, with the exception of Stations 15-01 and 15-10. Both stations exceeded the ERL value and Zeeman screening level for benthic invertebrates (Figure 10). Station 15-01 also exceeded Zeeman screening levels for sea lion and tern.

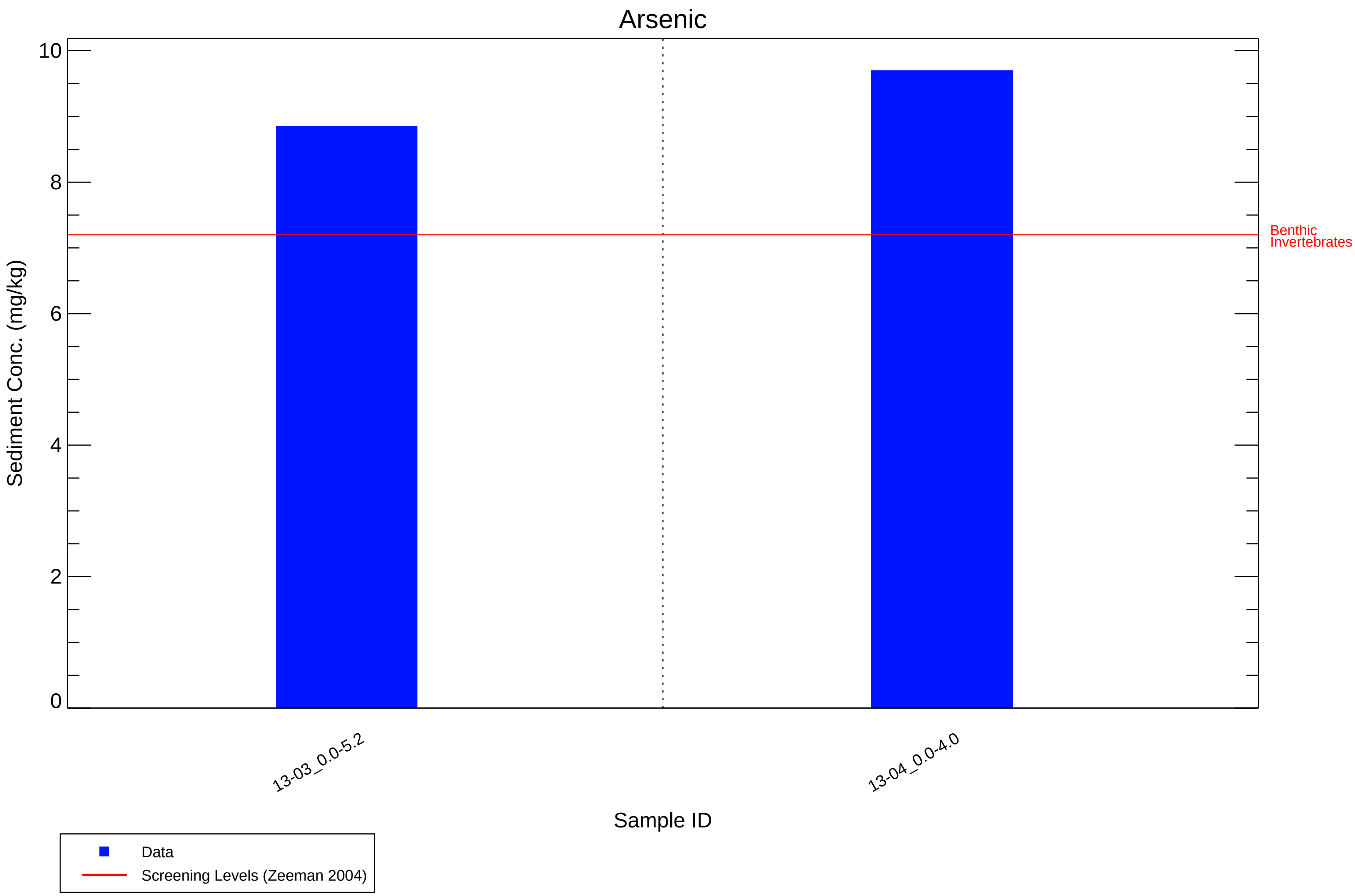

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Figure 5

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Arsenic
South San Diego Bay Salt Ponds 12, 13, 14, and 15

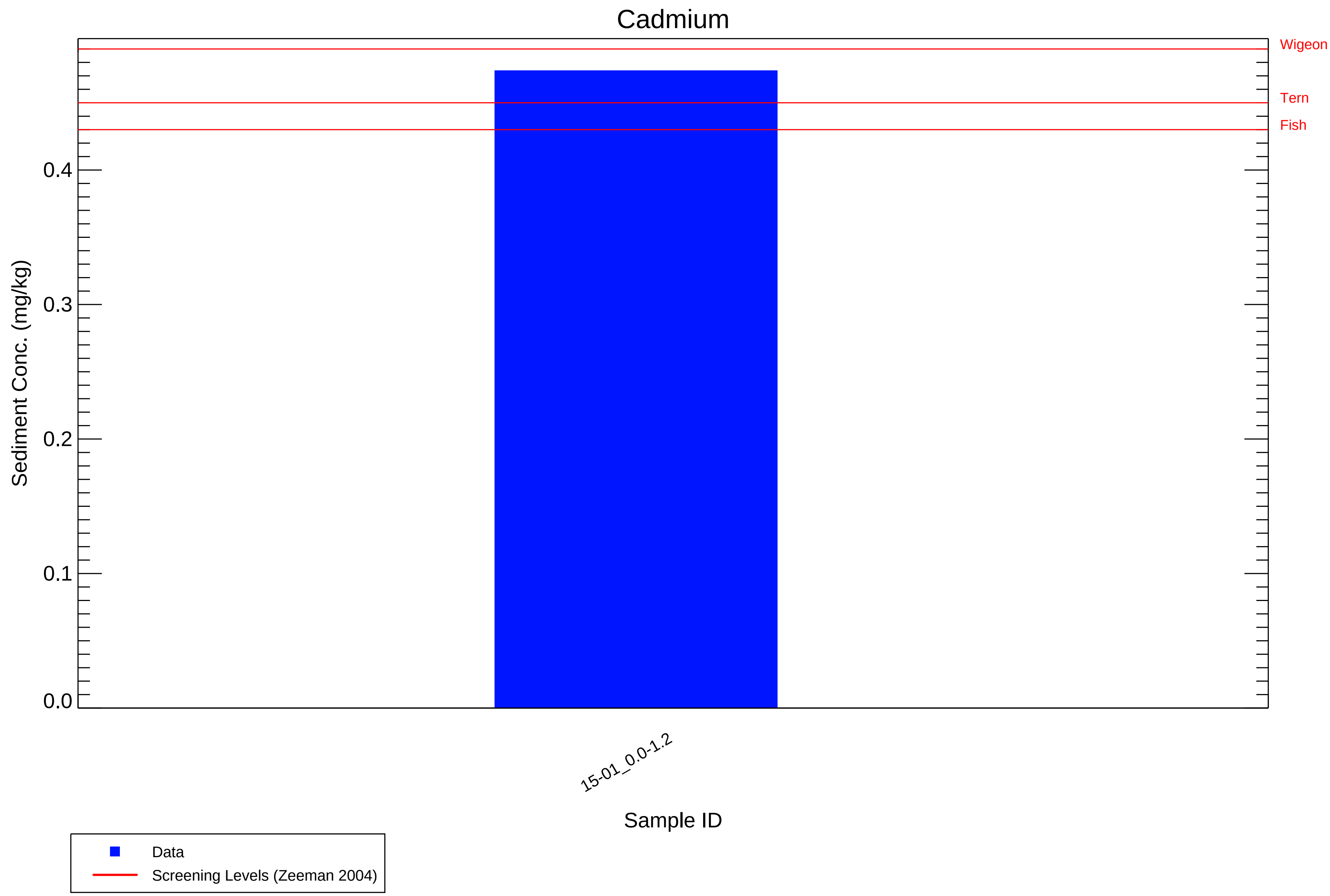

Figure 6

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Cadmium
South San Diego Bay Salt Ponds 12, 13, 14, and 15

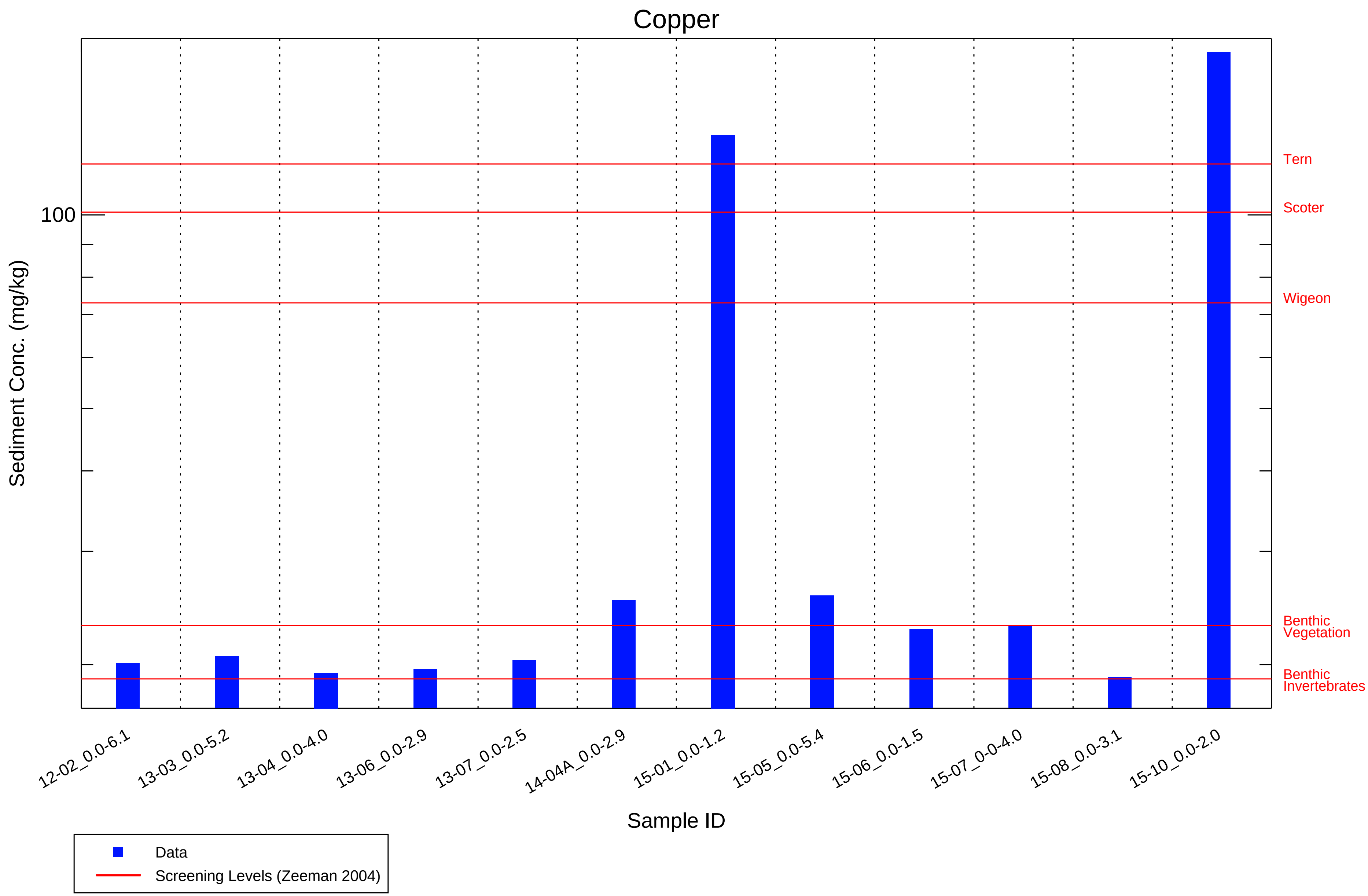

Figure 7

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Copper
South San Diego Bay Salt Ponds 12, 13, 14, and 15

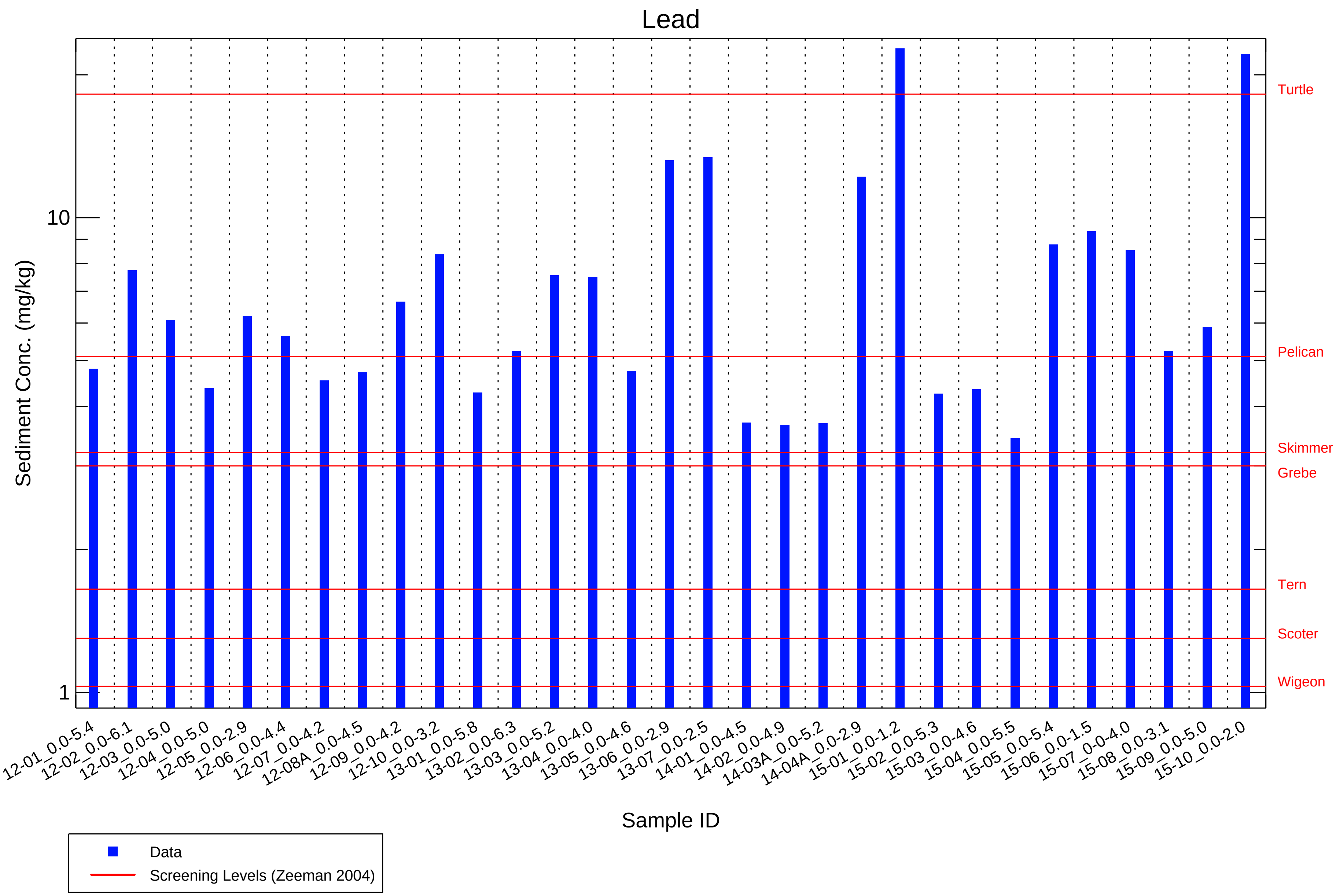

Figure 8

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Lead
South San Diego Bay Salt Ponds 12, 13, 14, and 15

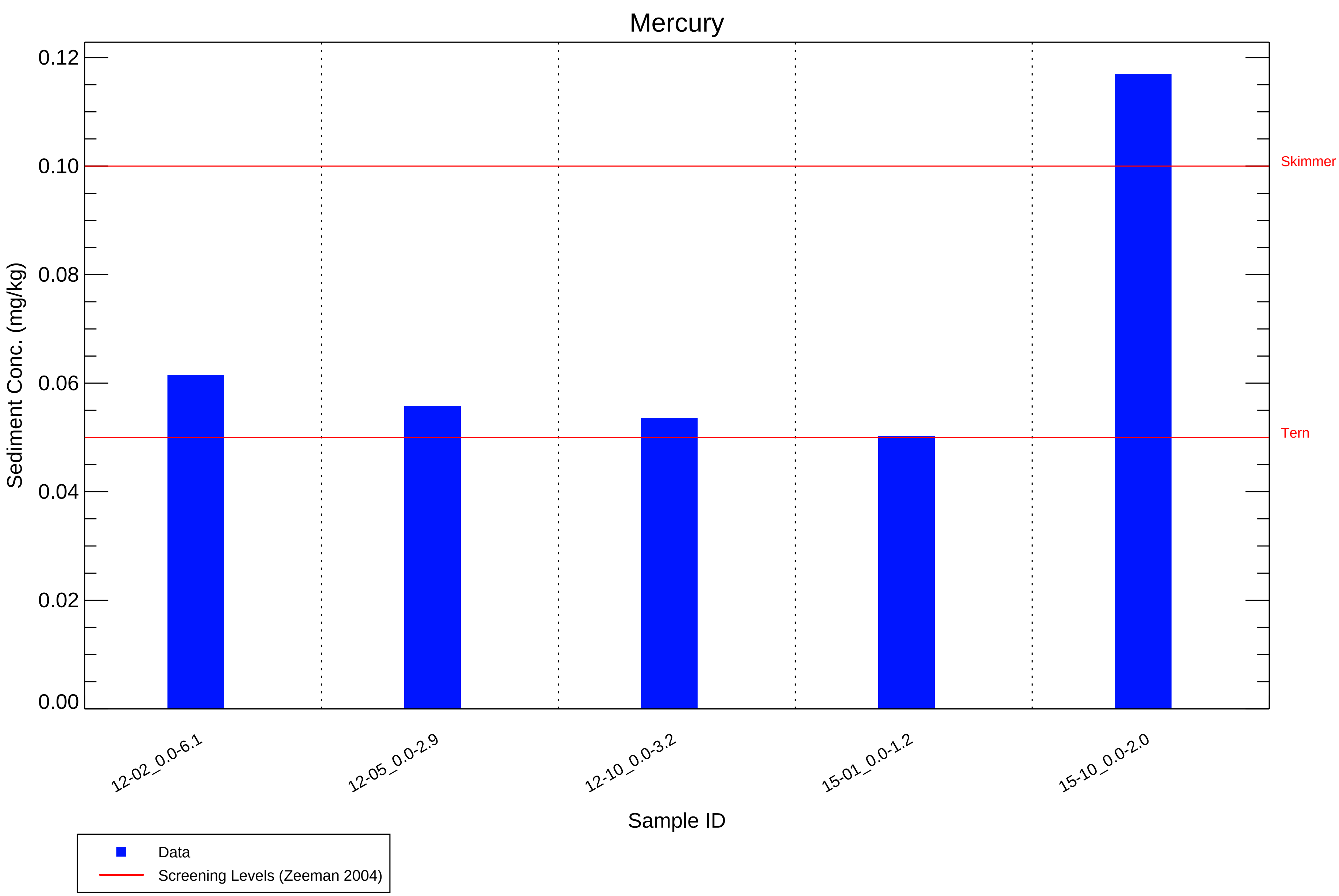

Figure 9

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Mercury
South San Diego Bay Salt Ponds 12, 13, 14, and 15

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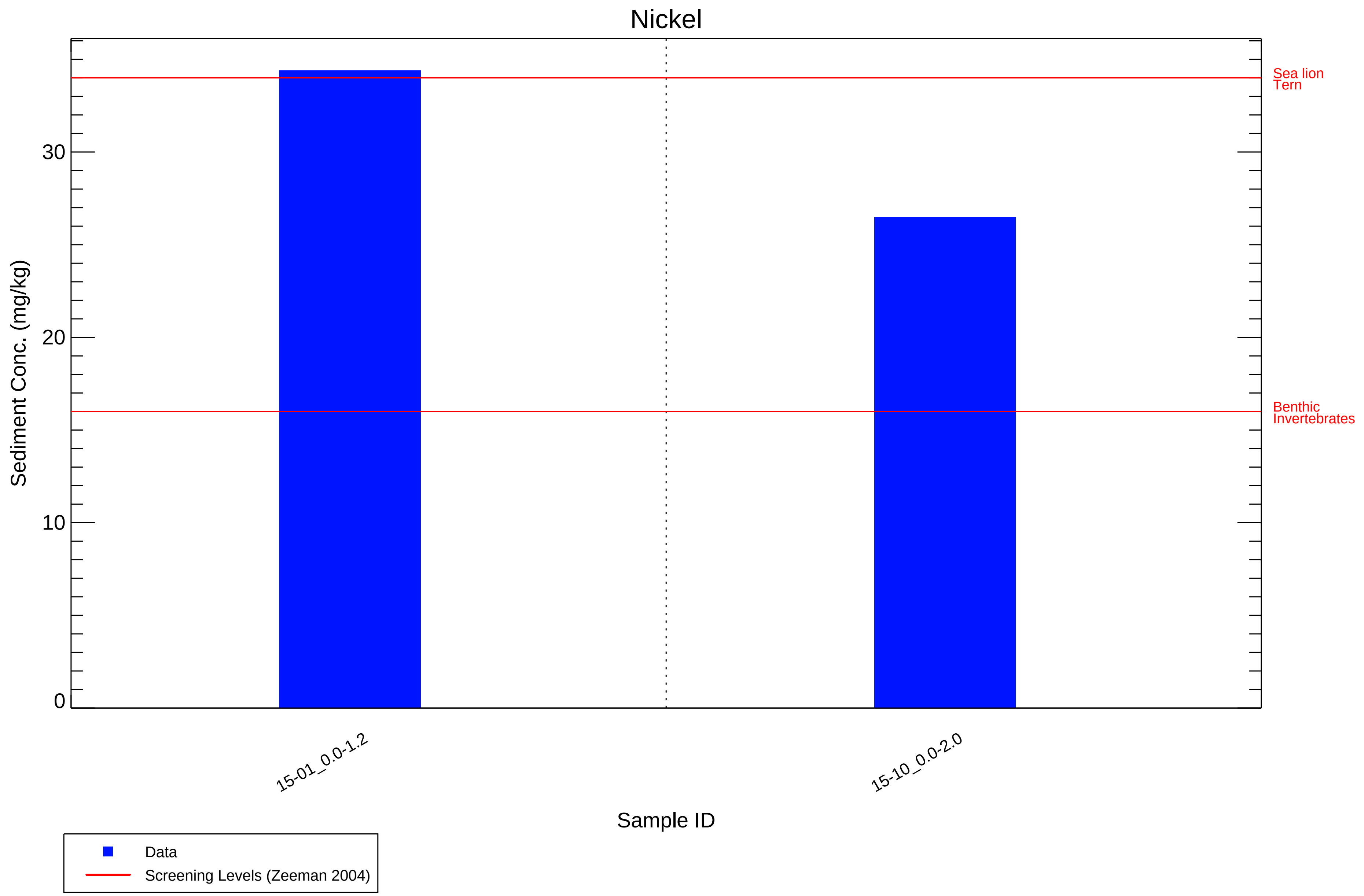

Figure 10

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Nickel
South San Diego Bay Salt Ponds 12, 13, 14, and 15

3.2.3 Organics

PAHs and pesticides were detected in salt pond sediments. PAHs were measured at low concentrations in approximately half of the samples from Ponds 12 and 13 and all of the samples from Ponds 14 and 15. Station 15-01 exceeded the ERL value for total low molecular weight PAHs, while Station 12-09 exceeded the Residential RSL for benzo(a)pyrene.

DDTs and dieldrin were the only pesticides detected in salt pond sediments. DDTs were measured at four stations (13-07, 14-04A, 15-01, and 15-10). Station 15-01 exceeded the ERL values for 4,4'-DDE and total DDTs. Dieldrin was measured at four stations (12-10, 13-02, 13-07, and 14-04A). All concentrations were greater than the ERL value.

PCB congeners were not detected in salt pond sediment.

3.2.4 Quality Assurance/Quality Control

A review of analytical results for sediment was conducted to evaluate the laboratory's performance in meeting QA/QC guidelines outlined in the SAP (Anchor QEA 2013). The data validation report prepared by Anchor QEA is presented in Appendix C. All samples were analyzed within the appropriate holding times. Generally, QA/QC sample results were within the project-specified and/or laboratory control limits, with the following exceptions:

- Mercury was detected in the method blank at a concentration between the MDL and RL; however, this compound was not detected in the associated samples. Data are not expected to be affected.
- The surrogate 2-fluorobiphenyl recovered at a concentration greater than control limits in samples SSDBSP-15-08_0.0-3.1, SSDBSP-12-07_0.0-4.2, and SSDBSP-12-03_0.0-5.0. All PCB results were non-detect in these samples; therefore, data are not expected to be affected.
- The surrogate 2,4,5,6-tetrachloro-m-xylene recovered at a concentration greater than control limits for SSDBSP-15-01_0.0-1.2, SSDBSP-15-201_0.0-1.2, and SSDBSP-15-101_0.0-1.2. Pesticide results in these samples may be biased high.
- Acenaphthene, acenaphthylene, fluorene, and phenanthrene recovered at concentrations less than control limits in the MS/MSD in SSDBSP-12-04_0.0-5.0. Associated sample results may be biased low.

Field QA/QC samples included duplicates, splits, and rinsate blanks. Field duplicate results were similar to the original samples, with two exceptions. At Station 15-01, lead was approximately six times greater than the original sample, and copper was approximately five times less than the original sample. These results indicate some natural variability at the site. Split sample relative percent difference (RPD) values were within 50 percent, with only minor exceptions. RPD values for selenium, fluoranthene, pyrene, and 1,6,7-trimethylnaphthalene were greater than 50 percent in at least one split sample. All concentrations were within five times the RL, and the difference between the split sample and original sample was less than two times the RL; therefore, data are not expected to be affected. Variability is expected to be higher at concentrations near the RL. Within field rinsate blanks, all concentrations were less than the RL.

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LIST OF APPENDICES

APPENDIX F2

Soil Characterization Program Sampling and Analysis Report

FINAL

SAMPLING AND ANALYSIS REPORT
OTAY RIVER ESTUARY RESTORATION
SOIL CHARACTERIZATION PROGRAM

Prepared for

Poseidon Water, LLC

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Prepared by

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March 2013

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LIST OF ACRONYMS AND ABBREVIATIONS

%R	percent recovery
µg	microgram
bgs	below ground surface
Calscience	Calscience Environmental Laboratories, Inc.
kg	kilogram
MLLW	mean low lower water
MOU	Memorandum of Understanding
MS	matrix spike
MSD	matrix spike duplicate
NAVD88	North American Vertical Datum of 1988
ORERP	Otay River Estuary Restoration Project
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QA	quality assurance
QC	quality control
Red Tail	Red Tail Monitoring and Research, Inc.
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SAR	Sampling and Analysis Report
SVOC	semi-volatile organic compound
TOC	total organic carbon
TPH	total petroleum hydrocarbon
USFWS	U.S. Fish and Wildlife Service

1 INTRODUCTION

This Sampling and Analysis Report (SAR) provides an overview of data collection and sampling analysis activities that occurred during the May 2012 field effort in support of the Otay River Estuary restoration soil characterization program. Activities were completed in accordance with the equipment, procedures, and methods documented in the Sampling and Analysis Plan (SAP; Anchor QEA 2012).

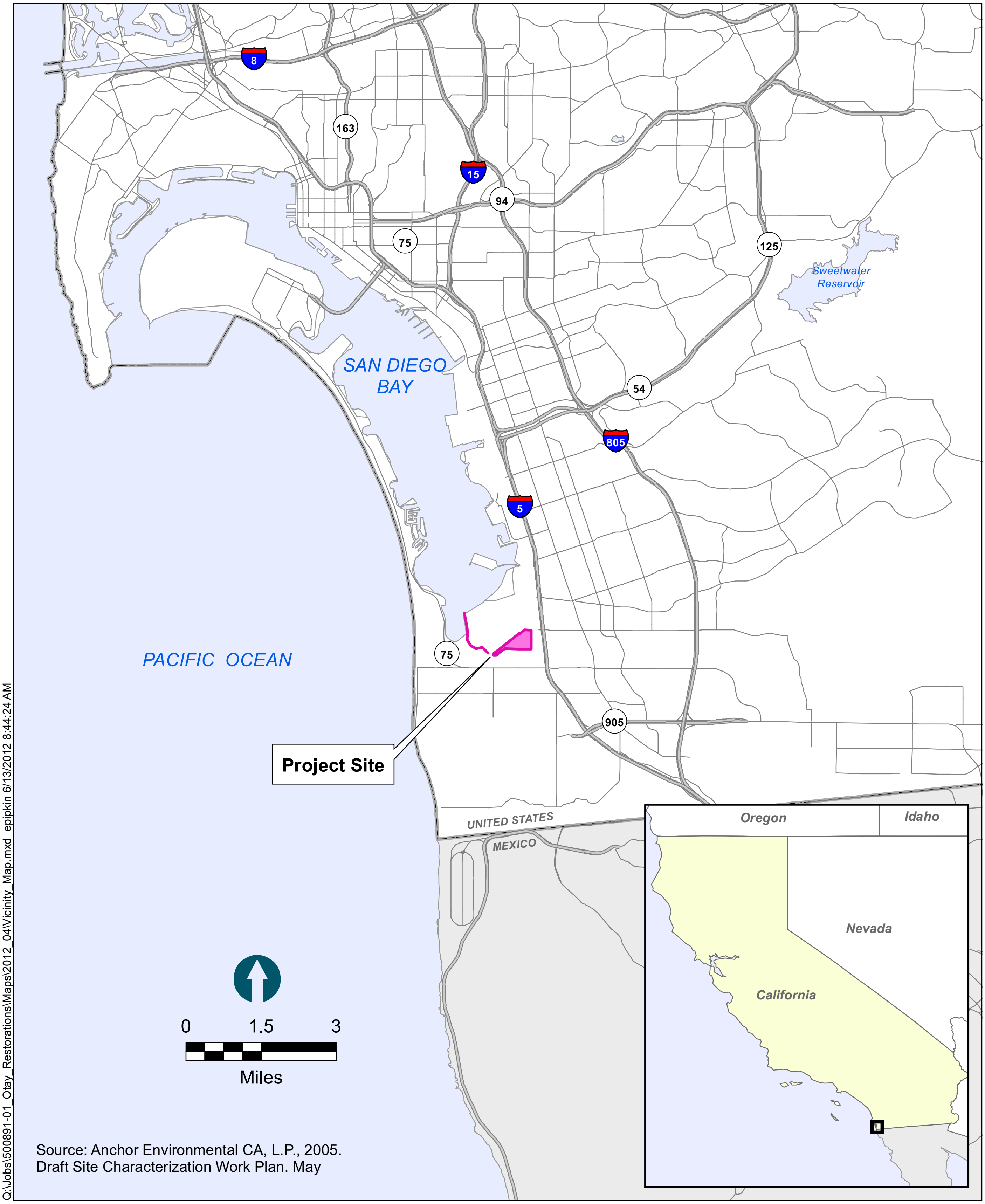
1.1 Study Objective

Poseidon Water, LLC is developing plans in coordination with the U.S. Fish and Wildlife Service (USFWS) to restore approximately 67 acres of disturbed wetlands and upland habitat within the Otay River Floodplain to functional estuarine and salt marsh habitats. The larger Otay River Estuary Restoration Project (ORERP) will involve the excavation of approximately 750,000 to 1 million cubic yards of material from this area to create an intertidal estuarine and salt marsh habitat system. The purpose of the May 2012 soil characterization program was to evaluate the magnitude, extent, and variability of physical and chemical soil and sediment properties throughout the area proposed for restoration.

1.2 Site Description

The Otay River Floodplain is located at the western terminus of the Otay River. The project site is included within the management boundaries of the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge. The property is located along Saturn Boulevard (19th Street) and is bounded by Interstate 5 to the east, Main Street and the Otay River to the north, and residential structures and the Imperial Sands Mobile Park (1810 Palm Avenue) to the south. San Diego Bay is northwest of the site (Figure 1).

The project site originally consisted of wetlands that were diked and drained decades ago. Fill material was imported to the site, and the area was converted to upland. The site is currently vacant and relatively flat.



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ANCHOR QEA

Figure 1
Vicinity Map
Otay River Estuary Restoration Soil Characterization Program

The project site is depicted on Figure 2 and includes the following areas[1]:

- The northern portion of former evaporative Salt Pond 20A (Subarea 1)
- Former agricultural land (Subareas 2 and 5)
- A former agricultural equipment storage and supply area (Subarea 3)
- Former wastewater treatment ponds (Subareas 6A and 6B)
- Nestor Creek, which runs north-to-south approximately midway through the project site
- The final reaches of the Otay River, which run between raised levees immediately north of the project site then westward and northward into San Diego Bay

1.3 Project Team and Responsibilities

The soil characterization program was performed and managed by Anchor QEA, L.P., who worked with a team of subcontractors. Vironex provided drilling services for upland borings taken from the Otay River Floodplain Area and Subarea 3. Biologists from Dudek provided biological resource monitoring throughout the sampling program. During upland excavations (Otay River Floodplain and Subarea 3) and Nestor Creek sampling; ASM Affiliates provided archeological monitoring services; and Red Tail Monitoring and Research, Inc. (Red Tail), provided Native American monitoring services. All analytical testing was performed by Calscience Environmental Laboratories, Inc. (Calscience).

1 Subareas for the Otay River Floodplain Area are referenced in parentheses and provided on Figure 2 for reference; these subareas were originally developed based on historic uses of the site and a 2005 restoration conceptual plan.

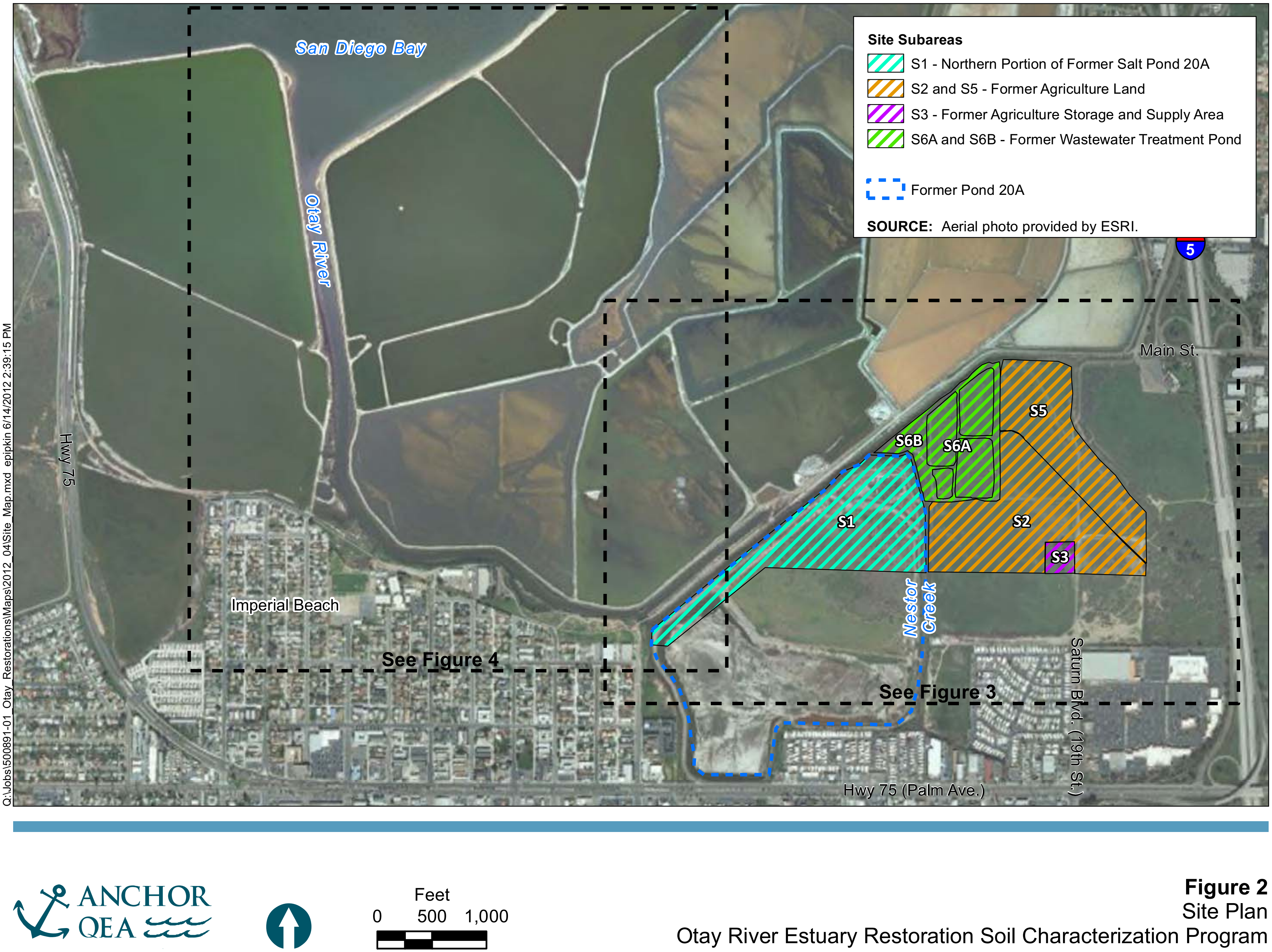


Figure 2
Site Plan
Otay River Estuary Restoration Soil Characterization Program

2 SAMPLING METHODS

2.1 Sediment Collection and Sample Processing

Sampling locations were pre-selected based on the current conceptual plan for ORERP (Figure 3). The sampling program was subdivided into four areas: the Otay River Floodplain Area (the majority of the ORERP site), Subarea 3 (the former agricultural equipment storage and supply area [subjected to a higher density of sampling]), Nestor Creek, and the Otay River. Sampling areas are presented on Figures 3 and 4.

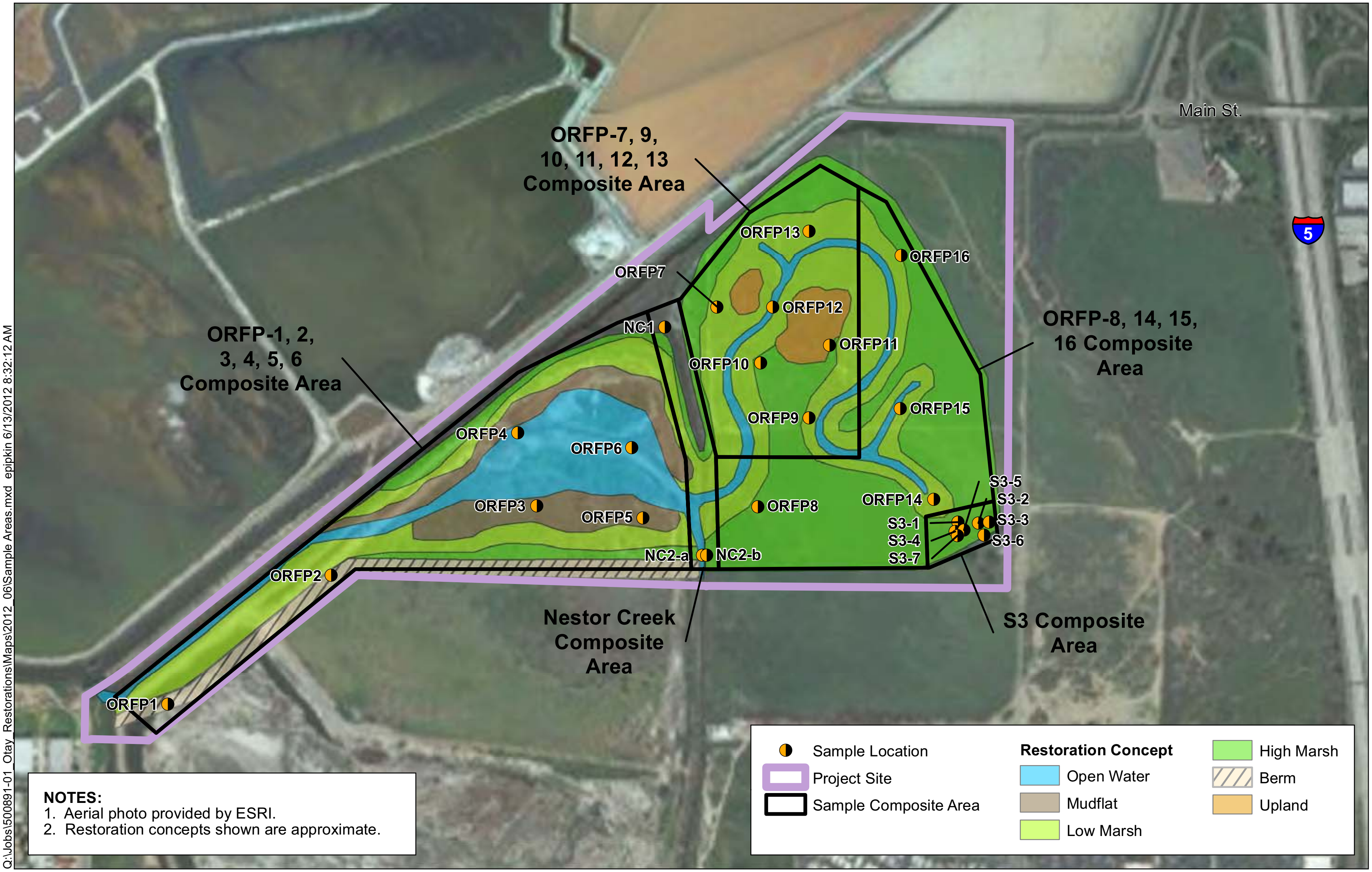
All sampling points were located and advanced in compliance with the SAP (Anchor QEA 2012), with a few exceptions and deviations needed to avoid biological and Native American resources (see Section 2.3). To proceed with the soil characterization effort in May 2012, site access and regulatory approvals were obtained from the USFWS, the Port of San Diego, and the County of San Diego. Table 1 provides a summary of the four sampling areas and associated number of cores, the approximate surface elevations, sample depths, and elevations achieved. Vertical datum is presented in North American Vertical Datum of 1988 (NAVD88).

Table 1
Sampling Location Coordinates, Elevations, and Depths Achieved

Sample ID	Longitude	Latitude	Ground Surface Elevation (feet NAVD88)	Depth Achieved (feet bgs)	Elevation Achieved (feet NAVD88)
Otay River Floodplain Area					
ORFP-1	-117.10448	32.58796	+8	16	-8
ORFP-2	-117.10220	32.58949	+12	20	-8
ORFP-3	-117.09933	32.59031	+12	20	-8
ORFP-4	-117.09960	32.59117	+10	18	-8
ORFP-5	-117.09785	32.59017	+12	20	-8
ORFP-6	-117.09801	32.59100	+12	20	-8
ORFP-7	-117.09682	32.59266	+9	17	-8
ORFP-8	-117.09625	32.59032	+11	19	-8
ORFP-9	-117.09553	32.59135	+11	19	-8
ORFP-10	-117.09621	32.59200	+11	19	-8

Sample ID	Longitude	Latitude	Ground Surface Elevation (feet NAVD88)	Depth Achieved (feet bgs)	Elevation Achieved (feet NAVD88)
ORFP-11	-117.09525	32.59221	+12	20	-8
ORFP-12	-117.09604	32.59266	+8	16	-8
ORFP-13	-117.09682	32.59266	+11	19	-8
ORFP-14	-117.09379	32.59039	+14	22	-8
ORFP-15	-117.09426	32.59146	+14	22	-8
ORFP-16	-117.09425	32.59327	+12	20	-8
Subarea 3					
S3-1	-117.09345	32.59012	+16	22	-6
S3-2	-117.09317	32.59011	+16	22	-6
S3-3	-117.09302	32.59012	+16	22	-6
S3-4	-117.09349	32.59001	+16	22	-6
S3-5	-117.09337	32.59003	+16	22	-6
S3-6	-117.09309	32.58997	+16	22	-6
S3-7	-117.09346	32.58996	+16	22	-6
Nestor Creek					
NC-1	-117.09755	32.59242	+5	13	-8
NC-2A	-117.09702	32.58973	+4	7	-3
NC-2B	-117.09696	32.58973	+10	18	-8
Otay River					
OR-1	-117.11551	32.59948	-2	6	-8
OR-2	-117.11520	32.59766	-1	4.2	-5.2
OR-3	-117.11462	32.59586	0	5.8	-5.8
OR-4	-117.11444	32.59394	0	5.2	-5.2
OR-5	-117.11452	32.59189	0	5.2	-5.2
OR-6	-117.11353	32.5908	0	5.5	-5.5
OR-7	-117.11173	32.58970	0	4	-4
OR-8	-117.10950	32.58956	0	4.4	-4.4
OR-9	-117.10758	32.58842	+1	2	-1

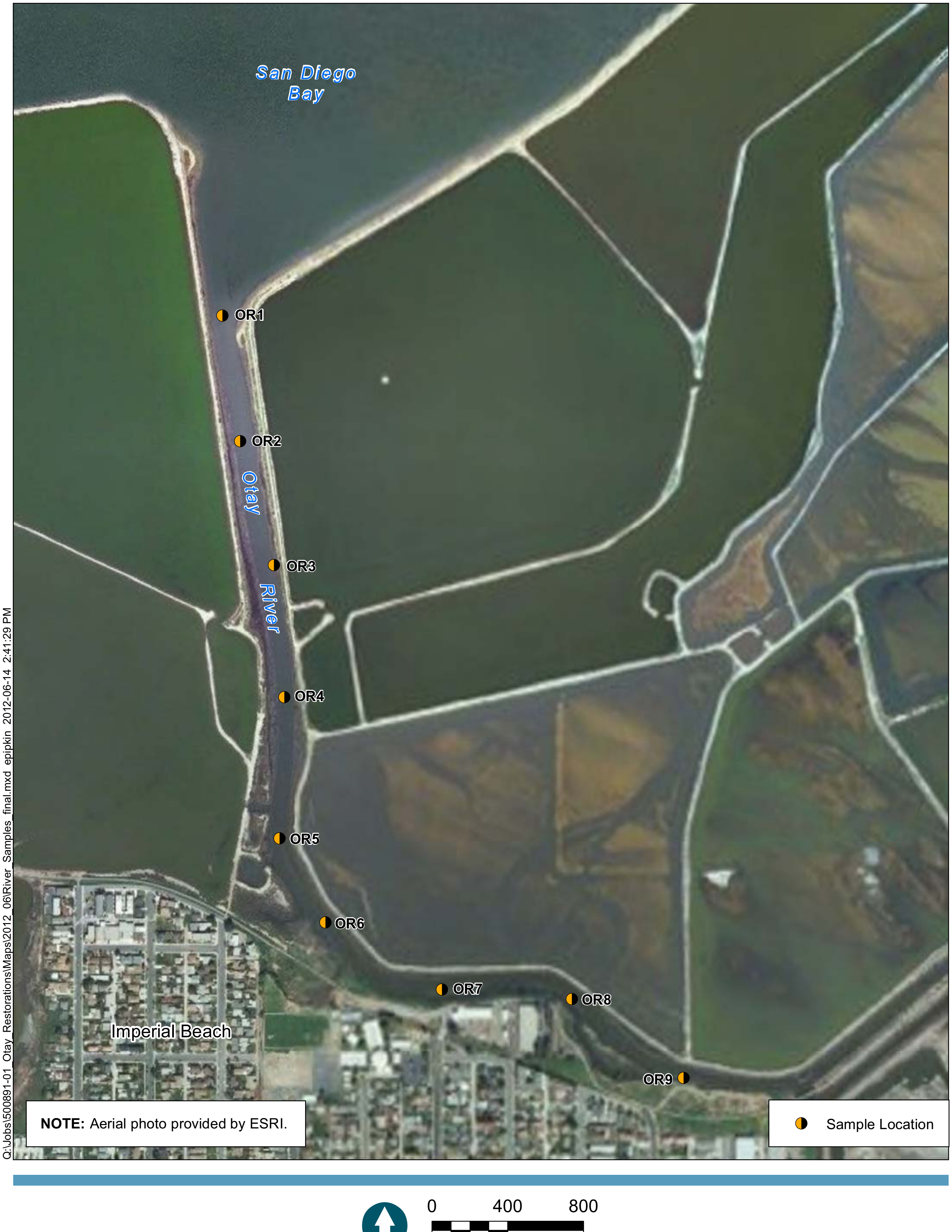
Note:
bgs = below ground surface



ANCHOR QEA

Feet
0 300 600

Figure 3
Otay River Floodplain Sample Locations and Composite Areas
Otay River Estuary Restoration Soil Characterization Program



ANCHOR QEA

Figure 4
Otay River Sample Locations
Otay River Estuary Restoration Soil Characterization Program

2.2 Summary of Sediment Collection Activities

2.2.1 Sample Collection Procedures

Soil and sediment sampling was conducted between May 1 and 11, 2012. The weather was warm and sunny through the duration of the field program.

Upland soil borings in the Otay River Floodplain and Subarea 3 were collected using a truck-mounted, direct-push Geoprobe rig (operated by Vironex). The rig advanced 2.3-inch-diameter core tubes using a Macro Core Sampler and Direct Push Technology to obtain soil cores to the full desired depth. To ensure each vertical profile was sampled, the Geoprobe rig was advanced and samples were extracted every 2 to 3 feet.

Sampling locations within Nestor Creek were accessed by foot only, and sediment samples were collected by hand auger. While attempting to collect the bottom soil/sediment intervals from NC-2, refusal was encountered at a depth of 7 feet or an approximate elevation of -3 feet NAVD88. The NC-2 sampling location was completed by advancing the direct-push Geoprobe rig adjacent to the creek to the desired elevation.

Sampling locations within the Otay River were accessed by foot and two small, inflatable Zodiac boats. Sediment cores were collected with hand-pushed fixed-piston cores. Refusal conditions were encountered at OR-7, OR-8, and OR-9 prior to reaching target sample depths.

Each soil core was characterized and documented on a boring log. Core samples were evaluated for evidence of stratigraphic subsurface differences, which was logged and physically described as separate vertical subsurface layers. Each soil sample was photographed, homogenized, and placed in appropriately labeled jars and bags for analysis. Field core logs, core photographs, and other associated documentation for the sampling effort are provided as Appendix A.

2.2.2 Biological, Archeological, and Native American Monitoring

Biologists from Dudek conducted pre-construction nesting bird surveys and biological monitoring during the sampling effort. Additional pre-construction surveys for nesting birds were conducted by a qualified biologist in the early morning, immediately prior to geotechnical activities at each location scheduled for work during that day. Following completion of the daily, early morning nest surveys, geotechnical activities were monitored by a qualified biologist to ensure that any potential impacts to biological resources were avoided and minimized to the maximum extent feasible. Equipment was re-routed and testing activities were altered to avoid impacting vegetation, sensitive plants, and breeding birds.

Prior to initiating sampling activities at the site, archeologists from ASM Affiliates performed a review of site records on file at the South Coastal Information Center (at San Diego State University) to identify any known archeological sites in the project area. Once construction began, a qualified archaeologist was present on site to observe exploration activities within the Otay River Floodplain, Subarea 3, and Nestor Creek. Previous consultations with the USFWS determined that archeological monitoring would not be required for Otay River sampling. No cultural materials were identified in the spoils from any boring.

The Viejas Band of Kumeyaay Indians, a federally recognized Indian Tribe, has a Memorandum of Understanding (MOU) with the County and City of San Diego that a Native American monitor be present during all ground disturbing activities on lands within the County and City of San Diego's jurisdiction. A Native American monitor from Red Tail was on site during all ground disturbance activities.

2.2.3 Sample Processing

When penetration at a station was complete, the core length was recovered from the borehole and transported to the staging area. The core was then placed in a horizontal position and subdivided into 2-foot sample intervals and labeled. Photographs were taken of each core length and are included in Appendix A. Soil from each 2-foot interval was then homogenized in a mixing bowl with a sample collected for archive.

The remaining material was retained for additional compositing with the other subsamples from other areas within the specified composite depth interval. A sufficient volume of composited material was placed in one or more appropriately sized sample jars, as needed for physical and chemical analyses planned for that composite sample. The sediment sample processing and testing strategy is presented in Table 2.

Table 2
Sediment Sample Processing and Testing Strategy

Sample Area	Composite Sample ID (each corresponds to defined depth interval)	Boring IDs used to Create Composites	Sample from Each 2-Foot Interval Archived	Composite Sample Analyzed for Grain Size, TOC, Pesticides, Metals, and TPHs	Composite Sample Analyzed for PCBs and SVOCs
Otay River Floodplain	A B C D	ORFP-1 ORFP-2 ORFP-3 ORFP-4 ORFP-5 ORFP-6	Yes	Yes	Yes
	A B C D	ORFP-7 ORFP-9 ORFP-10 ORFP-11 ORFP-12 ORFP-13	Yes	Yes	Yes
	A B C D	ORFP-08 ORFP-14 ORFP-15 ORFP-16	Yes	Yes	No
Subarea 3	A B C D	S3-1 S3-2 S3-3 S3-4 S3-5 S3-6 S3-7	Yes	Yes	Yes
Nestor Creek	A B	NC-1 NC-2	Yes	Yes	No

Sample Area	Composite Sample ID (each corresponds to defined depth interval)	Boring IDs used to Create Composites	Sample from Each 2-Foot Interval Archived	Composite Sample Analyzed for Grain Size, TOC, Pesticides, Metals, and TPHs	Composite Sample Analyzed for PCBs and SVOCs
Otay River	A B C	OR-1 OR-2 OR-3	Yes	Yes	No
	A B C	OR-4 OR-5 OR-6	Yes	Yes	No
	A B C	OR-7 OR-8 OR-9	Yes	Yes	No

Notes:
PCBs = polychlorinated biphenyls
SVOCs = semi-volatile organic carbons
TOC = total organic carbon
TPHs = total petroleum hydrocarbons

Each core section was logged through the full penetration depth. All logs are provided in Appendix A. A soil description of each core sample was recorded on the core log for the following parameters as appropriate and present:

- Sample recovery (depth in feet of penetration and sample compaction)
- Physical soil description (soil type, density/consistency of soil, and color)
- Odor (e.g., hydrogen sulfide and petroleum)
- Presence of vegetation or organic content
- Debris
- Any other distinguishing characteristics or features

2.2.4 Sample Compositing

The sample compositing scheme differed slightly for the various exploration subareas. Soil for each representative composite was homogenized until it appeared uniform in color and texture. Each composite sample consisted of an appropriate representative proportion of material from each individual sample. Sediment samples were placed into labeled, pre-cleaned sample jars and stored on ice until delivered to laboratory personnel. Soil samples were delivered to the laboratory within 24 hours of sampling. Signed and dated chain-of-custody forms are provided with the laboratory reports in Appendix B.

2.2.4.1 Otay River Floodplain

Composite samples were prepared for four vertical layers from samples collected in three subareas of the site:

1. Sampling locations ORFP-1,2,3,4,5,6
2. Sampling locations ORFP-7,9,10,11,12,13
3. Sampling locations ORFP-8,14,15,16

Physical and chemical testing for the first two listed composite samples included grain size, total organic carbon (TOC), metals, pesticides, total petroleum hydrocarbons (TPHs), polychlorinated biphenyls (PCBs), and semi-volatile organic carbons (SVOCs). The third listed composite was analyzed for grain size, TOC, heavy metals, pesticides, and TPHs. Table 3 summarizes the composite samples created from different elevation intervals within the three subareas of the site.

Table 3
Otay River Floodplain Area Sampling and Compositing Scheme

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
ORFP-1,2,3,4,5,6	A	Surface to 1 foot bgs
	B	1 foot bgs to 0 feet NAVD88
	C	0 to -6 feet NAVD88
	D	-6 to -8 feet NAVD88
ORFP-7,9,10,11,12,13	A	Surface to 1 foot bgs
	B	1 foot bgs to 0 feet NAVD88
	C	0 to -6 feet NAVD88
	D	-6 to -8 feet NAVD88

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
ORFP-8,14,15,16	A	Surface to 1 foot bgs
	B	1 foot bgs to 0 feet NAVD88
	C	0 to -6 feet NAVD88
	D	-6 to -8 feet NAVD88
Total number of composite samples		**12**

Note:
bgs = below ground surface

Although the SAP (Anchor QEA 2012) called for a separate compositing of ORFP-3 and ORFP-11 for the purposes of testing for PCBs and SVOCs, a field decision was made to analyze for these constituents within the larger composite group based on some heterogeneity of soils encountered on site. This modification from the SAP provided better representation of PCB and SVOC concentrations within these portions of the site.

2.2.4.2 Subarea 3

Samples were collected throughout Subarea 3 and composited by elevation interval as presented in Table 4. Physical and chemical testing for each of the four composite samples included grain size, TOC, heavy metals, pesticides, TPHs, PCBs, and SVOCs. Table 4 summarizes the composite samples created from different elevation intervals within Subarea 3.

Table 4
Subarea 3 Compositing Scheme

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
S3-1 S3-2 S3-3 S3-4 S3-5 S3-6 S3-7	A	Surface to 1 foot bgs
	B	1 foot bgs to +6 feet NAVD88
	C	+6 to -4 feet NAVD88
	D	-4 to -6 feet NAVD88
Total number of composite samples		**4**

Note:
bgs = below ground surface

2.2.4.3 Nestor Creek

Samples were collected from the Nestor Creek locations and composited by elevation interval as presented in Table 5. Physical and chemical testing for each of the three composite samples included grain size, TOC, heavy metals, pesticides, and TPHs. Table 5 summarizes the composite samples created from different elevation intervals within Nestor Creek.

Table 5
Nestor Creek Compositing Scheme

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
NC-1 NC-2	A	Surface to 1 foot bgs
	B	1 foot below mudline to -6 feet NAVD88
	C	-6 to -8 feet NAVD88
Total number of composite samples		**3**

Note:
bgs = below ground surface

2.2.4.4 Otay River

Samples were composited in three groups based relative location within the river (as presented in Table 6). Physical and chemical testing for each of the six composite samples included grain size, TOC, heavy metals, pesticides, and TPHs. Table 6 summarizes the composite samples created from the Otay River cores.

Table 6
Otay River Compositing Scheme

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
OR-1 OR-2 OR-3	A	Mudline to -4 feet MLLW
	B	-4 to -6 feet MLLW
OR-4 OR-5 OR-6	A	Mudline to -4 feet MLLW
	B	-4 to -6 feet MLLW
OR-7 OR-8 OR-9	A	Mudline to -4 feet MLLW
	B	-4 to -6 feet MLLW
Total number of composite samples		**6**

Note:
MLLW = mean lower low water

2.3 Deviations from the SAP

Sampling locations and site access routes were determined in the field based on consultation with on-site biological monitors to avoid sensitive habitat or vegetation. Similarly, adjustments to operations during sampling activities were made as needed due to the potential presence of archeological or Native American artifacts in coordination with on-site resource monitors.

Other than minor deviations to avoid sensitive habitat or significant brush, samples were collected in accordance with the SAP (Anchor QEA 2012). However, S3-3 failed to obtain good soil recovery, potentially because of its location in proximity to a large tree trunk and root system. This boring was relocated to a new position approximately 10 feet away and redone, with successful recovery.

3 RESULTS OF PHYSICAL AND CHEMICAL ANALYSES

3.1 Soil and Sediment Composite Samples

Soil and sediment composite samples were analyzed for grain size, total solids, TOC, pesticides, metals, TPHs, PCBs, and SVOCs in accordance with test methods provided in the SAP (Anchor QEA 2012). Results of physical and chemical analyses on composite samples are presented in Table 7. Laboratory reports are provided in Appendix B.

3.1.1 Physical Results

Grain size, total solids, and TOC analyses were performed on all composite samples. Physical testing results and distribution plots of grain size are provided in Appendix B. Soil and sediment were predominately found to consist of silts and clays, with pockets of fine to medium sand.

3.1.2 Chemical Results

Chemical analysis was performed on the composite samples as indicated in Table 2. Results are presented in Table 7, and the laboratory reports from Calscience are provided in Appendix B. All results are expressed in dry weight unless otherwise indicated. Target detection limits were provided in the SAP (Anchor QEA 2012). Actual detection limits and raw data for analyses are provided in Appendix B.

3.1.2.1 Metals

Metals were detected in all surface and subsurface composite samples. Metal concentrations in surface and subsurface soils are similar across all areas sampled, with the exception of composite samples from ORFP-7,9,10,11,12,13. Samples from this area contained elevated concentrations of metals, including copper, lead, and zinc.

3.1.2.2 Pesticides

Pesticides—DDT compounds, toxaphene, and dieldrin—were detected in the surface and/or subsurface samples of composites from the majority of samples.

Table 7

Results of Physical and Chemical Analyses of Soil and Sediment Composite Samples

Area	Otay River						Otay River Flood Plain			
Subarea Name	OR-1,2,3		OR-4,5,6		OR-7,8,9		ORFP-1,2,3,4,5,6			
Composite Sample ID	OR-1,2,3-A	OR-1,2,3-B	OR-4,5,6-A	OR-4,5,6-B	OR-7,8,9-A	OR-7,8,9-B	A-12	B-12	C-12	D-12
Depth Interval/Elevation Range	Mudline to -4 feet MLLW	-4 to -6 feet MLLW	Mudline to -4 feet MLLW	-4 to -6 feet MLLW	Mudline -4 feet MLLW	-4 to -6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to 0 feet NAVD88	0 to - 6 feet NAVD88	-6 to -8 feet NAVD88
Sample Date	5/11/2012	5/11/2012	5/10/2012	5/10/2012	5/9/2012	5/9/2012	5/8/2012	5/8/2012	5/8/2012	5/8/2012
Conventional Parameters (percent)										
Total organic carbon	0.81	0.49	0.71	1.1	1.5	3.6	0.37	0.65	0.66	0.84
Total solids	64.0	71.1	66.4	65.8	57.6	50.4	94.4	82.1	79.8	83.0
Clay (less than 0.00391mm)	14.84	11.88	13.77	23.34	23.51	13.98	7.61	14.73	19.76	21.27
Silt (0.00391 to 0.0625mm)	37.72	37.37	35.79	59.76	52.36	51.49	24.95	51.58	60.17	60.38
Total Silt and Clay (0 to 0.0625mm)	54.56	49.25	49.56	83.10	75.86	65.47	32.57	66.32	79.92	81.66
Very Fine Sand (0.0625 to 0.125mm)	9.04	15.17	14.26	13.37	10.25	16.3	10.48	17.43	13.79	12.2
Fine Sand (0.125 to 0.25mm)	7.21	11.30	15.55	3.23	6.60	9.89	12.77	6.78	4.38	4.95
Medium Sand (0.25 to 0.5mm)	19.91	16.65	13.26	0.01	5.89	6.96	21.86	5.60	1.81	1.20
Coarse Sand (0.5 to 1mm)	8.40	6.83	7.04	< 0.01	< 0.01	1.38	21.46	2.91	< 0.01	< 0.01
Very Coarse Sand (1 to 2mm)	< 0.01	0.02	0.04	< 0.01	< 0.01	< 0.01	0.58	< 0.01	< 0.01	< 0.01
Gravel (greater than 2mm)	0.87	0.78	0.30	0.29	1.40	< 0.01	0.29	0.96	0.10	< 0.01
Metals (mg/kg)										
Arsenic	5.04	3.51	4.79	5.69	6.71 B	7.96 B	1.88	2.87	2.83	2.51
Cadmium	0.207	0.091 J	0.16	0.105 J	0.385	0.144 J	0.024 J	0.021 J	0.029 J	0.026 J
Chromium	18.3	10.6	14.8	17.0	24.7	23.2	5.27	10.5	9.65	7.72
Copper	19.2	9.73	13.1	15.8	28.2	16.9	6.31	10.0	11.4	7.95
Lead	10.6	5.51	6.58	5.58	35.0	6.28	7.93	4.17	4.54	3.11
Mercury	0.038	0.018 J	0.024 J	0.019 J	0.064	< 0.012	< 0.006	< 0.007	< 0.007	< 0.007
Nickel	7.71	4.51	6.17	7.39	10.6	10.5	8.130 B	4.360 B	4.480 B	3.320 B
Selenium	< 0.086	< 0.077	< 0.082	< 0.083	< 0.088	< 0.100	< 0.054	< 0.062	< 0.063	< 0.061
Silver	0.115 J	0.045 J	0.087 J	0.065 J	0.187	0.062 J	0.015 J	0.016 J	0.043 J	0.047 J
Zinc	67.4	35.2	52.9	51.3	96.7	59.7	22.8	33.2	37.1	28.3
TPH (mg/kg)										
TPH (as diesel)	< 7.5	< 6.8	< 7.2	< 7.3	20 HD	< 9.5	< 5.1	< 5.9	< 6.0	< 5.8
Pesticides (µg/kg)										
2,4'-DDD	< 0.53	< 0.48	< 0.51	< 0.51	< 0.59	< 0.67	< 0.36	< 0.41	< 0.42	< 0.41
2,4'-DDE	< 0.48	< 0.43	< 0.46	< 0.46	< 0.53	< 0.61	< 0.32	< 0.37	< 0.38	< 0.37
2,4'-DDT	< 0.47	< 0.42	< 0.45	< 0.46	< 0.52	< 0.60	< 0.32	< 0.37	< 0.38	< 0.36
4,4'-DDD	< 0.49	0.61 J	< 0.48	< 0.48	3.4	< 0.63	< 0.33	< 0.38	< 0.40	< 0.38
4,4'-DDE	1.1 J	3.1	1.4 J	0.72 J	6.7	< 0.59	0.50 J	< 0.36	< 0.37	< 0.36
4,4'-DDT	< 0.52	< 0.47	< 0.50	< 0.51	2.1	< 0.66	< 0.35	< 0.41	< 0.42	< 0.40
Total DDTs	1.1 J	3.7 J	1.4 J	0.72 J	12.2	< 0.67	0.50 J	< 0.41	< 0.42	< 0.41
Aldrin	< 0.49	< 0.44	< 0.47	< 0.48	< 0.55	< 0.62	< 0.33	< 0.38	< 0.39	< 0.38
Alpha Chlordane	< 0.50	< 0.45	< 0.48	< 0.49	< 0.56	< 0.64	< 0.34	< 0.39	< 0.40	< 0.39
alpha-BHC	< 0.51	< 0.46	< 0.49	< 0.49	< 0.56	< 0.64	< 0.34	< 0.39	< 0.41	< 0.39
beta-BHC	< 0.41	< 0.37	< 0.40	< 0.40	< 0.46	< 0.52	< 0.28	< 0.32	< 0.33	< 0.32
Chlordane (Technical)	< 5.10	< 4.60	< 4.90	< 5.00	< 5.70	< 6.50	< 3.50	< 4.00	< 4.10	< 3.90
Cis-nonachlor	< 0.46	< 0.41	< 0.44	< 0.45	< 0.51	< 0.58	< 0.31	< 0.36	< 0.37	< 0.35
delta-BHC	< 0.40	< 0.36	< 0.39	< 0.39	< 0.44	< 0.51	< 0.27	< 0.31	< 0.32	< 0.31
Dieldrin	< 0.52	< 0.46	< 0.50	< 0.50	< 0.57	< 0.65	< 0.35	< 0.40	< 0.41	< 0.40
Endosulfan sulfate	< 0.53	< 0.48	< 0.51	< 0.51	< 0.59	< 0.67	< 0.36	< 0.41	< 0.42	< 0.41
Endosulfan-alpha (I)	< 0.41	< 0.37	< 0.39	< 0.40	< 0.45	< 0.52	< 0.28	< 0.32	< 0.33	< 0.32
Endosulfan-beta (II)	< 0.44	< 0.39	< 0.42	< 0.42	< 0.49	< 0.55	< 0.30	< 0.34	< 0.35	< 0.34
Endrin	< 0.56	< 0.50	< 0.54	< 0.54	< 0.62	< 0.71	< 0.38	< 0.44	< 0.45	< 0.43
Endrin aldehyde	< 0.38	< 0.34	< 0.37	< 0.37	< 0.42	< 0.48	< 0.26	< 0.30	< 0.31	< 0.29
Endrin ketone	< 0.54	< 0.49	< 0.52	< 0.53	< 0.60	< 0.69	< 0.37	< 0.42	< 0.44	< 0.42
Gamma Chlordane	< 0.50	< 0.45	< 0.48	< 0.48	< 0.55	< 0.63	< 0.34	< 0.39	< 0.40	< 0.38
gamma-BHC (Lindane)	< 0.54	< 0.49	< 0.52	< 0.53	< 0.60	< 0.69	< 0.37	< 0.42	< 0.43	< 0.42
Heptachlor	< 0.50	< 0.45	< 0.48	< 0.49	< 0.56	< 0.64	< 0.34	< 0.39	< 0.40	< 0.39
Heptachlor epoxide	< 0.56	< 0.50	< 0.54	< 0.54	< 0.62	< 0.71	< 0.38	< 0.43	< 0.45	< 0.43
Methoxychlor	< 0.51	< 0.46	< 0.49	< 0.49	< 0.56	< 0.64	< 0.34	< 0.40	< 0.41	< 0.39
Oxychlordane	< 0.44	< 0.40	< 0.42	< 0.43	< 0.49	< 0.56	< 0.30	< 0.34	< 0.35	< 0.34
Total Chlordanes	< 0.50	< 0.45	< 0.48	< 0.49	< 0.56	< 0.64	< 0.34	< 0.39	< 0.40	< 0.39
Toxaphene	< 9.9	< 8.9	< 9.5	< 9.6	< 11	< 13	< 6.7	< 7.7	< 7.9	< 7.6
Trans-nonachlor	< 0.45	< 0.40	< 0.43	< 0.44	< 0.50	< 0.57	< 0.30	< 0.35	< 0.36	< 0.35
PCB Congeners (µg/kg)										
PCB018	NA	NA	NA	NA	NA	NA	< 0.17	< 0.19	< 0.2	< 0.19
PCB028	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12
PCB037	NA	NA	NA	NA	NA	NA	< 0.14	< 0.16	< 0.16	< 0.16
PCB044	NA	NA	NA	NA	NA	NA	< 0.14	< 0.16	< 0.16	< 0.16
PCB049	NA	NA	NA	NA	NA	NA	< 0.12	< 0.14	< 0.15	< 0.14
PCB052	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12
PCB066	NA	NA	NA	NA	NA	NA	< 0.097	< 0.11	< 0.11	< 0.11
PCB070	NA	NA	NA	NA	NA	NA	< 0.087	< 0.10	< 0.10	< 0.099
PCB074	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.11
PCB077	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12
PCB081	NA	NA	NA	NA	NA	NA	< 0.13	< 0.15	< 0.15	< 0.15
PCB087	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.13	< 0.12
PCB099	NA	NA	NA	NA	NA	NA	< 0.090	< 0.10	< 0.11	< 0.10
PCB101	NA	NA	NA	NA	NA	NA	< 0.086	< 0.099	< 0.10	< 0.098
PCB105	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.13
PCB110	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.12
PCB114	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12
PCB118	NA	NA	NA	NA	NA	NA	< 0.14	< 0.16	< 0.17	< 0.16
PCB119	NA	NA	NA	NA	NA	NA	< 0.092	< 0.11	< 0.11	< 0.10
PCB123	NA	NA	NA	NA	NA	NA	< 0.092	< 0.11	< 0.11	< 0.11
PCB126	NA	NA	NA	NA	NA	NA	< 0.15	< 0.17	< 0.17	< 0.17
PCB128	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.13	< 0.12
PCB138/158	NA	NA	NA	NA	NA	NA	< 0.22	< 0.25	< 0.25	< 0.24
PCB149	NA	NA	NA	NA	NA	NA	< 0.095	< 0.11	< 0.11	< 0.11
PCB151	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.12
PCB153	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.13

Area	Otay River Flood Plain								
Subarea Name	ORFP-7,9,10,11,12,13				ORFP-8,14,15,16				
Composite Sample ID	A-12	B-12	C-12	D-12	A-12	B-12	C-12	D-12	D-12-DUP
Depth Interval/Elevation Range	Ground surface to 1 foot bgs	1 foot bgs to 0 feet NAVD88	0 to - 6 feet NAVD88	-6 to -8 feet NAVD88	Ground surface to 1 foot bgs	1 foot bgs to 0 feet NAVD88	0 to - 6 feet NAVD88	-6 to -8 feet NAVD88	-6 to -8 feet NAVD88
Sample Date	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012
Conventional Parameters (percent)									
Total organic carbon	0.53	0.46	0.31	0.23	0.60	0.56	0.18	0.20	0.26
Total solids	93.1	84.3	81.7	79.6	97.3	77.1	81.8	83.4	83.2
Clay (less than 0.00391mm)	5.24	12.92	15.29	16.49	1.45	8.63	16.88	13.36	NA
Silt (0.00391 to 0.0625mm)	27.39	38.47	40.94	49.99	7.28	20.14	51.19	49.24	NA
Total Silt and Clay (0 to 0.0625mm)	32.62	51.39	56.23	66.48	8.73	28.77	68.07	62.60	NA
Very Fine Sand (0.0625 to 0.125mm)	14.03	16.67	15.84	18.70	5.13	8.73	14.84	25.42	NA
Fine Sand (0.125 to 0.25mm)	15.78	10.95	10.16	11.00	10.28	14.22	7.84	10.27	NA
Medium Sand (0.25 to 0.5mm)	20.13	10.26	8.34	2.30	35.24	27.15	5.08	1.44	NA
Coarse Sand (0.5 to 1mm)	12.29	9.31	9.05	1.53	35.24	18.46	2.41	< 0.00	NA
Very Coarse Sand (1 to 2mm)	2.05	0.07	< 0.01	< 0.01	3.15	1.47	< 0.00	< 0.00	NA
Gravel (greater than 2mm)	3.09	1.35	0.39	< 0.01	2.13	1.21	1.77	0.28	NA
Metals (mg/kg)									
Arsenic	4.16	4.19	3.94	4.77	1.80	2.62	2.28	2.69	2.27
Cadmium	0.488	0.405	0.451	0.521	0.665	0.107 J	0.063 J	0.035 J	0.036 J
Chromium	15.7	15.0	17.9	16.7	9.78	7.49	7.89	8.6	8.05
Copper	61.3	55.5	67.3	55.5	16.7	10.0	9.14	8.51	8.19
Lead	78.8	43.2	50.3	53.1	8.24	3.95	5.04	3.61	3.28
Mercury	< 0.006	0.009 J	< 0.007	< 0.007	0.038	< 0.008	< 0.007	< 0.007	< 0.007
Nickel	5.35	6.35	6.80	7.04	3.45	3.45	3.55	4.78	3.70
Selenium	< 0.054	< 0.060	< 0.062	< 0.064	< 0.052	< 0.066	< 0.062	< 0.061	< 0.061
Silver	0.289	0.247	0.308	0.253	0.579	0.084 J	0.037 J	0.025 J	0.024 J
Zinc	177	153	167	156	53.3	90.1	27.3	28.1	26.9
TPH (mg/kg)									
TPH (as diesel)	29 HD	< 5.7	< 5.9	< 6.0	8.6 HD	< 6.2	< 5.9	< 5.8	< 5.8
Pesticides (µg/kg)									
2,4'-DDD	0.84 J	< 0.40	< 0.41	< 0.43	16	1.3	< 0.41	< 0.41	< 0.41
2,4'-DDE	1.3	< 0.36	< 0.37	< 0.38	8.1	0.48 J	< 0.37	< 0.37	< 0.37
2,4'-DDT	< 0.32	0.36 J	< 0.37	< 0.38	54	0.53 J	< 0.37	< 0.36	< 0.36
4,4'-DDD	2.3	2.1	< 0.39	< 0.40	35	5.3	0.44 J	< 0.38	< 0.38
4,4'-DDE	19	1.7	< 0.37	< 0.38	880	47	2.0	< 0.36	< 0.36
4,4'-DDT	8.3	11	< 0.41	< 0.42	350	3.9	< 0.41	< 0.40	< 0.40
Total DDTs	32 J	15 J	< 0.41	< 0.43	1340	59 J	2.4 J	< 0.41	< 0.41
Aldrin	< 0.34	< 0.37	< 0.39	< 0.40	< 0.65	< 0.41	< 0.38	< 0.38	< 0.38
Alpha Chlordane	< 0.34	< 0.38	< 0.39	< 0.40	< 0.66	< 0.42	< 0.39	< 0.38	< 0.39
alpha-BHC	< 0.35	< 0.38	< 0.40	< 0.41	< 0.67	< 0.42	< 0.40	< 0.39	< 0.39
beta-BHC	< 0.28	< 0.31	< 0.32	< 0.33	< 0.54	< 0.34	< 0.32	< 0.32	< 0.32
Chlordane (Technical)	< 3.50	< 3.90	< 4.00	< 4.10	< 6.70	< 4.20	< 4.00	< 3.90	< 3.90
Cis-nonachlor	< 0.32	< 0.35	< 0.36	< 0.37	< 0.60	< 0.38	< 0.36	< 0.35	< 0.35
delta-BHC	< 0.27	< 0.30	< 0.31	< 0.32	< 0.53	< 0.33	< 0.31	< 0.31	< 0.31
Dieldrin	< 0.35	< 0.39	< 0.40	< 0.41	< 0.68	< 0.43	< 0.40	< 0.40	< 0.40
Endosulfan sulfate	< 0.36	< 0.40	< 0.41	< 0.42	< 0.69	< 0.44	< 0.41	< 0.41	< 0.41
Endosulfan-alpha (I)	< 0.28	< 0.31	< 0.32	< 0.33	< 0.54	< 0.34	< 0.32	< 0.31	< 0.31
Endosulfan-beta (II)	< 0.30	< 0.33	< 0.34	< 0.35	< 0.57	< 0.36	< 0.34	< 0.34	< 0.34
Endrin	< 0.38	< 0.43	< 0.44	< 0.45	< 0.74	< 0.46	< 0.44	< 0.43	< 0.43
Endrin aldehyde	< 0.26	< 0.29	< 0.30	< 0.31	< 0.50	< 0.32	< 0.30	< 0.29	< 0.29
Endrin ketone	< 0.37	< 0.41	< 0.42	< 0.44	< 0.71	< 0.45	< 0.42	< 0.42	< 0.42
Gamma Chlordane	< 0.34	< 0.38	< 0.39	< 0.40	< 0.65	< 0.41	< 0.39	< 0.38	< 0.38
gamma-BHC (Lindane)	< 0.37	< 0.41	< 0.42	< 0.43	< 0.71	< 0.45	< 0.42	< 0.42	< 0.42
Heptachlor	< 0.35	< 0.38	< 0.39	< 0.40	< 0.66	< 0.42	< 0.39	< 0.39	< 0.39
Heptachlor epoxide	< 0.38	< 0.42	< 0.44	< 0.45	< 0.73	< 0.46	< 0.43	< 0.43	< 0.43
Methoxychlor	< 0.35	< 0.39	< 0.40	< 0.41	< 0.67	< 0.42	< 0.40	< 0.39	< 0.39
Oxychlordane	< 0.30	< 0.33	< 0.34	< 0.35	< 0.58	< 0.36	< 0.34	< 0.34	< 0.34
Total Chlordanes	< 0.34	< 0.38	< 0.39	< 0.40	< 0.66	< 0.42	< 0.39	< 0.38	< 0.39
Toxaphene	15 J	< 7.5	< 7.8	< 8.0	1200	34	< 7.7	< 7.6	< 7.6
Trans-nonachlor	< 0.31	< 0.34	< 0.35	< 0.36	< 0.59	< 0.37	< 0.35	< 0.35	< 0.35
PCB Congeners (µg/kg)									
PCB018	< 0.17	< 0.19	< 0.19	< 0.2	NA	NA	NA	NA	NA
PCB028	< 0.11	< 0.12	< 0.12	< 0.12	NA	NA	NA	NA	NA
PCB037	< 0.14	< 0.16	< 0.16	< 0.16	NA	NA	NA	NA	NA
PCB044	0.20 J	< 0.16	< 0.16	< 0.17	NA	NA	NA	NA	NA
PCB049	< 0.13	< 0.14	< 0.14	< 0.15	NA	NA	NA	NA	NA
PCB052	0.52 J	< 0.11	< 0.12	< 0.12	NA	NA	NA	NA	NA
PCB066	0.13 J	< 0.11	< 0.11	< 0.11	NA	NA	NA	NA	NA
PCB070	0.29 J	< 0.097	< 0.10	< 0.10	NA	NA	NA	NA	NA
PCB074	< 0.10	< 0.11	< 0.12	< 0.12	NA	NA	NA	NA	NA
PCB077	0.2 J	< 0.12	< 0.12	< 0.12	NA	NA	NA	NA	NA
PCB081	< 0.13	< 0.14	< 0.15	< 0.15	NA	NA	NA	NA	NA
PCB087	1.0	< 0.12	< 0.12	< 0.13	NA	NA	NA	NA	NA
PCB099	0.80	< 0.10	< 0.10	< 0.11	NA	NA	NA	NA	NA
PCB101	2.7	< 0.096	< 0.099	< 0.10	NA	NA	NA	NA	NA
PCB105	1.2	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA
PCB110	2.3	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA
PCB114	< 0.11	< 0.12	< 0.12	< 0.13	NA	NA	NA	NA	NA
PCB118	2.3	< 0.16	< 0.16	< 0.17	NA	NA	NA	NA	NA
PCB119	< 0.093	< 0.10	< 0.11	< 0.11	NA	NA	NA	NA	NA
PCB123	< 0.094	< 0.10	< 0.11	< 0.11	NA	NA	NA	NA	NA
PCB126	0.70	< 0.16	< 0.17	< 0.17	NA	NA	NA	NA	NA
PCB128	0.80	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA
PCB138/158	5.3	< 0.24	< 0.25	< 0.25	NA	NA	NA	NA	NA
PCB149	3.5	< 0.11	< 0.11	< 0.11	NA	NA	NA	NA	NA
PCB151	1.2	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA
PCB153	4.7	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA

Area	Nestor Creek				Subarea 3				
Subarea Name	NC-1 and NC-2				S3				
Composite Sample ID	A-12	B-12	B-12-DUP	C-12	A-12	B-12	B-12-DUP	C-12	D-12
Depth Interval/Elevation Range	Ground surface to 1 foot bgs	1 foot bgs to -6 feet NAVD88	1 foot bgs to -6 feet NAVD88	-6 to -8 feet NAVD88	Ground surface to 1 foot bgs	1 foot bgs to +6 feet NAVD88	1 foot bgs to +6 feet NAVD88	+6 to -4 feet NAVD88	-4 to -6 feet NAVD88
Sample Date	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012
Conventional Parameters (percent)									
Total organic carbon	0.97	0.47	0.46	0.23	0.58	0.39	0.5	0.15	0.04 J
Total solids	59	73.8	74.7	79.5	96.4	86.5	85.5	85.2	84.1
Clay (less than 0.00391mm)	12.73	17.28	NA	12.19	6.36	19.15	NA	8.83	2.53
Silt (0.00391 to 0.0625mm)	40.78	53.54	NA	43.26	17.23	55.25	NA	28.46	6.44
Total Silt and Clay (0 to 0.0625mm)	53.51	70.82	NA	55.45	23.59	74.39	NA	37.29	8.96
Very Fine Sand (0.0625 to 0.125mm)	14.84	16.63	NA	20.78	9.16	15.95	NA	13.11	4.04
Fine Sand (0.125 to 0.25mm)	8.93	6.14	NA	12.79	14.54	7.41	NA	12.53	9.41
Medium Sand (0.25 to 0.5mm)	9.10	3.68	NA	7.56	30.38	0.77	NA	16.22	25.03
Coarse Sand (0.5 to 1mm)	11.79	1.66	NA	3.32	21.71	< 0.01	NA	15.65	32.13
Very Coarse Sand (1 to 2mm)	0.10	< 0.01	NA	< 0.01	0.23	< 0.01	NA	2.32	9.32
Gravel (greater than 2mm)	1.73	1.08	NA	0.10	0.38	1.48	NA	2.88	11.11
Metals (mg/kg)									
Arsenic	4.510 B	3.25 B	3.50 B	2.45 B	2.34 B	2.71 B	2.33 B	2.19 B	1.57 B
Cadmium	0.178	0.066 J	0.068 J	0.038 J	0.337	0.098 J	0.061 J	0.035 J	< 0.015
Chromium	12.0	9.93	9.09	6.76	4.27	6.20	6.11	5.03	2.68
Copper	20.4	13.7	12.2	8.98	10.7	8.67	8.32	5.24	1.91
Lead	19.8	4.89	4.77	3.34	9.81	3.67	3.51	2.48	1.86
Mercury	0.024 J	< 0.008	< 0.008	< 0.007	0.009 J	< 0.007	< 0.007	< 0.007	< 0.007
Nickel	6.04	4.95	4.62	3.28	2.58	3.63	3.21	2.41	1.68
Selenium	< 0.086	< 0.069	< 0.068	< 0.064	< 0.052	< 0.059	< 0.059	< 0.059	< 0.06
Silver	0.147 J	0.036 J	0.037 J	0.024 J	0.090 J	0.048 J	0.037 J	0.019 J	< 0.012
Zinc	71.9	41.9	41.0	29.1	56.3	28.5	32.7	19.2	12.9
TPH (mg/kg)									
TPH (as diesel)	< 8.2	< 6.5	< 6.4	< 6.1	20 HD	< 5.6	< 5.6	< 5.6	< 5.7
Pesticides (µg/kg)									
2,4'-DDD	3.2	< 0.46	< 0.45	< 0.43	1.7	< 0.39	< 0.40	< 0.40	< 0.40
2,4'-DDE	2.3	< 0.41	< 0.41	< 0.38	2.5	< 0.35	< 0.36	< 0.36	< 0.36
2,4'-DDT	13	< 0.41	< 0.40	< 0.38	21	0.58 J	0.67 J	< 0.35	< 0.36
4,4'-DDD	23	< 0.43	< 0.42	< 0.40	24	0.71 J	1.0 J	< 0.37	< 0.38
4,4'-DDE	270	2.5	2.0	0.54 J	330	12	11	< 0.35	< 0.36
4,4'-DDT	120	< 0.45	< 0.45	< 0.42	110	3.1	2.6	< 0.39	< 0.40
Total DDTs	430	2.5	2.0	0.54 J	490	16 J	15 J	< 0.40	< 0.40
Aldrin	< 0.53	< 0.43	< 0.42	< 0.40	< 0.33	< 0.36	< 0.37	< 0.37	< 0.37
Alpha Chlordane	5.4	< 0.43	< 0.43	< 0.40	8.1	< 0.37	< 0.38	< 0.38	< 0.38
alpha-BHC	< 0.55	< 0.44	< 0.43	< 0.41	< 0.34	< 0.37	< 0.38	< 0.38	< 0.39
beta-BHC	< 0.45	< 0.36	< 0.35	< 0.33	< 0.27	< 0.31	< 0.31	< 0.31	< 0.31
Chlordane (Technical)	30	< 4.40	< 4.40	< 4.10	86	< 3.80	< 3.80	< 3.80	< 3.90
Cis-nonachlor	< 0.50	< 0.40	< 0.39	< 0.37	4.4	< 0.34	< 0.34	< 0.34	< 0.35
delta-BHC	< 0.43	< 0.35	< 0.34	< 0.32	< 0.27	< 0.30	< 0.30	< 0.30	< 0.30
Dieldrin	3.9	< 0.45	< 0.44	< 0.41	19	0.47 J	0.58 J	< 0.39	< 0.39
Endosulfan sulfate	< 0.57	< 0.46	< 0.45	< 0.43	< 0.35	< 0.39	< 0.40	< 0.40	< 0.40
Endosulfan-alpha (I)	< 0.44	< 0.36	< 0.35	< 0.33	< 0.27	< 0.30	< 0.31	< 0.31	< 0.31
Endosulfan-beta (II)	< 0.47	< 0.38	< 0.37	< 0.35	< 0.29	< 0.32	< 0.33	< 0.33	< 0.33
Endrin	< 0.61	< 0.49	< 0.48	< 0.45	< 0.37	< 0.41	< 0.42	< 0.42	< 0.43
Endrin aldehyde	< 0.41	< 0.33	< 0.33	< 0.31	< 0.25	< 0.28	< 0.29	< 0.29	< 0.29
Endrin ketone	< 0.59	< 0.47	< 0.46	< 0.44	< 0.36	< 0.40	< 0.41	< 0.41	< 0.41
Gamma Chlordane	3.7	< 0.43	< 0.43	< 0.40	9.3	< 0.37	< 0.37	< 0.37	< 0.38
gamma-BHC (Lindane)	< 0.59	< 0.47	< 0.46	< 0.44	< 0.36	< 0.40	< 0.40	< 0.41	< 0.41
Heptachlor	< 0.54	< 0.44	< 0.43	< 0.40	< 0.33	< 0.37	< 0.38	< 0.38	< 0.38
Heptachlor epoxide	< 0.60	< 0.48	< 0.48	< 0.45	< 0.37	< 0.41	< 0.42	< 0.42	< 0.42
Methoxychlor	< 0.55	< 0.44	< 0.43	< 0.41	< 0.34	< 0.38	< 0.38	< 0.38	< 0.39
Oxychlordane	< 0.48	< 0.38	< 0.38	< 0.35	< 0.29	< 0.33	< 0.33	< 0.33	< 0.33
Total Chlordanes	10.4	< 0.43	< 0.43	< 0.40	26	< 0.37	< 0.38	< 0.38	< 0.38
Toxaphene	310	< 8.6	< 8.5	< 8.0	670	17 J	19 J	< 7.4	< 7.5
Trans-nonachlor	1.30 J	< 0.39	< 0.39	< 0.36	3.8	< 0.33	< 0.34	< 0.34	< 0.34
PCB Congeners (µg/kg)									
PCB018	NA	NA	NA	NA	< 0.16	< 0.18	< 0.18	< 0.18	< 0.19
PCB028	NA	NA	NA	NA	< 0.10	< 0.11	< 0.12	< 0.12	< 0.12
PCB037	NA	NA	NA	NA	< 0.14	< 0.15	< 0.15	< 0.15	< 0.16
PCB044	NA	NA	NA	NA	< 0.14	< 0.15	< 0.15	< 0.15	< 0.16
PCB049	NA	NA	NA	NA	< 0.12	< 0.14	< 0.14	< 0.14	< 0.14
PCB052	NA	NA	NA	NA	< 0.10	< 0.11	< 0.11	< 0.11	< 0.12
PCB066	NA	NA	NA	NA	< 0.095	< 0.11	< 0.11	< 0.11	< 0.11
PCB070	NA	NA	NA	NA	< 0.085	< 0.095	< 0.096	< 0.096	< 0.098
PCB074	NA	NA	NA	NA	< 0.098	< 0.11	< 0.11	< 0.11	< 0.11
PCB077	NA	NA	NA	NA	< 0.10	< 0.11	< 0.11	< 0.11	< 0.12
PCB081	NA	NA	NA	NA	< 0.13	< 0.14	< 0.14	< 0.14	< 0.15
PCB087	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	< 0.12
PCB099	NA	NA	NA	NA	< 0.088	< 0.098	< 0.10	< 0.10	< 0.10
PCB101	NA	NA	NA	NA	0.17 J	< 0.094	< 0.095	< 0.095	< 0.097
PCB105	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12	< 0.12
PCB110	NA	NA	NA	NA	0.18 J	< 0.12	< 0.12	< 0.12	< 0.12
PCB114	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	< 0.12
PCB118	NA	NA	NA	NA	< 0.14	< 0.15	< 0.16	< 0.16	< 0.16
PCB119	NA	NA	NA	NA	< 0.090	< 0.10	< 0.10	< 0.10	< 0.10
PCB123	NA	NA	NA	NA	< 0.090	< 0.10	< 0.10	< 0.10	< 0.10
PCB126	NA	NA	NA	NA	< 0.14	< 0.16	< 0.16	< 0.16	< 0.16
PCB128	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12	< 0.12
PCB138/158	NA	NA	NA	NA	0.50 J	< 0.23	< 0.24	< 0.24	< 0.24
PCB149	NA	NA	NA	NA	0.32 J	< 0.10	< 0.10	< 0.10	< 0.11
PCB151	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12	< 0.12
PCB153	NA	NA	NA	NA	0.43 J	< 0.12	< 0.12	< 0.12	< 0.12

Table 7

Results of Physical and Chemical Analyses of Soil and Sediment Composite Samples

Subarea Name	OR-1,2,3		OR-4,5,6		OR-7,8,9		ORFP-1,2,3,4,5,6				ORFP-7,9,10,11,12,13				ORFP-8,14,15,16					NC-1 and NC-2				S3				
Composite Sample ID	OR-1,2,3-A	OR-1,2,3-B	OR-4,5,6-A	OR-4,5,6-B	OR-7,8,9-A	OR-7,8,9-B	A-12	B-12	C-12	D-12	A-12	B-12	C-12	D-12	A-12	B-12	C-12	D-12	D-12-DUP	A-12	B-12	B-12-DUP	C-12	A-12	B-12	B-12-DUP	C-12	D-12
Depth Interval/Elevation Range	Mudline to -4 feet MLLW	-4 to -6 feet MLLW	Mudline to -4 feet MLLW	-4 to -6 feet MLLW	Mudline -4 feet MLLW	-4 to -6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to 0 feet NAVD88	0 to - 6 feet NAVD88	-6 to -8 feet NAVD88	Ground surface to 1 foot bgs	1 foot bgs to 0 feet NAVD88	0 to - 6 feet NAVD88	-6 to -8 feet NAVD88	Ground surface to 1 foot bgs	1 foot bgs to 0 feet NAVD88	0 to - 6 feet NAVD88	-6 to -8 feet NAVD88	-6 to -8 feet NAVD88	Ground surface to 1 foot bgs	1 foot bgs to -6 feet NAVD88	1 foot bgs to -6 feet NAVD88	-6 to -8 feet NAVD88	Ground surface to 1 foot bgs	1 foot bgs to +6 feet NAVD88	1 foot bgs to +6 feet NAVD88	+6 to -4 feet NAVD88	-4 to -6 feet NAVD88
Sample Date	5/11/2012	5/11/2012	5/10/2012	5/10/2012	5/9/2012	5/9/2012	5/8/2012	5/8/2012	5/8/2012	5/8/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012
PCB156	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	0.71	< 0.12	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.11	< 0.11	< 0.11	< 0.12
PCB157	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	< 0.10	< 0.11	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.099	< 0.11	< 0.11	< 0.11	< 0.11
PCB167	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.13	< 0.12	< 0.11	< 0.12	< 0.12	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	< 0.12
PCB168	NA	NA	NA	NA	NA	NA	< 0.091	< 0.10	< 0.11	< 0.10	0.64	< 0.10	< 0.11	< 0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.089	< 0.099	< 0.10	< 0.10	< 0.10
PCB169	NA	NA	NA	NA	NA	NA	< 0.087	< 0.099	< 0.10	< 0.098	0.88	< 0.097	< 0.10	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.085	< 0.094	< 0.096	< 0.096	< 0.097
PCB170	NA	NA	NA	NA	NA	NA	< 0.098	< 0.11	< 0.12	< 0.11	3.1	< 0.11	< 0.11	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.25 J	< 0.11	< 0.11	< 0.11	< 0.11
PCB177	NA	NA	NA	NA	NA	NA	< 0.13	< 0.15	< 0.15	< 0.15	1.0	< 0.15	< 0.15	< 0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.13	< 0.14	< 0.14	< 0.14	< 0.15
PCB180	NA	NA	NA	NA	NA	NA	< 0.065	< 0.074	< 0.077	< 0.074	6.0	< 0.073	< 0.075	< 0.077	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.390 J	< 0.071	< 0.072	< 0.072	< 0.073
PCB183	NA	NA	NA	NA	NA	NA	< 0.12	< 0.14	< 0.14	< 0.13	1.3	< 0.13	< 0.14	< 0.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.12	< 0.13	< 0.13	< 0.13	< 0.13
PCB187	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.13	3.5	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.25 J	< 0.12	< 0.12	< 0.12	< 0.12
PCB189	NA	NA	NA	NA	NA	NA	< 0.091	< 0.10	< 0.11	< 0.10	< 0.092	< 0.10	< 0.10	< 0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.089	< 0.099	< 0.10	< 0.10	< 0.10
PCB194	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	2.7	< 0.11	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.15 J	< 0.11	< 0.11	< 0.11	< 0.11
PCB201	NA	NA	NA	NA	NA	NA	< 0.060	< 0.069	< 0.071	< 0.069	0.30 J	< 0.068	< 0.07	< 0.072	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.059	< 0.066	< 0.067	< 0.067	< 0.068
PCB206	NA	NA	NA	NA	NA	NA	< 0.088	< 0.10	< 0.10	< 0.10	1.3	< 0.098	< 0.10	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.19 J	< 0.096	< 0.097	< 0.097	< 0.099
Total PCB Congeners	NA	NA	NA	NA	NA	NA	< 0.22	< 0.25	< 0.25	< 0.24	49.3 J	< 0.24	< 0.25	< 0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.83 J	< 0.23	< 0.24	< 0.24	< 0.24
PAH (µg/kg)																												
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	< 1.9	< 2.2	3.70 J	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Acenaphthene	NA	NA	NA	NA	NA	NA	13	< 2.3	< 2.3	< 2.2	3.9 J	< 2.2	< 2.3	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	14	< 2.1	< 2.2	< 2.2	< 2.2
Acenaphthylene	NA	NA	NA	NA	NA	NA	14	< 2.0	< 2.1	< 2.0	3.3 J	< 2.0	< 2.0	< 2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	13	< 1.9	< 1.9	< 1.9	< 2.0
Anthracene	NA	NA	NA	NA	NA	NA	< 1.9	< 2.2	< 2.3	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Benzo (a) Anthracene	NA	NA	NA	NA	NA	NA	< 2.3	< 2.6	< 2.7	< 2.6	< 2.3	< 2.6	< 2.6	< 2.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.2	< 2.5	< 2.5	< 2.5	< 2.6
Benzo (a) Pyrene	NA	NA	NA	NA	NA	NA	2.2 J	< 2.1	< 2.2	< 2.1	< 1.9	< 2.1	< 2.1	< 2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.8	< 2.0	< 2.0	< 2.1	< 2.1
Benzo (b) Fluoranthene	NA	NA	NA	NA	NA	NA	2.3 J	< 2.2	< 2.3	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Benzo (g,h,i) Perylene	NA	NA	NA	NA	NA	NA	< 2.0	< 2.3	< 2.3	< 2.2	< 2.0	< 2.2	< 2.3	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.2	< 2.2	< 2.2
Benzo (k) Fluoranthene	NA	NA	NA	NA	NA	NA	< 2.6	< 3.0	< 3.1	< 3.0	< 2.7	< 3.0	< 3.1	< 3.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.6	< 2.9	< 2.9	< 2.9	< 3.0
Chrysene	NA	NA	NA	NA	NA	NA	3.0 J	< 2.5	< 2.6	< 2.5	< 2.2	< 2.4	< 2.5	< 2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.8 J	< 2.4	< 2.4	< 2.4	< 2.4
Dibenz (a,h) Anthracene	NA	NA	NA	NA	NA	NA	< 2.1	< 2.4	< 2.4	< 2.3	< 2.1	< 2.3	< 2.4	< 2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	< 2.3	< 2.3	< 2.3	< 2.3
Fluoranthene	NA	NA	NA	NA	NA	NA	4.6 J	< 2.3	< 2.4	< 2.3	< 2.0	< 2.3	< 2.3	< 2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6 J	< 2.2	< 2.2	< 2.2	< 2.3
Fluorene	NA	NA	NA	NA	NA	NA	7.7 J	< 2.1	< 2.2	< 2.1	2.9 J	< 2.1	< 2.1	< 2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.9 J	< 2.0	< 2.0	< 2.1	< 2.1
Indeno (1,2,3-c,d) Pyrene	NA	NA	NA	NA	NA	NA	< 1.9	< 2.2	< 2.3	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Naphthalene	NA	NA	NA	NA	NA	NA	49	< 2.3	3.5 J	< 2.2	7.0 J	< 2.2	< 2.3	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	86	3.6 J	< 2.2	< 2.2	< 2.2
Phenanthrene	NA	NA	NA	NA	NA	NA	2.9 J	< 2.3	< 2.4	< 2.3	< 2.0	< 2.3	< 2.3	< 2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	< 2.2	< 2.2	< 2.2	< 2.3
Pyrene	NA	NA	NA	NA	NA	NA	11	< 3.0	< 3.1	< 3.0	2.7 J	< 3.0	< 3.1	< 3.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.1 J	< 2.9	< 2.9	< 2.9	< 3.0
Total HMW PAHs	NA	NA	NA	NA	NA	NA	23	< 3.0	< 3.1	< 3.0	2.7	< 3.0	< 3.1	< 3.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.5	< 2.9	< 2.9	< 2.9	< 3.0
Total LMW PAHs	NA	NA	NA	NA	NA	NA	87	< 2.3	7.2	< 2.3	17.1	< 2.3	< 2.3	< 2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	116	3.6	< 2.2	< 2.2	< 2.3
Total PAHs	NA	NA	NA	NA	NA	NA	110	< 3.0	7.2	< 3.0	19.8	< 3.0	< 3.1	< 3.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	124	3.6	< 2.9	< 2.9	< 3.0
Phenols (µg/kg)																												
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.2	< 2.1	< 1.9	< 2.1	< 2.1	< 2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.8	< 2.0	< 2.0	< 2.1	< 2.1
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	< 1.4	< 1.6	< 1.6	< 1.6	< 1.4	< 1.5	< 1.6	< 1.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.3	< 1.5	< 1.5	< 1.5	< 1.5
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	< 1.4	< 1.6	< 1.7	< 1.6	< 1.5	< 1.6	< 1.7	< 1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.4	< 1.6	< 1.6	< 1.6	< 1.6
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	< 1.7	< 2.0	< 2.1	< 2.0	< 1.8	< 2.0	< 2.0	< 2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.7	< 1.9	< 1.9	< 1.9	< 2.0
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	< 57	< 66	< 68	< 65	< 58	< 64	< 66	< 68	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 56	< 62	< 63	< 63	< 64
2-Chlorophenol	NA	NA	NA	NA	NA	NA	8.3 J	< 2.0	< 2.1	< 2.0	4.3 J	< 2.0	< 2.0	< 2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	37	< 1.9	< 1.9	< 1.9	< 2.0
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.2	< 2.1	< 1.9	< 2.1	< 2.1	< 2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.8	< 2.0	< 2.0	< 2.1	< 2.1
2-Methylphenol	NA	NA	NA	NA	NA	NA	< 1.7	< 1.9	< 2.0	< 1.9	< 1.7	< 1.9	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.7	< 1.8	< 1.9	< 1.9	< 1.9
2-Nitrophenol	NA	NA	NA	NA	NA	NA	< 1.6	< 1.8	< 1.9	< 1.8	< 1.6	< 1.8	< 1.8	< 1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.6	2.1 J	< 1.8	< 1.8	< 1.8
3/4-Methylphenol	NA	NA	NA	NA	NA	NA	< 1.7	< 1.9	< 2.0	< 1.9	< 1.7	< 1.9	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.7	< 1.8	< 1.9	< 1.9	< 1.9
4,6-Dinitro-2-Methylphenol	NA	NA	NA	NA	NA	NA	< 73	< 84	< 87	< 83	< 74	< 82	< 85	< 87	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 72	< 80	< 81	< 81	< 82
4-Chloro-3-Methylphenol	NA	NA	NA	NA	NA	NA	4.8 J	< 1.7	< 1.8	< 1.7	< 1.5	< 1.7	< 1.7	< 1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.6	< 1.6	< 1.6	< 1.7
4-Nitrophenol	NA	NA	NA	NA	NA	NA	< 68	< 78	< 80	< 77	< 69	< 76	< 78	< 80	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 66	< 74	< 75	< 75	< 76
Pentachlorophenol	NA	NA	NA	NA	NA	NA	< 57	< 66	< 68	< 65	< 58	< 64	< 66	< 68	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 56	< 62	< 63	< 63	< 64
Phenol	NA	NA	NA	NA	NA	NA	< 1.9	< 2.2	< 2.3	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Phthalates (µg/kg)																												
Diethyl Phthalate	NA	NA	NA	NA	NA	NA	5.8 BJ	6.8 BJ	6.4 BJ	6.2 BJ	8.7 BJ	11 BJ	7.3 BJ	8.2 BJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.6 BJ	9.8 BJ	7.4 BJ	7.3 BJ	7.9 BJ
Dimethyl Phthalate	NA	NA	NA	NA	NA	NA	310 B	420 B	470 B	560 B	240 B	410 B	530 B	570 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	400 B	470 B	420 B	470 B	360 B
Di-n-Butyl Phthalate	NA	NA	NA	NA	NA	NA	4.9 BJ	4.3 BJ	4.2 BJ	3.4 BJ	4.5 BJ	10 BJ	5.9 BJ	6.1 BJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.0 BJ	10 BJ	7.1 BJ	8.2 BJ	7.3 BJ
Di-n-Octyl Phthalate	NA	NA	NA	NA	NA	NA	< 3.1	< 3.5	< 3.6	< 3.5	< 3.1	< 3.4	< 3.5	< 3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.0	< 3.4	< 3.4	< 3.4	< 3.4
Bis(2-Ethylhexyl) Phthalate	NA	NA	NA	NA	NA	NA	40 B	15 B	13 B	13 B	36 B	22 B	13 B	16 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 B	14 B	11 BJ	11 BJ	18 B
Butyl Benzyl Phthalate	NA	NA	NA	NA	NA	NA	7.6 J	4.3 J	4.7 J	4.1 J	11 J	33	7.7 J	9.2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4 J	9.9 J	7.8 J	10 J	8.8 J

Notes:

B = analyte was present in the associated method blank

J = reported value is estimated

HD = chromatographic pattern inconsistent with diesel fuel standard indicating a different type of fuel or weathered diesel

µg/kg = micrograms per kilogram

bgs = below ground surface

HMW = high molecular weight

LMW = low molecular weight

mg/kg = milligrams per kilogram

MLLW = mean lower low water

NA = not analyzed

NAVD88 = North American Vertical Datum of 1988

PAHs = polycyclic aromatic hydrocarbons

PCBs = polychlorinated biphenyls

TPHs = total petroleum hydrocarbons

Non-detect samples are reported as less than method c

For calculated total chemicals (Total DDTs, PAHs, PCBs, and Chlordane) only detected compounds were summed.

Total DDTs are the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.

Total Chlordanes are the sum of Alpha Chlordane, Gamma Chlordane, Cis-Nonachlor, Oxychlordane, and Trans-Nonachlor.

Total HMW PAHs are the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)flouranthene, chrysene, dibenzo(a,h,)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene, and pyrene.

Total LMW PAHs are the sum of 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, flourene, napthalene, and phenathrene.

Total PAHs are the sum of the HMW and LMW PAHs.

In the Otay River Floodplain, DDTs were detected in composite samples from ORFP-7,9,10,11,12,13 in the surface (top 1 foot) and second depth interval (extending down to 0 feet NAVD88). For composite samples from ORFP-8,14,15,16, detections were observed in the surface, and in the second and third depth intervals (extending down to -6 feet NAVD88). Toxaphene was detected in the surface from ORFP-7,9,10,11,12,13 and in the surface and second depth interval (extending down to 0 feet NAVD88) from ORFP-8,14,15,16. No pesticides were detected within composite samples from ORFP-1,2,3,4,5,6.

In Subarea 3, DDTs, dieldrin, and toxaphene were detected in the surface and second depth interval (extending to +6 feet NAVD88).

In Nestor Creek, DDT compounds were detected in the surface and second depth interval (extending to -6 feet NAVD88). Dieldrin and toxaphene were detected in the surface.

In the Otay River, DDT compounds were detected in the lower depth interval (from -4 to -6 feet mean lower low water [MLLW]) for composite samples from OR-1,2,3. For composite samples from OR-7,8,9, similar detections were observed in the upper depth interval (from mudline to -4 feet MLLW).

3.1.2.3 PCBs

PCBs were detected in the surface composite samples from ORFP-7,9,10,11,12,13 and Subarea 3.

3.1.2.4 TPHs and SVOCs

No detections were observed for TPHs and polycyclic aromatic hydrocarbons (PAHs); phenols were generally not detected in most composite samples analyzed. Phthalates were detected; however, many samples were B qualified, indicating these results may be biased high due to chemicals being present in the laboratory's analytical blank samples.

3.2 Soil and Sediment Archive Samples

Based on the physical and chemical results of composite samples, additional testing was performed on archived samples. Testing was completed to further characterize grain size distributions throughout site soils and to better delineate concentrations of pesticides and PCBs, as follows:

- The grain size distribution of composite samples indicated variability between areas and depths. Therefore, grain size was measured in archived samples from each depth interval of each station to further delineate the vertical and horizontal grain size distribution and to identify areas and/or depths that are predominantly coarse-grained material for specific sediment/soil management alternatives.
- As described in Section 3.1.2.2, elevated concentrations of pesticides were detected within the top three depth intervals of composite samples from ORFP-7,9,10,11,12,13; ORFP-8,14,15,16; Subarea 3; and Nestor Creek. Pesticides were analyzed in archived samples from the top three depth intervals of each station within these areas to determine which stations contributed to the elevated concentrations within composite samples.
- As described in Section 3.1.2.3, elevated concentrations of PCBs were measured in the surface composite sample from ORFP-7,9,10,11,12,13. PCBs were measured in archived samples from the surface of each station within this area to determine which stations contributed to the elevated concentrations within the composite sample. PCBs were not initially measured on composite samples from ORFP-8,14,15,16 or Nestor Creek. These composite areas are located adjacent to ORFP-7,9,10,11,12,13; therefore, PCBs were also analyzed on archived composite samples from these areas to determine the horizontal extent of contamination. A summary of physical and chemical analyses performed on archived samples is presented in Table 8.

Table 8
Summary of Physical and Chemical Analyses Performed on Archived Samples

Station ID	Subsurface Sediment Sample ID	Sample Interval		Archive Testing	
		Depth (feet bgs)	Elevation (feet NAVD88)	Chemistry	Physical
Composite Area ORFP-1,2,3,4,5,6					
ORFP-1	ORFP-1-A-12-A	0 to 1	8 to 7	--	GS
	ORFP-1-B-12-A	1 to 3	7 to 5	--	GS
	ORFP-1-C-12-A	3 to 5	5 to 3	--	GS
	ORFP-1-D-12-A	5 to 7	3 to 1	--	GS
	ORFP-1-E-12-A	7 to 9	1 to -1	--	GS
	ORFP-1-F-12-A	9 to 11	-1 to -3	--	GS
	ORFP-1-G-12-A	11 to 14	-3 to -6	--	GS
	ORFP-1-H-12-A	14 to 16	-6 to -8	--	GS
ORFP-2	ORFP-2-A-12-A	0 to 1	12 to 11	--	GS
	ORFP-2-B-12-A	1 to 3	11 to 9	--	GS
	ORFP-2-C-12-A	3 to 5	9 to 7	--	GS
	ORFP-2-D-12-A	5 to 7	7 to 5	--	GS
	ORFP-2-E-12-A	7 to 9	5 to 3	--	GS
	ORFP-2-F-12-A	9 to 11	3 to 1	--	GS
	ORFP-2-G-12-A	11 to 13	1 to -1	--	GS
	ORFP-2-H-12-A	13 to 15	-1 to -3	--	GS
	ORFP-2-I-12-A	15 to 17	-3 to -5	--	GS
	ORFP-2-J-12-A	17 to 20	-5 to -8	--	GS
ORFP-3	ORFP-3-A-12-A	0 to 1	12 to 11	--	GS
	ORFP-3-B-12-A	1 to 3	11 to 9	--	GS
	ORFP-3-C-12-A	3 to 5	9 to 7	--	GS
	ORFP-3-D-12-A	5 to 7	7 to 5	--	GS
	ORFP-3-E-12-A	7 to 9	5 to 3	--	GS
	ORFP-3-F-12-A	9 to 11	3 to 1	--	GS
	ORFP-3-G-12-A	11 to 13	1 to -1	--	GS
	ORFP-3-H-12-A	13 to 15	-1 to -3	--	GS
	ORFP-3-I-12-A	15 to 17	-3 to -5	--	GS
	ORFP-3-J-12-A	17 to 20	-5 to -8	--	GS
ORFP-4	ORFP-4-A-12-A	0 to 1	10 to 9	--	GS
	ORFP-4-B-12-A	1 to 3	9 to 7	--	GS
	ORFP-4-C-12-A	3 to 5	7 to 5	--	GS
	ORFP-4-D-12-A	5 to 7	5 to 3	--	GS
	ORFP-4-E-12-A	7 to 9	3 to 1	--	GS
	ORFP-4-F-12-A	9 to 11	1 to -1	--	GS
	ORFP-4-G-12-A	11 to 13	-1 to -3	--	GS
	ORFP-4-H-12-A	13 to 15	-3 to -5	--	GS
	ORFP-4-I-12-A	15 to 18	-5 to -8	--	GS
ORFP-5	ORFP-5-A-12-A	0 to 1	12 to 11	--	GS
	ORFP-5-B-12-A	1 to 3	11 to 9	--	GS
	ORFP-5-C-12-A	3 to 5	9 to 7	--	GS
	ORFP-5-D-12-A	5 to 7	7 to 5	--	GS
	ORFP-5-E-12-A	7 to 9	5 to 3	--	GS
	ORFP-5-F-12-A	9 to 11	3 to 1	--	GS
	ORFP-5-G-12-A	11 to 13	1 to -1	--	GS
	ORFP-5-H-12-A	13 to 15	-1 to -3	--	GS
	ORFP-5-I-12-A	15 to 17	-3 to -5	--	GS
	ORFP-5-J-12-A	17 to 20	-5 to -8	--	GS
ORFP-6	ORFP-6-A-12-A	0 to 1	12 to 11	--	GS
	ORFP-6-B-12-A	1 to 3	11 to 9	--	GS
	ORFP-6-C-12-A	3 to 5	9 to 7	--	GS
	ORFP-6-D-12-A	5 to 7	7 to 5	--	GS
	ORFP-6-E-12-A	7 to 9	5 to 3	--	GS
	ORFP-6-F-12-A	9 to 11	3 to 1	--	GS
	ORFP-6-G-12-A	11 to 13	1 to -1	--	GS
	ORFP-6-H-12-A	13 to 15	-1 to -3	--	GS
	ORFP-6-I-12-A	15 to 17	-3 to -5	--	GS
	ORFP-6-J-12-A	17 to 20	-5 to -8	--	GS
Composite Area ORFP-7,9,10,11,12,13					
ORFP-7	ORFP-7-A-12-A	0 to 1	9 to 8	PCBs/Pesticides	GS/TS
	ORFP-7-B-12-A	1 to 3	8 to 6	Pesticides	GS/TS
	ORFP-7-C-12-A	3 to 5	6 to 4	Pesticides	GS/TS
	ORFP-7-D-12-A	5 to 7	4 to 2	--	GS
	ORFP-7-E-12-A	7 to 9	2 to 0	--	GS
	ORFP-7-F-12-A	9 to 11	0 to -2	--	GS
	ORFP-7-G-12-A	11 to 13	-2 to -4	--	GS

Table 8
Summary of Physical and Chemical Analyses Performed on Archived Samples

Station ID	Subsurface Sediment Sample ID	Sample Interval		Archive Testing	
		Depth (feet bgs)	Elevation (feet NAVD88)	Chemistry	Physical
	ORFP-7-H-12-A	13 to 15	-4 to -6	--	GS
	ORFP-7-I-12-A	15 to 17	-6 to -8	--	GS
ORFP-9	ORFP-9-A-12-A	0 to 1	11 to 10	PCBs/Pesticides	GS/TS
	ORFP-9-B-12-A	1 to 3	10 to 8	Pesticides	GS/TS
	ORFP-9-C-12-A	3 to 5	8 to 6	Pesticides	GS/TS
	ORFP-9-D-12-A	5 to 7	6 to 4	--	GS
	ORFP-9-E-12-A	7 to 9	4 to 2	--	GS
	ORFP-9-F-12-A	9 to 11	2 to 0	--	GS
	ORFP-9-G-12-A	11 to 13	0 to -2	--	GS
	ORFP-9-H-12-A	13 to 15	-2 to -4	--	GS
	ORFP-9-I-12-A	15 to 17	-4 to -6	--	GS
	ORFP-9-J-12-A	17 to 19	-6 to -8	--	GS
ORFP-10	ORFP-10-A-12-A	0 to 1	11 to 10	PCBs/Pesticides	GS/TS
	ORFP-10-B-12-A	1 to 3	10 to 8	Pesticides	GS/TS
	ORFP-10-C-12-A	3 to 5	8 to 6	Pesticides	GS/TS
	ORFP-10-D-12-A	5 to 7	6 to 4	--	GS
	ORFP-10-E-12-A	7 to 9	4 to 2	--	GS
	ORFP-10-F-12-A	9 to 11	2 to 0	--	GS
	ORFP-10-G-12-A	11 to 13	0 to -2	--	GS
	ORFP-10-H-12-A	13 to 15	-2 to -4	--	GS
	ORFP-10-I-12-A	15 to 17	-4 to -6	--	GS
	ORFP-10-J-12-A	17 to 19	-6 to -8	--	GS
ORFP-11	ORFP-11-A-12-A	0 to 1	12 to 11	PCBs/Pesticides	GS/TS
	ORFP-11-B-12-A	1 to 3	11 to 9	Pesticides	GS/TS
	ORFP-11-C-12-A	3 to 5	9 to 7	Pesticides	GS/TS
	ORFP-11-D-12-A	5 to 7	7 to 5	--	GS
	ORFP-11-E-12-A	7 to 9	5 to 3	--	GS
	ORFP-11-F-12-A	9 to 11	3 to 1	--	GS
	ORFP-11-G-12-A	11 to 13	1 to -1	--	GS
	ORFP-11-H-12-A	13 to 15	-1 to -3	--	GS
	ORFP-11-I-12-A	15 to 17	-3 to -5	--	GS
	ORFP-11-J-12-A	17 to 20	-5 to -8	--	GS
ORFP-12	ORFP-12-A-12-A	0 to 1	8 to 7	PCBs/Pesticides	GS/TS
	ORFP-12-B-12-A	1 to 3	7 to 5	Pesticides	GS/TS
	ORFP-12-C-12-A	3 to 5	5 to 3	Pesticides	GS/TS
	ORFP-12-D-12-A	5 to 7	3 to 1	--	GS
	ORFP-12-E-12-A	7 to 9	1 to -1	--	GS
	ORFP-12-F-12-A	9 to 11	-1 to -3	--	GS
	ORFP-12-G-12-A	11 to 13	-3 to -5	--	GS
	ORFP-12-H-12-A	13 to 17	-5 to -9	--	GS
ORFP-13	ORFP-13-A-12-A	0 to 1	11 to 10	PCBs/Pesticides	GS/TS
	ORFP-13-B-12-A	1 to 3	10 to 8	Pesticides	GS/TS
	ORFP-13-C-12-A	3 to 5	8 to 6	Pesticides	GS/TS
	ORFP-13-D-12-A	5 to 7	6 to 4	--	GS
	ORFP-13-E-12-A	7 to 9	4 to 2	--	GS
	ORFP-13-F-12-A	9 to 11	2 to 0	--	GS
	ORFP-13-G-12-A	11 to 13	0 to -2	--	GS
	ORFP-13-H-12-A	13 to 15	-2 to -4	--	GS
	ORFP-13-I-12-A	15 to 17	-4 to -6	--	GS
	ORFP-13-J-12-A	17 to 20	-6 to -9	--	GS
Composite Area ORFP-8,14,15,16					
Composite	ORFP-8,14,15,16-A-12	Composite	Ground surface to 1 below	PCBS	GS/TS
ORFP-8	ORFP-8-A-12-A	0 to 1	11 to 10	Pesticides	GS/TS
	ORFP-8-B-12-A	1 to 3	10 to 8	Pesticides	GS/TS
	ORFP-8-C-12-A	3 to 5	8 to 6	Pesticides	GS/TS
	ORFP-8-D-12-A	5 to 7	6 to 4	--	GS
	ORFP-8-E-12-A	7 to 9	4 to 2	--	GS
	ORFP-8-F-12-A	9 to 11	2 to 0	--	GS
	ORFP-8-G-12-A	11 to 13	0 to -2	--	GS
	ORFP-8-H-12-A	13 to 15	-2 to -4	--	GS
	ORFP-8-I-12-A	15 to 17	-4 to -6	--	GS
	ORFP-8-J-12-A	17 to 19	-6 to -8	--	GS
	ORFP-14-A-12-A	0 to 1	14 to 13	Pesticides	GS/TS
	ORFP-14-B-12-A	1 to 3	13 to 11	Pesticides	GS/TS
	ORFP-14-C-12-A	3 to 5	11 to 9	Pesticides	GS/TS
	ORFP-14-D-12-A	5 to 7	9 to 7	--	GS

Table 8
Summary of Physical and Chemical Analyses Performed on Archived Samples

Station ID	Subsurface Sediment Sample ID	Sample Interval		Archive Testing	
		Depth (feet bgs)	Elevation (feet NAVD88)	Chemistry	Physical
ORFP-14	ORFP-14-E-12-A	7 to 9	7 to 5	--	GS
	ORFP-14-F-12-A	9 to 11	5 to 3	--	GS
	ORFP-14-G-12-A	11 to 14	3 to 0	--	GS
	ORFP-14-H-12-A	14 to 16	0 to -2	--	GS
	ORFP-14-I-12-A	16 to 18	-2 to -4	--	GS
	ORFP-14-J-12-A	18 to 20	-4 to -6	--	GS
	ORFP-14-K-12-A	20 to 22	-6 to -8	--	GS
ORFP-15	ORFP-15-A-12-A	0 to 1	13 to 12	Pesticides	GS/TS
	ORFP-15-B-12-A	1 to 3	12 to 10	Pesticides	GS/TS
	ORFP-15-C-12-A	3 to 5	10 to 8	Pesticides	GS/TS
	ORFP-15-D-12-A	5 to 7	8 to 6	--	GS
	ORFP-15-E-12-A	7 to 9	6 to 4	--	GS
	ORFP-15-F-12-A	9 to 11	4 to 2	--	GS
	ORFP-15-G-12-A	11 to 13	2 to 0	--	GS
	ORFP-15-H-12-A	13 to 15	0 to -2	--	GS
	ORFP-15-I-12-A	15 to 17	-2 to -4	--	GS
	ORFP-15-J-12-A	17 to 19	-4 to -6	--	GS
	ORFP-15-K-12-A	19 to 21	-6 to -8	--	GS
ORFP-16	ORFP-16-A-12-A	0 to 1	11 to 10	Pesticides	GS/TS
	ORFP-16-B-12-A	1 to 3	10 to 8	Pesticides	GS/TS
	ORFP-16-C-12-A	3 to 5	8 to 6	Pesticides	GS/TS
	ORFP-16-D-12-A	5 to 7	6 to 4	--	GS
	ORFP-16-E-12-A	7 to 9	4 to 2	--	GS
	ORFP-16-F-12-A	9 to 11	2 to 0	--	GS
	ORFP-16-G-12-A	11 to 13	0 to -2	--	GS
	ORFP-16-H-12-A	13 to 15	-2 to -4	--	GS
	ORFP-16-I-12-A	15 to 17	-4 to -6	--	GS
	ORFP-16-J-12-A	17 to 19	-6 to -8	--	GS
Nestor Creek					
Composite	NC-A-12	Composite	Surface to 1 ft below	PCBS	GS/TS
NC-1	NC-1-A-12-A	0 to 1	5 to 4	Pesticides	GS/TS
	NC-1-B-12-A	1 to 3	4 to 2	Pesticides	GS/TS
	NC-1-C-12-A	3 to 5	2 to 0	Pesticides	GS/TS
	NC-1-D-12-A	5 to 7	0 to -2	--	GS
	NC-1-E-12-A	7 to 9	-2 to -4	--	GS
	NC-1-F-12-A	9 to 11	-4 to -6	--	GS
	NC-1-G-12-A	11 to 13	-6 to -8	--	GS
NC-2	NC-2-A-12-A	0 to 1	4 to 3	Pesticides	GS/TS
	NC-2-B-12-A	1 to 3	3 to 1	Pesticides	GS/TS
	NC-2-C-12-A	3 to 5	1 to -1	Pesticides	GS/TS
	NC-2-D-12-A	5 to 7	-1 to -3	--	GS
	NC-2-E-12-A	7 to 9	-3 to -5	--	GS
	NC-2-F-12-A	9 to 11	-5 to -7	--	GS
	NC-2-G-12-A	11 to 13	-7 to -9	--	GS
Subarea S3					
S3-1	S3-1-A-12-A	0 to 1	16 to 15	Pesticides	GS/TS
	S3-1-B-12-A	1 to 3	15 to 13	Pesticides	GS/TS
	S3-1-C-12-A	3 to 5	13 to 11	Pesticides	GS/TS
	S3-1-D-12-A	5 to 7	11 to 9	--	GS
	S3-1-E-12-A	7 to 9	9 to 7	--	GS
	S3-1-F-12-A	9 to 11	7 to 5	--	GS
	S3-1-G-12-A	11 to 13	5 to 3	--	GS
	S3-1-H-12-A	13 to 15	3 to 1	--	GS
	S3-1-I-12-A	15 to 17	1 to -1	--	GS
	S3-1-J-12-A	17 to 19	-1 to -3	--	GS
	S3-1-K-12-A	19 to 22	-3 to -6	--	GS
S3-2	S3-2-A-12-A	0 to 1	16 to 15	Pesticides	GS/TS
	S3-2-B-12-A	1 to 3	15 to 13	Pesticides	GS/TS
	S3-2-C-12-A	3 to 5	13 to 11	Pesticides	GS/TS
	S3-2-D-12-A	5 to 7	11 to 9	--	GS
	S3-2-E-12-A	7 to 9	9 to 7	--	GS
	S3-2-F-12-A	9 to 11	7 to 5	--	GS
	S3-2-G-12-A	11 to 13	5 to 3	--	GS
	S3-2-H-12-A	13 to 15	3 to 1	--	GS
	S3-2-I-12-A	15 to 17	1 to -1	--	GS
	S3-2-J-12-A	17 to 19	-1 to -3	--	GS

Table 8
Summary of Physical and Chemical Analyses Performed on Archived Samples

Station ID	Subsurface Sediment Sample ID	Sample Interval		Archive Testing	
		Depth (feet bgs)	Elevation (feet NAVD88)	Chemistry	Physical
	S3-2-K-12-A	19 to 22	-3 to -6	--	GS
S3-3	S3-3-A-12-A	0 to 1	16 to 15	Pesticides	GS/TS
	S3-3-B-12-A	1 to 3	15 to 13	Pesticides	GS/TS
	S3-3-C-12-A	3 to 5	13 to 11	Pesticides	GS/TS
	S3-3-D-12-A	5 to 7	11 to 9	--	GS
	S3-3-E-12-A	7 to 9	9 to 7	--	GS
	S3-3-F-12-A	9 to 11	7 to 5	--	GS
	S3-3-G-12-A	11 to 13	5 to 3	--	GS
	S3-3-H-12-A	13 to 15	3 to 1	--	GS
	S3-3-I-12-A	15 to 17	1 to -1	--	GS
	S3-3-J-12-A	17 to 19	-1 to -3	--	GS
	S3-3-K-12-A	19 to 22	-3 to -6	--	GS
S3-4	S3-4-A-12-A	0 to 1	16 to 15	Pesticides	GS/TS
	S3-4-B-12-A	1 to 3	15 to 13	Pesticides	GS/TS
	S3-4-C-12-A	3 to 5	13 to 11	Pesticides	GS/TS
	S3-4-D-12-A	5 to 7	11 to 9	--	GS
	S3-4-E-12-A	7 to 9	9 to 7	--	GS
	S3-4-F-12-A	9 to 11	7 to 5	--	GS
	S3-4-G-12-A	11 to 13	5 to 3	--	GS
	S3-4-H-12-A	13 to 15	3 to 1	--	GS
	S3-4-I-12-A	15 to 17	1 to -1	--	GS
	S3-4-J-12-A	17 to 19	-1 to -3	--	GS
	S3-4-K-12-A	19 to 22	-3 to -6	--	GS
S3-5	S3-5-A-12-A	0 to 1	16 to 15	Pesticides	GS/TS
	S3-5-B-12-A	1 to 3	15 to 13	Pesticides	GS/TS
	S3-5-C-12-A	3 to 5	13 to 11	Pesticides	GS/TS
	S3-5-D-12-A	5 to 7	11 to 9	--	GS
	S3-5-E-12-A	7 to 9	9 to 7	--	GS
	S3-5-F-12-A	9 to 11	7 to 5	--	GS
	S3-5-G-12-A	11 to 13	5 to 3	--	GS
	S3-5-H-12-A	13 to 15	3 to 1	--	GS
	S3-5-I-12-A	15 to 17	1 to -1	--	GS
	S3-5-J-12-A	17 to 19	-1 to -3	--	GS
	S3-5-K-12-A	19 to 21	-3 to -5	--	GS
S3-6	S3-6-A-12-A	0 to 1	16 to 15	Pesticides	GS/TS
	S3-6-B-12-A	1 to 3	15 to 13	Pesticides	GS/TS
	S3-6-C-12-A	3 to 5	13 to 11	Pesticides	GS/TS
	S3-6-D-12-A	5 to 7	11 to 9	--	GS
	S3-6-E-12-A	7 to 9	9 to 7	--	GS
	S3-6-F-12-A	9 to 11	7 to 5	--	GS
	S3-6-G-12-A	11 to 13	5 to 3	--	GS
	S3-6-H-12-A	13 to 15	3 to 1	--	GS
	S3-6-I-12-A	15 to 17	1 to -1	--	GS
	S3-6-J-12-A	17 to 19	-1 to -3	--	GS
	S3-6-K-12-A	19 to 22	-3 to -6	--	GS
S3-7	S3-7-A-12-A	0 to 1	16 to 15	Pesticides	GS/TS
	S3-7-B-12-A	1 to 3	15 to 13	Pesticides	GS/TS
	S3-7-C-12-A	3 to 5	13 to 11	Pesticides	GS/TS
	S3-7-D-12-A	5 to 7	11 to 9	--	GS
	S3-7-E-12-A	7 to 9	9 to 7	--	GS
	S3-7-F-12-A	9 to 11	7 to 5	--	GS
	S3-7-G-12-A	11 to 13	5 to 3	--	GS
	S3-7-H-12-A	13 to 15	3 to 1	--	GS
	S3-7-I-12-A	15 to 17	1 to -1	--	GS
	S3-7-J-12-A	17 to 19	-1 to -3	--	GS
	S3-7-K-12-A	19 to 22	-3 to -6	--	GS

Notes:
bgs = below ground surface
GS = Grain size
NAVD88 = North American Vertical Datum of 1988
PCBs = polychlorinated biphenyls
TS = total solids

3.2.1 Grain Size Results

Grain size results for archived samples are presented in Table 9. Laboratory reports are presented in Appendix B. Results indicate that soils within Otay River Floodplain, Subarea 3, and Nestor Creek are generally comprised of fine-grained materials (silt and clay) with some pockets of silty sand. No trends were apparent, and only a few stations consisted of primarily coarse-grained materials (ORFP-7, ORFP-10, ORFP-15, and S3-5).

3.2.2 Chemical Results

Chemical results for archived samples are presented in Table 10. Laboratory reports are presented in Appendix B.

3.2.2.1 Pesticides

Within the Otay River Floodplain, concentrations of DDTs, chlordane, and toxaphene were highest at the surface and decreased with depth, with only a few exceptions. At ORFP-13, concentrations of DDTs, chlordane, and toxaphene were highest in the third depth interval. At ORFP-12, concentrations of DDTs were similar across all three depth intervals. Highest concentrations of DDTs and toxaphene within the Otay River Floodplain were measured in the surface of ORFP-8, ORFP-14, ORFP-15, and ORFP-16. Dieldrin was only measured at ORFP-8, ORFP-13, and ORFP-14.

Within Nestor Creek, concentrations of DDTs, chlordane, and toxaphene were highest at the surface and decreased with depth. DDTs were detected at both stations; however, substantially higher concentrations were measured at NC-2. Chlordane and toxaphene were only measured at NC-2.

Within Subarea 3, concentrations of DDTs, chlordane, toxaphene, and dieldrin were highest at the surface and decreased with depth, with the exception of S3-4. At this station, concentrations increased with depth and were highest in the third depth interval. DDTs, chlordane, and toxaphene were elevated in at least one depth interval of all stations, while dieldrin was only detected at four stations (S3-2, S3-3, S3-6, and S3-7). Highest dieldrin concentrations were measured in the surface at S3-2 and S3-3.

Table 9
Grain Size Results for Archived Samples

Sample ID	Sample Date	Clay (less than 0.00391 mm)	Silt (0.00391 to 0.0625 mm)	Total Silt and Clay (0 to 0.0625 mm)	Very Fine Sand (0.0625 to 0.125 mm)	Fine Sand (0.125 to 0.25 mm)	Medium Sand (0.25 to 0.5 mm)	Coarse Sand (0.5 to 1 mm)	Very Coarse Sand (1 to 2 mm)	Gravel (greater than 2 mm)
NC-1-A-12-A	5/4/2012	**24.81**	**61.02**	**85.83**	**8.49**	**5.39**	**0.28**	< 0.01	< 0.01	< 0.01
NC-1-B-12-A	5/4/2012	**26.24**	**59.3**	**85.54**	**13.4**	**1.06**	< 0.01	< 0.01	< 0.01	< 0.01
NC-1-C-12-A	5/4/2012	**24.36**	**53.69**	**78.05**	**18.8**	**3.15**	< 0.01	< 0.01	< 0.01	< 0.01
NC-1-D-12-A	5/4/2012	**12.16**	**28.4**	**40.56**	**13.4**	**19.1**	**21.6**	**4.9**	**0.45**	< 0.01
NC-1-E-12-A	5/4/2012	**23.51**	**65.06**	**88.57**	**11.39**	**0.04**	< 0.01	< 0.01	< 0.01	< 0.01
NC-1-F-12-A	5/4/2012	**27.1**	**66.17**	**93.26**	**6.72**	**0.02**	< 0.01	< 0.01	< 0.01	< 0.01
NC-1-G-12-A	5/4/2012	**27.96**	**67.83**	**95.79**	**4.16**	**0.05**	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-A-12-A	5/4/2012	**24.09**	**54.12**	**78.21**	**15.41**	**6.37**	**0.01**	< 0.01	< 0.01	< 0.01
NC-2-B-12-A	5/4/2012	**35.91**	**64.08**	**100**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-C-12-A	5/4/2012	**36**	**64**	**100**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-D-12-A	5/4/2012	**21.38**	**65.16**	**86.54**	**13.09**	**0.37**	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-E-12-A	5/4/2012	**29.91**	**65.08**	**94.99**	**4.99**	**0.03**	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-F-12-A	5/4/2012	**30.07**	**62.08**	**92.14**	**7.71**	**0.15**	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-G-12-A	5/4/2012	**32.89**	**66.9**	**99.79**	**0.21**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-A-12-A	5/8/2012	**28.83**	**69.77**	**98.6**	**1.4**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-B-12-A	5/8/2012	**27.82**	**72.15**	**99.96**	**0.04**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-C-12-A	5/8/2012	**32.34**	**67.54**	**99.88**	**0.12**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-D-12-A	5/8/2012	**29.72**	**69.59**	**99.31**	**0.69**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-E-12-A	5/8/2012	**38.09**	**61.8**	**99.89**	**0.11**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-F-12-A	5/8/2012	**35.51**	**64.4**	**99.9**	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-G-12-A	5/8/2012	**30.86**	**62.79**	**93.65**	**6.35**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-H-12-A	5/8/2012	**38.83**	**60.49**	**99.32**	**0.68**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-A-12-A	5/4/2012	**34.73**	**59.02**	**93.75**	**5.6**	**0.65**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-B-12-A	5/4/2012	**2.79**	**4.39**	**7.18**	**5.68**	**37.31**	**44.91**	**4.92**	< 0.01	< 0.01
ORFP-2-C-12-A	5/4/2012	**5.62**	**14.18**	**19.8**	**11.88**	**32.96**	**31.26**	**3.78**	**0.32**	< 0.01
ORFP-2-D-12-A	5/4/2012	**17.55**	**63.4**	**80.95**	**13.2**	**5.84**	**0.01**	< 0.01	< 0.01	< 0.01
ORFP-2-E-12-A	5/4/2012	**24.42**	**67.51**	**91.93**	**8.05**	**0.01**	**0.01**	< 0.01	< 0.01	< 0.01
ORFP-2-F-12-A	5/4/2012	**25.88**	**59.68**	**85.56**	**14.2**	**0.24**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-G-12-A	5/4/2012	**21.1**	**57.36**	**78.46**	**18.29**	**3.26**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-H-12-A	5/4/2012	**35.69**	**64.12**	**99.81**	**0.19**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-I-12-A	5/4/2012	**35.07**	**62.64**	**97.72**	**2.28**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-J-12-A	5/4/2012	**3.56**	**9.26**	**12.82**	**7.6**	**21.71**	**38.72**	**18.71**	**0.43**	< 0.01
ORFP-3-A-12-A	5/8/2012	**2.65**	**6.09**	**8.73**	**1.62**	**5.46**	**40.57**	**41.57**	**2.06**	< 0.01
ORFP-3-B-12-A	5/8/2012	**1.49**	**2.74**	**4.23**	**1.73**	**9.59**	**51.51**	**32.8**	**0.14**	< 0.01
ORFP-3-C-12-A	5/8/2012	**3.16**	**4.99**	**8.14**	**2.83**	**15.29**	**53.26**	**20.29**	**0.19**	< 0.01
ORFP-3-D-12-A	5/8/2012	**15.87**	**46.82**	**62.68**	**23.01**	**14.31**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-E-12-A	5/8/2012	**19.88**	**62.38**	**82.26**	**17.7**	**0.04**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-F-12-A	5/8/2012	**24.65**	**67.7**	**92.35**	**7.65**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-G-12-A	5/8/2012	**16.96**	**47.4**	**64.36**	**27.1**	**8.52**	**0.01**	< 0.01	< 0.01	< 0.01
ORFP-3-H-12-A	5/8/2012	**30.32**	**66.49**	**96.81**	**3.19**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-I-12-A	5/8/2012	**20.89**	**60.86**	**81.74**	**17.99**	**0.27**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-J-12-A	5/8/2012	**17.81**	**52.85**	**70.66**	**16.32**	**13.01**	**0.01**	< 0.01	< 0.01	< 0.01
ORFP-4-A-12-A	5/8/2012	**19.49**	**46.9**	**66.4**	**21.5**	**12.1**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-B-12-A	5/8/2012	**10.13**	**25.31**	**35.44**	**14.5**	**18.8**	**25.11**	**5.8**	**0.35**	< 0.01
ORFP-4-C-12-A	5/8/2012	**18.43**	**56.31**	**74.74**	**16.2**	**9.01**	**0.05**	< 0.01	< 0.01	< 0.01
ORFP-4-D-12-A	5/8/2012	**29.33**	**59.59**	**88.92**	**7.83**	**3.25**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-E-12-A	5/8/2012	**29.36**	**64.41**	**93.77**	**5.98**	**0.25**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-F-12-A	5/8/2012	**25.18**	**62.12**	**87.29**	**12.7**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-G-12-A	5/8/2012	**28.45**	**71.05**	**99.5**	**0.5**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-H-12-A	5/8/2012	**18.45**	**66.25**	**84.71**	**15.11**	**0.18**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-I-12-A	5/8/2012	**28.3**	**64.68**	**92.98**	**7.02**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-A-12-A	5/8/2012	**0.83**	**3.69**	**4.52**	**3.22**	**10**	**35**	**40.6**	**6.65**	< 0.01
ORFP-5-B-12-A	5/8/2012	**0.84**	**2.29**	**3.13**	**2.21**	**9.95**	**44.4**	**37.3**	**3.02**	< 0.01
ORFP-5-C-12-A	5/8/2012	**20.21**	**60.54**	**80.75**	**14.41**	**4.84**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-D-12-A	5/8/2012	**29.96**	**66.71**	**96.67**	**3.33**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-E-12-A	5/8/2012	**28.39**	**69.29**	**97.68**	**2.32**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-F-12-A	5/8/2012	**23.21**	**53.11**	**76.33**	**20.9**	**2.77**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-G-12-A	5/8/2012	**37.19**	**62.76**	**99.95**	**0.05**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-H-12-A	5/8/2012	**29.02**	**61.28**	**90.3**	**9.4**	**0.3**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-I-12-A	5/8/2012	**36.63**	**57.67**	**94.3**	**4.86**	**0.84**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-J-12-A	5/8/2012	**24.85**	**52.76**	**77.62**	**20.79**	**1.6**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-A-12-A	5/8/2012	**10.19**	**31.11**	**41.3**	**12.9**	**13.5**	**18.31**	**13.9**	**0.08**	< 0.01
ORFP-6-B-12-A	5/8/2012	**13.4**	**46.19**	**59.59**	**19.5**	**8.82**	**10.7**	**1.4**	< 0.01	< 0.01
ORFP-6-C-12-A	5/8/2012	**12.11**	**41.52**	**53.63**	**15.61**	**10.81**	**13.41**	**6.54**	< 0.01	< 0.01
ORFP-6-D-12-A	5/8/2012	**18.97**	**62**	**80.97**	**17.6**	**1.43**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-E-12-A	5/8/2012	**20.88**	**62.05**	**82.93**	**13.11**	**3.96**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-F-12-A	5/8/2012	**13.74**	**46.2**	**59.94**	**26.9**	**11.8**	**1.2**	**0.16**	< 0.01	< 0.01
ORFP-6-G-12-A	5/8/2012	**28.04**	**61.28**	**89.32**	**8.02**	**2.66**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-H-12-A	5/8/2012	**31.29**	**64.74**	**96.02**	**3.85**	**0.13**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-I-12-A	5/8/2012	**32.56**	**63.86**	**96.43**	**3.57**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-J-12-A	5/8/2012	**17.34**	**46.4**	**63.75**	**16.7**	**16.5**	**3.05**	< 0.01	< 0.01	< 0.01
ORFP-7-A-12-A	5/2/2012	**4.85**	**15.4**	**20.25**	**10.8**	**20.19**	**26.19**	**14.83**	**1.63**	**6.11**
ORFP-7-B-12-A	5/2/2012	**3.1**	**7.55**	**10.65**	**6.08**	**15.79**	**29.67**	**15.55**	**1.68**	**20.58**
ORFP-7-C-12-A	5/2/2012	**14.43**	**39.59**	**54.01**	**30.19**	**15.79**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-7-D-12-A	5/2/2012	**30.68**	**66.51**	**97.19**	**2.81**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-7-E-12-A	5/2/2012	**7**	**14.39**	**21.39**	**4.92**	**15.59**	**34.67**	**21.48**	**1.95**	< 0.01
ORFP-7-F-12-A	5/2/2012	**11.54**	**31.52**	**43.06**	**11.91**	**12.61**	**18.91**	**13.51**	**0.01**	< 0.01
ORFP-7-G-12-A	5/2/2012	**19.98**	**52.96**	**72.94**	**21.02**	**6.04**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-7-H-12-A	5/2/2012	**10.68**	**29.99**	**40.67**	**13.29**	**17.09**	**19.29**	**9.65**	**0.01**	< 0.01
ORFP-7-I-12-A	5/2/2012	**4.79**	**12.01**	**16.8**	**7.63**	**16.43**	**30.74**	**23.25**	**1.25**	**3.89**
ORFP-8-A-12-A	5/1/2012	**2.21**	**13.7**	**15.91**	**7.99**	**10.47**	**32.97**	**28.67**	**1.76**	**2.22**
ORFP-8-B-12-A	5/1/2012	**10.92**	**22.17**	**33.1**	**4.24**	**14.94**	**28.17**	**14.56**	**0.07**	**4.93**
ORFP-8-C-12-A	5/1/2012	**24.62**	**59.94**	**84.56**	**7.05**	**8.34**	**0.04**	< 0.01	< 0.01	< 0.01
ORFP-8-D-12-A	5/1/2012	**24.43**	**54.32**	**78.75**	**14.81**	**6.44**	< 0.01	< 0.01	< 0.01	< 0.01

Table 9
Grain Size Results for Archived Samples

Sample ID	Sample Date	Clay (less than 0.00391 mm)	Silt (0.00391 to 0.0625 mm)	Total Silt and Clay (0 to 0.0625 mm)	Very Fine Sand (0.0625 to 0.125 mm)	Fine Sand (0.125 to 0.25 mm)	Medium Sand (0.25 to 0.5 mm)	Coarse Sand (0.5 to 1 mm)	Very Coarse Sand (1 to 2 mm)	Gravel (greater than 2 mm)
ORFP-8-E-12-A	5/1/2012	**37.74**	**61.96**	**99.7**	**0.3**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-8-F-12-A	5/1/2012	**20.77**	**51.89**	**72.66**	**17.6**	**9.74**	**0.01**	< 0.01	< 0.01	< 0.01
ORFP-8-G-12-A	5/1/2012	**34.14**	**65.25**	**99.39**	**0.61**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-8-H-12-A	5/1/2012	**27.06**	**64.07**	**91.12**	**8.86**	**0.02**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-8-I-12-A	5/1/2012	**23.67**	**62.26**	**85.93**	**12.99**	**1.08**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-8-J-12-A	5/1/2012	**26.85**	**69.65**	**96.5**	**3.5**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-A-12-A	5/2/2012	**3.47**	**19.75**	**23.22**	**11.34**	**14.79**	**20.67**	**12.19**	**1.77**	**16.01**
ORFP-9-B-12-A	5/2/2012	**9.96**	**26.4**	**36.35**	**12.72**	**17.63**	**16.16**	**3.1**	< 0.01	**14.03**
ORFP-9-C-12-A	5/2/2012	**20.61**	**50.19**	**70.8**	**19.9**	**9**	**0.3**	< 0.01	< 0.01	< 0.01
ORFP-9-D-12-A	5/2/2012	**25.74**	**62.19**	**87.93**	**12**	**0.07**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-E-12-A	5/2/2012	**34.2**	**59.72**	**93.93**	**5.51**	**0.56**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-F-12-A	5/2/2012	**19.06**	**49.83**	**68.89**	**15.11**	**14.21**	**1.79**	< 0.01	< 0.01	< 0.01
ORFP-9-G-12-A	5/2/2012	**35.88**	**57.5**	**93.38**	**4.71**	**1.91**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-H-12-A	5/2/2012	**17.53**	**44.27**	**61.8**	**30.28**	**7.92**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-I-12-A	5/2/2012	**29.03**	**53.81**	**82.84**	**6.93**	**10.18**	**0.04**	< 0.01	< 0.01	< 0.01
ORFP-9-J-12-A	5/2/2012	**20.37**	**47.12**	**67.49**	**15.21**	**15.81**	**1.49**	< 0.01	< 0.01	< 0.01
ORFP-10-A-12-A	5/2/2012	**9.4**	**22.8**	**32.2**	**10.8**	**15.9**	**24.4**	**14.3**	**2.4**	< 0.01
ORFP-10-B-12-A	5/2/2012	**27.17**	**66.19**	**93.36**	**6.01**	**0.63**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-10-C-12-A	5/2/2012	**6.68**	**16**	**22.68**	**12.2**	**25.31**	**29.01**	**9.57**	**1.23**	< 0.01
ORFP-10-D-12-A	5/2/2012	**2.6**	**8.2**	**10.81**	**3.25**	**11.51**	**47.63**	**25.52**	**1.29**	< 0.01
ORFP-10-E-12-A	5/2/2012	**0.8**	**1.47**	**2.27**	**1.09**	**10.29**	**45.45**	**36.46**	**4.44**	< 0.01
ORFP-10-F-12-A	5/2/2012	**1.21**	**3.68**	**4.89**	**2.41**	**8.11**	**28.59**	**49.38**	**6.64**	< 0.01
ORFP-10-G-12-A	5/2/2012	**1.64**	**5.29**	**6.93**	**1.47**	**5.07**	**21.51**	**48.61**	**16.4**	< 0.01
ORFP-10-H-12-A	5/2/2012	**4.81**	**11.7**	**16.51**	**6.34**	**16.1**	**26.3**	**30.6**	**4.16**	< 0.01
ORFP-10-I-12-A	5/2/2012	**29.73**	**61.34**	**91.06**	**7.17**	**1.76**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-10-J-12-A	5/2/2012	**31.17**	**66.07**	**97.25**	**2.75**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-11-A-12-A	5/2/2012	**12.04**	**35.7**	**47.74**	**23**	**19.4**	**7.73**	**2.14**	< 0.01	< 0.01
ORFP-11-B-12-A	5/2/2012	**31.95**	**53.7**	**85.65**	**8.16**	**0.22**	< 0.01	< 0.01	< 0.01	**5.97**
ORFP-11-C-12-A	5/2/2012	**25.23**	**46.31**	**71.54**	**5.65**	**1.82**	**0.27**	< 0.01	< 0.01	**20.72**
ORFP-11-D-12-A	5/2/2012	**18.31**	**41.16**	**59.47**	**21.18**	**16.98**	**2.14**	**0.23**	< 0.01	< 0.01
ORFP-11-E-12-A	5/2/2012	**31.18**	**66.05**	**97.22**	**2.18**	**0.6**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-11-F-12-A	5/2/2012	**21.87**	**48.99**	**70.86**	**14**	**14.5**	**0.65**	< 0.01	< 0.01	< 0.01
ORFP-11-G-12-A	5/2/2012	**29.08**	**70.63**	**99.71**	**0.29**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-11-H-12-A	5/2/2012	**35.83**	**64.03**	**99.86**	**0.14**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-11-I-12-A	5/2/2012	**21.61**	**60.05**	**81.66**	**11.21**	**7.09**	**0.04**	< 0.01	< 0.01	< 0.01
ORFP-11-J-12-A	5/2/2012	**23.86**	**61.12**	**84.98**	**13.51**	**1.51**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-A-12-A	5/2/2012	**3.53**	**8.17**	**11.7**	**4.57**	**11.7**	**43.49**	**27.79**	**0.75**	< 0.01
ORFP-12-B-12-A	5/2/2012	**37.81**	**60.89**	**98.7**	**1.3**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-C-12-A	5/2/2012	**19.24**	**56.08**	**75.33**	**21.99**	**2.68**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-D-12-A	5/2/2012	**24.76**	**69.48**	**94.24**	**5.76**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-E-12-A	5/2/2012	**37.81**	**62.13**	**99.93**	**0.07**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-F-12-A	5/2/2012	**36.33**	**63.02**	**99.35**	**0.65**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-G-12-A	5/2/2012	**41.87**	**58.11**	**99.97**	**0.03**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-H-12-A	5/2/2012	**34.63**	**63.5**	**98.13**	**1.87**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-A-12-A	5/2/2012	**30.4**	**63**	**93.4**	**6.12**	**0.48**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-B-12-A	5/2/2012	**23.24**	**64.42**	**87.66**	**12.3**	**0.03**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-C-12-A	5/2/2012	**22.67**	**46.01**	**68.69**	**14.67**	**7.85**	< 0.01	< 0.01	< 0.01	**8.8**
ORFP-13-D-12-A	5/2/2012	**21.79**	**60.1**	**81.89**	**18.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-E-12-A	5/2/2012	**8.34**	**21.71**	**30.05**	**11.61**	**16.11**	**23.11**	**14.71**	**4.41**	< 0.01
ORFP-13-F-12-A	5/2/2012	**15.71**	**46.91**	**62.63**	**16.1**	**15.2**	**5.61**	**0.45**	< 0.01	< 0.01
ORFP-13-G-12-A	5/2/2012	**23.96**	**53.42**	**77.38**	**11.5**	**10.6**	**0.51**	< 0.01	< 0.01	< 0.01
ORFP-13-H-12-A	5/2/2012	**28.36**	**66.42**	**94.78**	**5.22**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-I-12-A	5/2/2012	**37.09**	**62.73**	**99.82**	**0.18**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-J-12-A	5/2/2012	**36.12**	**63.79**	**99.91**	**0.09**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-A-12-A	5/1/2012	**1.84**	**11**	**12.84**	**8.32**	**14.4**	**41.1**	**22.9**	**0.44**	< 0.01
ORFP-14-B-12-A	5/1/2012	**1.86**	**6.41**	**8.27**	**5.28**	**13.79**	**43.18**	**27.89**	**1.6**	< 0.01
ORFP-14-C-12-A	5/1/2012	**21.09**	**56.25**	**77.35**	**13.09**	**9.55**	**0.01**	< 0.01	< 0.01	< 0.01
ORFP-14-D-12-A	5/1/2012	**25.11**	**63.77**	**88.88**	**10.7**	**0.42**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-E-12-A	5/1/2012	**29.95**	**57.82**	**87.78**	**9.26**	**2.96**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-F-12-A	5/1/2012	**23.25**	**56.84**	**80.09**	**12.59**	**7.08**	**0.24**	< 0.01	< 0.01	< 0.01
ORFP-14-G-12-A	5/1/2012	**29.42**	**61.69**	**91.11**	**5.62**	**3.27**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-H-12-A	5/1/2012	**31.25**	**65.12**	**96.37**	**3.41**	**0.22**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-I-12-A	5/1/2012	**49.44**	**50.56**	**100**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-J-12-A	5/1/2012	**12.51**	**33.91**	**46.42**	**19.41**	**24.31**	**8.53**	**1.33**	< 0.01	< 0.01
ORFP-14-K-12-A	5/1/2012	**2.09**	**6.41**	**8.5**	**4.34**	**13.59**	**42.97**	**27.68**	**2.93**	< 0.01
ORFP-15-A-12-A	5/1/2012	**2.5**	**15.4**	**17.91**	**8.58**	**12**	**36.91**	**23.61**	**0.99**	< 0.01
ORFP-15-B-12-A	5/1/2012	**2.6**	**6.13**	**8.73**	**4.04**	**12.3**	**44.58**	**28.99**	**1.37**	< 0.01
ORFP-15-C-12-A	5/1/2012	**35.05**	**62.6**	**97.65**	**2.35**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-15-D-12-A	5/1/2012	**9.92**	**21.21**	**31.13**	**9.99**	**15.91**	**27.21**	**14.01**	**1.75**	< 0.01
ORFP-15-E-12-A	5/1/2012	**5.65**	**12.09**	**17.74**	**5.65**	**16.08**	**34.76**	**22.87**	**2.89**	< 0.01
ORFP-15-F-12-A	5/1/2012	**8.01**	**18.98**	**27**	**6.51**	**10.25**	**20.65**	**11.68**	**3.4**	**20.52**
ORFP-15-G-12-A	5/1/2012	**6.25**	**16.68**	**22.93**	**7.19**	**13.23**	**19.4**	**14.43**	**2.95**	**19.87**
ORFP-15-H-12-A	5/1/2012	**29.31**	**67.48**	**96.79**	**3.21**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-15-I-12-A	5/1/2012	**24.19**	**63.77**	**87.96**	**9.6**	**2.44**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-15-J-12-A	5/1/2012	**28.74**	**67.03**	**95.77**	**4.23**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-15-K-12-A	5/1/2012	**11.35**	**32.12**	**43.47**	**19.71**	**27.12**	**9.36**	**0.35**	< 0.01	< 0.01
ORFP-16-A-12-A	5/1/2012	**2.94**	**21.73**	**24.67**	**10.91**	**11.82**	**27.84**	**22.93**	**1.83**	< 0.01
ORFP-16-B-12-A	5/1/2012	**27.35**	**59.82**	**87.17**	**10**	**2.83**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-C-12-A	5/1/2012	**19.14**	**49.13**	**68.27**	**14.18**	**16.28**	**1.27**	< 0.01	< 0.01	< 0.01
ORFP-16-D-12-A	5/1/2012	**24.65**	**53.68**	**78.33**	**10.3**	**11.1**	**0.28**	< 0.01	< 0.01	< 0.01
ORFP-16-E-12-A	5/1/2012	**25.37**	**72.09**	**97.46**	**2.54**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-F-12-A	5/1/2012	**22.17**	**61.98**	**84.15**	**13.29**	**2.56**	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-G-12-A	5/1/2012	**28.73**	**67.99**	**96.72**	**3.28**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-H-12-A	5/1/2012	**31.18**	**61.87**	**93.05**	**5.67**	**1.28**	< 0.01	< 0.01	< 0.01	< 0.01

Table 9
Grain Size Results for Archived Samples

Sample ID	Sample Date	Clay (less than 0.00391 mm)	Silt (0.00391 to 0.0625 mm)	Total Silt and Clay (0 to 0.0625 mm)	Very Fine Sand (0.0625 to 0.125 mm)	Fine Sand (0.125 to 0.25 mm)	Medium Sand (0.25 to 0.5 mm)	Coarse Sand (0.5 to 1 mm)	Very Coarse Sand (1 to 2 mm)	Gravel (greater than 2 mm)
ORFP-16-I-12-A	5/1/2012	37.16	62.84	100	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-J-12-A	5/1/2012	52.13	47.87	100	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-A-12-A	5/4/2012	31.83	58.97	90.8	5.92	3.28	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-B-12-A	5/4/2012	36.46	62.53	98.99	1.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-C-12-A	5/4/2012	14.96	39.87	54.83	26.88	18.29	0.01	< 0.01	< 0.01	< 0.01
S3-1-D-12-A	5/4/2012	22.02	70.33	92.35	7.64	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-E-12-A	5/4/2012	37.31	62.46	99.77	0.23	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-F-12-A	5/4/2012	27.77	63.96	91.74	8.26	0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-G-12-A	5/4/2012	31.92	67.85	99.77	0.23	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-H-12-A	5/4/2012	32.73	66.49	99.22	0.78	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-I-12-A	5/4/2012	17.39	46.76	64.15	14.99	17.48	3.38	< 0.01	< 0.01	< 0.01
S3-1-J-12-A	5/4/2012	3.03	7.67	10.71	6.08	19.91	46.12	15.71	1.47	< 0.01
S3-1-K-12-A	5/4/2012	2.42	5.68	8.1	3.41	9.25	21.01	32.01	26.21	< 0.01
S3-2-A-12-A	5/3/2012	5.61	17.1	22.71	8.62	15.7	34.5	17.9	0.57	< 0.01
S3-2-B-12-A	5/3/2012	32.82	60.58	93.4	6.42	0.18	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-C-12-A	5/3/2012	15.29	43.6	58.88	25.4	11.9	3.05	0.77	< 0.01	< 0.01
S3-2-D-12-A	5/3/2012	30.86	62.68	93.54	6.46	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-E-12-A	5/3/2012	29.85	64.82	94.67	5.33	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-F-12-A	5/3/2012	18.25	49.92	68.16	20.21	11.6	0.02	< 0.01	< 0.01	< 0.01
S3-2-G-12-A	5/3/2012	27.71	65.69	93.4	6.59	0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-H-12-A	5/3/2012	22.44	58.58	81.03	15.8	3.18	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-I-12-A	5/3/2012	18.56	58.26	76.82	18.59	4.6	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-J-12-A	5/3/2012	9.34	28.8	38.14	22	26.1	12.7	1.07	< 0.01	< 0.01
S3-2-K-12-A	5/3/2012	13.21	38.3	51.51	20.4	21.2	6.52	0.37	< 0.01	< 0.01
S3-3-A-12-A	5/3/2012	2.51	11	13.5	6.78	13.89	40.48	24.79	0.55	< 0.01
S3-3-B-12-A	5/3/2012	1.16	2.5	3.66	2.06	9.49	48.18	35.69	0.93	< 0.01
S3-3-C-12-A	5/3/2012	24.36	62.65	87.01	12.21	0.78	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-D-12-A	5/3/2012	29.72	66.69	96.41	3.59	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-E-12-A	5/3/2012	33.03	62.72	95.75	4.25	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-F-12-A	5/4/2012	34.29	65.62	99.91	0.09	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-G-12-A	5/3/2012	24.04	62.34	86.38	12.11	1.51	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-H-12-A	5/4/2012	35.11	64.09	99.2	0.8	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-I-12-A	5/3/2012	17.19	56.93	74.12	22.01	3.87	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-J-12-A	5/3/2012	4.93	13.42	18.36	10.88	37.25	9.25	2.78	0.05	21.43
S3-3-K-12-A	5/3/2012	1.77	3.71	5.48	0.61	1.59	9.73	33.36	30.98	18.24
S3-4-A-12-A	5/3/2012	22.34	55.71	78.05	18.5	3.45	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-B-12-A	5/3/2012	24.46	63.41	87.87	11	1.13	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-C-12-A	5/3/2012	2.02	10.7	12.72	8.28	19.1	42.4	17.3	0.2	< 0.01
S3-4-D-12-A	5/3/2012	29.63	64.8	94.43	5.57	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-E-12-A	5/3/2012	26.49	59.19	85.68	9.5	4.79	0.03	< 0.01	< 0.01	< 0.01
S3-4-F-12-A	5/3/2012	23.4	67.62	91.02	7.47	1.51	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-G-12-A	5/3/2012	22.32	58.67	80.99	11.49	5.31	2.21	< 0.01	< 0.01	< 0.01
S3-4-H-12-A	5/3/2012	28.15	59.65	87.8	8.36	3.84	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-I-12-A	5/3/2012	2.21	6.91	9.12	4.44	12.7	39	32.2	2.54	< 0.01
S3-4-J-12-A	5/3/2012	2.96	6.62	9.59	3.77	7.98	24.31	27.91	12.28	14.16
S3-4-K-12-A	5/3/2012	2.45	6.12	8.57	4.04	7.03	19.29	27.39	33.69	< 0.01
S3-5-A-12-A	5/4/2012	7.4	14.2	21.61	7.09	17.31	36.31	17.31	0.38	< 0.01
S3-5-B-12-A	5/4/2012	3.75	8.7	12.44	5.36	17.09	44.17	20.89	0.05	< 0.01
S3-5-C-12-A	5/4/2012	9.55	22.81	32.37	23.11	31.22	10.81	2.39	0.11	< 0.01
S3-5-D-12-A	5/4/2012	30.35	65.93	96.32	3.68	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-5-E-12-A	5/4/2012	22.91	57.98	80.89	13.29	5.82	< 0.01	< 0.01	< 0.01	< 0.01
S3-5-F-12-A	5/4/2012	14.86	41.5	56.37	20.9	17.2	3.73	1.8	< 0.01	< 0.01
S3-5-G-12-A	5/4/2012	29.06	69.86	98.92	1.08	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-5-H-12-A	5/4/2012	21.58	43.52	65.1	15.31	19.31	0.28	< 0.01	< 0.01	< 0.01
S3-5-I-12-A	5/4/2012	4.71	10.7	15.42	7.72	17.81	37.31	20.81	0.93	< 0.01
S3-5-J-12-A	5/4/2012	7.67	16.7	24.37	6.93	23.9	25.51	17.5	1.78	< 0.01
S3-5-K-12-A	5/4/2012	3.37	9.48	12.85	6.19	13.7	36	29.6	1.66	< 0.01
S3-6-A-12-A	5/3/2012	1.51	8.54	10.05	7.58	16.49	42.97	22.28	0.63	< 0.01
S3-6-B-12-A	5/3/2012	2.49	15.8	18.29	13.6	19	34.3	14.7	0.12	< 0.01
S3-6-C-12-A	5/3/2012	32.72	61.51	94.23	5.19	0.58	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-D-12-A	5/3/2012	28.01	60.04	88.04	7.84	4.11	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-E-12-A	5/3/2012	31.37	63.41	94.78	5.22	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-F-12-A	5/3/2012	19.8	48.91	68.71	15.9	10.7	4.46	0.22	< 0.01	< 0.01
S3-6-G-12-A	5/3/2012	21.38	58.24	79.61	13.78	6.6	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-H-12-A	5/3/2012	19.75	57.62	77.36	17.31	5.33	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-I-12-A	5/3/2012	23.63	63.11	86.75	12.4	0.85	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-J-12-A	5/3/2012	4.41	11.89	16.3	8.49	24.38	34.68	14.39	1.76	< 0.01
S3-6-K-12-A	5/3/2012	4.32	12	16.32	7.57	18.7	37.19	19.5	0.73	< 0.01
S3-7-A-12-A	5/3/2012	3.69	20.9	24.59	11.8	17.6	31.69	13.9	0.43	< 0.01
S3-7-B-12-A	5/3/2012	9.76	40.5	50.26	18.8	17.1	9.67	4.14	0.02	< 0.01
S3-7-C-12-A	5/3/2012	19.81	50.2	70.01	17.7	11.6	0.69	< 0.01	< 0.01	< 0.01
S3-7-D-12-A	5/3/2012	28.1	61.91	90.01	8.16	1.83	< 0.01	< 0.01	< 0.01	< 0.01
S3-7-E-12-A	5/3/2012	30.56	65.7	96.26	3.74	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-7-F-12-A	5/3/2012	25.61	65.1	90.71	9.28	0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-7-G-12-A	5/3/2012	25.98	64.41	90.39	9.58	0.03	< 0.01	< 0.01	< 0.01	< 0.01
S3-7-H-12-A	5/3/2012	6.12	15.8	21.92	7.98	15.1	31.1	20.5	3.41	< 0.01
S3-7-I-12-A	5/3/2012	1.81	6.11	7.92	4.63	13.71	43.14	27.83	2.77	< 0.01
S3-7-J-12-A	5/3/2012	2.09	7.15	9.24	4.63	10.8	31.71	33.51	10.1	< 0.01
S3-7-K-12-A	5/3/2012	3.02	7.9	10.92	4.73	8.31	24.72	30.28	6.57	14.48

Notes:
Bold = detected result
< = less than listed method detection limit
mm = millimeters

Table 10
Pesticide and PCB Results for Archived Samples

	Composite Area ORFP-7,9,10,11,12,13																		Composite Area ORFP-8,14,15,16													Nestor Creek						
Parameter	ORFP-7-A-12-A	ORFP-7-B-12-A	ORFP-7-C-12-A	ORFP-9-A-12-A	ORFP-9-B-12-A	ORFP-9-C-12-A	ORFP-10-A-12-A	ORFP-10-B-12-A	ORFP-10-C-12-A	ORFP-11-A-12-A	ORFP-11-B-12-A	ORFP-11-C-12-A	ORFP-12-A-12-A	ORFP-12-B-12-A	ORFP-12-C-12-A	ORFP-13-A-12-A	ORFP-13-B-12-A	ORFP-13-C-12-A	ORFP-8,14,15,16-A-12	ORFP-8-A-12-A	ORFP-8-B-12-A	ORFP-8-C-12-A	ORFP-14-A-12-A	ORFP-14-B-12-A	ORFP-14-C-12-A	ORFP-15-A-12-A	ORFP-15-B-12-A	ORFP-15-C-12-A	ORFP-16-A-12-A	ORFP-16-B-12-A	ORFP-16-C-12-A	NC-A-12	NC-1-A-12-A	NC-1-B-12-A	NC-1-C-12-A	NC-2-A-12-A	NC-2-B-12-A	NC-2-C-12-A
	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012
Conventional Parameters (%)																																						
Total solids	92.3	88.8	78.4	92.6	89.5	82.1	96	92.5	88.3	95.2	88.6	91.3	96.4	88.3	83.1	85.3	80.4	91.8	97.3	96.8	96.7	80.6	96.7	94.4	86.5	96	95.1	90.6	93.6	69.8	77.2	59	45.9	69.5	72.8	76.7	72.7	69.2
Pesticides (µg/kg)																																						
2,4'-DDD	2.2	< 0.38	< 0.43	2.5	< 0.38	< 0.41	< 0.35	< 0.37	< 0.38	1.1	< 0.38	< 0.37	< 0.35	0.95 J	0.76 J	< 0.40	< 0.42	< 0.37	NA	27	< 0.35	< 0.42	19	< 0.36	< 0.39	49	1.2	7.1	160	13	< 0.44	NA	2.00 J	< 0.49	< 0.47	6.1	< 0.47	< 0.49
2,4'-DDE	3.6	< 0.34	< 0.39	< 0.33	< 0.34	< 0.37	11	< 0.33	< 0.35	< 0.32	< 0.34	< 0.33	< 0.32	< 0.35	< 0.37	< 0.36	< 0.38	4.2	NA	25	0.99 J	< 0.38	21	< 0.32	< 0.35	32	1.00 J	4.3	66	5.1	< 0.40	NA	< 0.67	< 0.44	< 0.42	4.6	< 0.42	< 0.44
2,4'-DDT	1.9	< 0.34	< 0.38	2.2	< 0.34	< 0.37	< 0.31	< 0.32	< 0.34	< 0.32	0.61 J	< 0.33	< 0.31	< 0.34	< 0.36	< 0.35	< 0.37	19	NA	150	< 0.31	< 0.37	140	6.3	< 0.35	240	13	28	230	18	< 0.39	NA	< 0.65	< 0.43	< 0.41	16	0.44 J	< 0.43
4,4'-DDD	7.6	< 0.36	< 0.40	6.4	0.59 J	< 0.38	< 0.33	1.2	0.47 J	2	0.65 J	1.8	1.9	2.1	8.8	1.6	< 0.39	< 0.34	NA	< 3.30	< 0.33	< 0.39	< 3.30	< 0.33	< 0.37	130	< 0.33	15	< 3.40	< 0.45	< 0.41	NA	1.80 J	< 0.45	< 0.43	15	1.20 J	< 0.46
4,4'-DDE	33	0.71 J	< 0.38	43	5.3	< 0.36	24	7.3	2.1	6.7	1.6	2.4	12	11	5.9	1.2	< 0.37	30	NA	890	14	7.2	680	42	2.9	1300	45	140	1700	150	2.3	NA	5.3	0.95 J	0.58 J	170	6.7	0.90 J
4,4'-DDT	9.1	< 0.38	< 0.43	6.3	0.70 J	< 0.41	< 0.35	0.68 J	< 0.38	3.5	3.2	3.6	1.2	0.71 J	< 0.40	3.3	< 0.42	170	NA	320	1.6	1.6	310	13	1.10 J	720	35	84	590	33	< 0.43	NA	< 0.73	< 0.48	< 0.46	67	0.95 J	< 0.48
Total DDTs (ND = 0)	57.4	0.71	< 0.43	60.4	6.59	< 0.41	35	9.18	2.57	13.3	6.06	7.8	15.1	14.76	15.46	6.1	< 0.42	223.2	NA	1412	16.59	8.8	1170	61.3	4	2471	95.2	278.4	2746	219.1	2.3	NA	9.1	0.95	0.58	278.7	9.29	0.9
Aldrin	< 0.34	< 0.35	< 0.40	< 0.34	< 0.35	< 0.38	< 0.33	< 0.34	< 0.36	< 0.33	< 0.36	< 0.34	< 0.33	< 0.36	< 0.38	< 0.37	< 0.39	< 0.34	NA	< 3.30	< 0.33	< 0.39	< 3.30	< 0.33	< 0.36	< 3.30	< 0.33	< 0.35	< 3.40	< 0.45	< 0.41	NA	< 0.69	< 0.45	< 0.43	< 0.41	< 0.43	< 0.45
Alpha Chlordane	< 0.35	< 0.36	< 0.41	< 0.35	< 0.36	< 0.39	< 0.33	< 0.35	< 0.36	< 0.34	< 0.36	< 0.35	< 0.33	< 0.36	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.30	< 0.33	< 0.40	< 3.30	< 0.34	< 0.37	< 3.30	< 0.34	< 0.35	< 3.40	< 0.46	< 0.42	NA	< 0.70	< 0.46	< 0.44	< 0.42	< 0.44	< 0.46
alpha-BHC	< 0.35	< 0.36	< 0.41	< 0.35	< 0.36	< 0.39	< 0.34	< 0.35	< 0.37	< 0.34	< 0.37	< 0.35	< 0.34	< 0.37	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.30	< 0.34	< 0.40	< 3.40	< 0.34	< 0.37	< 3.40	< 0.34	< 0.36	< 3.50	< 0.46	< 0.42	NA	< 0.71	< 0.47	< 0.45	< 0.42	< 0.45	< 0.47
beta-BHC	< 0.29	< 0.30	< 0.34	< 0.29	< 0.30	< 0.32	< 0.28	< 0.29	< 0.30	< 0.28	< 0.30	< 0.29	< 0.27	< 0.30	< 0.32	< 0.31	< 0.33	< 0.29	NA	< 2.70	< 0.27	< 0.33	< 2.70	< 0.28	< 0.31	< 2.80	0.31 J	< 0.29	< 2.80	< 0.38	< 0.34	NA	< 0.58	< 0.38	< 0.36	< 0.34	< 0.36	< 0.38
Chlordane (Technical)	32	< 3.70	< 4.20	< 3.50	< 3.70	< 4.00	< 3.40	< 3.50	< 3.70	< 3.40	< 3.70	< 3.60	< 3.40	< 3.70	< 3.90	< 3.80	< 4.10	120	NA	64	< 3.40	< 4.10	49	< 3.50	< 3.80	130	< 3.40	23	170	17	< 4.20	NA	< 7.10	< 4.70	< 4.50	36	< 4.50	< 4.70
Cis-nonachlor	< 0.32	< 0.33	< 0.37	< 0.32	< 0.33	< 0.36	20	< 0.32	< 0.33	< 0.31	< 0.33	< 0.32	< 0.30	< 0.33	< 0.35	< 0.34	< 0.37	< 0.32	NA	< 3.00	< 0.30	< 0.36	< 3.00	< 0.31	< 0.34	< 3.10	< 0.31	< 0.32	< 3.10	< 0.42	< 0.38	NA	< 0.64	< 0.42	< 0.40	< 0.38	< 0.40	< 0.42
delta-BHC	< 0.28	< 0.29	< 0.33	< 0.28	< 0.29	< 0.31	< 0.27	< 0.28	< 0.29	< 0.27	< 0.29	< 0.28	< 0.27	< 0.29	< 0.31	< 0.30	< 0.32	< 0.28	NA	< 2.60	< 0.26	< 0.32	< 2.60	< 0.27	0.38 J	< 2.70	< 0.27	< 0.28	< 2.70	< 0.37	< 0.33	NA	< 0.56	< 0.37	< 0.35	< 0.33	< 0.35	< 0.37
Dieldrin	< 0.36	< 0.37	< 0.42	< 0.36	< 0.37	< 0.40	< 0.34	< 0.36	< 0.37	< 0.35	< 0.37	< 0.36	< 0.34	< 0.37	< 0.40	< 0.39	< 0.41	4.8	NA	< 3.40	0.63 J	< 0.41	< 3.40	2.4	0.39 J	< 3.40	< 0.35	< 0.36	< 3.50	< 0.47	< 0.43	NA	< 0.72	< 0.47	< 0.45	< 0.43	< 0.45	< 0.48
Endosulfan sulfate	< 0.37	< 0.38	< 0.43	< 0.36	< 0.38	< 0.41	< 0.35	< 0.37	< 0.38	< 0.35	< 0.38	< 0.37	< 0.35	< 0.38	< 0.41	< 0.40	< 0.42	< 0.37	NA	< 3.50	< 0.35	< 0.42	< 3.50	< 0.36	< 0.39	< 3.50	< 0.36	< 0.37	< 3.60	< 0.48	< 0.44	NA	< 0.74	< 0.49	< 0.46	< 0.44	< 0.46	< 0.49
Endosulfan-alpha (I)	< 0.28	< 0.30	< 0.33	< 0.28	< 0.29	< 0.32	< 0.27	< 0.28	< 0.30	< 0.28	< 0.30	< 0.29	< 0.27	< 0.30	< 0.32	< 0.31	< 0.33	< 0.29	NA	< 2.70	< 0.27	< 0.33	< 2.70	< 0.28	< 0.30	< 2.70	< 0.28	< 0.29	< 2.80	< 0.38	< 0.34	NA	< 0.57	< 0.38	< 0.36	< 0.34	< 0.36	< 0.38
Endosulfan-beta (II)	< 0.30	< 0.31	< 0.36	< 0.30	< 0.31	< 0.34	< 0.29	< 0.30	< 0.32	< 0.29	< 0.32	< 0.31	< 0.29	< 0.32	< 0.34	< 0.33	< 0.35	< 0.30	NA	< 2.90	< 0.29	< 0.35	< 2.90	< 0.30	< 0.32	< 2.90	< 0.29	< 0.31	< 3.00	< 0.40	< 0.36	NA	< 0.61	< 0.40	< 0.38	< 0.36	< 0.38	< 0.40
Endrin	< 0.39	< 0.40	< 0.46	< 0.39	< 0.40	< 0.44	< 0.37	< 0.39	< 0.41	< 0.38	< 0.40	< 0.39	< 0.37	< 0.41	< 0.43	< 0.42	< 0.45	< 0.39	NA	< 3.70	< 0.37	< 0.44	< 3.70	< 0.38	< 0.41	< 3.70	< 0.38	< 0.40	< 3.80	< 0.51	< 0.46	NA	< 0.78	< 0.52	< 0.49	< 0.47	< 0.49	< 0.52
Endrin aldehyde	< 0.26	< 0.28	< 0.31	< 0.26	< 0.27	< 0.30	< 0.25	< 0.26	< 0.28	< 0.26	< 0.28	< 0.27	< 0.25	< 0.28	< 0.29	< 0.29	< 0.30	< 0.27	NA	< 2.50	< 0.25	< 0.30	< 2.50	< 0.26	< 0.28	< 2.50	< 0.26	< 0.27	< 2.60	< 0.35	< 0.32	NA	< 0.53	< 0.35	< 0.34	< 0.32	< 0.34	< 0.35
Endrin ketone	< 0.38	< 0.39	< 0.44	< 0.37	< 0.39	< 0.42	< 0.36	< 0.38	< 0.39	< 0.36	< 0.39	< 0.38	< 0.36	< 0.39	< 0.42	< 0.41	< 0.43	< 0.38	NA	< 3.60	< 0.36	< 0.43	< 3.60	< 0.37	< 0.40	< 3.60	< 0.37	< 0.38	< 3.70	< 0.50	< 0.45	NA	< 0.76	< 0.50	< 0.48	< 0.45	< 0.48	< 0.50
Gamma Chlordane	< 0.34	< 0.36	< 0.41	< 0.34	< 0.35	< 0.39	< 0.33	< 0.34	< 0.36	< 0.33	< 0.36	< 0.35	< 0.33	< 0.36	< 0.38	< 0.37	< 0.40	< 0.35	NA	< 3.30	< 0.33	< 0.39	< 3.30	< 0.34	< 0.37	4.30 J	< 0.33	< 0.35	< 3.40	< 0.46	< 0.41	NA	< 0.69	< 0.46	< 0.44	< 0.41	< 0.44	< 0.46
gamma-BHC (Lindane)	< 0.38	< 0.39	< 0.44	< 0.37	< 0.39	< 0.42	< 0.36	< 0.37	< 0.39	< 0.36	< 0.39	< 0.38	< 0.36	< 0.39	< 0.42	< 0.41	< 0.43	< 0.38	NA	< 3.60	< 0.36	< 0.43	< 3.60	< 0.37	< 0.40	< 3.60	< 0.36	< 0.38	< 3.70	< 0.50	< 0.45	NA	< 0.75	< 0.50	< 0.48	< 0.45	< 0.48	< 0.50
Heptachlor	< 0.35	< 0.36	< 0.41	< 0.35	< 0.36	< 0.39	< 0.33	< 0.35	< 0.36	< 0.34	< 0.36	< 0.35	< 0.33	< 0.36	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.30	< 0.33	< 0.40	< 3.30	< 0.34	< 0.37	< 3.30	< 0.34	< 0.35	< 3.40	< 0.46	< 0.42	NA	< 0.70	< 0.46	< 0.44	< 0.42	< 0.44	< 0.46
Heptachlor epoxide	< 0.39	< 0.40	0.46 J	< 0.38	< 0.40	< 0.43	< 0.37	< 0.38	< 0.40	< 0.37	< 0.40	< 0.39	< 0.37	< 0.40	< 0.43	< 0.42	< 0.44	< 0.39	NA	< 3.70	< 0.37	< 0.44	< 3.70	< 0.38	< 0.41	< 3.70	< 0.37	< 0.39	< 3.80	< 0.51	< 0.46	NA	< 0.77	< 0.51	< 0.49	< 0.46	< 0.49	< 0.51
Methoxychlor	< 0.35	< 0.37	< 0.41	< 0.35	< 0.36	< 0.40	< 0.34	< 0.35	< 0.37	< 0.34	< 0.37	< 0.36	< 0.34	< 0.37	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.40	< 0.34	< 0.40	< 3.40	< 0.34	< 0.38	< 3.40	< 0.34	< 0.36	< 3.50	< 0.47	< 0.42	NA	< 0.71	< 0.47	< 0.45	< 0.42	< 0.45	< 0.47
Oxychlordane	2.2	< 0.32	< 0.36	43	< 0.31	< 0.34	6.1	< 0.30	< 0.32	6.8	< 0.32	< 0.31	< 0.29	< 0.32	< 0.34	< 0.33	< 0.35	< 0.31	NA	< 2.90	< 0.29	< 0.35	< 2.90	< 0.30	< 0.33	< 2.90	< 0.30	< 0.31	< 3.00	< 0.40	< 0.36	NA	< 0.61	< 0.40	< 0.39	< 0.37	< 0.39	< 0.41
Toxaphene	35	< 7.10	< 8.10	< 6.80	< 7.10	< 7.70	< 6.60	< 6.90	< 7.20	< 6.70	< 7.20	< 6.90	< 6.60	< 7.20	< 7.60	< 7.40	< 7.90	17.00 J	NA	1500	18.00 J	13.00 J	1500	59	9.80 J	2100	150	250	2500	140	< 8.20	NA	< 14.00	< 9.10	< 8.70	160	< 8.70	< 9.20
Trans-nonachlor	< 0.31	< 0.32	< 0.37	< 0.31	< 0.32	< 0.35	< 0.30	< 0.31	< 0.33	< 0.30	< 0.32	< 0.32	< 0.30	< 0.33	< 0.35	< 0.34	< 0.36	< 0.31	NA	< 3.00	< 0.30	< 0.36	< 3.00	< 0.30	< 0.33	< 3.00	< 0.30	< 0.32	< 3.10	< 0.41	< 0.37	NA	< 0.63	< 0.41	< 0.40	< 0.38	< 0.40	< 0.42
Total Chlordanes (ND = 0)	2.2	< 0.36	< 0.41	43	< 0.36	< 0.39	26.1	< 0.35	< 0.36	6.8	< 0.36	< 0.35	< 0.33	< 0.36	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.30	< 0.33	< 0.40	< 3.30	< 0.34	< 0.37	4.3	< 0.34	< 0.35	< 3.40	< 0.46	< 0.42	NA	< 0.70	< 0.46	< 0.44	< 0.42	< 0.44	< 0.46
PCB Congeners (µg/kg)																																						
PCB018	< 0.170	NA	NA	< 0.170	NA	NA	< 0.160	NA	NA	< 0.170	NA	NA	< 0.160	NA	NA	< 0.180	NA	NA	< 0.160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.270	NA	NA	NA	NA	NA	NA
PCB028	< 0.110	NA	NA	< 0.110	NA	NA	0.340 J	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.120	NA	NA	< 0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.190 J	NA	NA	NA	NA	NA	NA
PCB037	< 0.140	NA	NA	< 0.140	NA	NA	< 0.140	NA	NA	< 0.140	NA	NA	< 0.140	NA	NA	< 0.150	NA	NA	< 0.130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.220	NA	NA	NA	NA	NA	NA
PCB044	0.380 J	NA	NA	< 0.140	NA	NA	2.3	NA	NA	< 0.140	NA	NA	< 0.140	NA	NA	< 0.150	NA	NA	< 0.140	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.710 J	NA	NA	NA	NA	NA	NA
PCB049	< 0.130	NA	NA	< 0.130	NA	NA	0.99	NA	NA	< 0.120	NA	NA	< 0.120	NA	NA	< 0.140	NA	NA	< 0.120	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.350 J	NA	NA	NA	NA	NA	NA
PCB052	0.510 J	NA	NA	< 0.100	NA	NA	3.7	NA	NA	0.200 J	NA	NA	< 0.100	NA	NA	< 0.110	NA	NA	0.120 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93	NA	NA	NA	NA	NA	NA
PCB066	0.250 J	NA	NA	< 0.099	NA	NA	1.1	NA	NA	< 0.096	NA	NA	< 0.095	NA	NA	< 0.110	NA	NA	< 0.094	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.660 J	NA	NA	NA	NA	NA	NA
PCB070	0.440 J	NA	NA	< 0.089	NA	NA	2.4	NA	NA	< 0.086	NA	NA	< 0.085	NA	NA	< 0.096	NA	NA	< 0.084	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.560 J	NA	NA	NA	NA	NA	NA
PCB074	0.100 J	NA	NA	< 0.100	NA	NA	0.56	NA	NA	< 0.099	NA	NA	< 0.098	NA	NA	< 0.110	NA	NA	< 0.097	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.380 J	NA	NA	NA	NA	NA	NA
PCB077	< 0.110	NA	NA	< 0.110	NA	NA	0.9	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.110	NA	NA	< 0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.170	NA	NA	NA	NA	NA	NA
PCB081	< 0.130	NA	NA	< 0.130	NA	NA	< 0.130	NA	NA	< 0.130	NA	NA	< 0.130	NA	NA	< 0.140	NA	NA	< 0.130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.210	NA	NA	NA	NA	NA	NA
PCB087	0.56	NA	NA	< 0.110	NA	NA	5.8	NA	NA	0.240 J	NA	NA	< 0.100	NA	NA	< 0.120	NA	NA	0.200 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.320 J	NA	NA	NA	NA	NA	NA
PCB099	0.470 J	NA	NA	< 0.092	NA	NA	4.8	NA	NA	0.260 J	NA	NA	< 0.088	NA	NA	< 0.100	NA	NA	0.170 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.350 J	NA	NA	NA	NA	NA	NA
PCB101	1.2	NA	NA	< 0.088	NA	NA	15	NA	NA	0.62	NA	NA	< 0.084	NA	NA	< 0.095	NA	NA	0.440 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.680 J	NA	NA	NA	NA	NA	NA
PCB105	0.420 J	NA	NA	< 0.110	NA	NA	6.9	NA	NA	0.310 J	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	0.270 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.430 J	NA	NA	NA	NA	NA	NA
PCB110	1.3	NA	NA	< 0.110	NA	NA	14	NA	NA	0.73	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	0.54	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.720 J	NA	NA	NA	NA	NA	NA
PCB114	< 0.110	NA	NA	< 0.110	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.120	NA	NA	< 0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.170	NA	NA	NA	NA	NA	NA
PCB118	1	NA	NA	< 0.140	NA	NA	15	NA	NA	0.450 J	NA	NA	< 0.140	NA	NA	< 0.160	NA	NA	0.340 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.660 J	NA	NA	NA	NA	NA	NA
PCB119	< 0.094	NA	NA	< 0.094	NA	NA	0.220 J	NA	NA	< 0.091	NA	NA	< 0.090	NA	NA	< 0.100	NA	NA	< 0.089	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.150	NA	NA	NA	NA	NA	NA
PCB123	< 0.095	NA	NA	< 0.094	NA	NA	< 0.091	NA	NA	< 0.092	NA	NA	< 0.090	NA	NA	< 0.100	NA	NA	< 0.090	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.150	NA	NA	NA	NA	NA	NA
PCB126	0.280 J	NA	NA	< 0.150	NA	NA	0.290 J	NA	NA	0.260 J	NA	NA	< 0.140	NA	NA	< 0.160	NA	NA	0.300 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.230	NA	NA	NA	NA	NA	NA
PCB128	0.310 J	NA	NA	< 0.110	NA	NA	5.5	NA	NA	0.280 J	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	0.240 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.250 J	NA	NA	NA	NA	NA	NA
PCB138/158	1.4	NA	NA	< 0.220	NA	NA	30	NA	NA	1.1	NA	NA	< 0.210	NA	NA	< 0.240	NA	NA	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.200 J	NA	NA	NA	NA	NA	NA
PCB149	0.83	NA	NA	< 0.097	NA	NA	20	NA	NA	0.7	NA	NA	< 0.093	NA	NA	< 0.100	NA	NA	0.79	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.660 J	NA	NA	NA	NA	NA	NA
PCB151	0.210 J	NA	NA	< 0.110	NA	NA	6.5	NA	NA	0.190 J	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	0.210 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.220 J	NA	NA	NA	NA	NA	NA
PCB153	1.2	NA	NA	< 0.110	NA	NA	31	NA	NA	1	NA	NA	0.130 J	NA	NA	< 0.120	NA	NA	1.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.94	NA	NA	NA	NA	NA	NA
PCB156	< 0.110	NA	NA	< 0.110	NA	NA	3.3	NA	NA	0.150 J	NA	NA	< 0.100	NA	NA	< 0.110	NA	NA	0.100 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.170	NA	NA	NA	NA	NA	NA
PCB157	< 0.100	NA	NA	< 0.100	NA	NA	0.76	NA	NA	< 0.100	NA	NA	< 0.099	NA	NA	< 0.110	NA	NA	< 0.098	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.160	NA	NA	NA	NA	NA	NA
PCB167	< 0.110	NA	NA	< 0.110	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.120	NA	NA	< 0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.170	NA	NA	NA	NA	NA	NA
PCB168	< 0.093	NA	NA	< 0.093	NA	NA	< 0.090	NA	NA	< 0.090	NA	NA	< 0.089	NA	NA	< 0.100	NA	NA	< 0.088	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.150	NA	NA	NA	NA	NA	NA
PCB169	< 0.088	NA	NA	< 0.088	NA	NA	3.7	NA	NA	< 0.086	NA	NA	< 0.085	NA	NA	< 0.096	NA	NA	0.090 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.140	NA	NA	NA	NA	NA	NA
PCB170	0.62	NA	NA	< 0.100	NA	NA	16	NA	NA	0.510 J	NA	NA	< 0.096	NA	NA	< 0.110	NA	NA	0.78	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.630 J	NA	NA	NA	NA	NA	NA
PCB177	< 0.130	NA	NA	< 0.130	NA	NA	6.7	NA	NA	< 0.130	NA	NA	< 0.130	NA	NA	< 0.140	NA	NA	0.230 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.210	NA	NA	NA	NA	NA	NA
PCB180	0.82	NA	NA	< 0.066	NA	NA	31	NA	NA	0.66	NA	NA	0.095 J	NA	NA	< 0.072	NA	NA	0.94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.820 J	NA	NA	NA	NA	NA	NA
PCB183	0.170 J	NA	NA	< 0.120	NA	NA	6.5	NA	NA	0.140 J	NA	NA	< 0.120	NA	NA	< 0.130	NA	NA	0.190 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.190	NA	NA	NA	NA	NA	NA
PCB187	0.380 J	NA	NA	< 0.110	NA	NA	20	NA	NA	0.390 J	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	0.57	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.540 J	NA	NA	NA	NA	NA	NA
PCB189	< 0.093	NA	NA	< 0.092	NA	NA	0.350 J	NA	NA	< 0.090	NA	NA	< 0.089	NA	NA	< 0.100	NA	NA	< 0.088	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.150	NA	NA	NA	NA	NA	NA
PCB194	0.270 J	NA	NA	< 0.100	NA	NA	13	NA	NA	0.350 J	NA	NA	< 0.099	NA	NA	< 0.110	NA	NA	0.390 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.540 J	NA	NA	NA	NA	NA	NA
PCB201	< 0.062	NA	NA	< 0.062	NA	NA	1.3	NA	NA	< 0.060	NA	NA	< 0.059	NA	NA	< 0.067	NA	NA	< 0.059	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.097	NA	NA	NA	NA	NA	NA
PCB206	0.320 J	NA	NA	< 0.089	NA	NA	5.2	NA	NA	0.360 J	NA	NA	< 0.086	NA	NA	< 0.097	NA	NA	< 0.085	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.410 J	NA	NA	NA	NA	NA	NA
Total PCB Congeners (ND = 0)	13.44	NA	NA	< 0.220	NA	NA	275.11	NA	NA	8.9	NA	NA	0.225	NA	NA	< 0.240	NA	NA	9.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13.15	NA	NA	NA	NA	NA	NA

Table 10
Pesticide and PCB Results for Archived Samples

Parameter	Subarea 3																				
	S3-1-A-12-A	S3-1-B-12-A	S3-1-C-12-A	S3-2-A-12-A	S3-2-B-12-A	S3-2-C-12-A	S3-3-A-12-A	S3-3-B-12-A	S3-3-C-12-A	S3-4-A-12-A	S3-4-B-12-A	S3-4-C-12-A	S3-5-A-12-A	S3-5-B-12-A	S3-5-C-12-A	S3-6-A-12-A	S3-6-B-12-A	S3-6-C-12-A	S3-7-A-12-A	S3-7-B-12-A	S3-7-C-12-A
	5/4/2012	5/4/2012	5/4/2012	5/3/2012	5/3/2012	5/3/2012	5/3/2012	5/3/2012	5/3/2012	5/3/2012	5/3/2012	5/3/2012	5/4/2012	5/4/2012	5/4/2012	5/3/2012	5/3/2012	5/3/2012	5/3/2012	5/3/2012	5/3/2012
Conventional Parameters (%)																					
Total solids	**96.4**	**95.8**	**86.9**	**88.8**	**93.7**	**85.8**	**93.2**	**95.6**	**86.5**	**89.4**	**87.3**	**95.8**	**96.4**	**94.6**	**89.9**	**96.6**	**94.8**	**85.2**	**93.7**	**86.2**	**90.4**
Pesticides (µg/kg)																					
2,4'-DDD	**1.00 J**	< 0.35	< 0.39	**4.6**	**1.1**	< 0.39	< 0.36	< 0.35	< 0.39	< 0.38	< 0.39	**2.9**	< 3.50	< 0.36	< 0.38	**5.9**	< 0.36	< 0.40	**2.8**	< 0.39	< 0.37
2,4'-DDE	**8**	**3.1**	< 0.35	**7.2**	**1.2**	< 0.36	**6**	< 0.32	< 0.35	< 0.34	< 0.35	**6.9**	**12**	**2.3**	< 0.34	< 0.32	< 0.32	< 0.36	**7.5**	< 0.35	< 0.34
2,4'-DDT	**44**	**18**	< 0.35	**57**	**3.3**	< 0.35	**50**	< 0.31	< 0.35	< 0.34	< 0.34	**56**	**120**	**23**	**0.96 J**	**5.7**	< 0.32	< 0.35	**43**	< 0.35	< 0.33
4,4'-DDD	**27**	**6.7**	< 0.36	**9.8**	**4.5**	< 0.37	**16**	< 0.33	< 0.37	< 0.35	**0.44 J**	< 0.33	< 3.30	< 0.33	< 0.35	< 0.33	**4.1**	< 0.37	< 0.34	**0.38 J**	< 0.35
4,4'-DDE	**290**	**150**	**0.98 J**	**260**	**47**	**0.36 J**	**300**	**1.8**	**0.47 J**	**0.49 J**	**2.1**	**300**	**410**	**97**	**4.6**	**120**	**3.8**	**1.3**	**330**	**3.1**	< 0.33
4,4'-DDT	**110**	**41**	< 0.39	**140**	**6.9**	< 0.39	**160**	< 0.35	< 0.39	< 0.37	**0.47 J**	**150**	**220**	**43**	**2.3**	**77**	< 0.35	**1.10 J**	**140**	**0.87 J**	< 0.37
Total DDTs (ND = 0)	**480**	**218.8**	**0.98**	**478.6**	**64**	**0.36**	**532**	**1.8**	**0.47**	**0.49**	**3.01**	**515.8**	**762**	**165.3**	**7.86**	**208.6**	**7.9**	**2.4**	**523.3**	**4.35**	< 0.37
Aldrin	< 0.33	< 0.33	< 0.36	< 0.35	< 0.34	< 0.37	< 0.34	< 0.33	< 0.36	< 0.35	< 0.36	< 0.33	< 3.30	< 0.33	< 0.35	< 0.33	< 0.33	< 0.37	< 0.34	< 0.37	< 0.35
Alpha Chlordane	< 0.33	< 0.33	< 0.37	< 0.36	< 0.34	< 0.37	< 0.34	< 0.34	< 0.37	< 0.36	< 0.37	< 0.33	< 3.30	< 0.34	< 0.36	< 0.33	< 0.34	< 0.38	< 0.34	< 0.37	< 0.35
alpha-BHC	< 0.34	< 0.34	< 0.37	< 0.36	< 0.35	< 0.38	< 0.35	< 0.34	< 0.37	< 0.36	< 0.37	< 0.34	< 3.40	< 0.34	< 0.36	< 0.34	< 0.34	< 0.38	< 0.35	< 0.38	< 0.36
beta-BHC	< 0.27	< 0.28	< 0.30	< 0.30	< 0.28	< 0.31	< 0.28	< 0.28	< 0.31	< 0.30	< 0.30	< 0.28	< 2.70	< 0.28	< 0.29	< 0.27	< 0.28	< 0.31	< 0.28	< 0.31	< 0.29
Chlordane (Technical)	**74**	**40**	< 3.80	**40**	< 3.50	< 3.80	**64**	< 3.40	< 3.80	< 3.70	< 3.70	**120**	**86**	**13**	< 3.60	**720**	**7.80 J**	**12**	**140**	< 3.80	< 3.60
Cis-nonachlor	< 0.30	< 0.31	< 0.34	< 0.33	< 0.31	< 0.34	< 0.32	< 0.31	< 0.34	< 0.33	< 0.34	< 0.31	< 3.00	< 0.31	< 0.33	< 0.30	< 0.31	< 0.34	< 0.31	< 0.34	< 0.32
delta-BHC	< 0.27	< 0.27	< 0.29	< 0.29	< 0.27	< 0.30	< 0.27	< 0.27	< 0.30	< 0.29	< 0.29	< 0.27	< 2.70	< 0.27	< 0.28	< 0.26	< 0.27	< 0.30	< 0.27	< 0.30	< 0.28
Dieldrin	< 0.34	< 0.34	< 0.38	**23**	**2**	< 0.38	**41**	**0.66 J**	< 0.38	< 0.37	< 0.38	< 0.34	< 3.40	< 0.35	< 0.37	< 0.34	**1.7**	< 0.39	< 0.35	**0.72 J**	< 0.36
Endosulfan sulfate	< 0.35	< 0.35	< 0.39	< 0.38	< 0.36	< 0.39	< 0.36	< 0.35	< 0.39	< 0.38	< 0.39	< 0.35	< 3.50	< 0.36	< 0.38	< 0.35	< 0.36	< 0.40	< 0.36	< 0.39	< 0.37
Endosulfan-alpha (I)	< 0.27	< 0.27	< 0.30	< 0.30	< 0.28	< 0.31	< 0.28	< 0.27	< 0.30	< 0.29	< 0.30	< 0.27	< 2.70	< 0.28	< 0.29	< 0.27	< 0.28	< 0.31	< 0.28	< 0.30	< 0.29
Endosulfan-beta (II)	< 0.29	< 0.29	< 0.32	< 0.31	< 0.30	< 0.33	< 0.30	< 0.29	< 0.32	< 0.31	< 0.32	< 0.29	< 2.90	< 0.30	< 0.31	< 0.29	< 0.29	< 0.33	< 0.30	< 0.32	< 0.31
Endrin	< 0.37	< 0.37	< 0.41	< 0.40	< 0.38	< 0.42	< 0.38	< 0.37	< 0.41	< 0.40	< 0.41	< 0.37	< 3.70	< 0.38	< 0.40	< 0.37	< 0.38	< 0.42	< 0.38	< 0.42	< 0.40
Endrin aldehyde	< 0.25	< 0.25	< 0.28	< 0.28	< 0.26	< 0.28	< 0.26	< 0.26	< 0.28	< 0.27	< 0.28	< 0.25	< 2.50	< 0.26	< 0.27	< 0.25	< 0.26	< 0.29	< 0.26	< 0.28	< 0.27
Endrin ketone	< 0.36	< 0.36	< 0.40	< 0.39	< 0.37	< 0.40	< 0.37	< 0.36	< 0.40	< 0.39	< 0.40	< 0.36	< 3.60	< 0.37	< 0.39	< 0.36	< 0.37	< 0.41	< 0.37	< 0.40	< 0.38
Gamma Chlordane	< 0.33	< 0.33	< 0.37	< 0.36	< 0.34	< 0.37	< 0.34	< 0.33	< 0.37	< 0.36	< 0.36	< 0.33	< 3.30	< 0.34	< 0.35	< 0.33	< 0.34	< 0.37	< 0.34	< 0.37	< 0.35
gamma-BHC (Lindane)	< 0.36	< 0.36	< 0.40	< 0.39	< 0.37	< 0.40	< 0.37	< 0.36	< 0.40	< 0.39	< 0.40	< 0.36	< 3.60	< 0.37	< 0.39	< 0.36	< 0.37	< 0.41	< 0.37	< 0.40	< 0.38
Heptachlor	< 0.33	< 0.34	< 0.37	< 0.36	< 0.34	< 0.37	< 0.34	< 0.34	< 0.37	< 0.36	< 0.37	< 0.34	< 3.30	< 0.34	< 0.36	< 0.33	< 0.34	< 0.38	< 0.34	< 0.37	< 0.36
Heptachlor epoxide	< 0.37	< 0.37	< 0.41	< 0.40	< 0.38	< 0.41	< 0.38	< 0.37	< 0.41	< 0.40	< 0.41	< 0.37	< 3.70	< 0.38	< 0.40	< 0.37	< 0.38	< 0.42	< 0.38	< 0.41	< 0.39
Methoxychlor	< 0.34	< 0.34	< 0.37	< 0.37	< 0.35	< 0.38	< 0.35	< 0.34	< 0.38	< 0.36	< 0.37	< 0.34	< 3.40	< 0.34	< 0.36	< 0.34	< 0.34	< 0.38	< 0.35	< 0.38	< 0.36
Oxychlordane	< 0.29	< 0.29	< 0.32	< 0.32	< 0.30	< 0.33	< 0.30	< 0.29	< 0.33	< 0.31	< 0.32	< 0.29	< 2.90	< 0.30	< 0.31	< 0.29	< 0.30	< 0.33	< 0.30	< 0.33	< 0.31
Toxaphene	**1000**	**220**	< 7.30	**480**	< 6.80	< 7.40	**360**	< 6.60	< 7.30	< 7.10	< 7.30	**960**	**1700**	**250**	**19.00 J**	**160**	**7.90 J**	< 7.40	**960**	**14.00 J**	< 7.00
Trans-nonachlor	< 0.30	< 0.30	< 0.33	< 0.32	< 0.31	< 0.34	< 0.31	< 0.30	< 0.33	< 0.32	< 0.33	< 0.30	< 3.00	< 0.30	< 0.32	< 0.30	< 0.30	< 0.34	< 0.31	< 0.33	< 0.32
Total Chlordanes (ND = 0)	< 0.33	< 0.33	< 0.37	< 0.36	< 0.34	< 0.37	< 0.34	< 0.34	< 0.37	< 0.36	< 0.37	< 0.33	< 3.30	< 0.34	< 0.36	< 0.33	< 0.34	< 0.38	< 0.34	< 0.37	< 0.35
PCB Congeners (µg/kg)																					
PCB018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB028	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB037	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB044	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB049	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB052	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB066	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB070	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB074	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB077	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB081	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB087	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB099	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB101	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB105	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB110	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB118	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB119	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB138/158	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB149	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB151	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB153	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB157	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB168	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB169	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB170	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB177	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB183	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB194	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB201	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB206	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCB Congeners (ND = 0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Bold = detected result
< = less than listed method detection limit
J = indicates an estimated value
µg/kg = micrograms per kilogram
NA = not analyzed
ND = non-detect
Non-detect samples are reported as less than method detection limit.
For calculated total chemicals (Total DDTs, PAHs, PCBs, and Chlordane) only detected compounds were summed.
Total DDTs are the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.
Total Chlordanes are the sum of Alpha Chlordane, Gamma Chlordane, Cis-Nonachlor, Oxychlordane, and Trans-Nonachlor.

3.2.2.2 PCBs

PCBs were detected in composite archive samples from ORFP-8,14,15,16 and Nestor Creek. Total PCB concentrations were 9.61 and 13.15 micrograms per kilogram (µg/kg), respectively.

For the composite archive sample from ORFP-7,9,10,11,12,13, PCBs were detected in ORFP-7, ORFP-10, ORFP-11, and ORFP-12. Concentrations were substantially higher at OERFP-10 when compared to the other stations.

3.3 Quality Assurance/Quality Control Summary

A review of analytical results was conducted to evaluate the laboratory performance in meeting quality assurance/quality control (QA/QC) guidelines outlined in the SAP (Anchor QEA 2012). Data validation reports generated by Anchor QEA are presented in Appendix C. All composite samples were analyzed within holding times. Archived samples were frozen prior to holding time expiration and remained in that condition until analysis. Generally, QA/QC sample results were within the project-specified and/or laboratory control limits, with the following exceptions:

- Composite samples
  - Arsenic, nickel, and several SVOCs were detected in method blanks. All concentrations detected in method blanks were at levels below reporting limits.
  - The matrix spike (MS) and/or matrix spike duplicate (MSD) percent recovery (%R) values for lead and zinc were outside the project-specific control limits.
  - The MS and/or MSD %R values and/or relative percent difference (RPD) values for several pesticides were greater than control limits.
  - The MS and/or MSD RPD values for four SVOCs were greater than control limits.
- Archive samples
  - The pesticide surrogate %R values were greater than control limits due to matrix interference in 10 samples.
  - The PCB surrogate %R values were greater than control limits due to matrix interference in two samples.

- The MS and/or MSD %R values and/or RPD values for several pesticides were outside control limits.

4 REFERENCES

Anchor QEA, L.P., 2012. *Sampling and Analysis Plan for Otay River Estuary Restoration Soil Characterization Program*. Prepared for Poseidon Resources, LLC. April 2012.

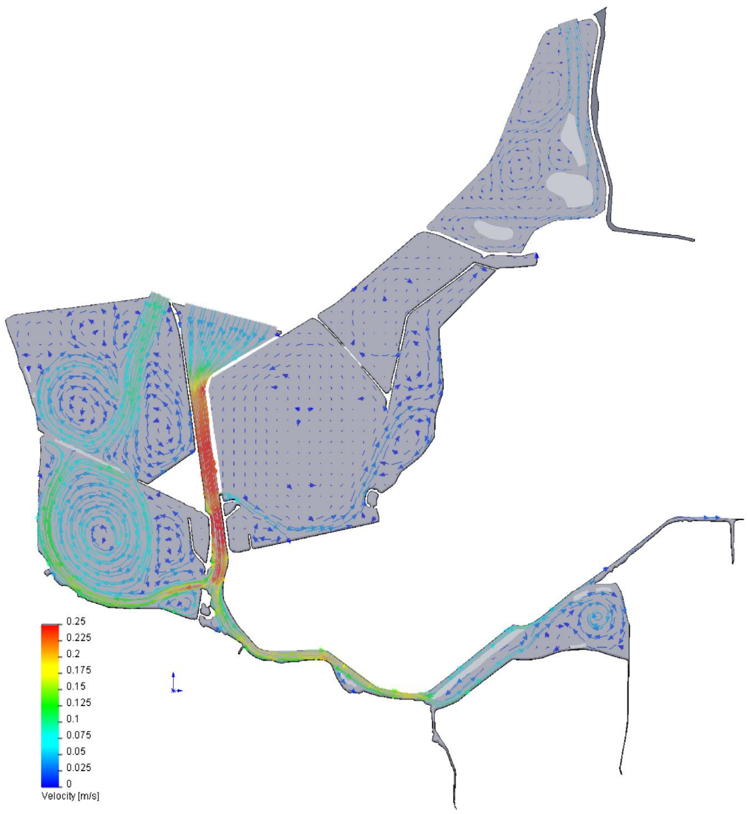
LIST OF APPENDICES

APPENDIX G

Tidal Hydraulics Analysis

Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan

by
Scott A. Jenkins, Ph. D. & Joseph Wasyl



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Draft: 23 September 2014

Table of Contents

ABSTRACT: This study employs a well-tested and peer-reviewed hydrodynamic model to evaluate the tidal hydraulics the Intertidal Alternative and the Subtidal Alternative for the Otay River Estuary Restoration Project (ORERP). Both alternatives involve restoration of a portion of the Otay River Floodplain Site and Pond 15 Site to native habitat by lowering the existing ground elevations in the Otay River Floodplain Site and using the excavated soils from the Otay River Floodplain Site as fill material in the Pond 15 Site.

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). The analysis is based on updated bathymetry provided by Wetlands Research Associates (WRA) and latest updates to San Diego Bay tides for the 1983-2001 tidal epoch supported by Otay Sonde tidal elevation measurements at the mouth of the Otay River. The computer models used in this study are 2-dimensional finite element types, built from some well-studied and proven computational methods and numerical architecture that have been successful in predicting shallow water tidal propagation. Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a calibration proxy for the restoration alternatives because of morphologic similarities: in particular, both the San Dieguito and restoration sites have a long “goose-neck” feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). The hydroperiod functions were calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

The elevation breaks (zonation) between the different wetland habitat types from the modeled hydroperiod curves are summarized below in Tables ES-1 and ES-2 for the Intertidal Alternative; and in Tables ES-3 and ES-4 for the Subtidal Alternative. The elevations for the habitat breaks in these tables are applied to the KTUA grading designs and yield the acreages of habitat creation listed in Table ES-5 for the Intertidal Alternative at present sea level, and at 2050 sea levels in Table ES-6.The companion set of habitat creation acres for the Subtidal Alternative are listed in Table ES-7 at present sea level, and in Table ES-8 at 2050 sea levels. Comparing Tables ES-5 and ES-7, it is apparent that the Intertidal Alternative creates an additional 1.37 acres of habitat in 2018 than does the Subtidal Alternative. For all possible sea level scenarios, the elevation limit of subtidal habitat in the floodplain basin of both restoration alternatives is limited by existing bars, hummocks and other channel bottom features at the inlet and inside the branch channel into this basin. These channel bottom features create an inlet sill at 0.0 ft NAVD 88. However, if sea level were to rise by 2 ft. according to the maximum sea level rise prediction in 2050, the available tidal range is not sufficient to prevent a rise in subtidal elevations in Pond # 15 of either restoration alternative. This amount of sea level rise will raise the elevations of the

zonation of all habitat types. This upward displacement of wetland zonation is largest for the linear superposition scenario of sea level rise, because the spectral correction scenario predicts a larger tidal range of about 1.0 ft. Under the 24 in. spectral sea level rise scenario at 2050, intertidal wetland habitat would begin at an elevation of between -0.25 ft. and -0.20 ft NAVD, and the mud flat habitat would reside about 0.4 ft. to 0.5 ft. lower than under the linear super-position scenario; while the low marsh habitat would reside about 0.25 ft. lower than under the linear super-position scenario. Therefore there are some apparent differences between the habitat mix predictions of these two sea-level rise prediction methods; although both give the same estimate of the maximum elevation of high salt marsh wetland zonation in both of the proposed basins of the restoration alternatives.

From model simulations of tidal currents throughout complete spring-neap tidal cycles, it is concluded that both source water inlets to the tidal basins of the Intertidal and Subtidal Alternatives are stable and immune to closure or restriction by sedimentation under dry weather tidal exchange. (Wet-weather conditions are addressed in a companion study, Everest, 2014). Inlet sedimentation due to influxes of wave driven long-shore transport of sand (as occurs on the open coast), does not occur in the fetch limited environment of South San Diego Bay. The mouth of the Otay River that supplies source water to the floodplain tidal basin is in a dynamic steady-state equilibrium that is neither depositional nor erosional; while the inlet to Pond 15 will remain in a non-equilibrium stationary state (as-built) in the absence of a local sediment sources or adequate fluid forcing by waves and currents that might otherwise import sediment from more distant sources.

Table ES-1: Elevations of Upper Limits of Habitat Breaks Intertidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.40 ft.	3.40 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.55 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.05 ft.	9.71 ft.	9.71 ft.

Table ES-2: Elevations of Upper Limits of Habitat Breaks in the Intertidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.25 ft.
Frequently Flooded Mud Flat	2.40 ft.	2.50 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table ES-3: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.38 ft.	3.40 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.52 ft.	6.25 ft.
Mid Marsh	6.27 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.10 ft.	9.71 ft.	9.71 ft.

Table ES-4: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.20 ft.
Frequently Flooded Mud Flat	2.35 ft.	2.50 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table ES-5: Intertidal Alternative Predicted Habitat Distribution, acres 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0.00	9.53
Mudflat – Frequently Flooded	4.45	16.36
Mudflat – Frequently Exposed	0.70	1.57
Low Marsh	10.34	15.73
Mid Marsh	10.99	34.47
High Marsh	3.23	5.61
Total Marsh	29.26	80.68
Transitional	0.45	2.59
Total Created Habitat	**29.71**	**83.27**

Table ES-6: Intertidal Alternative Predicted Habitat Distribution, acres 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0	9.35
Mudflat – Frequently Flooded	8.84	17.06
Mudflat – Frequently Exposed	2.21	1.85
Low Marsh	7.91	17.32
Mid Marsh	10.36	35.38
High Marsh	0.52	2.87
Total Created Habitat	**29.84**	**83.83**

Table ES-7: Subtidal Alternative Predicted Habitat Distribution, acres, 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.17
Mudflat – Frequently Flooded	5.26	14.70
Mudflat – Frequently Exposed	1.79	1.32
Low Marsh	8.64	11.77
Mid Marsh	7.90	33.25
High Marsh	1.64	11.78
Total Salt Marsh	29.71	82.00
Transitional	0.45	2.15
Total Created Habitat	**29.26**	**79.85**

Table ES-8: Subtidal Alternative Predicted Habitat Distribution, acres, 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.0
Mudflat – Frequently Flooded	110.01	15.28
Mudflat – Frequently Exposed	1.70	1.58
Low Marsh	5.43	12.68
Mid Marsh	6.71	41.20
High Marsh	0.52	3..06
Total Created Habitat	**29.85**	**82.80**

Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan

by: Scott A. Jenkins, Ph. D. and Joseph Wasyl

1) Introduction:

The Otay River Estuary Restoration Project (ORERP) is a partnership between Poseidon Water (Channelside) L.P. (Poseidon), the U.S. Fish and Wildlife Service (Service or USFWS), and San Diego Bay National Wildlife Refuge (Refuge). The ORERP project involves the creation, restoration, and enhancement of 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 Refuge (Figure 1).

There are two restoration alternatives considered in this study: *The Intertidal Plan*, and *The Sub-tidal Plan*. Both alternatives involve restoration of the two noncontiguous sites outlined in red in Figure 2, including the Otay River Floodplain Site (identified in Figure 3) and the Pond 15 Site, as labeled in Figure 1. The approximately 78-acre Otay River Floodplain Site is located west of Interstate 5 (I-5) between Main Street to the north and Palm Avenue to the south (cf Figures 2 & 3). The approximately 90-acre Pond 15 Site is located approximately 0.75 miles north of the Otay River Floodplain Site and directly south of the Chula Vista Marina (cf Figure 1).

Both alternatives involve restoration of a portion of the Otay River Floodplain Site and Pond 15 Site to native habitat by lowering the existing ground elevations in the Otay River Floodplain Site and using the excavated soils from the Otay River Floodplain Site as fill material in the Pond 15 Site. Both alternatives would impact identical footprints on the two noncontiguous sites shown in Figure 2, with the variance relating to the habitat implemented within this site boundary. Both alternatives would permanently impact approximately 34 acres on the 78-acre Otay River Floodplain Site. The remaining 60 acres of the Otay River Floodplain Site east of Nestor Creek include soil contamination from prior agricultural use as well as cultural resources which would be avoided under both alternatives. Under both restoration alternatives, 88 acres of the approximately 90-acre Pond 15 Site would be permanently impacted by proposed habitat restoration. Under both restoration alternatives the Otay River Floodplain Site would be excavated to a range of elevations and then vegetated to create tidally influenced wetlands communities. The excavated materials from the Otay River Floodplain Site would be transferred to the Pond 15 Site to raise to the appropriate elevations to support a range of wetlands that would also be tidally influenced once an approximately 200 foot wide portion of the levee separating the Pond 15 Site from San Diego Bay is removed. Neither restoration alternative would require dredging the Otay River from the Otay River Floodplain Site to the San Diego Bay.

The Intertidal Alternative would involve lowering the elevation and contouring the Otay River Floodplain Site to create approximately 30 acres of tidally-influenced habitat, as shown in Figure 4. The grading design shown in Figure 4 is designed to achieve approximately 17% intertidal mudflat and, through increasing elevations on the site, 83% intertidal salt marsh habitat. The Intertidal Alternative would also involve raising the elevation and contouring the Pond 15

Figure 1: The Otay River Estuary Restoration Project Site in south San Diego Bay, CA.

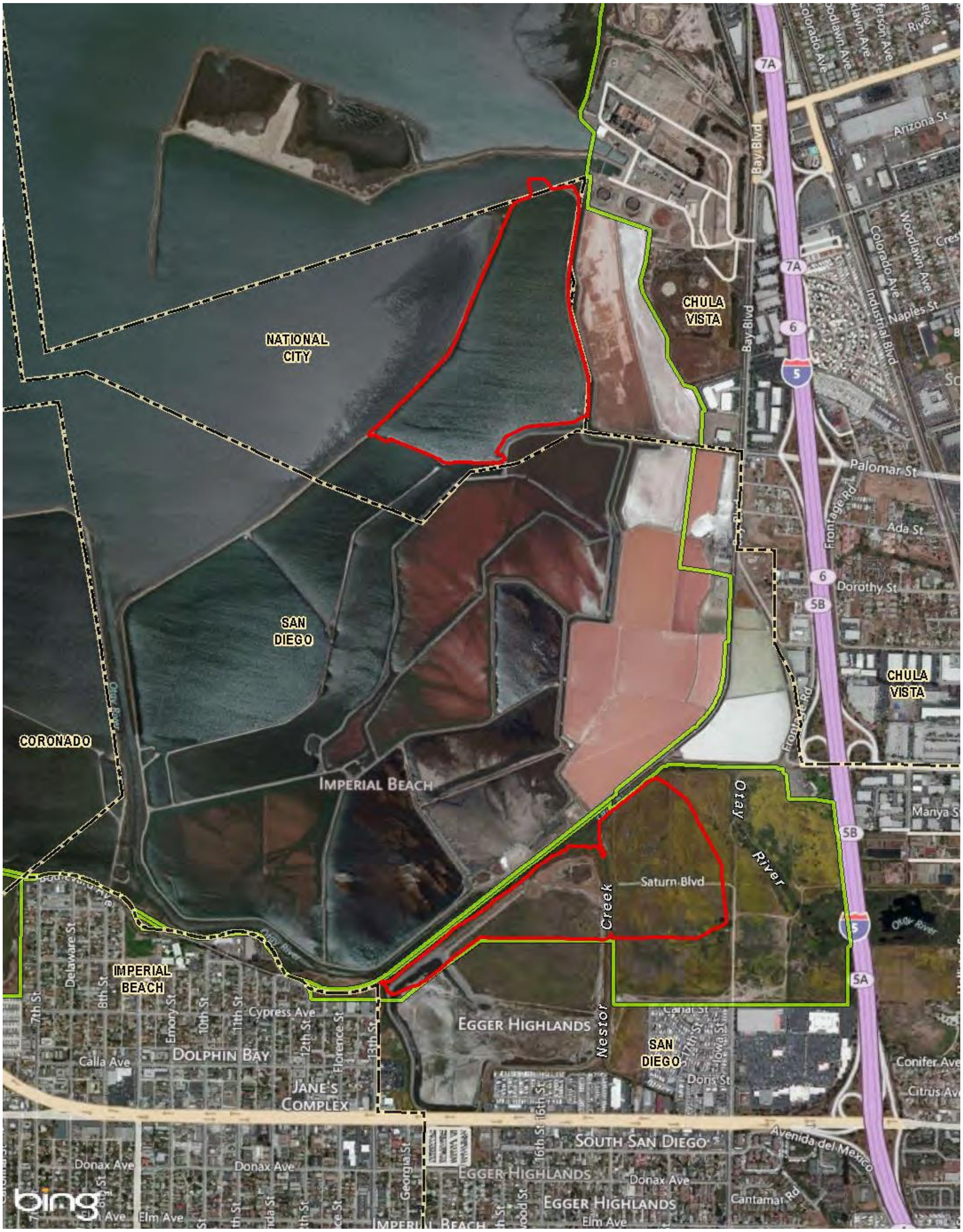


Figure 2: Noncontiguous restoration sites outlined in red.

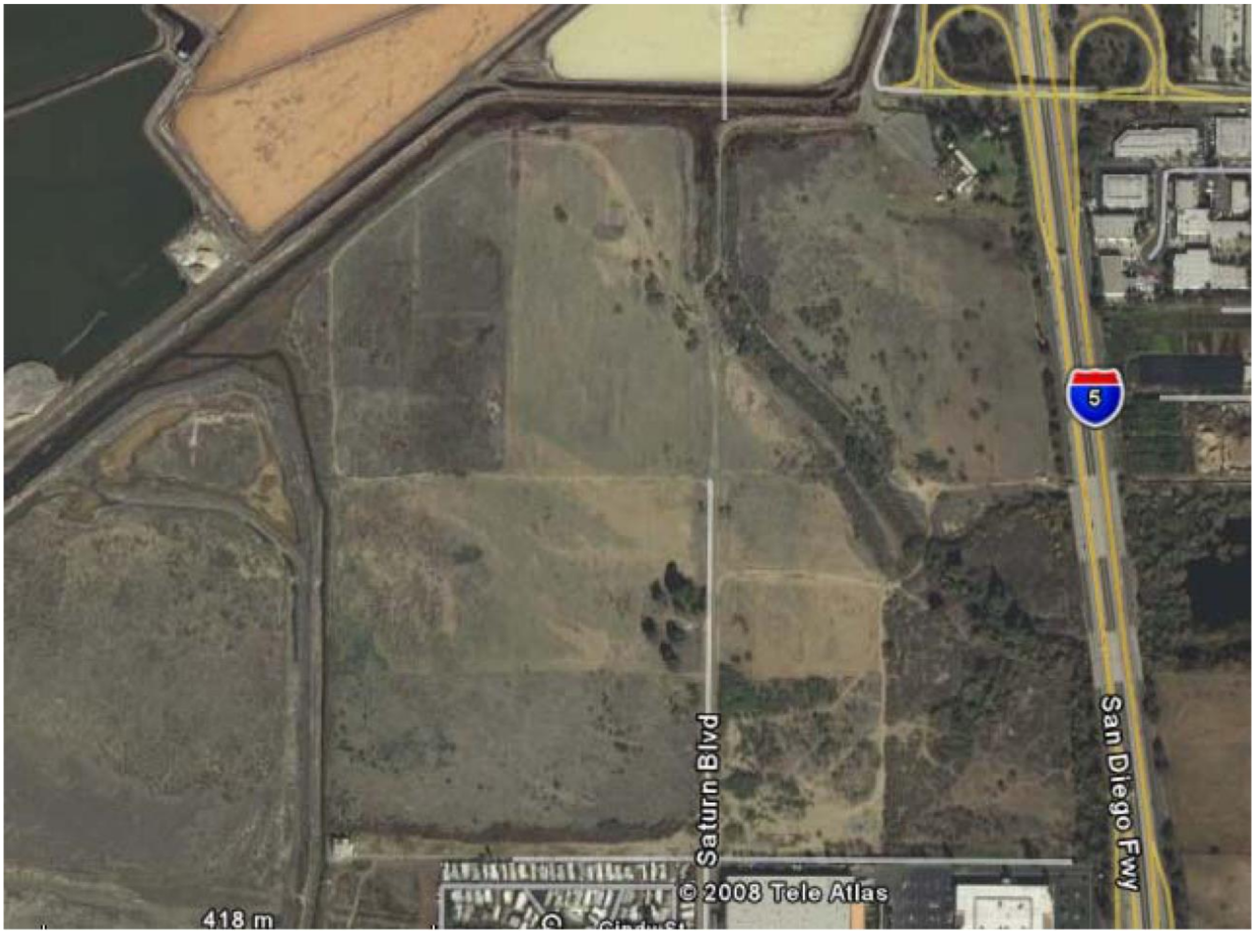


Figure 2: Otay River floodplain, site of the wetland restoration alternatives.

Site as shown in Figure 5, with grading contours intended to create approximately 11% subtidal channel, 22% intertidal mudflat and 67% intertidal salt marsh habitat. Both sites would be planted with a mix of native wetland vegetation that would mature into low marsh, mid marsh, and high marsh vegetative communities. The intertidal areas and the unvegetated mudflat would provide foraging habitat for adult and juvenile fish which form the basis of the food chain that would benefit larger fish, birds and other species on and off the site. Construction of the Intertidal Alternative would require excavation of approximately 320,000 cubic yards of soils at the Otay River Floodplain Site to lower the elevation to the necessary contours to establish a subtidal wetland on the site. The majority of the 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, levees, and upland habitat creation.

The Subtidal Alternative would involve lowering the Otay River Floodplain Site and Pond 15 Site to an elevation lower than that proposed under the Intertidal Alternative to create a subtidal channel within the Otay River Floodplain Site. Under the Subtidal Alternative, the subtidal zone would be surrounded by mudflat and increasing elevations of salt marsh. The Subtidal Alternative would involve lowering the elevation and contouring the Otay River Floodplain Site. Here, the proposed grading plan for the Subtidal Alternative (Figure 6) is intended to create approximately 15% subtidal channel, 24% intertidal mudflat and 61% intertidal salt marsh mudflat. The grading plan of the Subtidal Alternative at the Pond 15 Site would involve raising the elevation and contouring the Pond 15 Site to create approximately 11% subtidal channel, 20% intertidal mudflat and 69% intertidal salt marsh mudflat as shown in Figure 7. Again, both excavated and fill sites would be planted with a mix of immature plants that would mature into low marsh, mid marsh, and high marsh vegetative communities. The subtidal areas would provide spawning and foraging habitat, and the unvegetated mudflat would provide foraging habitat for adult and juvenile fish during high tides. Combined, the habitat would provide habitat for the basis of the food chain that would benefit larger fish, birds and other species on and off the site. Construction of the Subtidal Alternative would require excavation of approximately 370,000 cubic yards of soils at the Otay River Floodplain Site to lower the elevation the necessary contours to establish a subtidal wetland on the site. In addition, between 50,000 and 60,000 cubic yards of soil would be excavated from Pond 15. The majority of the 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, levees, and upland habitat creation.

The Intertidal Preferred Alternative would require fewer truck trips or a shorter construction window for either the conveyor belt or pipeline haul methods, due to the decreased amount of soil that would need to be hauled to Pond 15 as compared to the Subtidal Alternative. This in turn results in less air quality and greenhouse gas emissions, less construction traffic, and generally less environmental impacts related to construction.

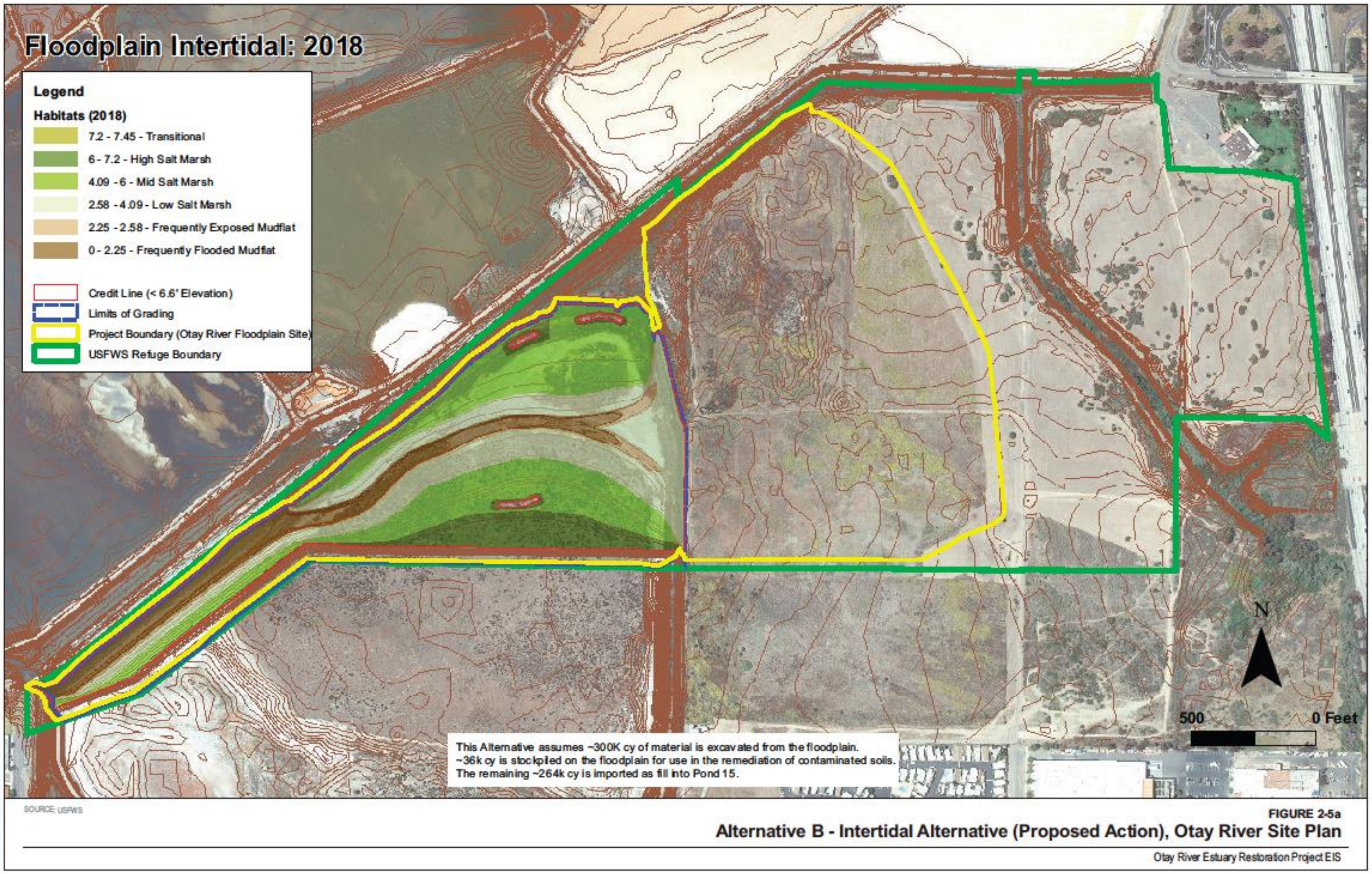


Figure 4: Grading plan for the Otay River Floodplain Tidal Basin under the Intertidal Alternative.

Figure 5: Pond 15 grading plan under the Intertidal Alternative.

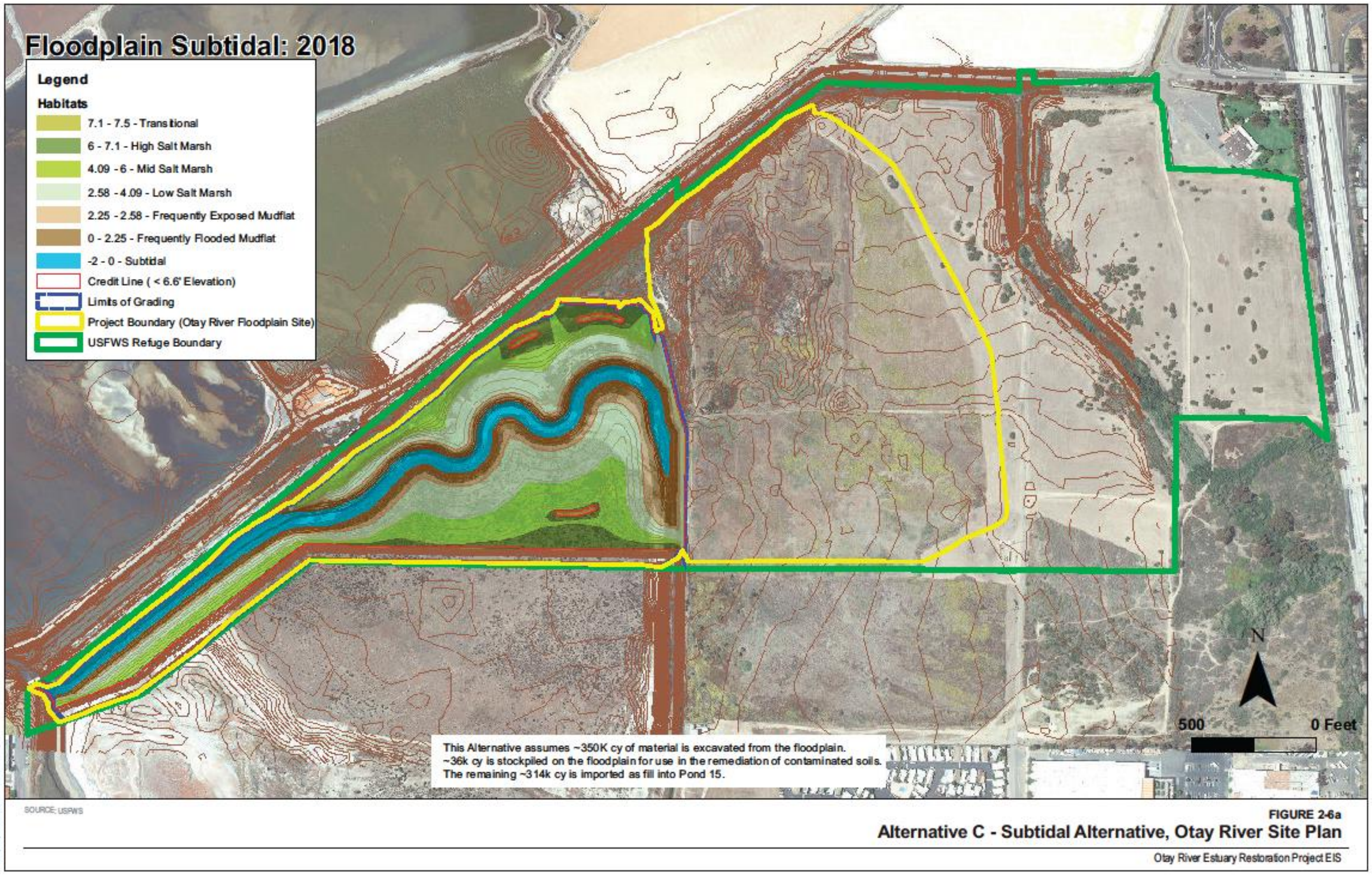


Figure 6: Grading plan for the Otay River Floodplain Tidal Basin under the Subtidal Alternative

Figure 7: Pond 15 grading plan under the Subtidal Alternative

The objective of this study is to perform hydrodynamic simulation of the tidal exchange that would occur in each of these restoration alternatives, and make quantitative evaluation of the acreages of each habitat type that would be created. The hydrodynamic simulations will also asses the velocities of tidal flows and the stability and potential maintenance requirements of the approximately 7,000 ft long river channel that connects the new tidal basin in the Otay River Floodplain with south San Diego Bay.

2.0) Technical Approach

This study employs a well-tested and peer-reviewed hydrodynamic model to evaluate the tidal hydraulics the Intertidal Alternative and the Subtidal Alternative based on updated bathymetry provided by Wetlands Research Associates (WRA) and latest updates to San Diego Bay tides for the 1983-2001 tidal epoch. The computer models used in this study are finite element types. The tidal hydraulics model is the research model, *TIDE_FEM*, [Inman & Jenkins, 1996] and the littoral transport model is TIDE_FEM/SEDXPORT**.** TIDE_FEM was built from some well-studied and proven computational methods and numerical architecture that have been successful in predicting shallow water tidal propagation in Massachusetts Bay [Connor & Wang, 1974] and estuaries in Rhode Island, [Wang, 1975], and have been reviewed in basic text books [Weiyan, 1992] and symposia on the subject, e.g., Gallagher (1981). A discussion of the physics of TIDE_FEM is given in Jenkins and Wasyl (2003 & 2005).

In its most recent version, the TIDE_FEM/TIDE_FEM/SEDXPORT modeling system has been integrated into the Navy's Coastal Water Clarity Model and the Littoral Remote Sensing Simulator (LRSS) (see Hammond, et al., 1995). The TIDE_FEM/SEDXPORT code has been validated in mid-to-inner shelf waters (see Hammond, et al., 1995; Schoonmaker, et al., 1994). A detailed description of the architecture and codes of the TIDE_FEM/SEDXPORT is given in Jenkins and Wasyl (2005) that is available on-line at the University of California digital library at: http://repositories.cdlib.org/sio/techreport/58/.

Validation of the TIDE_FEM/SEDXPORT code was shown by three independent methods: 1) direct measurement of suspended particle transport and particle size distributions by means of a laser particle sizer; 2) measurements of water column optical properties; and, 3) comparison of computed stratified plume dispersion patterns with LANDSAT imagery. Besides being validated in coastal waters of Southern California, the TIDE_FEM/SEDXPORT modeling system has been extensively peer reviewed. Although some of the early peer review was confidential and occurred inside the Office of Naval Research and the Naval Research Laboratory, the following is a listing of 5 independent peer review episodes of TIDE_FEM/SEDXPORT that were conducted by 9 independent experts and can be found in the public records of the State Water Resources Control Board, the California Coastal Commission and the City of Huntington Beach.

1997- Reviewing Agency: State Water Resources Control Board
Project: NPDES 316 a/b Permit renewal, Scripps Beach, Carlsbad, CA
Reviewer: Dr. Andrew Lissner, SAIC, La Jolla, CA

1998- Reviewing Agency: California Coastal Commission
Project: Coastal Development Permit, San Dieguito Lagoon Restoration
Reviewers: Prof. Ashish Mehta, University of Florida, Gainesville;
Prof. Paul Komar, Oregon State University, Corvallis;
Prof. Peter Goodwin, University of Idaho, Moscow

2000- Reviewing Agency: California Coastal Commission
Project: Coastal Development Permit, Crystal Cove Development
Reviewers: Prof. Robert Wiegel, University of California, Berkeley;
Dr.Ron Noble, Noble Engineers, Irvine, CA

2002- Reviewing Agency: California Coastal Commission
Project: Coastal Development Permit, Dana Point Headland Reserve
Reviewers: Prof. Robert Wiegel, University of California, Berkeley;
Dr. Richard Seymour, University of California, San Diego

2003- Reviewing Agency: City of Huntington Beach
Project: EIR Certification, Poseidon Desalination Project
Reviewer: Prof. Stanley Grant, University of California, Irvine

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was also used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a proxy for the restoration alternatives because of morphologic similarities: in particular, both restoration sites have a long “goose-neck” feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

2.1 Tidal Hydraulics Model Physics: The tidal hydraulics are treated herein as a vertically well-mixed, two-dimensional, homogeneous flow because of a number of factors, including: the shallow depths in both the existing Otay River; the episodic and usually infrequent river flow events; and the enormous complexity of attempting to model a continuously stratified, brackish system. Salinity measurements from 1994-1997 by Boland (1998) suggest that this is not an unrealistic approximation. These salinity measurements indicate fairly uniform seawater salinities exist in the estuary most of the time, with relatively brief periods of fresh water dominance when high river flow rates prevent saline intrusion, e.g., the February 1995 flood series. Consequently, the lower Otay River is a tidally dominated system throughout most any given long-term period of record.

A finite element approach was adapted in preference to more common finite difference shallow water tidal models, e.g., Leendertse (1970), Abbott et al (1973), etc. Finite difference models employ rectangular grids which would be difficult to adapt to the complex geometry of the systems of channels of the Otay. It is believed that large errors would accumulate from attempting to approximate the irregular boundaries of the Otay system with orthogonal segments. On the other hand, finite element methods allow the computational problem to be contained within a domain bounded by a continuous contour surface, such as the S_f contours stored within the ***bathym*** file.

A finite element tidal hydraulics model, **TIDE_FEM**, [Inman and Jenkins, 1996] was employed to evaluate the tidal hydraulics of the existing conditions. **TIDE_FEM** was built from some well-studied and proven computational methods and numerical architecture that have done well in predicting shallow water tidal propagation in Massachusetts Bay [Connor and Wang, 1974] and estuaries in Rhode Island, [Wang, 1975], and have been reviewed in basic text books [Weiyan, 1992] and symposia on the subject, e.g., Gallagher (1981).

TIDE_FEM employs a variant of the vertically integrated equations for shallow water tidal propagation after Connor and Wang (1975). These are based upon the Boussinesq approximations with Chezy friction and Manning's roughness. The finite element discretization is based upon the commonly used ***Galerkin weighted residual method*** to specify integral functionals that are minimized in each finite element domain using a variational scheme, see Gallagher (1981). Time integration is based upon the simple ***trapezoidal rule*** [Gallagher, 1981]. The computational architecture of **TIDE_FEM** is adapted from Wang (1975), whereby a transformation from a **global** coordinate system to a **natural** coordinate system based on the unit triangle is used to reduce the weighted residuals to a set of order-one ordinary differential equations with constant coefficients. These coefficients (***influence coefficients***) are posed in terms of a ***shape function*** derived from the natural coordinates of each nodal point. The resulting systems of equations are assembled and coded as banded matrices and subsequently solved by ***Cholesky's method***, see Oden and Oliveira (1973 and Boas (1966).

We adapt the California coordinates as our **global** coordinate system (x, y) to which the nodes are referenced, with **x** (easting) and **y** (northing). The vertical coordinate **z** is fixed at 0.0 ft NGVD and is positive upward. The local depth relative to 0.0 ft NGVD is **h** and the mean surface elevation about 0.0 ft NGVD is $\boldsymbol{\eta}$. The total depth of water at any node is $\mathbf{H} = \mathbf{h} + \boldsymbol{\eta}$. The vertically averaged xy-components of velocity are $(\bar{u}, \bar{v})$. The continuity and momentum equations may be written from Connor and Wang, (1974), as:

$$\frac{\partial}{\partial t}\rho H + \frac{\partial}{\partial x} q_x + \frac{\partial}{\partial y} q_y = 0$$
$$\frac{\partial}{\partial t} q_x + \frac{\partial}{\partial x}\bar{u} q_x + \frac{\partial}{\partial y}\bar{u} q_y = B_x + \frac{\partial}{\partial x}\left(F_{xx} - F_p\right) + \frac{\partial}{\partial x} F_{yx} \qquad (1)$$
$$\frac{\partial}{\partial t} q_y + \frac{\partial}{\partial x}\bar{v} q_x + \frac{\partial}{\partial y}\bar{v} q_y = B_y + \frac{\partial}{\partial y}\left(F_{yy} - F_p\right) + \frac{\partial}{\partial x} F_{xy}$$

Here **q_x, q_y** are mass flux components

$$q_x = \rho \int_{-h}^{\eta} \bar{u}\, dz \qquad (2)$$
$$q_y = \rho \int_{-h}^{\eta} \bar{v}\, dz \qquad (3)$$

and **q_I** is the mass flux through the ocean inlet due to water surface elevation changes in the estuary:

$$q_I = \rho \frac{\partial}{\partial t}\left(\frac{\partial s}{\partial \eta}\right) \qquad (4)$$

F_p is the pressure force resultant and **F_{xx}, F_{xy}, F_{yy}** are "equivalent" internal stress resultants due to turbulent and dispersive momentum fluxes

$$F_p = \int_{-h}^{\eta} p\, dz = \frac{\rho g H^2}{2}$$
$$F_{xx} = 2\varepsilon \frac{\partial}{\partial x} q_x$$
$$F_{yy} = 2\varepsilon \frac{\partial}{\partial y} q_y \qquad (5)$$
$$F_{yx} = F_{xy} = \varepsilon\left(\frac{\partial}{\partial y} q_y + \frac{\partial}{\partial x} q_x\right)$$

and ε is the eddy viscosity. **B_x** and **B_y** are the bottom stress components

$$B_x = \tau_x + \rho g H \frac{\partial h}{\partial x}$$
$$B_y = \tau_y + \rho g H \frac{\partial h}{\partial y} \qquad (6)$$

In Equation (6), $\boldsymbol{\tau_x}$ and $\boldsymbol{\tau_y}$ are the bottom shear stress components that are quasi-linearized by Chezy-based friction using Manning's roughness factor, $\mathbf{n_o}$:

$$\tau_x = -\frac{g}{\rho H^2 C_z^{\ 2}} q_x \left(q_x^{\ 2} + q_y^{\ 2}\right)^{1/2}$$
$$\tau_y = -\frac{g}{\rho H^2 C_z^{\ 2}} q_y \left(q_x^{\ 2} + q_y^{\ 2}\right)^{1/2} \qquad (7)$$

where $\mathbf{C_z}$ is the Chezy coefficient calculated as:

$$C_z = \frac{1.49}{n_0} H^{1/6} \qquad (8)$$

Boundary conditions are imposed at the locus of possible land/water boundaries, $\mathbf{S_f}$ in the ***bathym*** file and at the ocean inlet, $\mathbf{S_o}$. Flux quantities normal to these contours are denoted with "n" subscripts and tangential fluxes are given "s" subscripts. At any point along a boundary contour, the normal and tangential mass fluxes are:

$$q_n = \int_{-h}^{\eta} \rho u_n dz = \alpha_{nx} q_x + \alpha_{ny} q_y$$
$$q_s = \int_{-h}^{\eta} \rho u_s dz = -\alpha_{nx} q_x + \alpha_{ny} q_y \qquad (9)$$
$$\alpha_{nx} = \cos(n, x)$$
$$\alpha_{ny} = \cos(n, y)$$

Components of momentum fluxes across a boundary are equivalent to internal force resultants according to:

$$F_{nx} = \alpha_{nx}(F_{xx} - F_p) + \alpha_{ny} F_{yx}$$
$$F_{ny} = \alpha_{ny}(F_{yy} - F_p) + \alpha_{nx} F_{xy} \qquad (10)$$

On land boundary contours, the flux components are prescribed

$$q_n = q_s = 0 \qquad \text{on land} \qquad (11)$$

On the ocean boundary, the normal boundary forces (due to sea surface elevation) are continuous with ocean values, and the mass exchange is limited by the storage capacity of the estuary.

Hence

$$F_{nm} = \overline{F}_{nm} \quad \text{and} \quad q_{nm} = q_I \quad \text{at inlet} \qquad (12)$$

In the problem at hand $\overline{F}_{nn}$ is prescribed at the inlet by the ocean tidal elevation, η_0 , and the inlet sill depth, $\mathbf{h_o}$ according to

$$\overline{F}_{nm} = \frac{\rho g}{2}\left(\eta_0 + h_0\right)^2 \qquad \text{on } S_0 \qquad (13)$$

Ocean ***tidal forcing functions*** η_0 were developed in Section 3. The ocean boundary condition as specified by Equation (12) places a dynamic boundary condition on the momentum equations and a kinematic boundary condition on the continuity equation that is constrained by the storage rating curve. Solutions are possible by specifying only the dynamic boundary condition, but then mass exchanges are controlled by the wetting and drying of individual grid cells with associated discretization and interpolation errors which threaten mass conservation. The technique of over specifying the ocean boundary condition with both a dynamic and kinematic condition is discussed in the book by Weiyan (1992).

The governing equations and the boundary conditions are cast as a set of integral functionals in a variational scheme, [Boas, 1966]. Within the domain of each element of the mesh, $\mathbf{A_i}$ the unknown solution to the governing equations is simulated by a set of ***trial functions*** $(\hat{H}, \hat{q})$ having adjustable coefficients. The trial functions are substituted into the governing equations to form ***residuals,*** **(R_H, R_q)**. The residuals are modified by ***weighting functions,*** **(ΔH, Δq)**. The coefficients of the trial functions are adjusted until the weighted residuals vanish. The solution condition on the weighted residuals then becomes:

$$\iint_{A_i} R_H \Delta H dA = 0$$
$$\iint_{A_i} R_q \Delta q dA = 0$$

By the Galerkin method of weighted residuals, [Finlaysen, 1972], the weighting functions are set equal to nodal ***shape functions***, **<N>**, or:

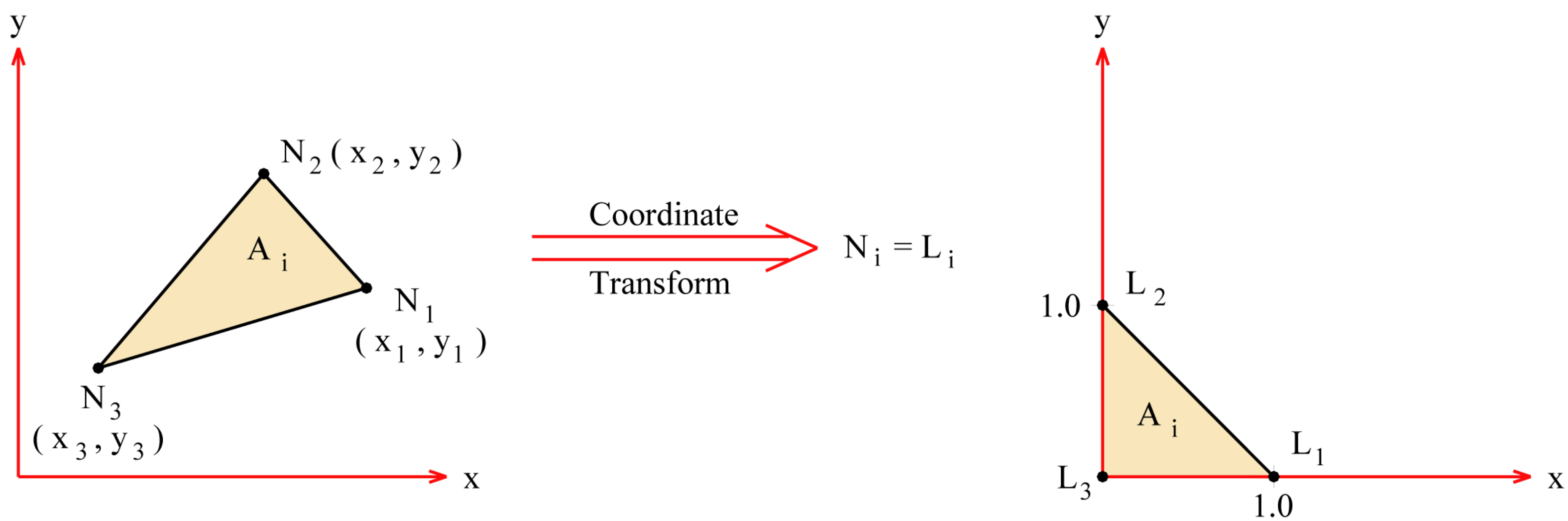
$$\Delta H \sim N_i$$
$$\Delta q \sim N_j$$

The shape function, <N>, is a polynomial of degree which must be at least equivalent to the order of the highest derivative in the governing equations. The shape function also provides the mechanism to discretized the governing equations. The shape function polynomial is specified in terms of ***global (California)*** coordinates (Figure 8a) for the first nodal point, $\mathbf{N_1}$ of a generalized

Specifying the Shape Function <N> for any 3-Node Triangular Element

a) Global (California) Coordinates

b) Natural Coordinates



$$\langle N \rangle = (N_1, N_2, N_3)$$

$$N_1 = [(x_2 y_3 - x_3 y_2) + (y_2 - y_3) x + (x_3 - y_2) y] / 2 A_i$$

$$2 A_i = (x_1 - x_3) (y_2 - y_3) - (x_2 - x_3) (y_1 - y_3)$$

$$x = L_1 x_1 + L_2 x_2 + L_3 x_3$$

$$y = L_1 y_1 + L_2 y_2 + L_3 y_3$$

$$L_1 + L_2 + L_3 = 1.0$$

Figure 8: Shape function polynomial and transform to natural coordinates for a generalized 3-node triangular element; (a) 3-node element in California coordinates; (b) 3-node element in natural coordinates.

3-node triangular element of area $\mathbf{A_i}$,. Wang (1975) obtained significant numerical efficiency in computing the weighted residuals when the shape functions of each nodal point, $\mathbf{N_i}$, are transformed to a system of ***natural*** coordinates based upon the unit triangle, giving $\mathbf{N_i} \rightarrow \mathbf{L_i}$, see Figure 8b. The shape functions also permit semi-discretization of the governing equations when the trial functions are posed in the form:

$$\hat{H}(x,y,t) = \sum_i H_i(t) N_i(x,y)$$
$$\hat{q}(x,y,t) = \sum_j q_j(t) N_j(x,y) \qquad (14)$$

Discretization using the weighting and trial functions expressed in terms of the nodal shape functions allows the ***distribution*** of dependent variables over each element to be obtained from the values of the independent variables at discrete nodal points. However, the shape function at any given nodal point, say $\mathbf{N_1}$, is a function of the independent variables of the two other nodal points which make up that particular 3-node triangular element. Consequently, the computations of the weighted residuals leads to a series of influence coefficient matrices defined

$$a_{ij} = \frac{1}{A_i} \iint N_i N_j \, dA$$
$$s_{ij} = \frac{1}{A_i} \iint N_i \frac{\partial N_j}{\partial x} dA$$
$$t_{ij} = \frac{1}{A_i} \iint N_i \frac{\partial N_j}{\partial y} dA \qquad (15)$$
$$g_{ijk} = \frac{1}{A_i} \iint N_i N_j \frac{\partial N_k}{\partial x} dA$$
$$h_{ijk} = \frac{1}{A_i} \iint N_i N_j \frac{\partial N_k}{\partial y} dA$$

The influence coefficient matrices given by equation (15) are evaluated in both global and natural coordinates. Once the influence coefficients have been calculated for each 3-node element, the weighted residuals reduce to a set of order-one ordinary differential with constant coefficients. The continuity equation becomes:

$$\sum \left(a_{ij} \frac{dH_i}{dt} \right) = -\sum_i \sum_k \left[g_{ijk} \left(H_i q_{xk} + H_k q_{xi} \right) + h_{ijk} \left(H_i q_{yk} + H_k q_{yi} \right) \right]$$

$$\sum \left(a_{ij} \frac{dq_{xj}}{dt} \right) = -\sum_j \sum_k \left[g_{ijk} \left(q_{xk} q_{xj} \right) + h_{ijk} \left(q_{yj} q_{xk} \right) \right] + N_i \sum_j N_j S_{fj} + g \sum_i s_{ij} H_i \qquad (16)$$

$$\sum \left(a_{ij} \frac{dq_{yj}}{dt} \right) = -\sum_j \sum_k \left[g_{ijk} \left(q_{xj} q_{yk} \right) + h_{ijk} \left(q_{yj} q_{xk} \right) \right] + N_i \sum_j N_j S_{fj} + g \sum_i t_{ij} H_i$$

Equations (16) are essentially simple oscillator equations forced by the collection of algebraic terms appearing on the right hand side; and are therefore easily integrated over time. The time integration scheme used over each time step of the tidal forcing function is based upon the ***trapezoidal rule***, see Gallagher 1981) or Conte and deBoor (1972). This scheme was chosen because it is known to be unconditionally stable, and in tidal propagation problems has not been known to introduce spurious phase differences or damping. It replaces time derivatives between two successive times, $\Delta t = t_{n+1} - t_n$, with a truncated Taylor series. For the water depth it would take on the form:

$$\frac{dH}{dt} = \eta(t)$$

$$H_{n+1} - H_n = \frac{\Delta t}{2} \left(\eta_{n+1} + \eta_n \right) + E \Delta t \qquad (17)$$

$$E = \frac{1}{12} \left(\Delta t \right)^2 \left| \frac{d^2 \eta}{dt^2} \right|$$

To solve equation (17), iteration is required involving successive forward and backward substitutions.

The influence and friction slope coefficient matrices together with the trapezoidal rule reduce equations to a system of algebraic equations [Grotkop, 1973] which are solved by Cholesky's method per a numerical coding scheme by Wang (1975). For more details, refer to the TIDE_FEM code in Appendix-I of Jenkins and Wasyl (1996), and Gallagher (1981) or Oden and Oliveira (1973).

3.0) Model Initialization

Tidal basin water levels and tidal currents are studied using numerical transport models that are run over a historic surrogate time period for which environmental forcing is well-known. In all such *boundary value problems* input variables are divided between two general classes, forcing functions and boundary conditions. The primary forcing function is San Diego Bay water level variation. The important boundary conditions are basin and feeder channel bathymetry, sediment grain size, and river channel scour configurations. Input for San Diego Bay water level variations are discussed below in Sections 3.1 and 3.2. The remaining variables are site specific and will be dealt with separately for the Intertidal Alternative in Section 4, and the Subtidal Alternative in Section 5.

3.1) San Diego Bay Circulation: Currents in San Diego Bay are predominately produced by tides (Wang et al. 1998). This tidal exchange between the ocean and the bay is a result of a phenomenon called "tidal pumping" (Chadwick, et al.. 1997). The "pumping" of water is due to the flow difference between the ebb and the flood flows. Being located at mid-latitude, tides and currents within the San Diego Bay are dominated by a mixed diurnal-semidiurnal component (Peeling 1975). Typical tidal current speeds range between 0.3-0.5 m/s near the inlet and 0.1 m/s to 0.2 m/s in the southern region of the bay. The phase propagation suggests that the tides behave almost as standing waves with typical lags between the mouth and the back portion of the bay of 10 min and an increase in tidal amplitude in the inner bay compared to the outer bay. The overall tidal prism for the bay is 5.5×10^7 m^3 and the tidal excursion is larger than the mouth with a value of 4.4 km (Chadwick and Largier 1999b). Chu, et al. (2012) measured mass exchange between San Diego Bay and the Pacific Ocean using a combination of flow measurements by acoustic Doppler current profiling and tracer measurements using a naturally occurring ultraviolet fluorescence tracer. They found that variations in exchange with tidal range could be isolated by separately evaluating the ebb and flood tidal transport budgets. The tracer transport during the ebb increased rapidly with tidal range, while during the flood tide, the transport increased more gradually. The resulting difference in tidal transport between the ebb and flood accounts for the exchange between the bay and ocean. For weak tides, the exchange tends to increase rapidly with increasing tidal range, while for stronger tides, the exchange is more constant.

3.2 San Diego Bay Tidal Regime: The flow of sea water into and out of the Otay River Channel, the South Bay salt ponds and the proposed restoration tidal basins are driven by the time variation in San Diego Bay water level. The nearest NOAA tide gage to the Otay River and South Bay salt ponds is located at the Navy Pier in San Diego Bay. This tide gage (NOAA #941-0170) was last leveled using the 1983-2001 tidal epoch. Elevations of tidal datums referred to NAVD 88 are given in the second column of Table 1.

Tidal data in Table 1 indicates that tidal ranges in San Diego Bay are greater than those found on the open coast. Mean diurnal tidal ranges are 5.72 ft as compared to 5.33 ft on the open coast, an increase of 0.39 ft of diurnal range in San Diego Bay. The extreme water level range is 11.23 ft in San Diego Bay as compared to 10.51 ft on the open coast, an increase of 0.72 ft of extreme range in the bay. All high water datum in the bay exceed those on the open coast and all the low water level datum are lower in the bay than on the open coast. This occurs because San Diego Bay is a resonant tidal system where higher harmonics of the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent are bathymetrical trapped in the bay, leading to a build-up in tidal amplitude. The tidal resonance of San Diego Bay provides additional tidal energy for forcing tidal inundation of the proposed tidal basins in the Otay River floodplain and in Salt Pond #15, and is an attribute of this site that increases the chance of achieving a sustainable functioning wetland restoration.

TABLE 1: Tidal datums for SAN DIEGO BAY at NOAA #941-0170 Navy Pier:

LENGTH OF DATA SERIES: 19 Years
TIME PERIOD: January 1983 - December 2001
TIDAL EPOCH: 1983-2001

HIGHEST WATER LEVEL (01/27/1983)		= 7.71 ft NAVD (8.1402 ft MLLW)
MEAN HIGHER HIGH WATER	MHHW	= 5.292 ft NAVD (5.7253 ft MLLW)
MEAN HIGH WATER	MHW	= 4.5507 ft NAVD (4.9838 ft MLLW)
MEAN TIDE LEVEL	MTL	= 2.5264 ft NAVD (2.9595 ft MLLW)
MEAN SEA LEVEL	MSL	= 2.5067 ft NAVD (2.9398 ft MLLW)
MEAN LOW WATER	MLW	= 0.5020 ft NAVD (0.9351 ft MLLW)
North American Vertical Datum	NAVD88	= 0.00 ft NAVD (0.4331 ft MLLW)
MEAN LOWER LOW WATER	MLLW	= -0.4331 ft NAVD (0.000 ft MLLW)
LOWEST WATER LEVEL (12/17/1937)		= -3.5238 ft NAVD (-3.0907 MLLW ft)

In spite of the resonant tidal system in the deeper middle and outer portions of San Diego Bay, there is significant muting of the tidal range in the far southern portions of the Bay in the neighborhood of the mouth of the Otay River and the South Bay salt ponds. NOAA lists four other tide gages in San Diego Bay, including: Ballast Point, NOAA # 9410155; Sweetwater Channel, NOAA #9410136; North Island Navy Wharf, NOAA # 9410169; and US Coast Guard AirStation, NOAA #9410175. However no data is available (or exists) for any of these other four NOAA tide gages in The Bay. Tide information at other locations in The Bay are model predictions of the kind in the Wang et al, 1998 paper. However, the Southwest Wetland Interpretive Association (SWIA) has operated a self-recording water quality monitoring station since 2007 at the mouth of the Otay River at the location noted in yellow in Figure 1. This monitoring station (referred to as the Otay River Sonde) has recorded water level, salinity and dissolved oxygen at 15 minute intervals from December 2007 through December 2011. Figure 9 gives a comparison between the measured water levels at the NOAA #941-0170 Navy Pier tide gage versus the Otay River Sonde. Both monitoring stations give the same mean tidal level, but maximum water levels are slightly higher at the Otay River Sonde, and minimum water levels are significantly higher, indicating *low-tide muting* of the tides in the extreme South Bay. Lowest water levels recorded at the Otay River Sonde are -1.6108 ft. NAVD as compared with -3.5238 ft NAVD at the Navy Pier. This response is believed to be the result of bottom friction effects and additional resonances associated with the K1 and M2 barotropic tidal constituents flowing over the shallows of the *South Bay Shelf*. This hypothesis is supported by a spectral decomposition (distribution of tidal energy with frequency) of the water level measurements shown in Figure 10a. The principal spectral peaks show an enhanced second harmonic of the K1 lunar-solar diurnal tidal constituent at the mouth of the Otay River, indicating the effect of bottom friction over the shallow South Bay Shelf. There is also an enlarged resonant triad sub-harmonic (difference frequency) between the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent measured at the mouth of the Otay River, indicating

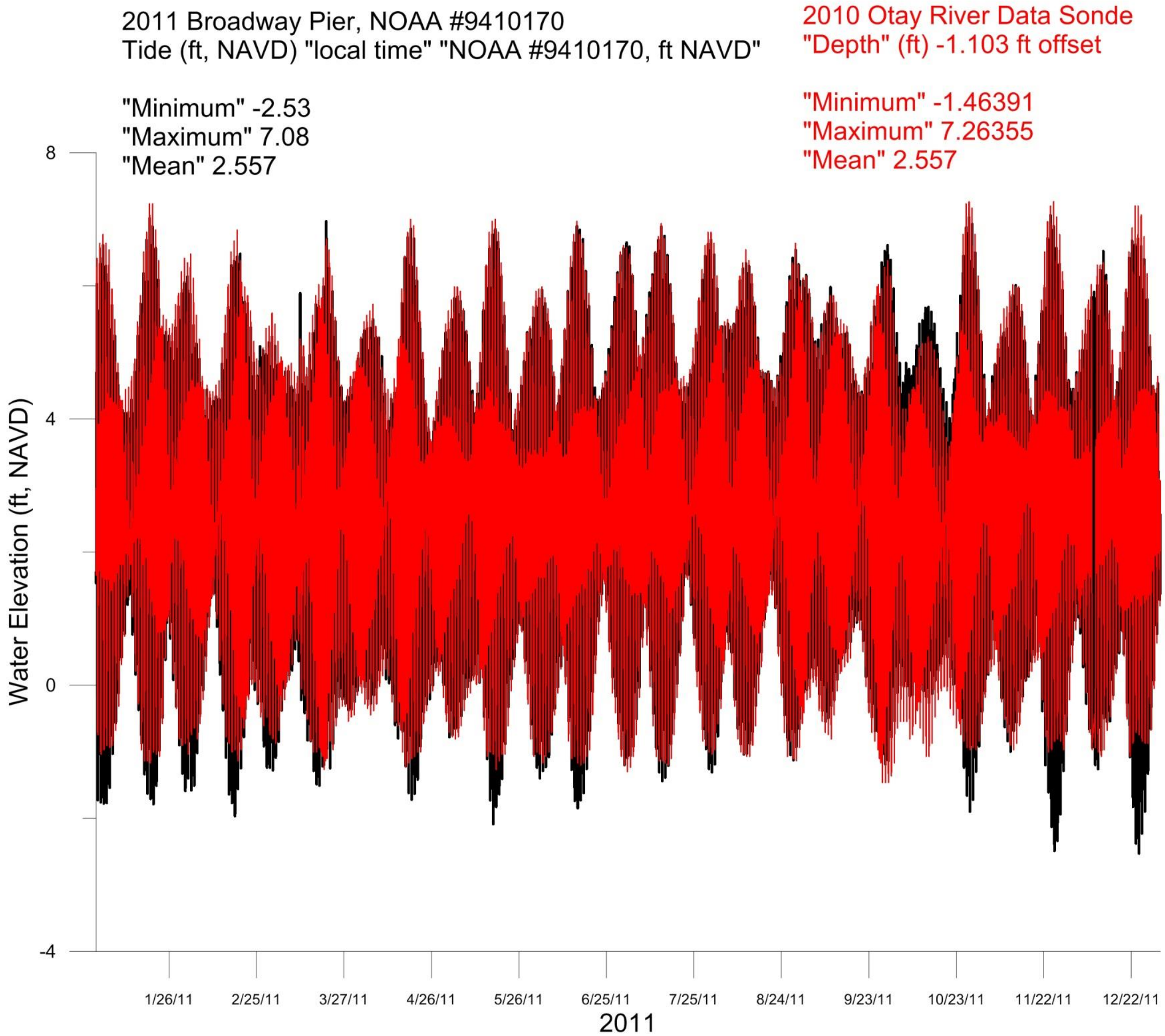


Figure 9: Comparison of mid-bay tides at the Navy Pier (black) versus south-bay tides at the mouth of the Otay River (red).

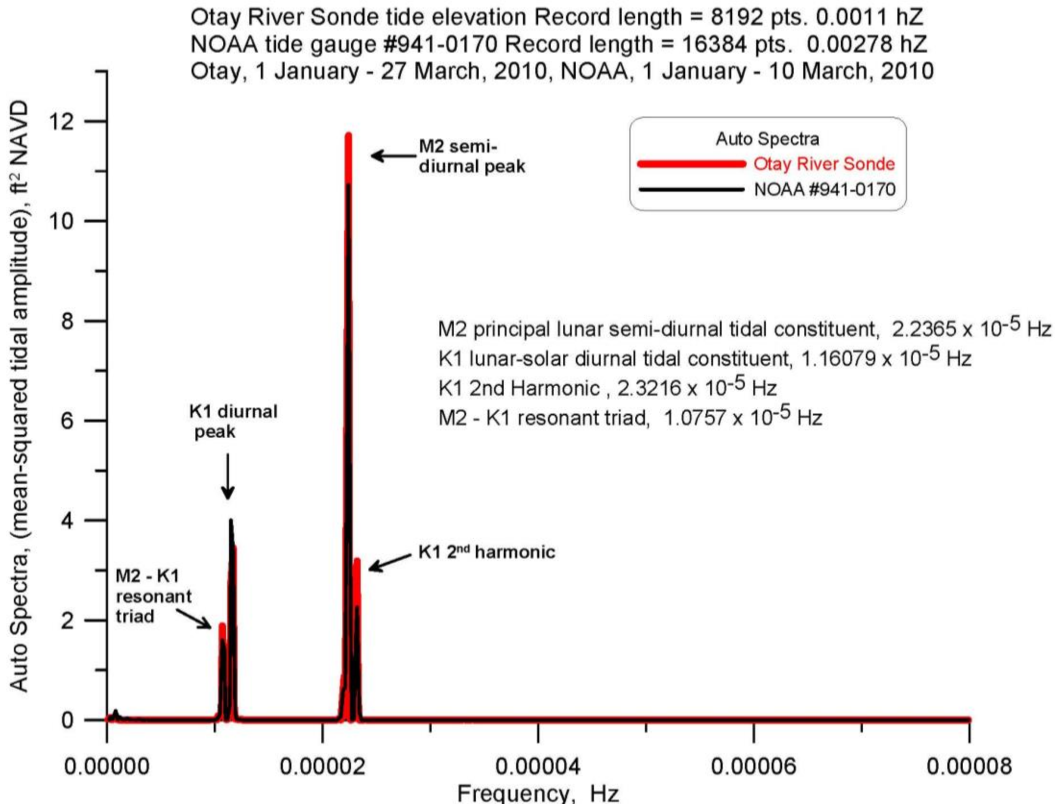


Figure 10a: Auto spectra (mean-squared tidal amplitude) of the Otay River Sonde measurements (red), versus the NOAA Navy Pier tidal record (black).

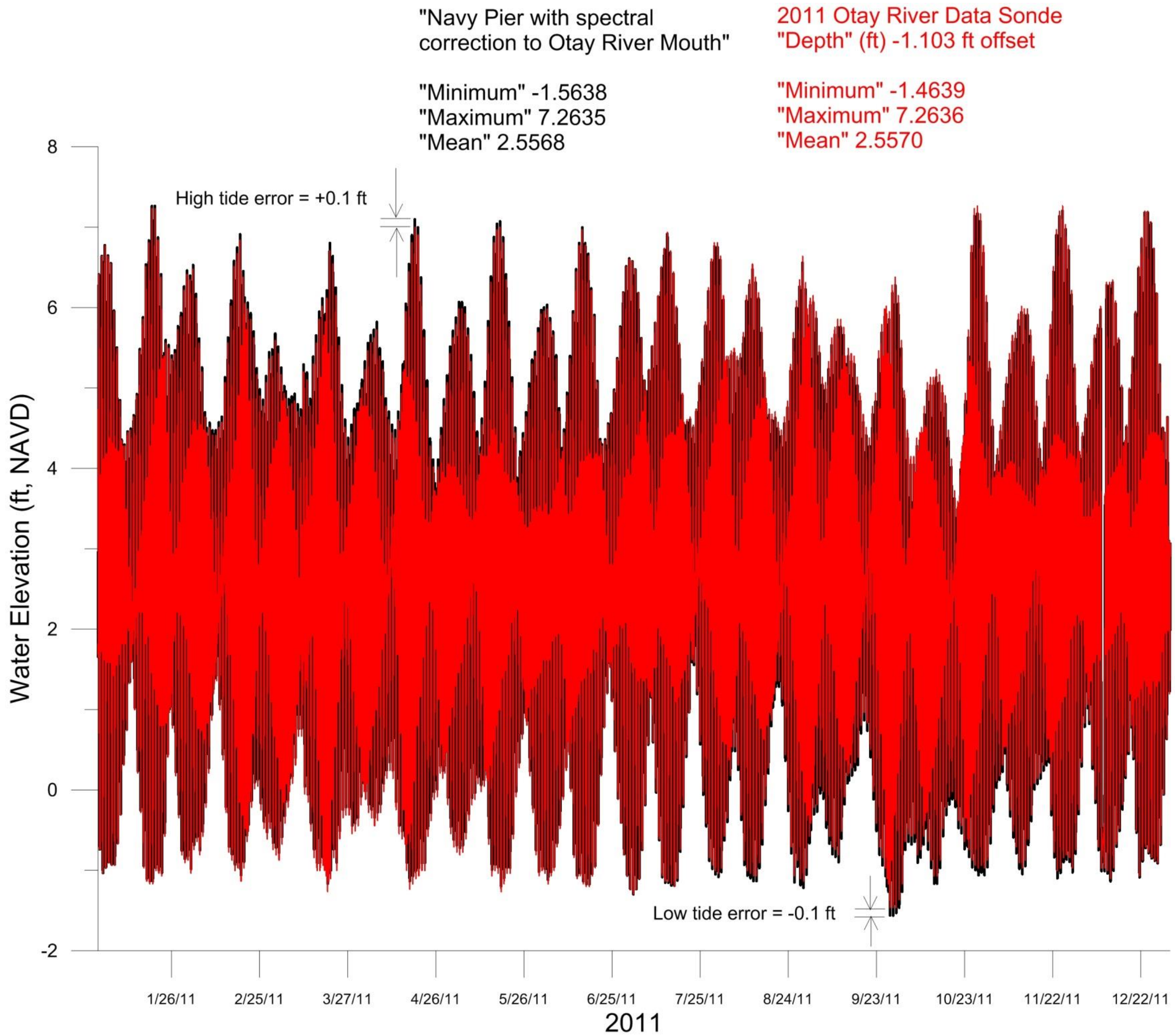


Figure 10b: Comparison of spectrally corrected Navy Pier tides (black) versus south-bay tides at the mouth of the Otay River (red). The spectral correction is made to transform Navy Pier tides to equivalent tides at the mouth of the Otay River. Transform error is +/- 0.1 ft.

bathymetrically trapped tidal oscillations on the South Bay Shelf.

The importance of the tidal spectra in Figure 10a is that it permits the very long term tidal records at the Navy Pier to be converted into long term records of the tides at the mouth of the Otay River. The published NOAA tidal constituents for the Navy Pier are modified to conform to the spectral harmonics for the Otay River tides in Figure 10a, and then re-assembled in the time domain as shown Figure 10b. This process gives a long term tidal records (30 year in length) of the South Bay tides at the mouth of the Otay River to within an error of +/- 0.1 ft. The analytic requirement for these long term South Bay tides is to have tidal forcing for the hydrodynamic models that captures the extremes of tidal inundation over many years. These extremes in tidal inundation are a determining factor in Natures adaptations to upper and lower limits of wetland habitat, while the frequency of long term tidal inundation at various intermediate elevations determines the zonation of wetland habitat types.

3.3) San Diego Bay Water Quality: The quality of the water that enters the Otay River mouth is another important aspect to the quality and distribution of wetland habitat that can recruit in the Otay River Floodplain. The Otay River Sonde (noted in yellow in Figure 1) has recorded salinity and dissolved oxygen at 15 minute intervals from December 2007 through April 2010. Figure 11 gives the temporal variation of the salinity in parts per thousand (ppt) recorded by the Otay River Sonde, while Figure 12 gives the dissolved oxygen in mg/L. The maximum salinity reached during the dry, evaporative summer months is 42.57 ppt, while the minimum salinity during wet winter periods reaches as low as 0.2 ppt, but the average salinity is 33.52 ppt, identical to the average salinity recorded on the open coast at Scripps Pier. These salinity ranges are comparable to what has been measured in the San Dieguito Lagoon on the open coast by Boland (1998), and are suitable for sustaining a healthy functioning salt water wetland. The dissolved oxygen readings (DO) in Figure 12 show a maximum DO reached during the wet, winter months of 17.5 mg/L, while the minimum DO occurs during summer and can reach 0.0 mg/L. However, the average DO is 6.47 mg/L, about the same as found in nearshore waters along the open coast as measured at Scripps Pier. DO readings at the Otay River Sonde are roughly equivalent to what Boland (1998) reported for San Dieguito Lagoon. Percent departures from the mean for salinity and DO are compared in Figure 13 indicating that DO maximums occur when Otay River flooding occurs and the salinity is depressed to minimum values, and conversely, DO minimums occur during warm evaporative months in summer when south San Diego Bay waters turn hyper saline. Regardless, variability in salinity and dissolved oxygen at the Otay River Sonde are within normal limits of a healthy functioning salt water wetland.

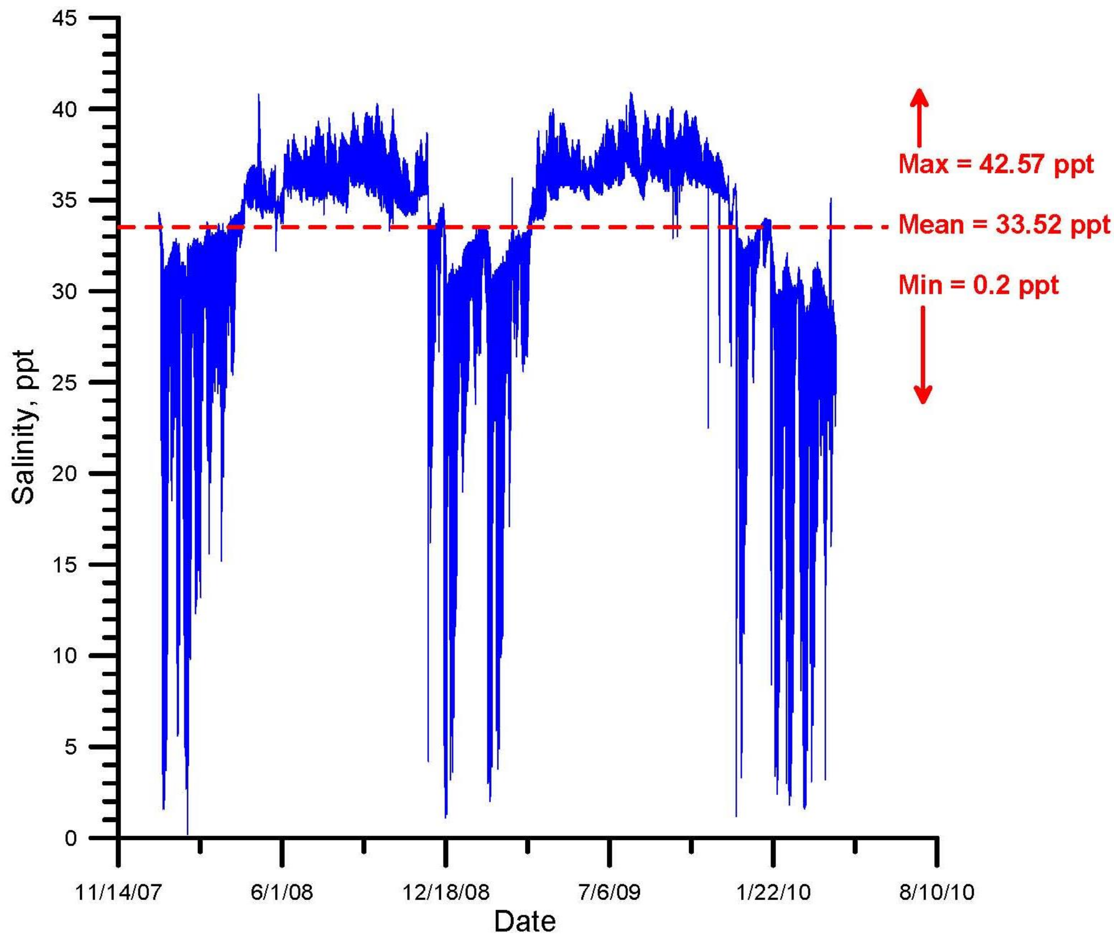


Figure 11: Salinity variation in south San Diego Bay at the Otay River mouth. Data from Otay River Sonde, 2007-2010.

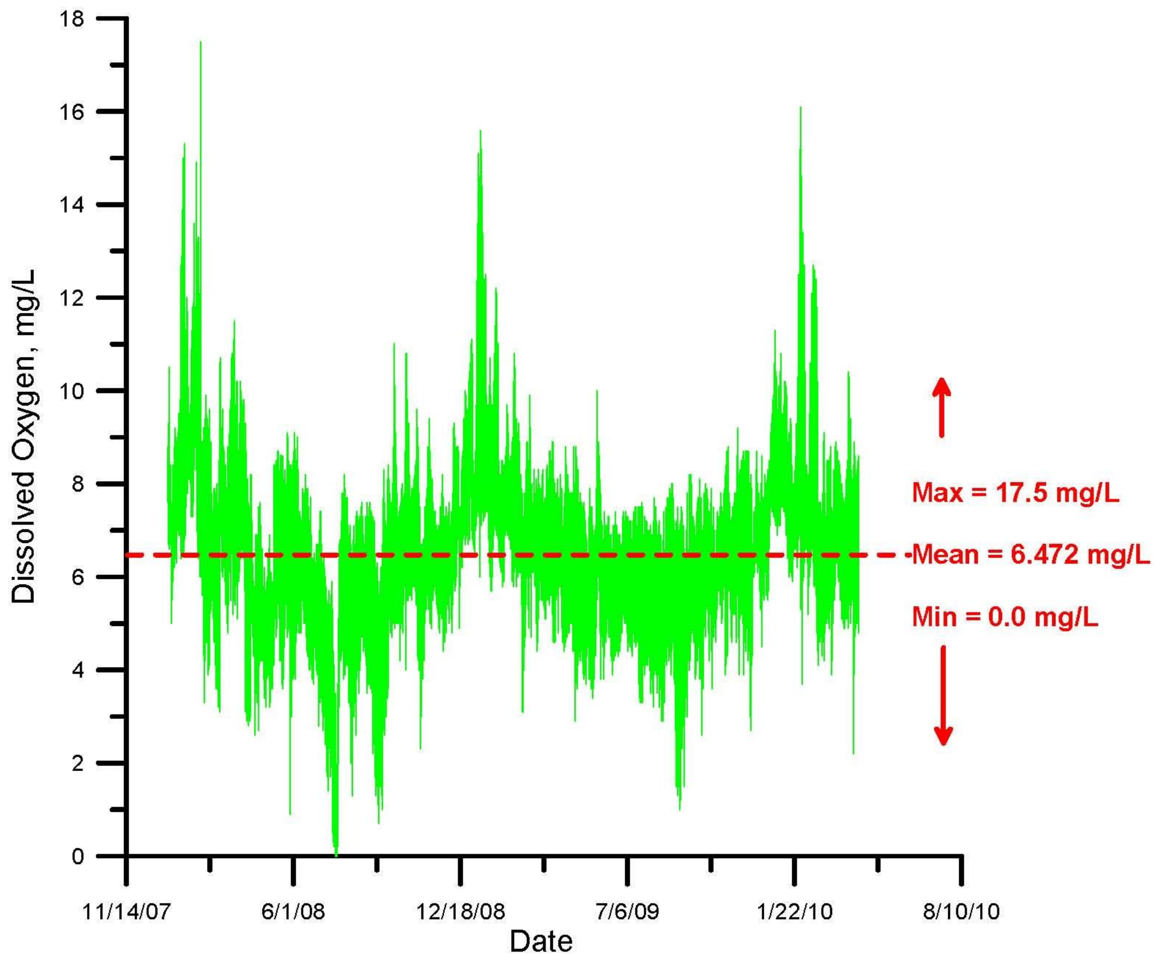


Figure 12: Dissolved Oxygen (DO) variation in south San Diego Bay at the Otay River mouth. Data from Otay River Sonde, 2007-2010.

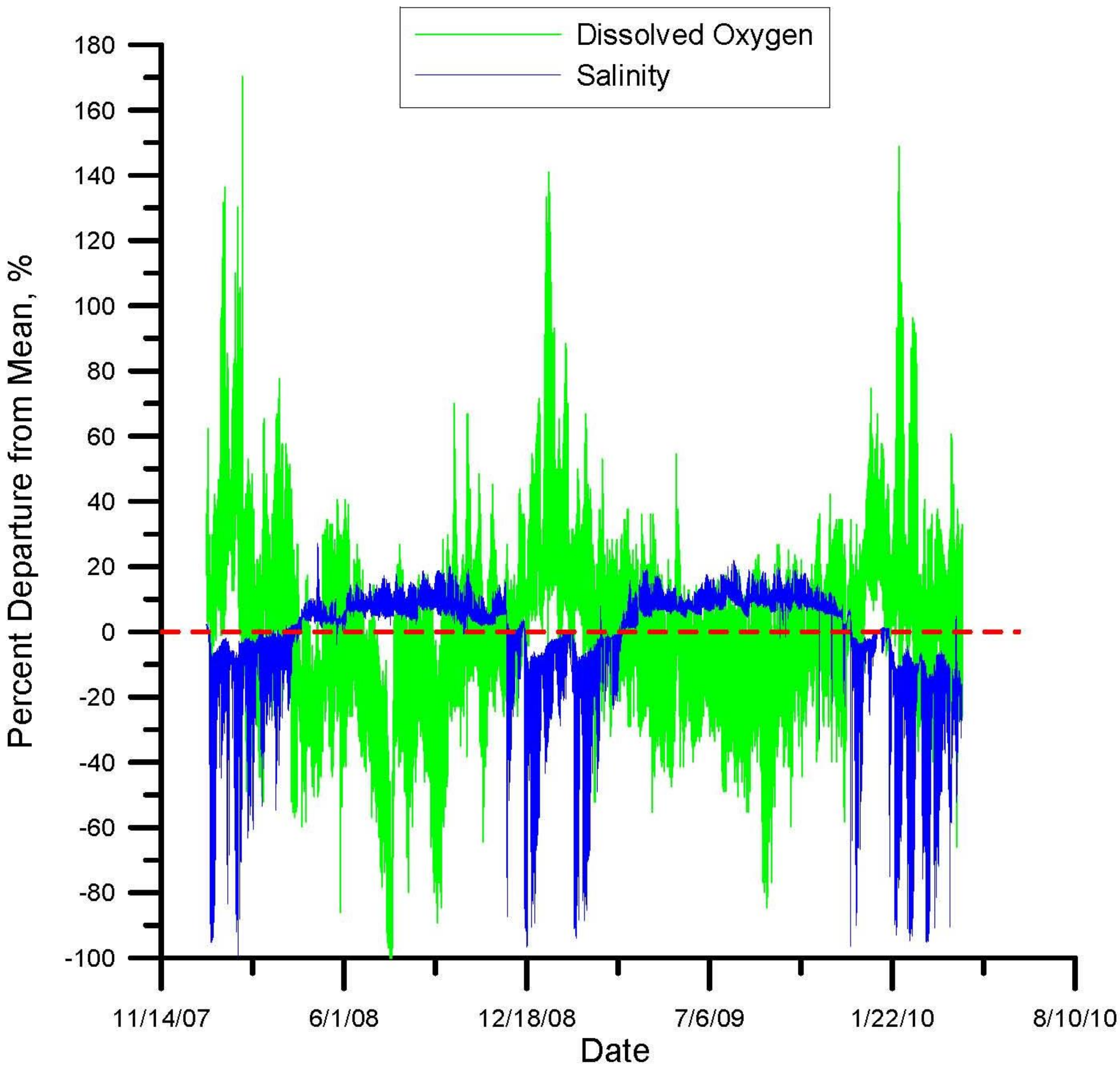


Figure 13: Variation in departure from the mean of salinity and dissolved oxygen at the Otay River mouth, from Otay Sonde data base, 2007-2010.

3.4 Sea Level Rise Effects on San Diego Bay Water Levels: Globally, oceans rose at an average rate of 0.7 inches (18 mm) per decade from 1961 to 2003.2 Local, or relative, sea level rise is affected by global sea level rise, as well as key additional factors such as El Nino events, circulation patterns, and land elevations changes. As shown in Figure 14, sea level rise has been documented in the San Diego Bay since 1906 with a rise of 0.8 inches (20.6mm) per decade over the past century.

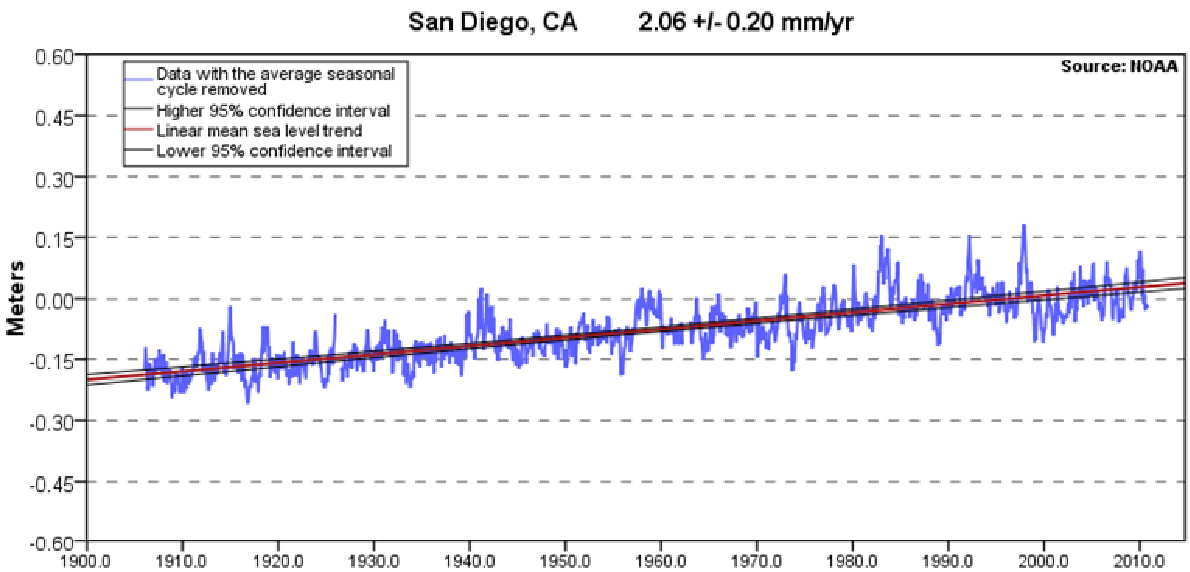


Figure 14: Observed sea level in San Diego Bay, 1900-2010, (from ICLEI, 2012)

Despite uncertainty, global climate experts have used greenhouse gas emissions scenarios and other methods to create a range of possible future sea level rise amounts. Figure 16 shows an estimated range of future global sea level rise trajectories from 7 different climate models. In California, the State is recommending the use of projections of between 4 and 24 inches (10.1 to 61 cm) in 2050 and of 31 to 69 inches (78 to 176 cm) in 2100. The restoration project will design for and evaluate sea level rise impacts based on State recommended projections for 2050. By the California State CAT-OPC guidance, sea level rise projections range between 4.68 and 24 inches (12 to 61 cm) by 2050. To calculate the tidal hydraulic responses of the restoration alternatives to these potential future sea levels, it is necessary to anticipate the tidal response inside San Diego Bay to these ranges of sea level rise on the open coastline. Two approaches are used. The first is linear superposition of the open ocean sea level rise on to the present 30 year time series of south San Diego Bay tides developed from spectral corrections to the NOAA Navy Pier tides detailed in Section 3.2. The second is to apply a spectral correction derived from the Navy's Bay tide model for sea level rise (ICLEI, 2012).

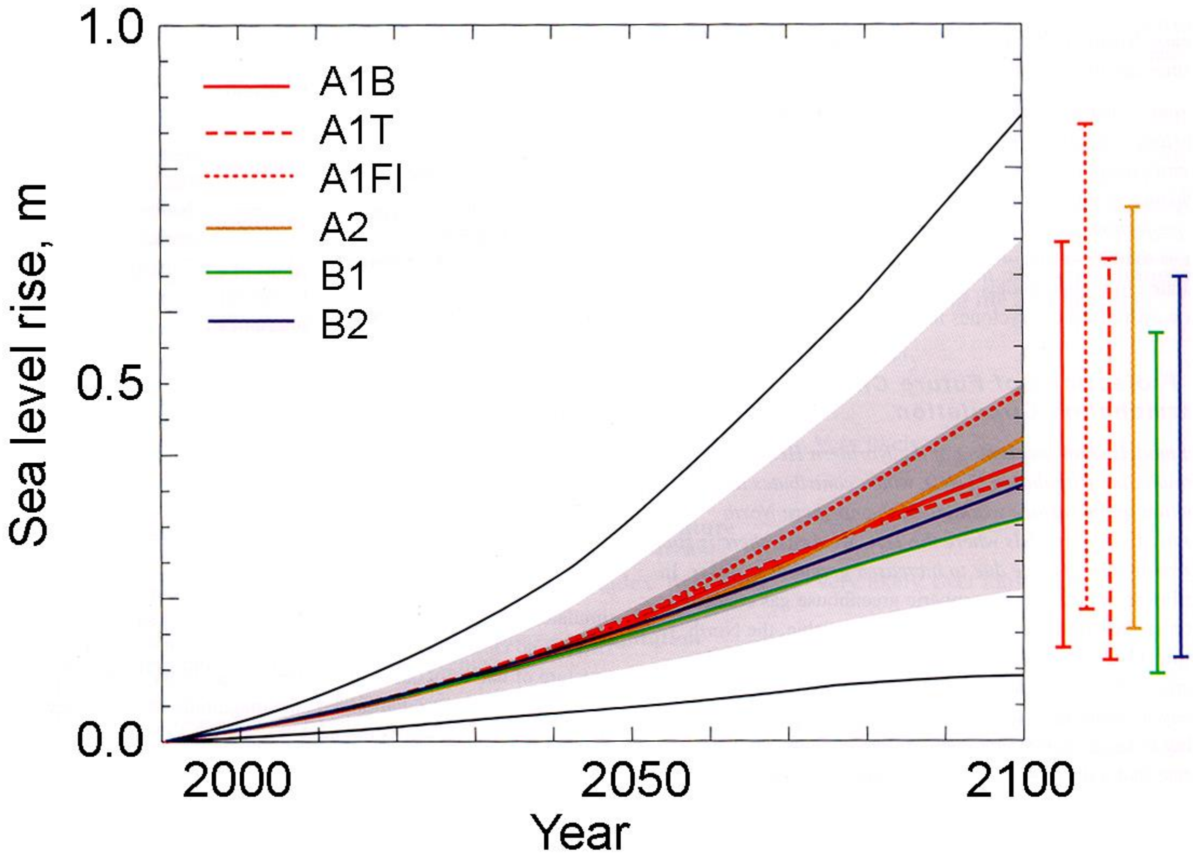


Figure 16: Range of sea level rise scenarios predicted out to year 2100 by seven separate global climate models (from IPCC, 2007)

Figure 17a shows a data snippet comparing tides at the mouth of the Otay River at present sea level (gray) versus the South Bay tidal response predicted for 2050 by the linear superposition method (red) and by the spectral correction method (blue). Obviously the higher-high and lower-low water levels will all be higher in 2050 based on the maximum CAT OPC guidance for sea level rise of 24 inches. The decisive issue is what the South Bay tidal range will be at these higher sea levels. The linear superposition method predicts the exact same tidal range as present, only oscillating around a 2 ft. higher sea level (Figure 17 a & b). The spectral correction method predicts the exact same higher high water levels as the linear superposition method, but yields a larger tidal range (Figure 17a & c). This is due to the fact that the 2050 tidal spectra derived from the Navy's Bay tide model predicts principle spectral peaks with a diminished second harmonic of the K1 lunar-solar diurnal tidal constituent at the mouth of the

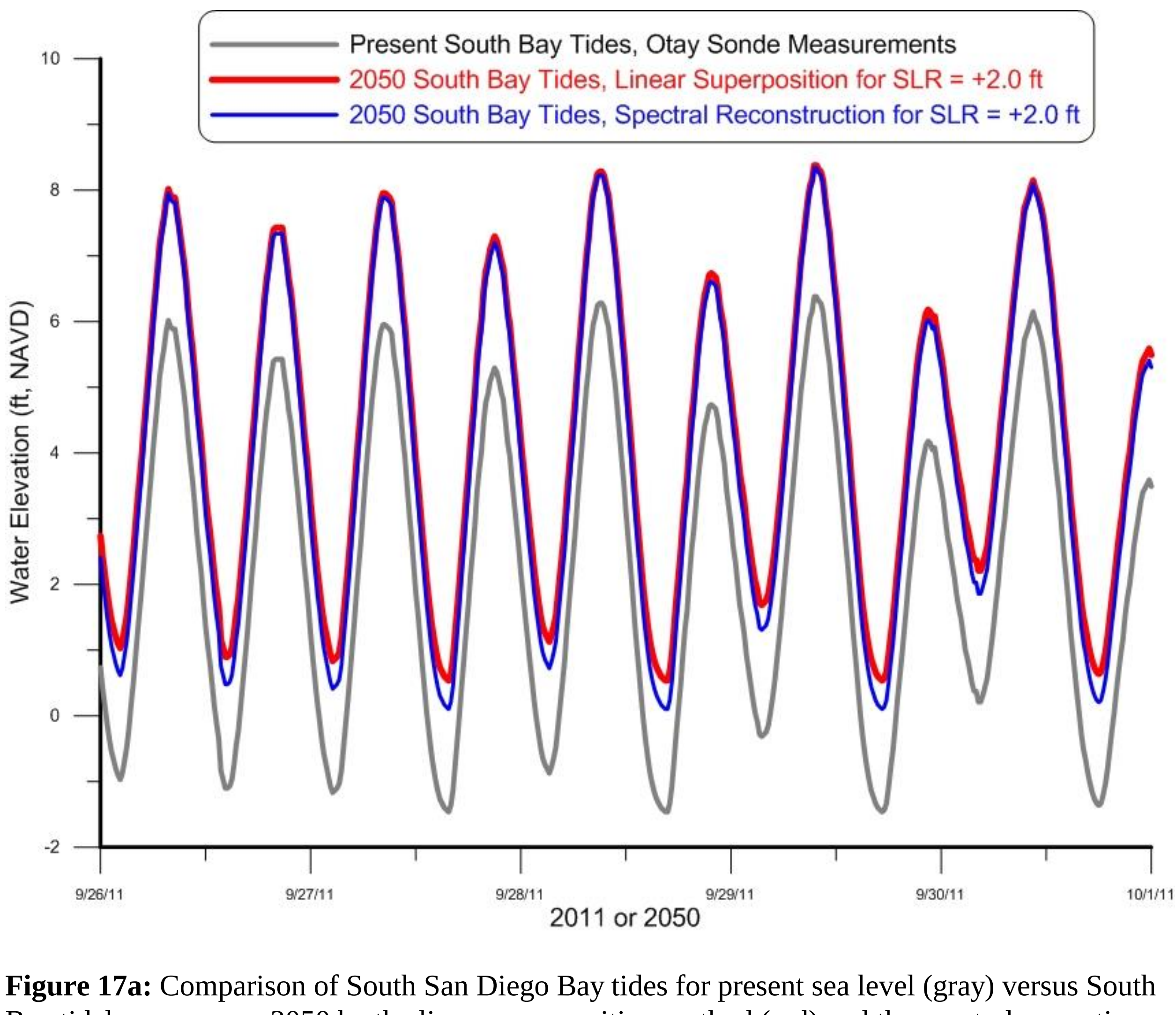


Figure 17a: Comparison of South San Diego Bay tides for present sea level (gray) versus South Bay tidal response on 2050 by the linear superposition method (red) and the spectral correction method (blue).

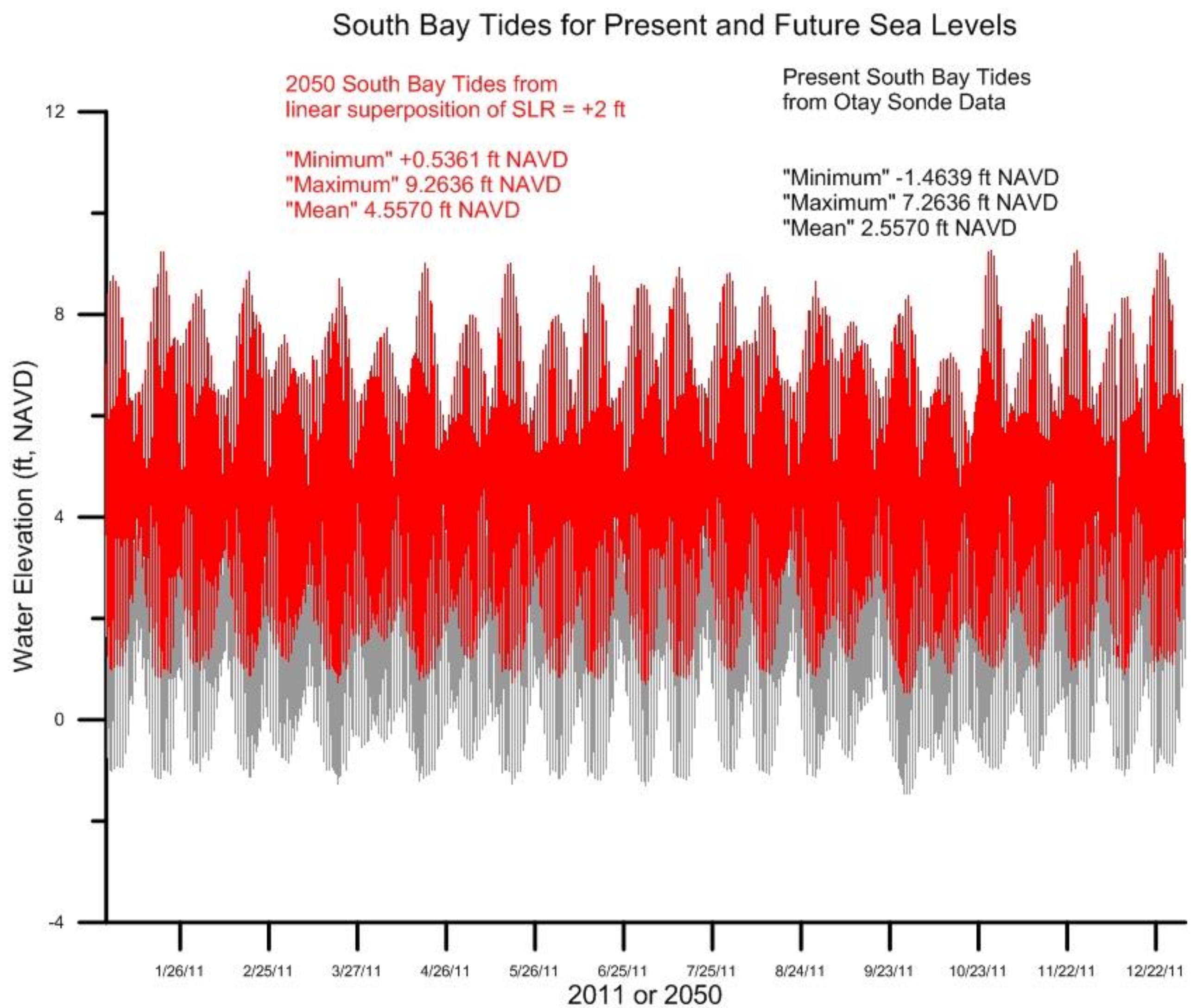


Figure 17b: Comparison of a typical year of South San Diego Bay tides for present sea level (gray) versus South Bay tidal response on 2050 by the linear superposition method (red).

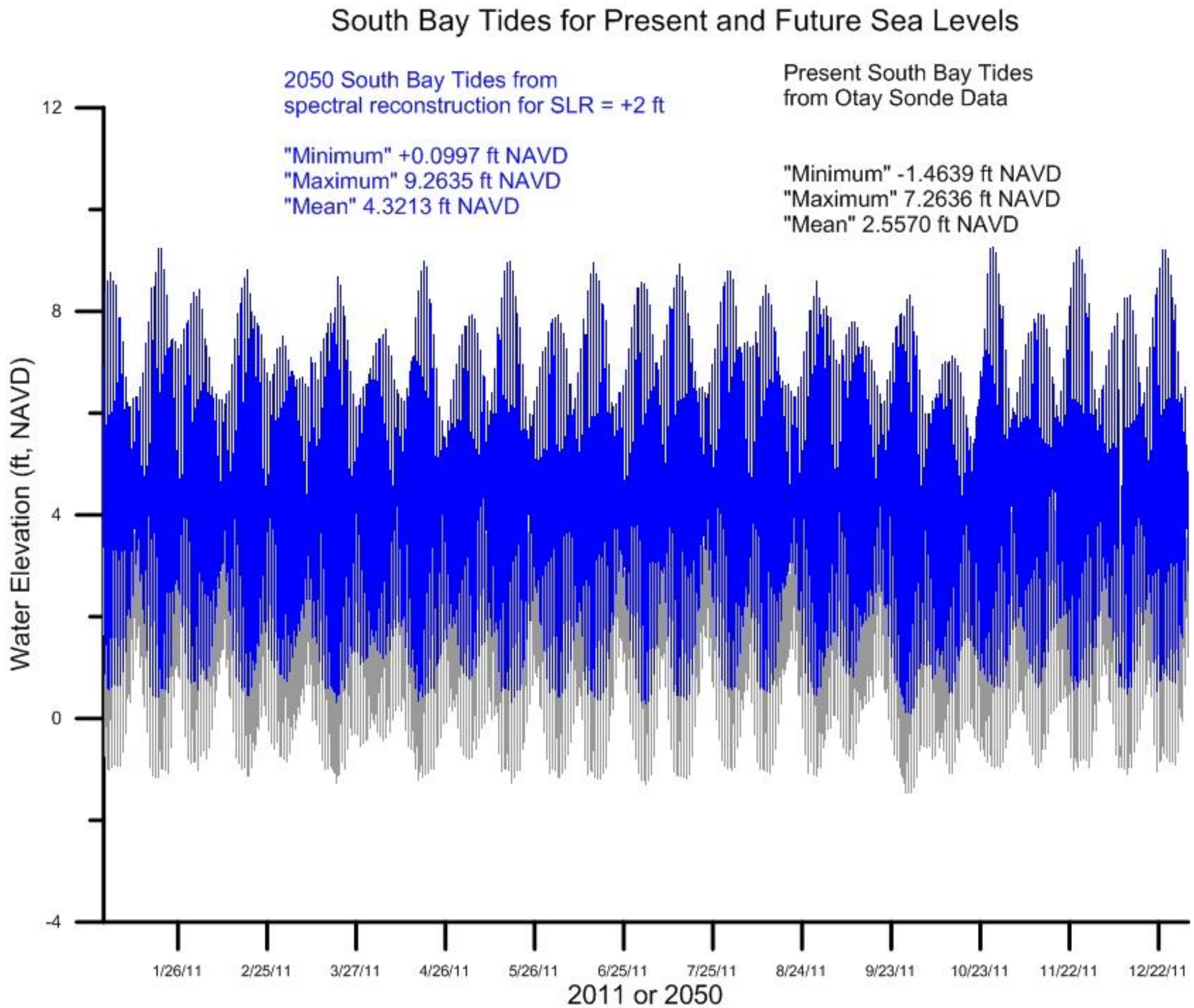


Figure 17c: Comparison of a typical year of South San Diego Bay tides for present sea level (gray) versus South Bay tidal response on 2050 by the spectral correction method (blue).

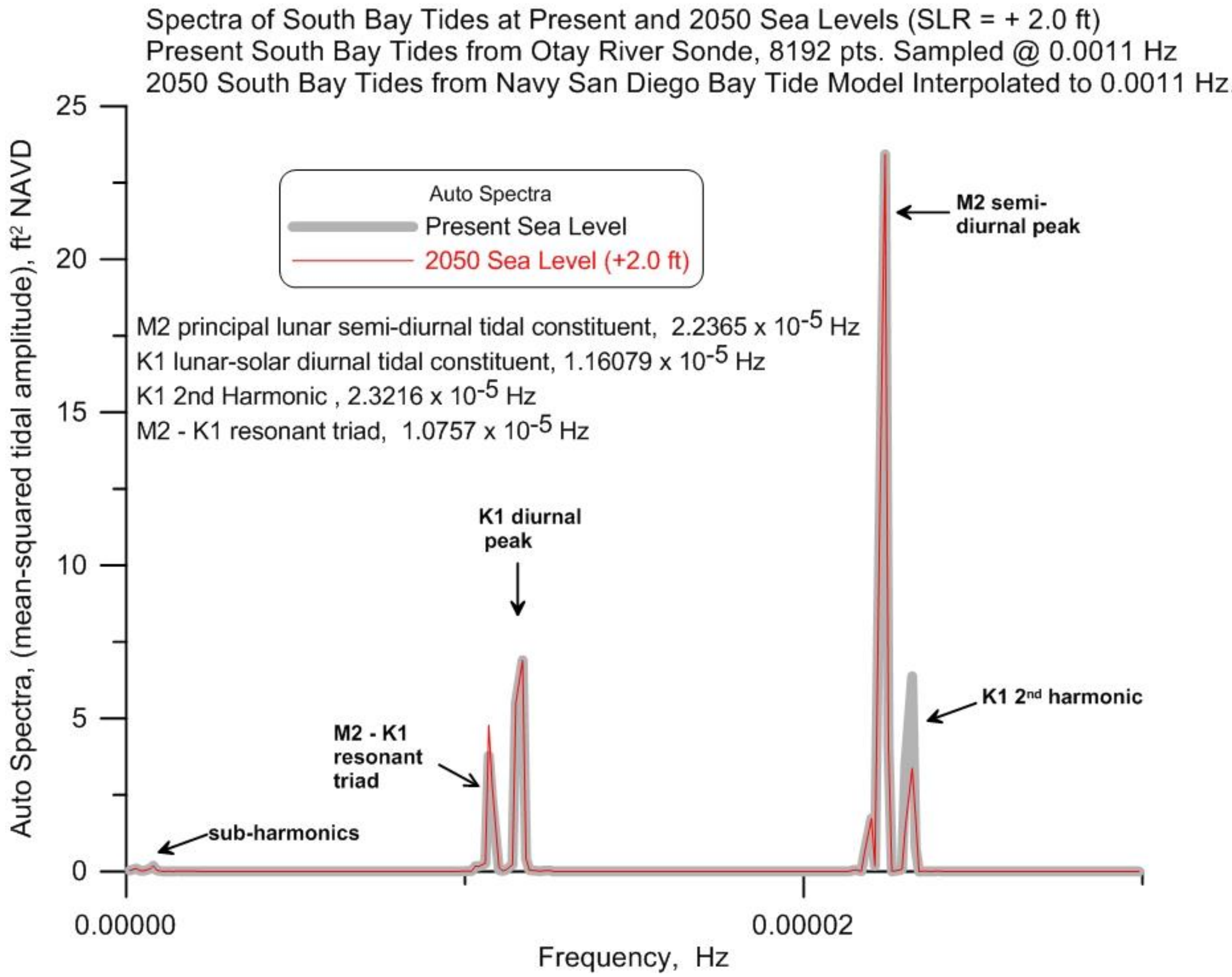


Figure 18: Comparison of spectra South San Diego Bay tides for present sea level (gray) versus South Bay tidal response for maximum estimated sea level rise in 2050 (red).

Otay River, (Figure 18), indicating diminished bottom friction over the South Bay Shelf due to feet of additional water depth at higher sea level. Also there is further enhancement of resonant triad sub-harmonic in Figure 18, (difference frequency) between the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent measured at the mouth of the Otay River, indicating bathymetrically trapped tidal oscillations on the South Bay Shelf has intensified in the presence of deeper water and diminished bottom friction.

Inundation refers to a condition when land that was once dry becomes permanently wet. Sea level rise could result in certain currently dry locations around the San Diego Bay being inundated by daily high tides. This potential future inundation in the Bay at 2050 is projected in Figure 19. Inspection of this figure reveals significant inundation impacts in South San Diego

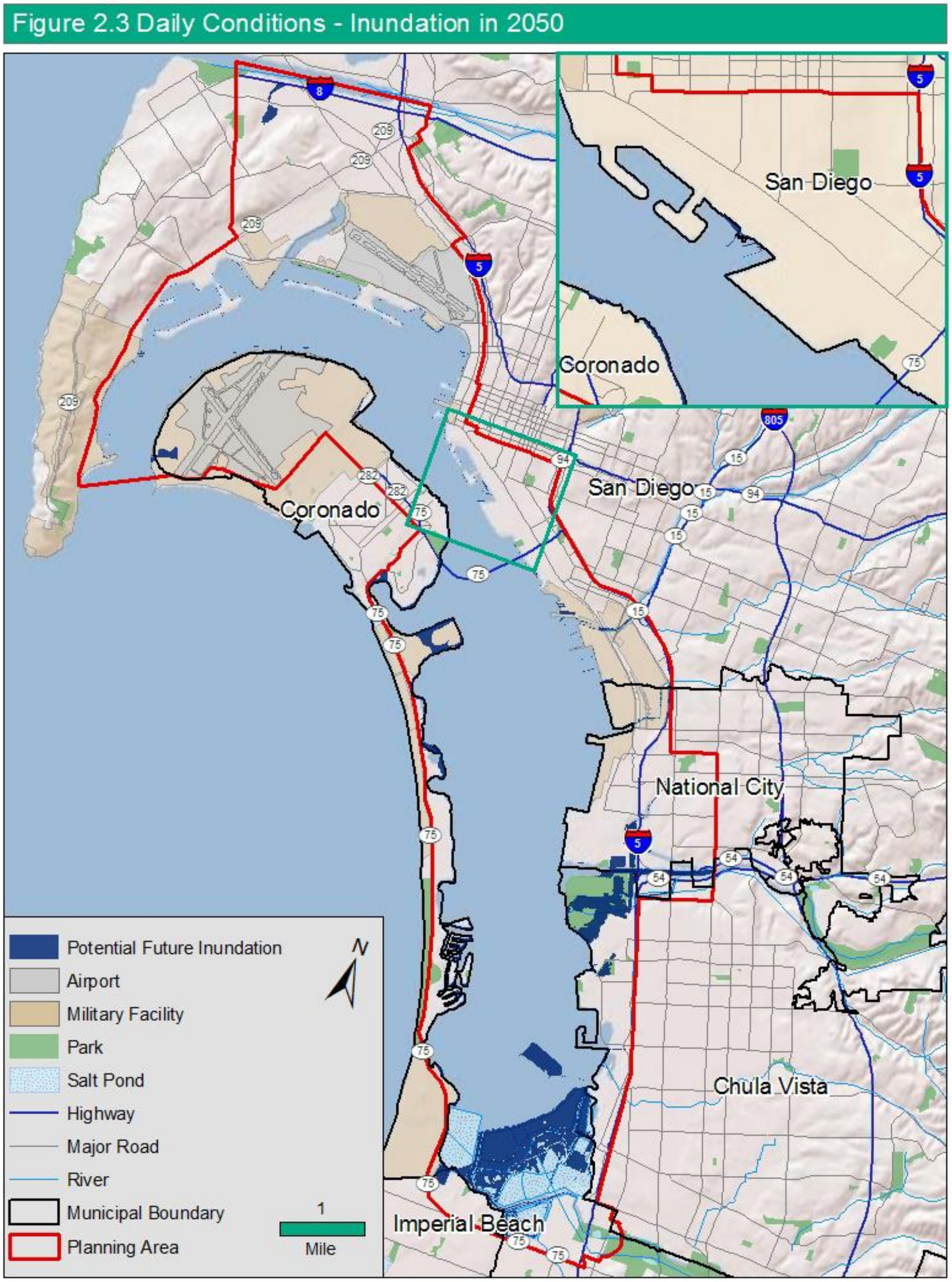


Figure 19: Projected Inundation impact areas in San Diego Bay due to 2050 sea level rise, (from ICLEI, 2012).

Bay by projected 2050 sea level rise. The Chula Vista Wildlife Reserve, and nearly all of the Pond #12 - #28 complex will be completely inundated, as well as most of Pond #10a. In addition to the clear threats inundation poses to the built environment, this impact is also predicted to impact natural systems or ecosystems in several key ways. Inundation is expected 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. The loss of these intertidal habitats would be highly destructive to the many species that rely heavily on their existence.

3.5) Model Calibration: We use monitoring data for the newly completed San Dieguito Lagoon Restoration Project to calibrate the TIDE_FEM tidal hydraulics model; and then use that calibration to simulate tidal inundation of the three wetland restoration alternatives in the Otay River flood plain. The San Dieguito Lagoon monitoring data was collected by Coastal Environments (2009) during September 2009. We select the W-16 tidal basin at San Dieguito Lagoon as a proxy for the proposed tidal basin in the Otay River floodplain because of morphologic similarities between the two cases: in particular both have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water.

Spring, neap and mean tidal range simulations of the tidal hydraulics of San Dieguito Lagoon were performed using astronomic tidal forcing functions at = 2 sec time step intervals for the period 1980-2007. Computed water surface elevations and depth averaged velocities from the global solution matrix were converted to lagoon waterline contours and flow trajectories. Calibrations for determining the appropriate Manning factors and eddy viscosities were performed by running the TIDE_FEM model on the San Dieguito bathymetry file and comparing calculated water surface elevations in the W-16 tidal basins against water level measurements by Coastal Environments (2009) during the monitoring period of 14-18 September 2009. Iterative selection of Manning factor n_0 = 0.0261 and an eddy viscosity of ε = 7.129 ft^2/sec gave calculations of water surface elevation and inlet that reproduced the measured values to within 2% over the 2009 monitoring period at San Dieguito Lagoon.

Figure 20 provides a quantitative assessment of predictive skill of the calibrated model using water level measurements in the newly created W-16 Tidal Basin located east of I-5 off the north bank of the San Dieguito River. Here we compare W-16 Tidal Basin water level variations predicted by the model (purple trace) with the water level measurements (black crosses) during the post-construction monitoring of the Edison Plan by Coastal Environments, (2005). The W-16 Basin water level variations are found to lag the ocean water levels by as much as 3.79 hr during the mid-range tides of the monitoring period. High tide water levels equal or exceed those in the ocean due to trapping of higher harmonics of the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent, similar to what occurs in San Diego Bay. However, low tide water levels in the W-16 basin never drop below + 1.49 ft NGVD and are well above ocean low tide water levels due to frictional impedance and depth limiting travel time of the tidal wave propagation in the long sinuous feeder channels that connect the W-16 tidal basin

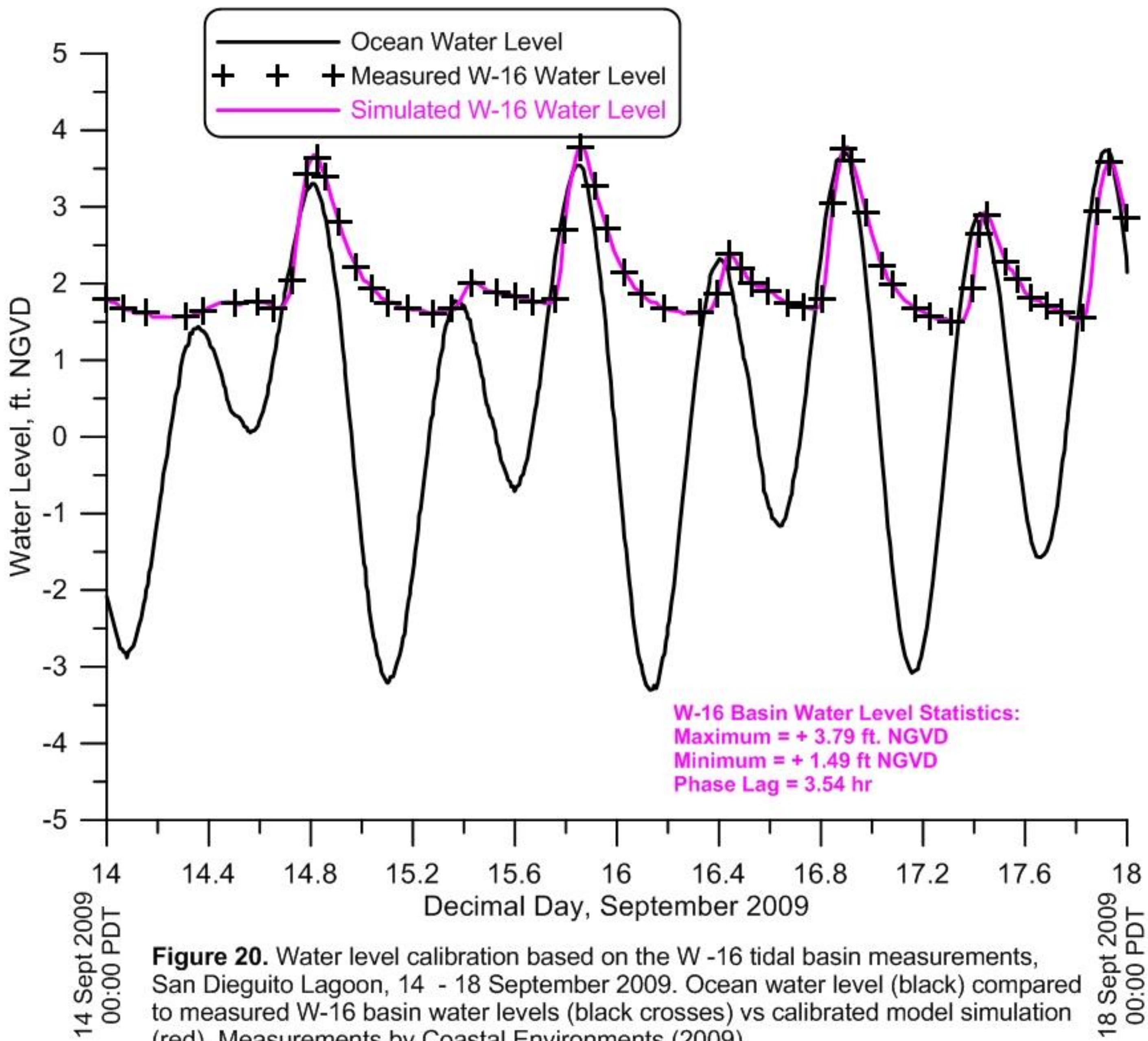


Figure 20. Water level calibration based on the W -16 tidal basin measurements, San Dieguito Lagoon, 14 - 18 September 2009. Ocean water level (black) compared to measured W-16 basin water levels (black crosses) vs calibrated model simulation (red). Measurements by Coastal Environments (2009).

with the ocean. Low tide levels in W-16 could fall no lower than +0.23 ft NGVD due to the present elevation of the hard channel bottom under the I-5 bridge. The amplitudes and degree of non-linearity in the W-16 Basin water level time series are accurately simulated by the model and closely duplicate those features observed in the measured lagoon tides.

4.0) Tidal Hydraulics of the Existing Otay River Floodplain

The TIDE_FEM bathymetric computational mesh was initialized for the updated Otay River Floodplain bathymetry derived from the 2011 WRA precision GPS surveys (Figure 21). The TIDE_FEM computational mesh is nested in the farfield of south San Diego Bay, and was subjected to 30 years of historic tidal forcing using the 1980-2009 period of record at the Navy Pier in San Diego Bay, after spectrally correcting that record to the mouth of the Otay River as detailed in Section 3.2 .

4.1) Tidal Current Simulations: Peak flooding currents during spring tides were simulated in the existing river channel in Figure 22, while ebbing currents during spring tides are found in Figure 23. These progressive vector diagrams show that flooding spring tidal currents are about 0.1 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 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) into the complex dendritic system of channels in the upper reaches of the flood plain.

The tidal currents calculated in the lower Otay River and feeder channel during spring tides (cf Figures 22 & 23) are compared against grain size data to estimate the potential for scour and erosion. A 2012 geotechnical investigation of the Otay River Floodplain was conducted by Calscience Environmental Laboratories, Inc. that included boring locations and some gradation curves in the lower Otay River channel. Figure 24a gives the grain size distribution from a composite sample of channel borings, indicating the river channel sediments are fairly well sorted (due to hydraulic sorting during river floods and perhaps relict wave action) with a median grain size of D_{50} = 0.3 mm. Comparing this median grain size against the Hjulstrom Curve in Figure 24b indicates these river channel sediments have a threshold scour speed of 0.66 ft/sec (0.2 m/s). Tidal current speeds between 0.27 ft/ sec (0.08 m/sec) and 0.66 ft/sec would lead to bed load transport but not erosion. Erosion and scour would only occur for tidal currents that exceed 0.66 ft/sec, while currents less 0.27 ft/sec would yield deposition. These transport thresholds of the native river bed sediments indicate that the only potentially problematic areas are the narrow, deep north-south reach of channel adjacent Ponds 10 and 11 and the two 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 Ponds 10 and 11, the channel has already scoured to an equilibrium depth where maximum tidal currents reach but do not exceed the threshold scour speed of the channel sediments; and at the two pinch points 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 prevails, wherein there is incipient sediment transport without either erosion or deposition. One special attribute of

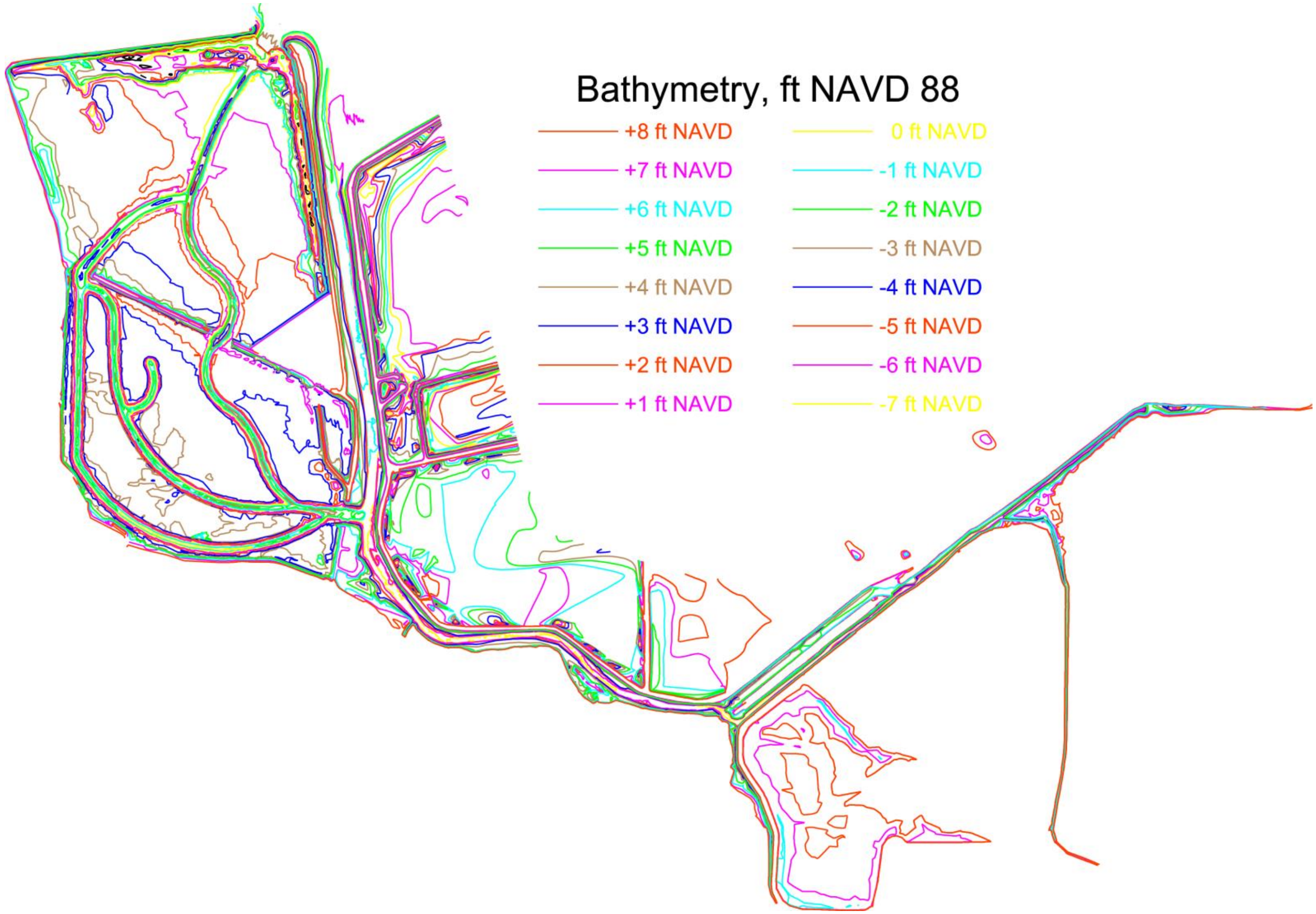


Figure 21: The updated Otay River Floodplain bathymetry derived from the 2011 WRA precision GPS survey.

Figure 22: Hydrodynamic simulation of progressive vector flow distribution at 30 min time integration during maximum flood flow during spring tides for the existing lower Otay River and salt pond system based on 2011 WRA bathymetric survey and the 1983-2001 tidal epoch for San Diego Bay tides.

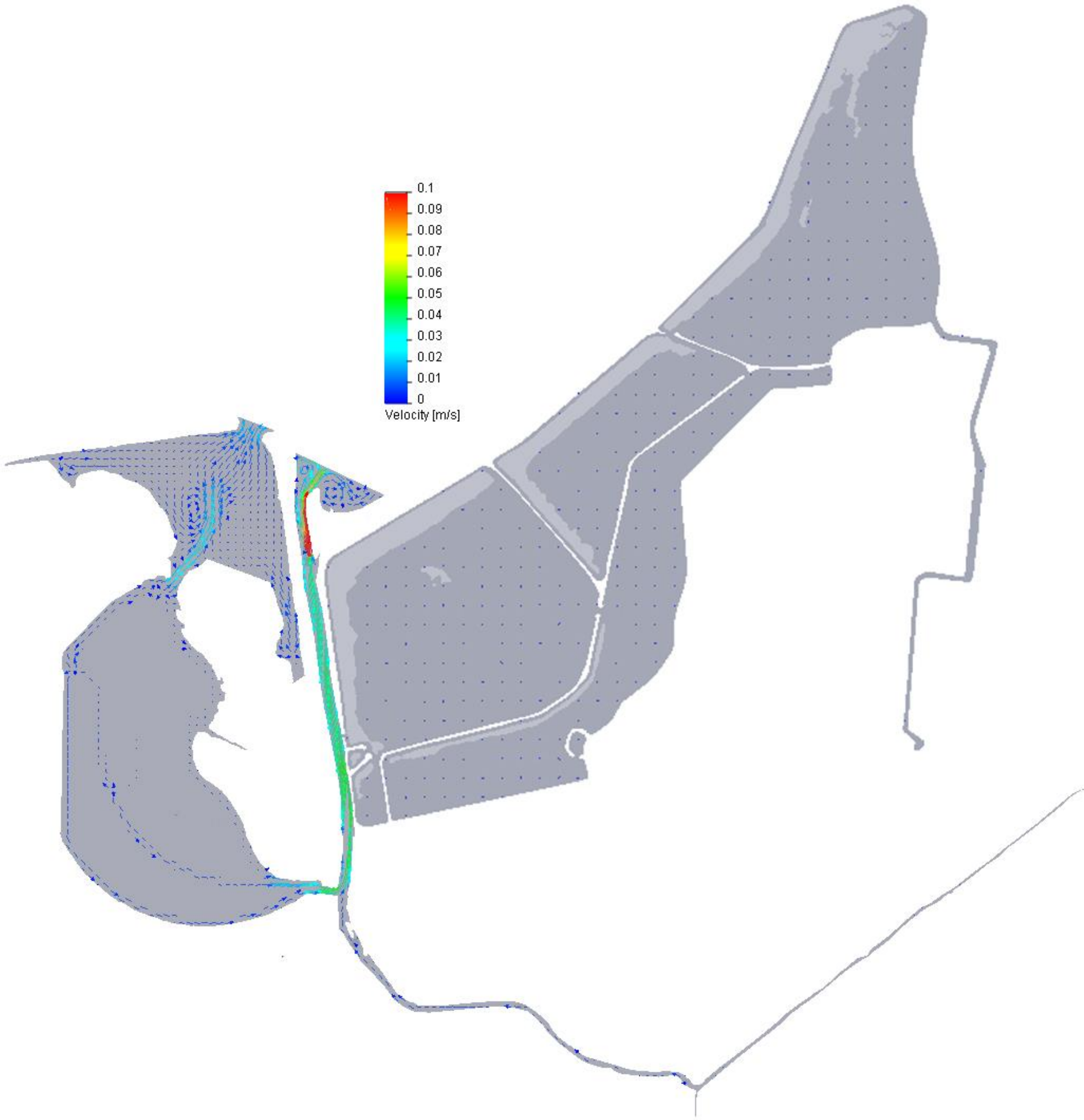


Figure 23: Hydrodynamic simulation of progressive vector flow distribution at 30 min time integration during maximum ebb flow during spring tides for the existing lower Otay River and salt pond system based on 2011 WRA bathymetric survey and the 1983-2001 tidal epoch for San Diego Bay tides.

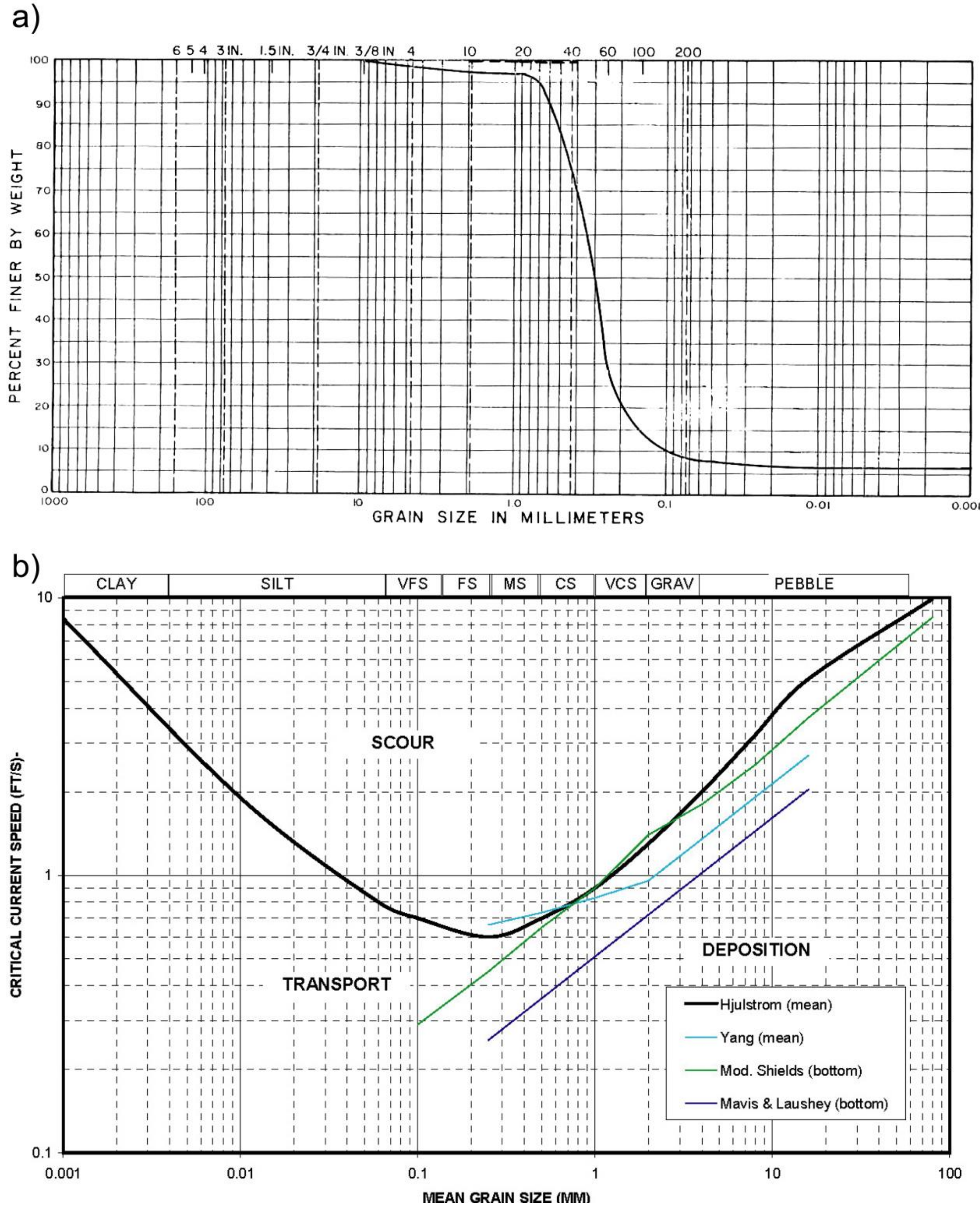


Figure 24: (a) Otay River channel grain size distribution from Calscience Environmental Laboratories, Inc., 15 May 2012. **(b)** Hjulstrom curve for critical current speeds of quartz sediment as a function of mean grain size, from Everest, (2007).

this site is that the inlet channel and the mouth of the Otay River are not subject to littoral transport by shoaling ocean waves, as south San Diego Bay provides complete sheltering from high energy shoaling swells. Consequently, the inlet channel is not likely to infill or close from sand influx in the source water, making the site significantly easier to maintain.

4.2 Hydroperiod Simulations: The hydroperiod function gives the percentage of exposure for each elevation throughout the full range of lagoon water level variation. This is the primary physical factor limiting the type of habitat that will thrive at a particular elevation in the wetland. These relationships are used later (Sections 4 & 5) to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

The spectrally corrected San Diego Bay water levels for the 1980-2009 period of record were used to drive the TIDE_FEM model at the mouth of the Otay River in order to solve for the time series of the water level variation in the existing Otay River floodplain. The computations involved N_o = 2,629,800 time steps, each 6 minutes in length, in order to sweep the 30 year period of record. At each time step the average basin water elevation, $\hat{\eta}$ was calculated from the ensemble average of the solutions at the nodes in the computational mesh. Conditional if statements and counting loops inserted into the TIDE_FEM code would count the number time steps, N, for which the average lagoon water elevation was less than a particular elevation, Z_i. The percent time that elevation Z_i was exposed over the period of record was calculated as:

$$E_i = \frac{100\%}{N_o} \sum N(\hat{\eta} < Z_i) \qquad (18)$$

The elevations dividing the various sub-tidal and intertidal habitat types are based on biological surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012). These surveys are mapped according to elevations and are used to develop functional relationships (referred to as *a hydroperiod function*) between habitat breaks and the exposure times computed from equation (18). From this procedure, the following exposure times were assigned to each habitat break:

TABLE 2: Exposure Levels for Hydroperiod Habitat Breaks

Subtidal Exposure < 0%;
0% < **Frequently Flooded Mud Flat Exposure** < 38%
38% < **Frequently Exposed Mud Flat Exposure** < 45%;
45% < **Low Salt Marsh Exposure** < 75%
75% < **Mid Salt Marsh Exposure** < 95%
95% < **High Salt Marsh Exposure** < 99.6%
99.6% < **Transitional Exposure** < 100%

Figure 25 below gives the hydroperiod function that was determined by this analysis the existing Otay River flood plain, and which is subsequently applied to the grading plans of the proposed restoration alternatives to determine the numbers of restored acres of each wetland habitat type.While the shape of this curve may vary with the particular restoration alternatives, the percent exposure times will determine the elevations on at which a particular habitat break occurs, and those elevations will in turn map into the grading design to determine the amount of acreage of each habitat type.

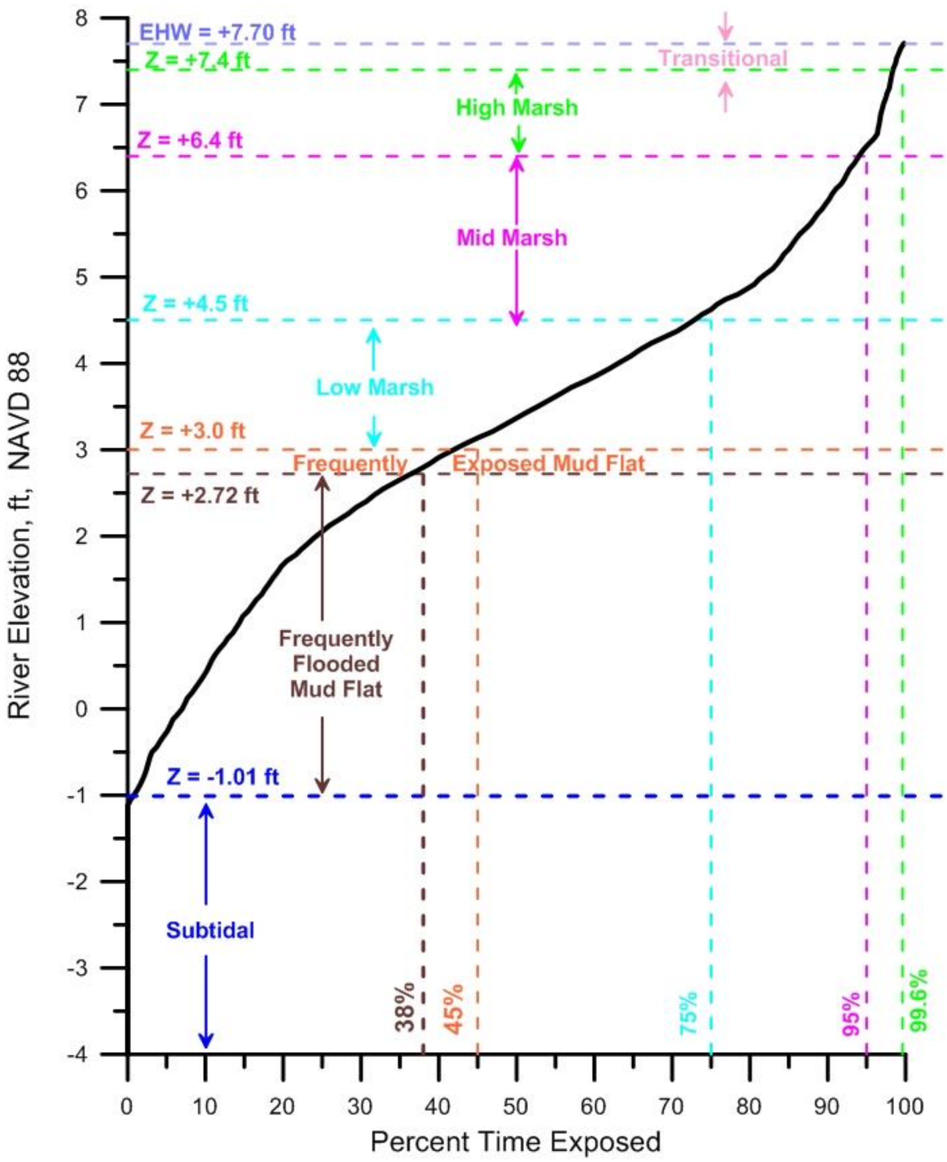


Figure 25. Hydroperiod function of the existing Otay River floodplain based on WRA 2011 bathymetric survey applied to water level data from NOAA tide gage #941-0170, for tidal epoch 1983-2001, with spectral correction from Otay River Sonde. Mannings roughness: n_0 = 0.0261

5.0 Analysis of the Intertidal Alternative:

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was also used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a proxy for the restoration alternatives because of morphologic similarities: in particular, both restoration sites have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the *Intertida*l restoration plan. Calculations of habitat creation were based on long-term tidal hydraulics simulations using tidal forcing at the mouth of the Otay River, derived from a spectral correction applied to the NOAA tide gage #941-0170 located at the Navy Pier (cf. Section 3.2)

5.1 Bathymetric Input for the Intertidal Alternative: Grading contours for the Intertidal Alternative were provided in 0.5 ft intervals between -4.0 ft NAVD and + 10 ft NGVD by KTU+A. The TIDE_FEM tidal hydraulics model presented in Jenkins and Inman (1999) was gridded for a computational mesh of the Intertidal Alternative built off the bathymetry in Figures 4 and 5. Figure 4 details the elevation grading contours of the Intertidal Alternative tidal basin in the Otay River floodplain merged with the Otay River bathymetry; while Figure 5 gives the elevation contours resulting from cut and fill of the Pond-15 tidal basin for the Intertidal Alternative. Of particular interest to the finite element mesh is the *hydraulic friction slope coefficient*, S_{fj}, providing tidal muting effects. Two separate formulations are used. One is given for the 3-node triangular elements situated in the interior of the mesh which do not experience successive wetting and drying during each tide cycle. The other formulation is for the elements situated along the wet and dry boundaries of the lagoon. These have been formulated as 3-node triangular elements with one curved side based upon the cubic-spline matrices developed by Weiyan (1992). These two sets of elements were assembled into a computational mesh of the restoration whose upper boundary conforms to the + 10 ft. NGVD contours in Figures 4 and 5. The + 10 ft. NGVD contour was chosen to allow sufficient computational domain to evaluate tidal inundation at 2050 sea levels that are as much as + 2.0 ft above present sealevel. The wet-dry boundary coordinates of the curved waterline, (x', y'), are linearly interpolated for any given water elevation from the contours stored in the bathymetry file.

Aside from gridding the TIDE_FEM tidal model, storage rating functions were calculated from the bathymetric contours of Figures 4 and 5. Figure 26 gives the storage rating function of the floodplain tidal basin merged with the tidally influenced lower reach of the Otay River; while Figure 27 gives the storage rating function for the Pond 15 tidal basin as configured for the

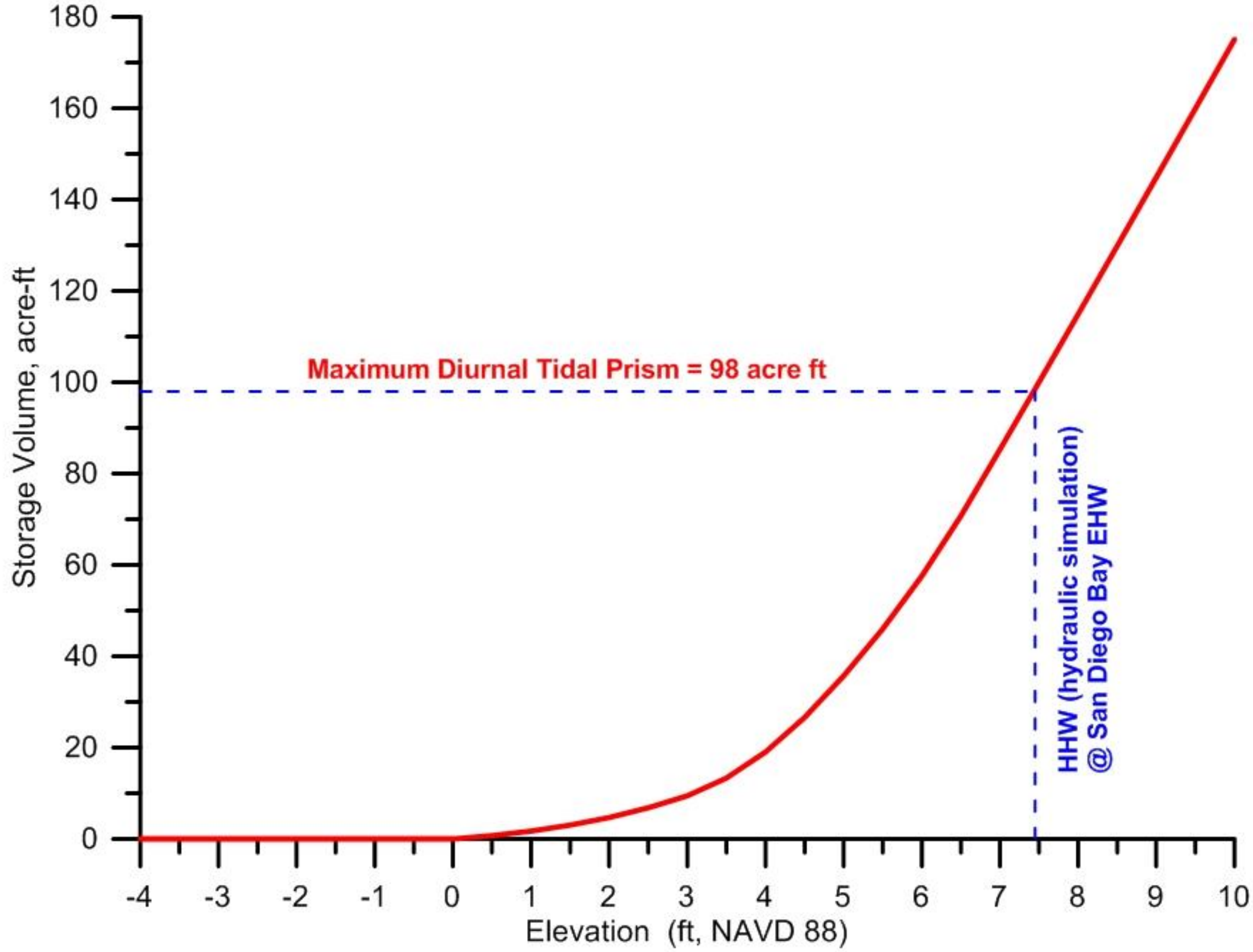


Figure 26: Storage rating function of the tidal basin in the Otay River floodplain for the Intertidal Alternative with no dredging of the existing river channel. Maximum diurnal tidal prism shown for extreme high-water event in San Diego Bay, 27 January 1983.

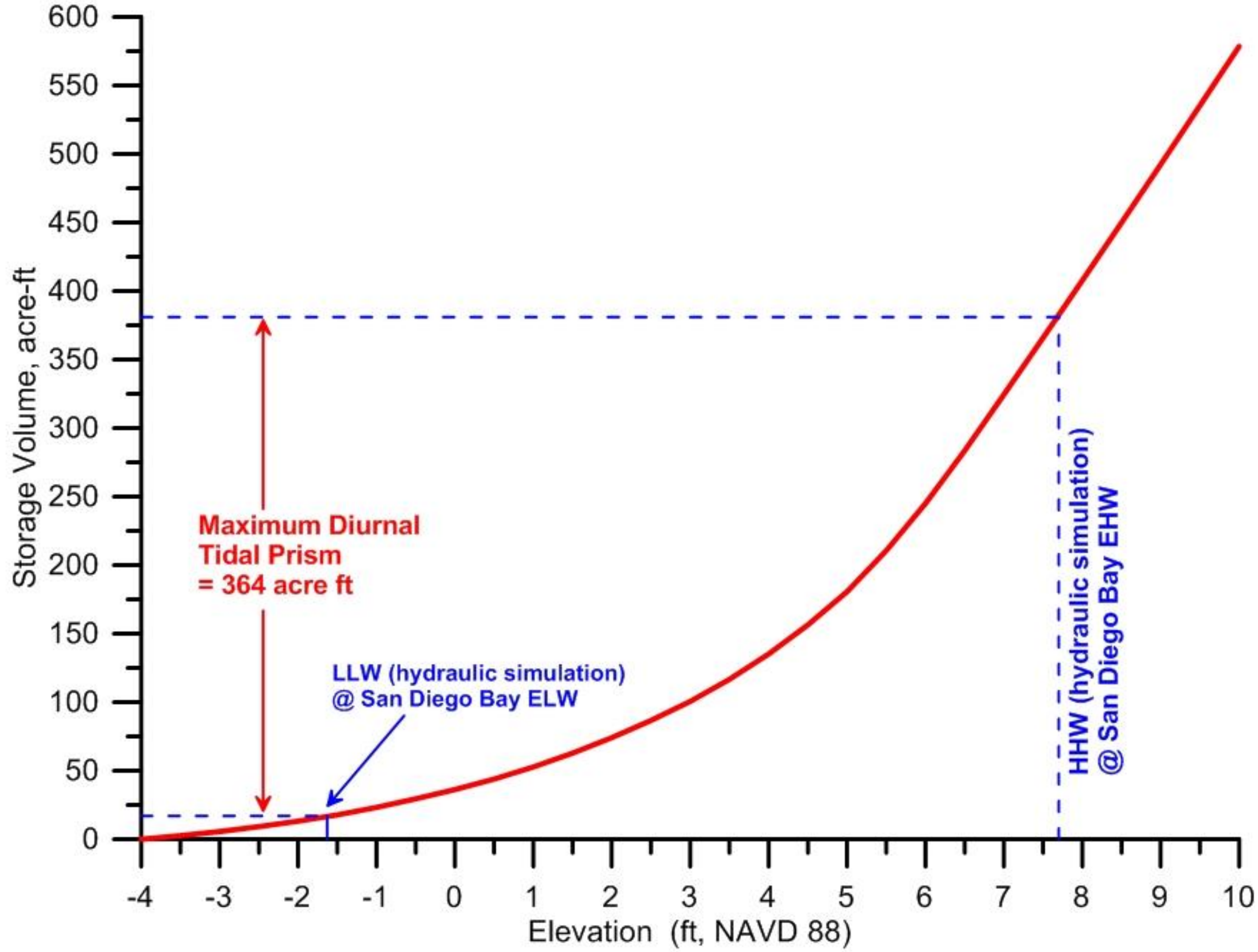


Figure 27: Storage rating function of the Pond 15 tidal basin for the Intertidal Alternative. Maximum diurnal tidal prism shown for extreme high-water event in San Diego Bay, 27 January 1983.

Intertidal Alternative. The storage rating functions are used in the initialization of the TIDE_FEM tidal hydraulics model in order to enforce mass conservation in the tidal inundation simulations (see Jenkins and Inman, 1999). The initialization involves fitting a series of high-order polynomials to the volumes of the storage rating function in Figure 26 & 27. To accommodate possible future sea level rise the polynomial fits were carried up to a daylight contour chosen at +10.0 ft NGVD, even though the tidal inundation in San Diego Bay has never been observed above +7.71 ft NGVD. A fifth- order polynomial was fitted to the storage rating functions in Figures 26 & 27 with a coefficient of determination of $r^2 = 0.998$.

For tidal inundation up to the historic extreme high water level of San Diego Bay (EHW = +7.71 ft NGVD, (upper dashed blue line in Figure 26), the maximum volume of San Diego Bay water that is exchanged with the Intertidal Alternative floodplain tidal basin is 98 acre-ft. The maximum potential diurnal tidal prism of the Pond 15 tidal basin of the Intertidal Alternative is 364 acre ft for an extreme high water event at present sea level.

5.2 Tidal Inundation Simulations of the Intertidal Alternative: Figure 28 gives the flow trajectories and depth averaged tidal currents for the Intertidal Alternative computed by the calibrated TIDE_FEM model during spring flooding tides on 18 September 2009. Velocities of tidal currents are portrayed according to the color coded velocity scale appearing in the lower left corner of the figure. Maximum flooding spring tidal currents at the mouth of the Otay River (in the neighborhood of the Otay Sonde) 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 & 11 to 0.2 m/sec (0.66 ft/sec) where the channel has scoured under existing conditions to equilibrium depths on the order of -2.0 ft NAVD. After passing Pond 10, currents 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; where tidal currents entering the tidal basin initially form a well-defined jet at the west bank with speeds of about 0.08 m/s (0.26 ft/sec). This entry jet quickly diverges into a complex set of clockwise rotating eddies that populate the interior of the tidal basin. Eddy speeds in the tidal basin are on the order of 0.02 m/sec (0.07 ft/sec), insufficient to transport fine sand but 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. Maximum flooding spring tidal currents in the inlet channel to Pond #15 are about 0.07 m/sec (0.22 ft/sec), and then decelerate as a weak entry jet with speeds of about 0.05 m/s (0.16 ft/sec). This entry jet also quickly diverges into a complex set of counter rotating eddies that populate the interior of the tidal basin. Eddy speeds in the Pond #15 tidal basin are on the order of 0.01 m/sec (0.03 ft/sec), again insufficient to transport fine sand or cohesive silts, but also providing a stirring mechanism for mixing the Pond #15 water mass to maintain high oxygen levels and to sustain suspension of fine silt and clay sized sediment particles.

Figure 29 gives the flow trajectories and depth averaged tidal currents for the Intertidal Alternative computed by the TIDE_FEM model during spring ebbing tides on 18 September 2009. The wetted area of the floodplain tidal basin is significantly reduced relative to the flood tide area in Figure 28, due to the fact that the grading plan allows for almost complete drainage at mean low water tidal stages. In Figure 29, creeping flow drains from the remnant dendritic channel of the floodplain basin, forming a feeder current in the upper river channel with speeds

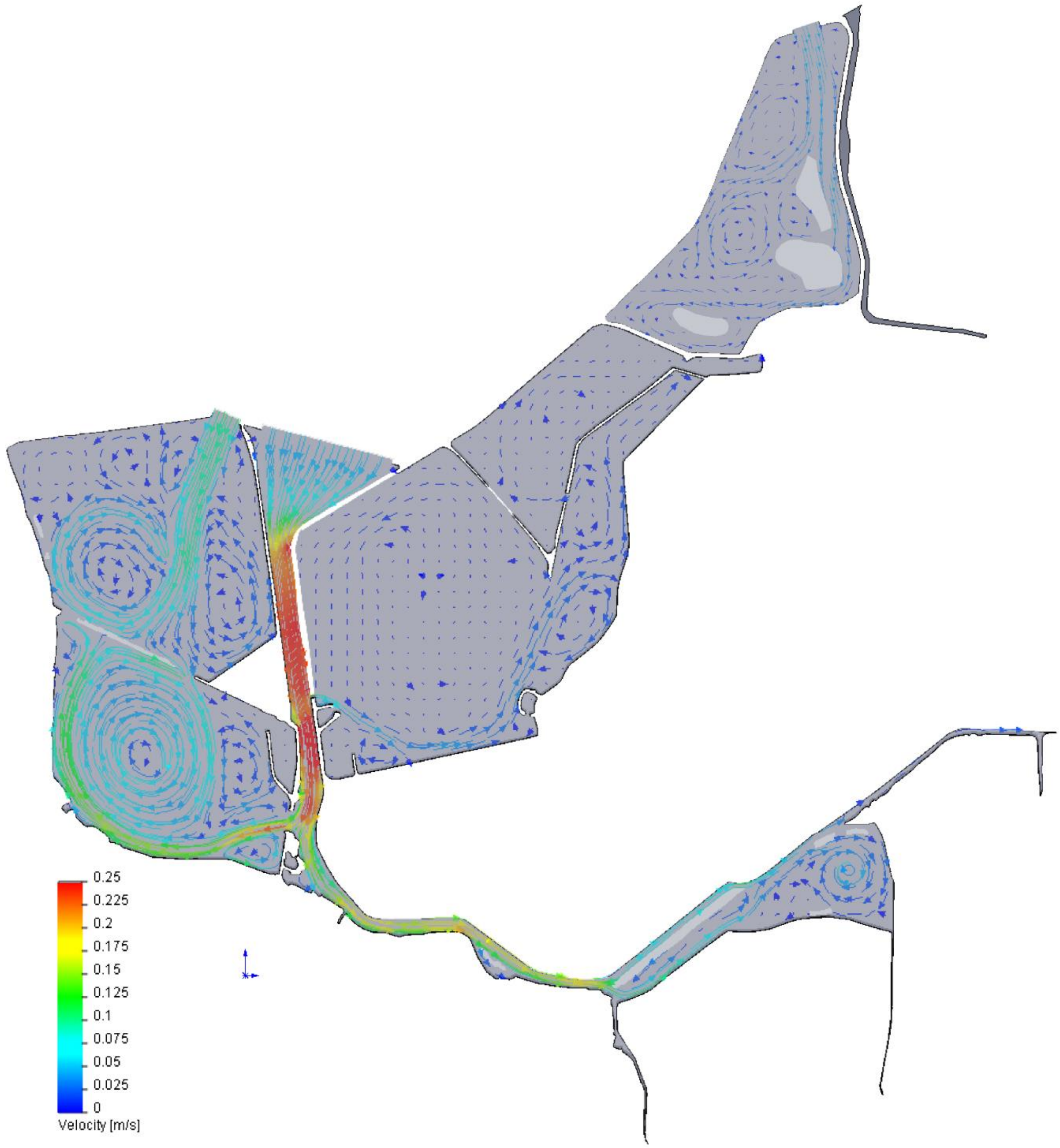


Figure 28: Intertidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

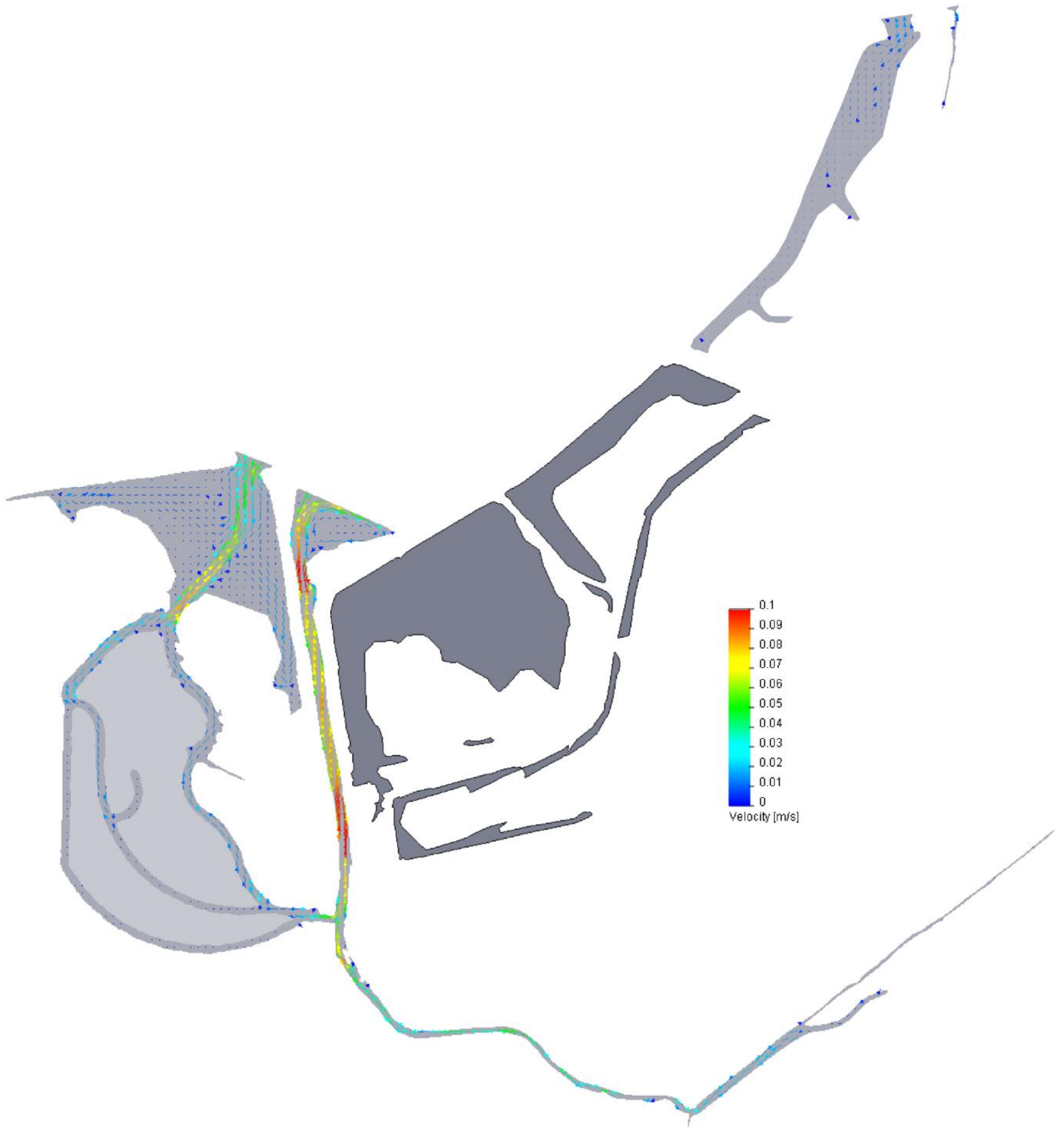


Figure 29: Intertidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

on the order of -0.01 m/sec, or (-0.03 ft/sec). This feeder current evacuates the tidal basin and then accelerates 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. (We adopt the convention of negative velocities for ebb tide flows and positive velocities for flood tide flows). Ebb flow in the channel then accelerates further to -0.09 m/sec (-0.289 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. In Pond #15 during ebb tide flow at mean low water level, the eastern half of the basin is completely drained and exposed, while a week feeder current evacuates the western half with ebb flow of about -0.02 m/sec (-0.07 ft/sec). This feeder current accelerates to about 0.06 m/sec (0.20 ft/sec), as it flows out the inlet of Pond #15, and is far below the threshold scour speed of the sediments along the bank of the Chula Vista Wildlife Reserve.

In Figure 30, tidal current speeds at the mouth of the Otay River for the Intertidal Alternative are simulated throughout an entire spring-neap tidal. These currents (plotted in red) are compared the threshold scour speeds for native river bed channel sediments as derived from the Hjulstrom Curve in Figure 24b based on grain size data in Figure 24a. These thresholds of incipient scour appear as red dashed lines for flood (positive) and ebb flow (negative) velocity sign conventions. It is apparent that ebb and flood flow velocities throughout a spring/neap cycle never reach the thresholds of incipient scour, where maximum flood flow velocity at the mouth of the Otay River is +0.329 ft./sec, while maximum ebb flow velocity reaches only – 0.289 ft./sec under the Intertidal Alternative. These flood and ebb flow maximums are consistent with the progressive vector simulations in Figures 28 & 29. Figure 31 gives the corresponding spring/neap velocity time series at the inlet to Pond 15 of the Intertidal Alternative. Because of the large non-equilibrium cross section engineered for this inlet, velocities are considerably less than at the mouth of the Otay River. For Pond 15, maximum flood flow velocity at the inlet is +0.224 ft./sec, while maximum ebb flow velocity reaches only – 0.196 ft./sec, well below the threshold scour speeds for the native sediments estimated to be +/- 0.66 ft./sec from the the Hjulstrom Curve in Figure 24b. Tidal current speeds between 0.27 ft/ sec (0.08 m/sec) and 0.66 ft/sec would lead to bed load transport but not erosion. Erosion and scour would only occur for tidal currents that exceed 0.66 ft/sec, while currents less 0.27 ft/sec would yield deposition. Therefore the mouth of the Otay River would be in steady state equilibrium that is neither depositional nor erosional under the Intertidal Alternative. However, the inlet to Pond 15 under the Intertidal Alternative could be depositional if there is an active sediment source nearby. However no such source appears to exist, other than perhaps very minimal and undocumented sediment yield from the Palomar Ditch during occasional El Nino floods. Littoral sediment transport by waves is generally de minimis due to the limited fetch across South San Diego Bay, and the inlet to Pond 15 is sheltered from direct wave exposure by the causeway of the Chula Vista Nature Reserve (cf. Figure 1).

Therefore, we conclude both source water inlets to the tidal basins of the Intertidal Alternative are stable and immune to closure or restriction by sedimentation under dry weather tidal exchange. (Wet-weather conditions are addressed in a companion study, Everest, 2014). Inlet sedimentation due to influxes of wave driven long-shore transport of sand (as occurs on the open coast), does not occur in the fetch limited environment of South San Diego Bay. The mouth of the Otay River that supplies source water to the floodplain tidal basin is in a dynamic steady-

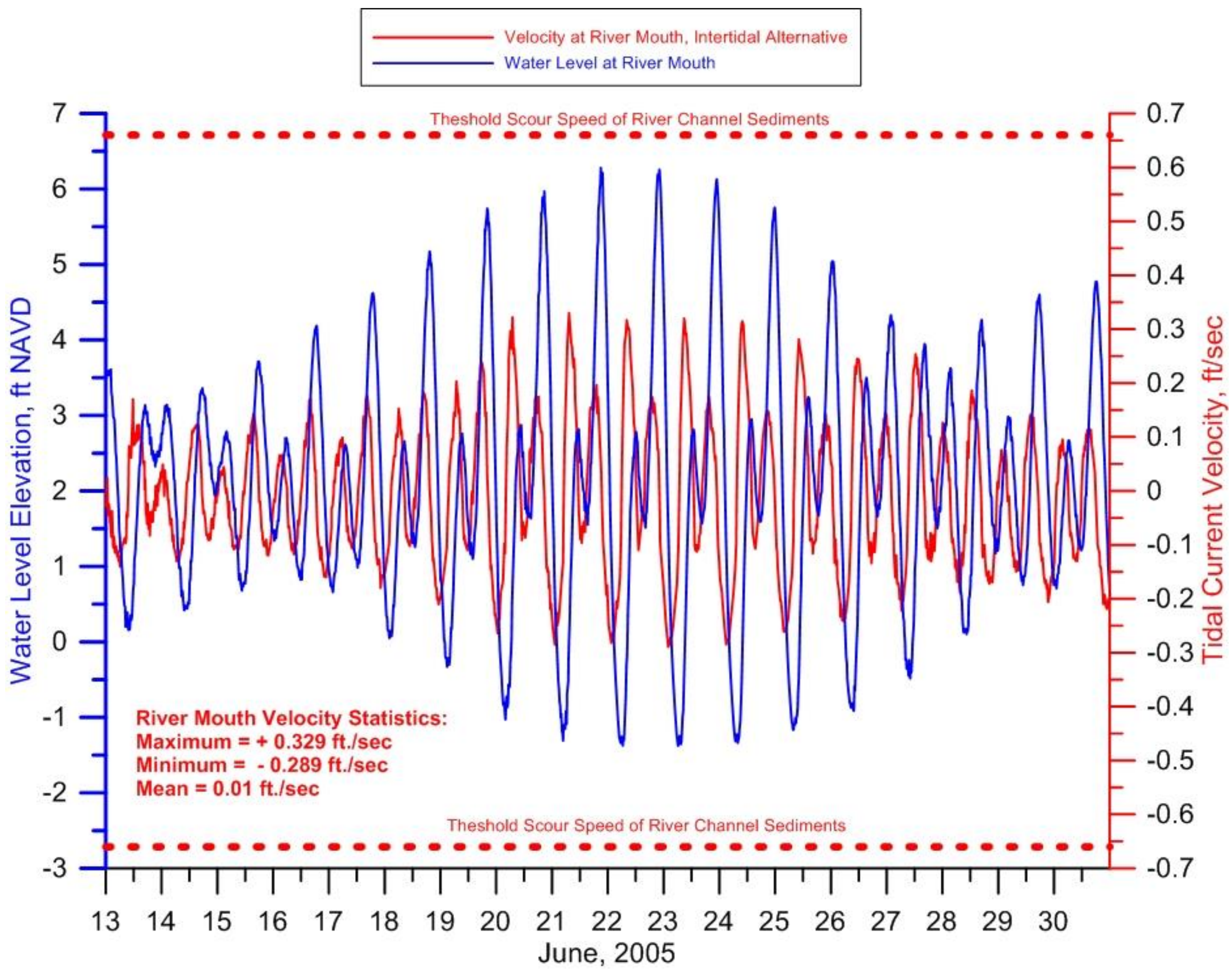


Figure 30: Tidal current speeds at the mouth of the Otay River as computed in red for the Intertidal Alternative throughout a spring-neap tidal cycle shown in blue. Threshold scour speeds for native river bed channel sediments shown as red dashed lines for flood and ebb flow conditions.

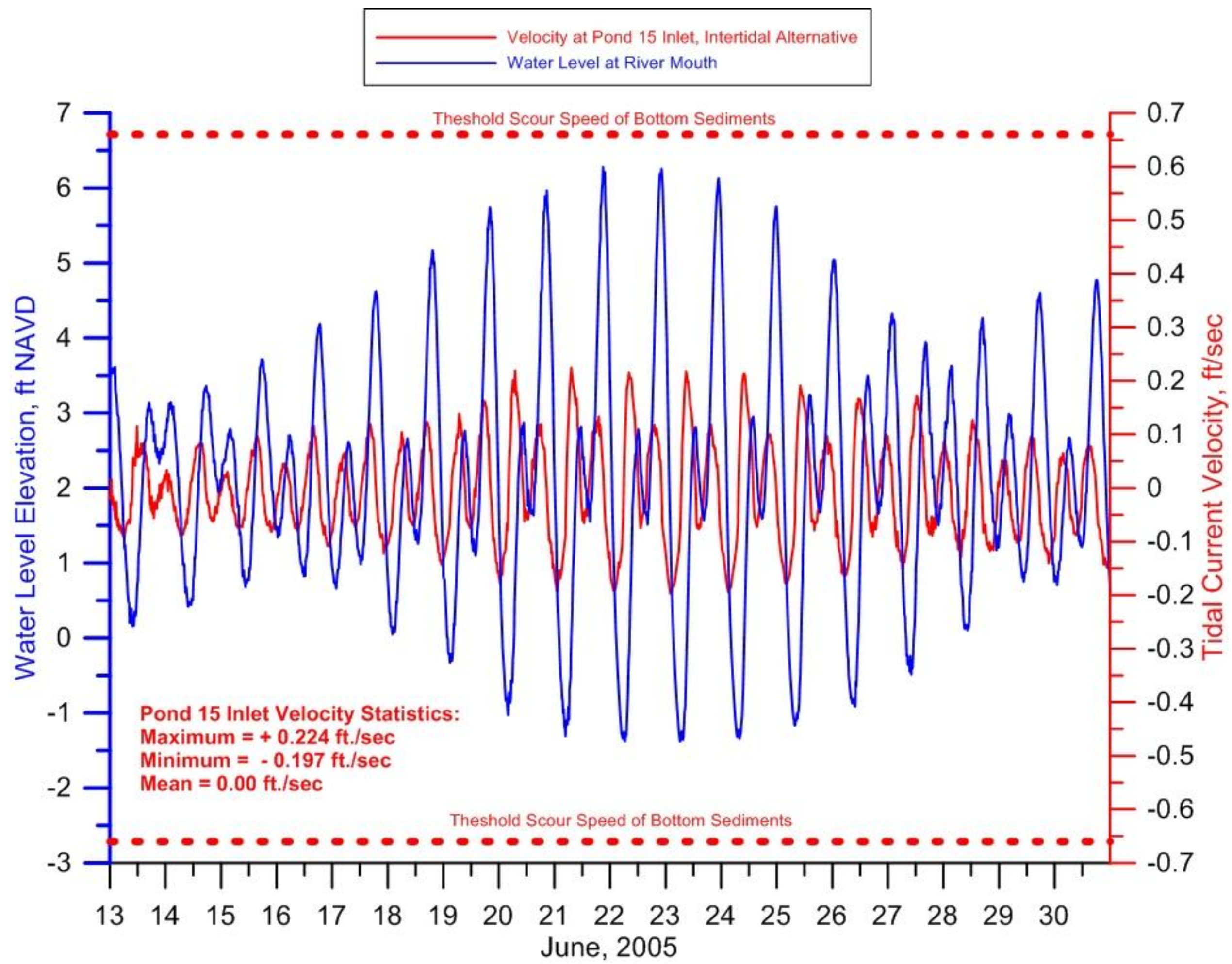


Figure 31: Tidal current speeds at the inlet to Pond 15 as computed in red for the Intertidal Alternative throughout a spring-neap tidal cycle shown in blue. Threshold scour speeds for native river bed channel sediments shown as red dashed lines for flood and ebb flow conditions.

state equilibrium that is neither depositional nor erosional, while the inlet to Pond 15 will remain in a non-equilibrium stationary state (as-built) in the absence of a local sediment sources or adequate fluid forcing by waves and currents that might otherwise import sediment from more distant sources.

Water elevations in the Intertidal Alternative floodplain basin are shown in Figure 32 for spring tides that occurred during 14-18 September, 2009, the same time period used for the model calibration with the proxy tidal system at San Dieguito Lagoon in Figure 20. Figure 32 provides a comparison between the water levels in the Intertidal Alternative floodplain tidal basin as predicted by the model (red trace) versus the actual San Diego Bay water level measurements (blue) reported by the Otay Sonde. The Intertidal Alternative floodplain tidal basin water level variations in red are found to lag the Bay water levels by as much as 27 minutes at higher high water (HHW) levels on flooding tides while this phase lag averages 2.46 hours at lower low water (LLW) level during ebb tides. These phase lags are an unavoidable consequence to frictional impedance and depth limited tidal propagation speeds down the 7,000 ft long channel that connects the floodplain tidal basin with the Bay. Lower low water levels in the Intertidal Alternative floodplain tidal basin are as much as 1.20 ft above South Bay water levels at the mouth of the Otay River due to the grading design which allows the floodplain basin to fully drain at LLW.

Higher high water levels in the Intertidal Alternative floodplain tidal basin sometimes exceed those in the South Bay at the river mouth by as much as +0.31 ft, (Figure 32), due to a trapped tidal modes (standing wave) typical of lagoons with large tidal basins and multiple choke point linkages to the ocean tides (Lamb, 1932; LeBlond & Mysak, 1978). Figure 33 shows these trapped modes are higher harmonics of the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent. Figure 14b plots the auto spectra of the Alternative-1 tidal basin tides and shows the predominant energy is centered on a diurnal frequency of the K1 lunar-solar diurnal tidal constituent at $f_{K1} = 1.16079 \text{ x } 10^{-5}$ Hz and the M2 principal lunar semi-diurnal tidal constituent, $f_{M2} = 2.2365 \text{ x } 10^{-5}$ Hz. The higher harmonics that lead to elevated basin high tide levels are a baroclinic *resonance* formed by a *triad* at the sum of the frequencies of the K1 and M2 barotropic tides, ie a diurnal third harmonic at a frequency $f_3 = f_{K1} + f_{M2} = 3.3973 \text{ x } 10^{-5}$ Hz. This diurnal third harmonic is a baroclinic tide excited by the barotropic K1 and M2 tides interacting with the bottom topography, principally the long inlet channel to the Intertidal Alternative floodplain tidal basin. Another baroclinic resonance apparent in the spectra of the ocean tides in Figure 33 is a second harmonic of the barotropic M2 tide appearing at a frequency of $2 f_{M2} = 4.4730 \text{ x } 10^{-5}$ Hz. An additional non-linear resonance appears as a triad formed by the sum of the K1 barotropic mode and the baroclinic second harmonic of the M2 tide, $f_{K1} + 2 f_{M2} = 5.6338 \text{ x } 10^{-5}$ Hz. Apparently this mode is excited by non-linear tidal interaction with the tidal basin and channel bathymetry.

The hydroperiod function (used to calculate the habitat acreage creation of the Intertidal Alternative) is calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. Using the methods detailed in Sections 3.2 and 3.4 for providing long-term, locally relevant tidal forcing for the model, the hydroperiod functions are calculated at present and future sea levels for the Intertidal

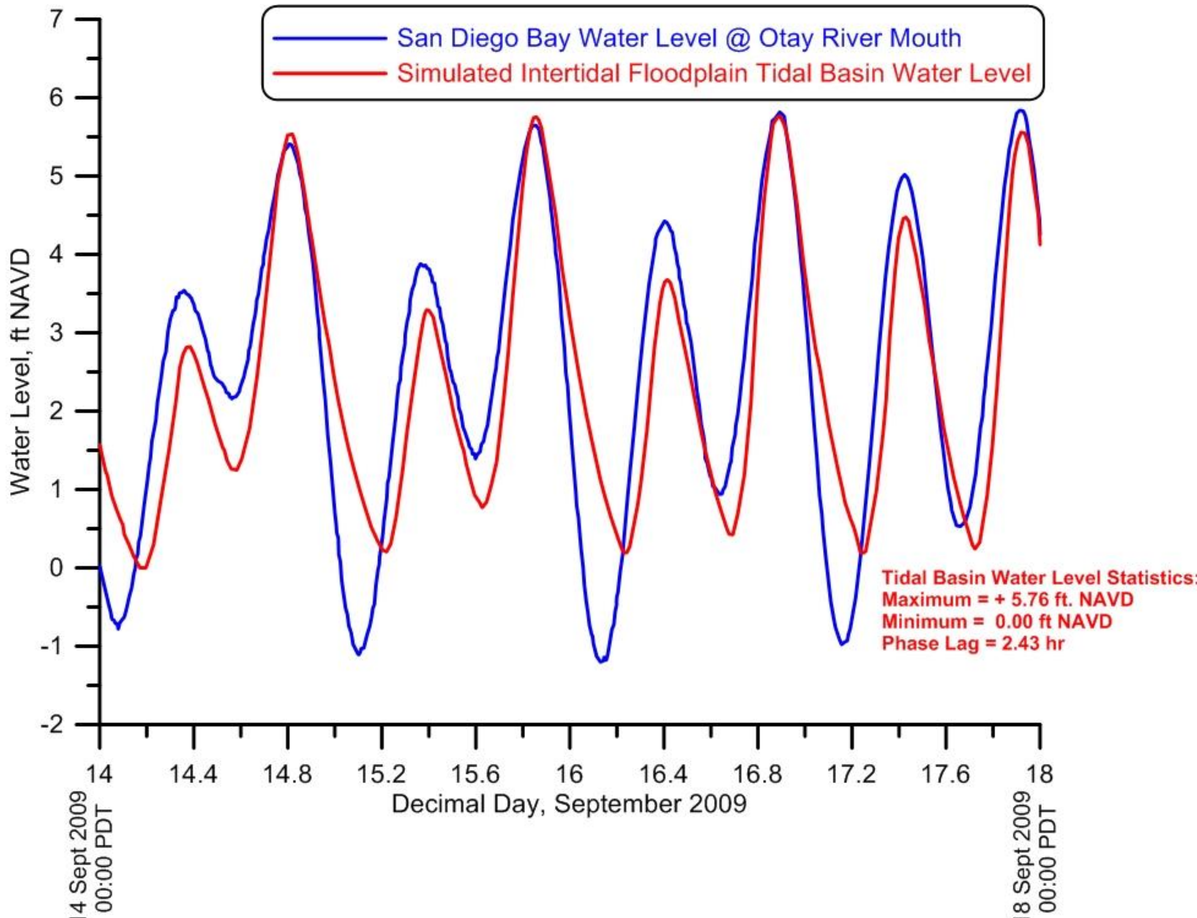


Figure 32: Water level elevations at the mouth of the Otay River (blue) compared to model simulation of Intertidal Alternative floodplain basin water levels (red) during spring tides, 14-18 September 2009.

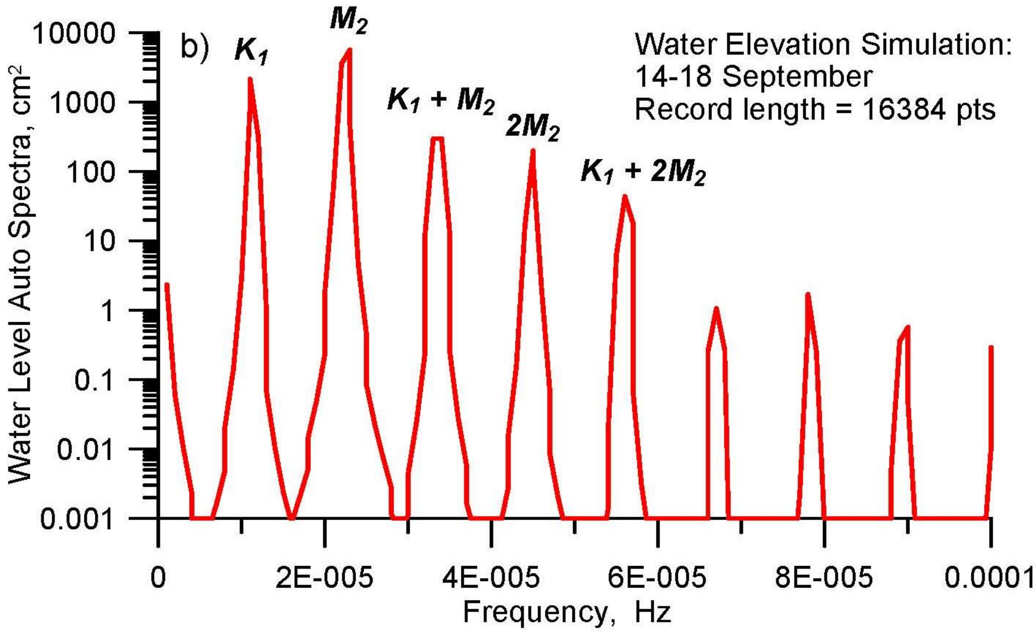


Figure 33: Auto spectra of water level elevations in the at the floodplain basin of the Intertidal Alternative during spring tides, 14-18 September 2009.

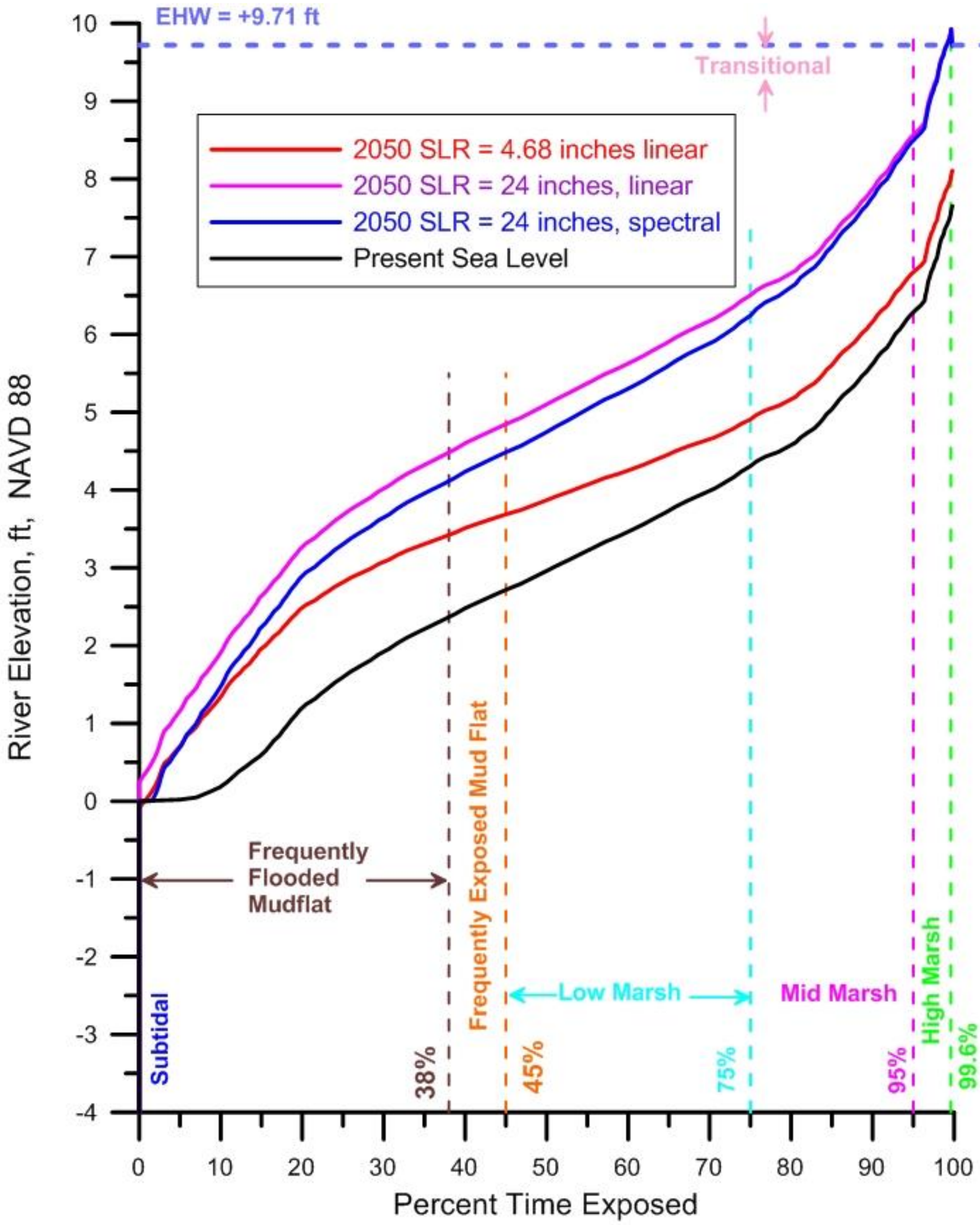


Figure 34: Hydroperiod Function for Intertidal Alternative, Otay Floodplain Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261

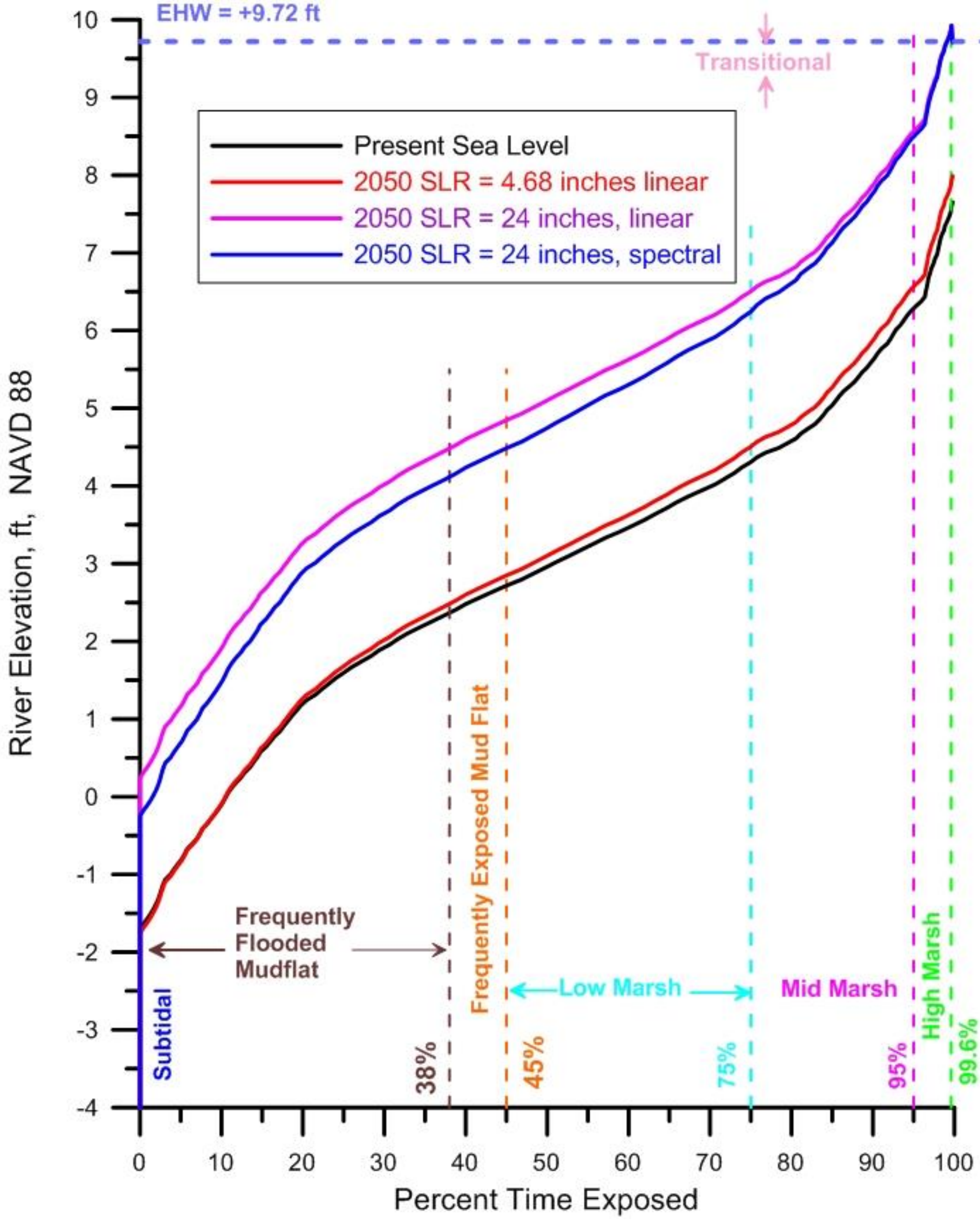


Figure 35: Hydroperiod Function for the Intertidal Alternative Pond #15 Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261.

Plan floodplain basin in Figure 34 and for the Pond #15 basin in Figure 35. The elevation breaks (zonation) between the different wetland habitat types from the hydroperiod curves are summarized in Tables 3 and Tables 4. The elevations for the habitat breaks in these figures and tables are applied to the KTUA grading designs and yield the acreages of habitat creation listed in Table 5 at present sea level, and at 2050 sea levels in Table 6.

Table 3: Elevations of Upper Limits of Habitat Breaks in the Intertidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.40 ft.	3.40 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.55 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.05 ft.	9.71 ft.	9.71 ft.

Table 4: Elevations of Upper Limits of Habitat Breaks in the Intertidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.25 ft.
Frequently Flooded Mud Flat	2.40 ft.	2.50 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

For all possible sea level scenarios, the elevation limit of subtidal habitat in the floodplain basin (Figure 34) is limited by the grading design (Figure 4) and by existing bars and channel bottom features at the inlet and inside the branch channel into this basin that create an inlet sill at 0.0 ft NAVD 88. The Intertidal Alternative calls for no construction dredging of the existing Otay River channel so as not to disrupt existing habitat residing down-river from the inlet to the proposed floodplain basin. That existing down-river habitat consists of additional mud flat residing below – 0.0 ft NAVD 88 and subtidal habitat below -1.01 ft NAVD 88 (cf. Section 4). Low tide drainage of the Pond # 15 (Figure 35) is constrained by the tidal muting of the South Bay Shelf (cf. Sections 3.2 & 3.4), which varies with sea level. At present sea level, Pond # 15 will not drain below – 1.65 ft. NAVD 88, producing the subtidal footprint shown in Figure 29. However, with a moderate amount of sea level rise, the linear SLR = 4.68 in. solution indicates a moderate improvement in drainage to – 1.70 ft NAVD 88. If sea level were to rise by 2 ft. according to the maximum sea level rise prediction in 2050, the available tidal range is not sufficient to prevent a rise in subtidal elevations in Pond # 15. This amount of sea level rise will raise the elevations of the zonation of all habitat types (Figure 35). This upward displacement of

Table 5: Intertidal Alternative Predicted Habitat Distribution, acres 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0.00	9.53
Mudflat – Frequently Flooded	4.45	16.36
Mudflat – Frequently Exposed	0.70	1.57
Low Marsh	10.34	15.73
Mid Marsh	10.99	34.47
High Marsh	3.23	5.61
Total Marsh	29.26	80.68
Transitional	0.45	2.59
Total Created Habitat	**29.71**	**83.27**

Table 6: Intertidal Alternative Predicted Habitat Distribution, acres 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0	9.35
Mudflat – Frequently Flooded	8.84	17.06
Mudflat – Frequently Exposed	2.21	1.85
Low Marsh	7.91	17.32
Mid Marsh	10.36	35.38
High Marsh	0.52	2.87
Total Created Habitat	**29.84**	**83.83**

wetland zonation is largest for the linear superposition scenario, because the spectral correction scenario predicts a larger tidal range of about 1.0 ft. Under the 24 in. spectral sea level rise scenario at 2050, intertidal wetland habitat would begin at an elevation of -0.25 ft NAVD, and the mud flat habitat would reside about 0.4 ft to 0.5 ft. lower than under the linear super-position scenario; while the low marsh habitat would reside about 0.25 ft. lower than under the linear super-position scenario. Therefore there is some apparent differences between the habitat mix predictions of these two sea-level rise prediction methods; although both give the same estimate of the maximum elevation of high salt marsh wetland zonation in both of the proposed basins of the Intertidal Plan (cf. Tables 3 & 4).

5.3) Residence Time of the Intertidal Alternative: Residence time refers to the average amount of time source water spends in a particular tidal system. Residence time begins from the moment a *material element of water* (a parcel that contains the same collection of water molecules) enters a tidal system on flooding tide and ends when that same element leaves the system on ebbing tide. At lowest order, the residence time in a particular tidal system can be approximated by *removal time*, which is a ratio of the storage capacity of that system at mean higher high water to the rate of tidal exchange during a mean diurnal tidal period (Horikawa, 1988; Schwartz, 2005), or :

$$\bar{\tau} = \frac{V_s}{V_p} T$$

Where $\bar{\tau}$ is the removal time; V_s is the storage capacity of a particular restoration alternative at mean higher high water (including both the inlet channel and tidal basin); V_p is the mean diurnal tidal prism of a particular restoration alternative, and T is a diurnal tidal period equal to 1.0347 days (24 hours and 50 minutes). From this simple relation the removal time varies between each restoration alternative according to the ratio of storage capacity to diurnal tidal prism, V_s / V_p. However, removal time is only a simple algebraic proxy for residence time because the mean diurnal tidal prism for each of the basins is less than the storage capacity of those basins at MHHW, and it takes a number of tide cycles to completely replace all of the *old water* in each of those systems. Old water is defined here as water that remains in the tidal system (including both the inlet channel and tidal basin) after water outflow during ebb tide. As new water comes into the inlet channel and tidal basin, the old water becomes more diluted with each tidal cycle until all the old water is eventually replaced by new water. We utilize the mass conservation and transport algorithms of the TIDE_FEM model to solve for this progressive dilution of old water in each of the restoration alternatives. To facilitate comparisons of residence time calculations performed at other coastal lagoons, we adopt the convention of assigning residence time as the time required for old water to dilute to less than 2% of the storage capacity of the system (Elwany, et. al., 2005; Coastal Environments, 2009).

Figure 36 gives the TIDE_FEM hydrodynamic simulations of the time for dilution of old water in each of the tidal systems (inlet channel + tidal basin) of the Intertidal Alternative. Figure 36 presents the model results of residence time of South Bay water in the tidal basins of the Intertidal Alternative for the Otay River floodplain basin (blue) and the Pond #15 basin (red). Residence time of South Bay water is 2 days in the floodplain basin and 3 days in the Pond#15 basin. Residence time is less in the floodplain basin because its maximum storage volume at higher-high water level is only 98 acre ft. (4.27 million cubic ft.) and nearly completely drains at mean lower low water levels; whereas the maximum storage volume of the Pond #15 basin is 3.6 times greater at 15.9 million cubic ft., and about 700 hundred thousand cubic ft. of water fail to drain after one diurnal tidal cycle. Regardless, the residence time numbers for the restoration are rather good for marginalizing potential dissolve oxygen depletion, although the DO of South Bay water can become quite low during evaporative summer time conditions (cf. Section 3.3). Maximum diurnal tidal prisms at present sea levels are 98 acre ft. (4.3 million cubic ft.) for the proposed Otay River floodplain basin; and 364 acre ft. (15.9 million cubic ft.) for the proposed Pond #15 basin.

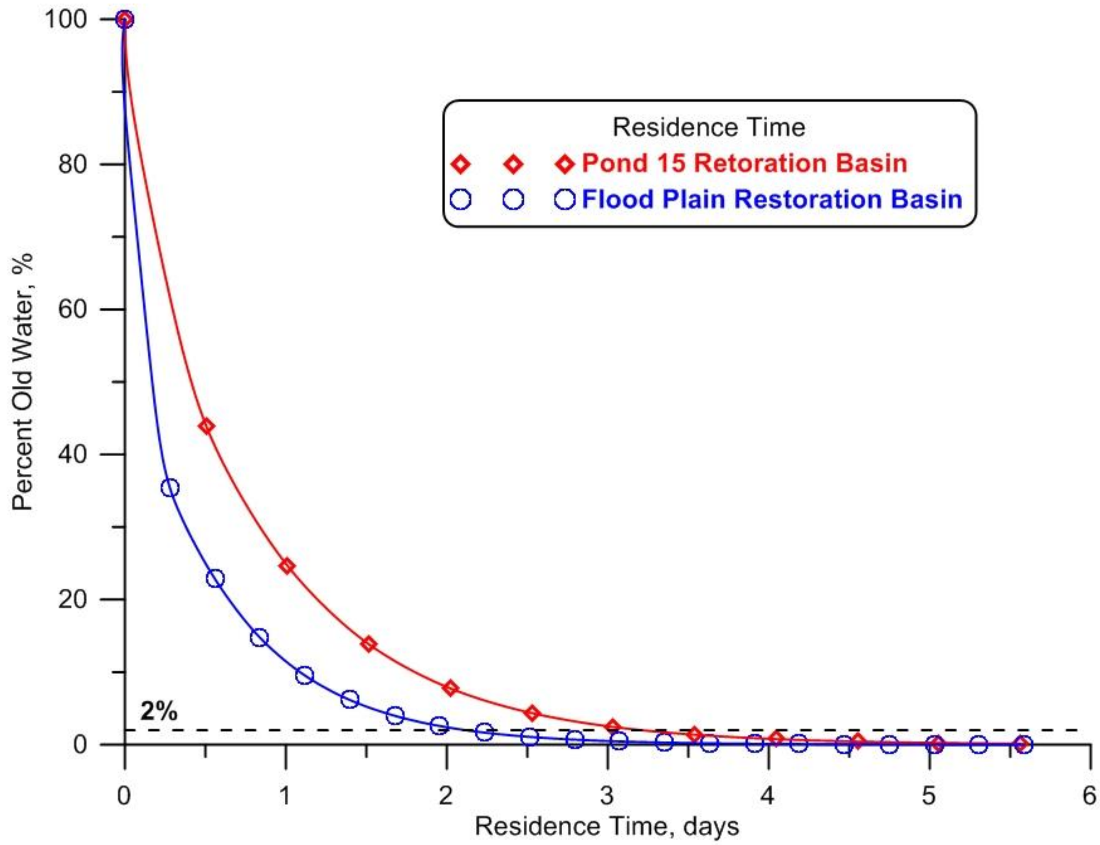


Figure 36: Residence time of South Bay water in the tidal basins of the Intertidal Alternative: Otay River floodplain basin (blue); Pond #15 basin (red).

6.0 Analysis of the Subtidal Alternative

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was also used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a proxy for the restoration alternatives because of morphologic similarities: in particular, both restoration sites have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the *Subtidal* restoration plan. Calculations of habitat creation were based on long-term tidal hydraulics simulations using tidal forcing at the mouth of the Otay River, derived from a spectral correction applied to the NOAA tide gage #941-0170 located at the Navy Pier (cf. Section 3.2)

6.1 Bathymetric Input for the Subtidal Alternative: Grading contours for the Subtidal Alternative were provided in 0.5 ft intervals between -4.0 ft NAVD and + 10 ft NGVD by KTU+A. The TIDE_FEM tidal hydraulics model presented in Jenkins and Inman (1999) was gridded for a computational mesh of the Subtidal Alternative built off the bathymetry in Figures 4 and 5. Figure 4 details the elevation grading contours of the Subtidal Alternative tidal basin in the Otay River floodplain merged with the Otay River bathymetry; while Figure 5 gives the elevation contours resulting from cut and fill of the Pond-15 tidal basin for the Subtidal Alternative. Of particular interest to the finite element mesh is the *hydraulic friction slope coefficient*, S_{fj}, providing tidal muting effects. Two separate formulations are used. One is given for the 3-node triangular elements situated in the interior of the mesh which do not experience successive wetting and drying during each tide cycle. The other formulation is for the elements situated along the wet and dry boundaries of the lagoon. These have been formulated as 3-node triangular elements with one curved side based upon the cubic-spline matrices developed by Weiyan (1992). These two sets of elements were assembled into a computational mesh of the restoration whose upper boundary conforms to the + 10 ft. NGVD contours in Figures 4 and 5. The + 10 ft. NGVD contour was chosen to allow sufficient computational domain to evaluate tidal inundation at 2050 sea levels that are as much as + 2.0 ft above present sealevel. The wet-dry boundary coordinates of the curved waterline, (x', y'), are linearly interpolated for any given water elevation from the contours stored in the bathymetry file.

Aside from gridding the TIDE_FEM tidal model, storage rating functions were calculated from the bathymetric contours of Figures 4 and 5. Figure 37 gives the storage rating function of the floodplain tidal basin merged with the tidally influenced lower reach of the Otay River; while Figure 38 gives the storage rating function for the Pond 15 tidal basin as configured for the

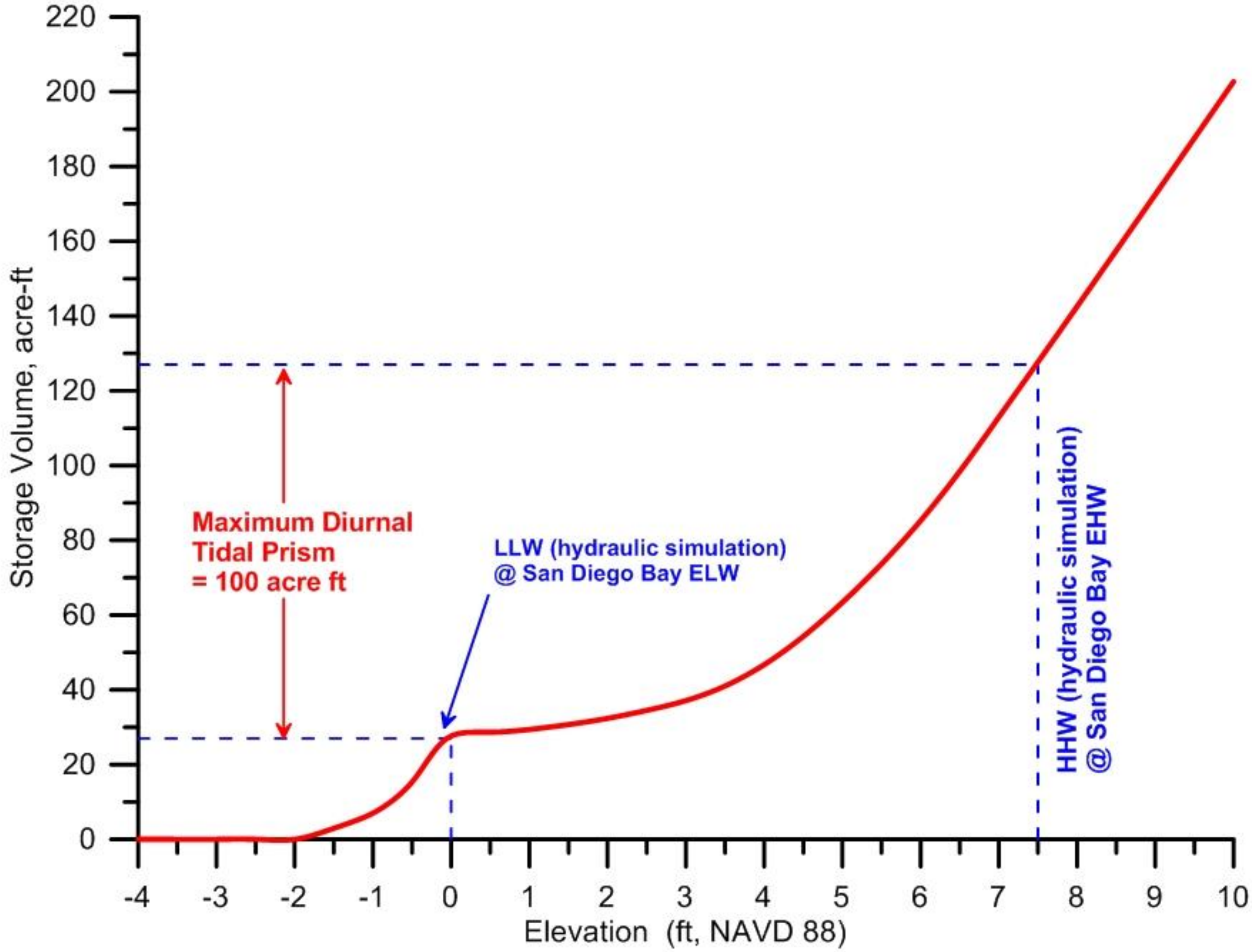


Figure 37: Storage rating function of the tidal basin in the Otay River floodplain for the Subtidal Alternative with no dredging of the existing river channel. Maximum diurnal tidal prism shown for extreme high-water event in San Diego Bay, 27 January 1983.

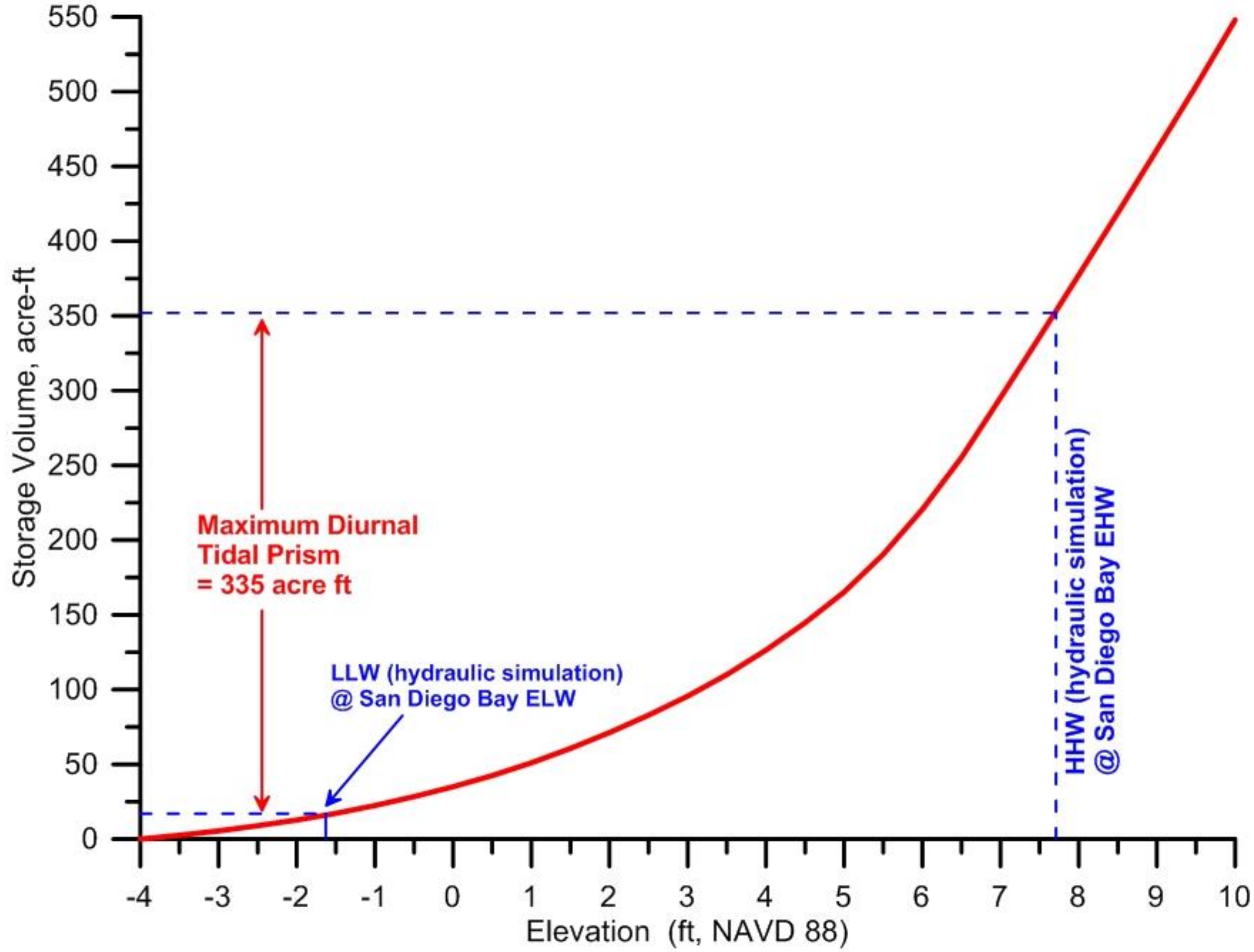


Figure 38: Storage rating function of the Pond 15 tidal basin for the Subtidal Alternative. Maximum diurnal tidal prism shown for extreme high-water event in San Diego Bay, 27 January 1983.

Subtidal Alternative. The storage rating functions are used in the initialization of the TIDE_FEM tidal hydraulics model in order to enforce mass conservation in the tidal inundation simulations (see Jenkins and Inman, 1999). The initialization involves fitting a series of high-order polynomials to the volumes of the storage rating function in Figure 37 & 38. To accommodate possible future sea level rise the polynomial fits were carried up to a daylight contour chosen at +10.0 ft NGVD, even though the tidal inundation in San Diego Bay has never been observed above +7.71 ft NGVD. A seventh- order polynomial was fitted to the storage rating functions in Figures 37 & 38 with a coefficient of determination of $r^2 = 0.996$.

For tidal inundation up to the historic extreme high water level of San Diego Bay (EHW = +7.71 ft NGVD, (upper dashed blue line in Figure 37), the maximum volume of San Diego Bay water that is exchanged with the Subtidal Alternative floodplain tidal basin is 100 acre-ft. Although this basin has a subtidal channel graded down to -2.0 ft NAVD, it does not drain much below lower low water levels due to bars, hummocks, and shoals that form a sill near the confluence of the Subtidal Floodplain basin and the Otay River channel as delineated in red in Figure 39. The maximum potential diurnal tidal prism of the Pond 15 tidal basin of the Subtidal Alternative is 335 acre ft for an extreme high water event at present sea level. The Subtidal Alternative Pond-15 basin has about 29 acre ft. less potential diurnal tidal prism than the Intertidal Alternative Pond-15 basin due to the disposal of additional dredge fill derived from the subtidal channel of the Subtidal Alternative Floodplain tidal basin.

6.2 Tidal Inundation Simulations of the Subtidal Alternative: Figure 40 gives the flow trajectories and depth averaged tidal currents for the Subtidal Alternative computed by the calibrated TIDE_FEM model during spring flooding tides on 18 September 2009. Velocities of tidal currents are portrayed according to the color coded velocity scale appearing in the lower left corner of the figure. Maximum flooding spring tidal currents at the mouth of the Otay River (in the neighborhood of the Otay Sonde) 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 & 11 to 0.2 m/sec (0.66 ft/sec) where the channel has scoured under existing conditions to equilibrium depths on the order of -2.0 ft NAVD. After passing Pond 10, currents 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; where tidal currents entering the tidal basin initially form a well-defined jet at the west bank with speeds of about 0.08 m/s (0.26 ft/sec). This entry jet quickly diverges into a complex set of clockwise rotating eddies that populate the interior of the tidal basin. Eddy speeds in the tidal basin are on the order of 0.02 m/sec (0.07 ft/sec), insufficient to transport fine sand but 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. Maximum flooding spring tidal currents in the inlet channel to Pond #15 are about 0.06 m/sec (0.21 ft/sec), and then decelerate as a weak entry jet with speeds of about 0.05 m/s (0.16 ft/sec). This entry jet also quickly diverges into a complex set of counter rotating eddies that populate the interior of the tidal basin. Eddy speeds in the Pond #15 tidal basin are on the order of 0.01 m/sec (0.03 ft/sec), again insufficient to transport fine sand or cohesive silts, but also providing a stirring mechanism for mixing the Pond #15 water mass to maintain high oxygen levels and to sustain suspension of fine silt and clay sized sediment particles.

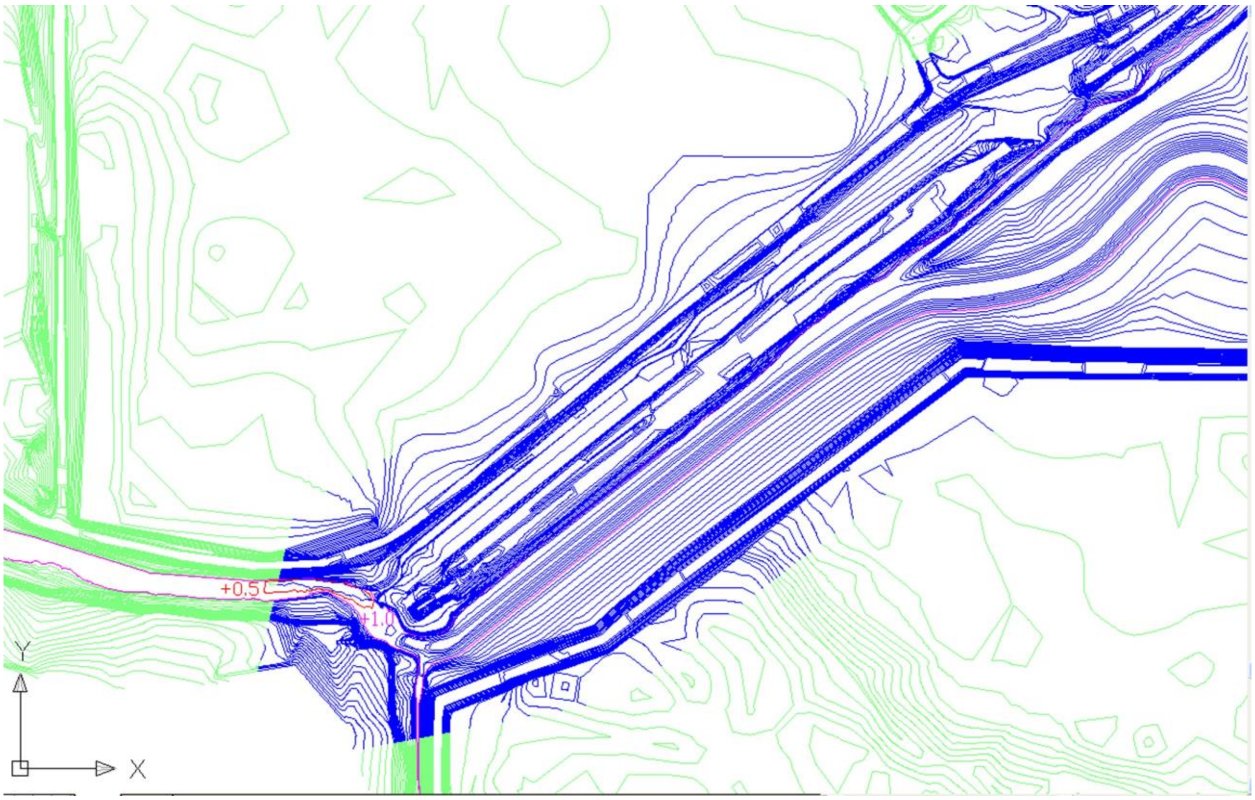


Figure 39: Existing Otay River channel bars and hummocks delineated in red limit drainage of Subtidal Floodplain Tidal Basin. Depth contours in ft. NAVD 88.

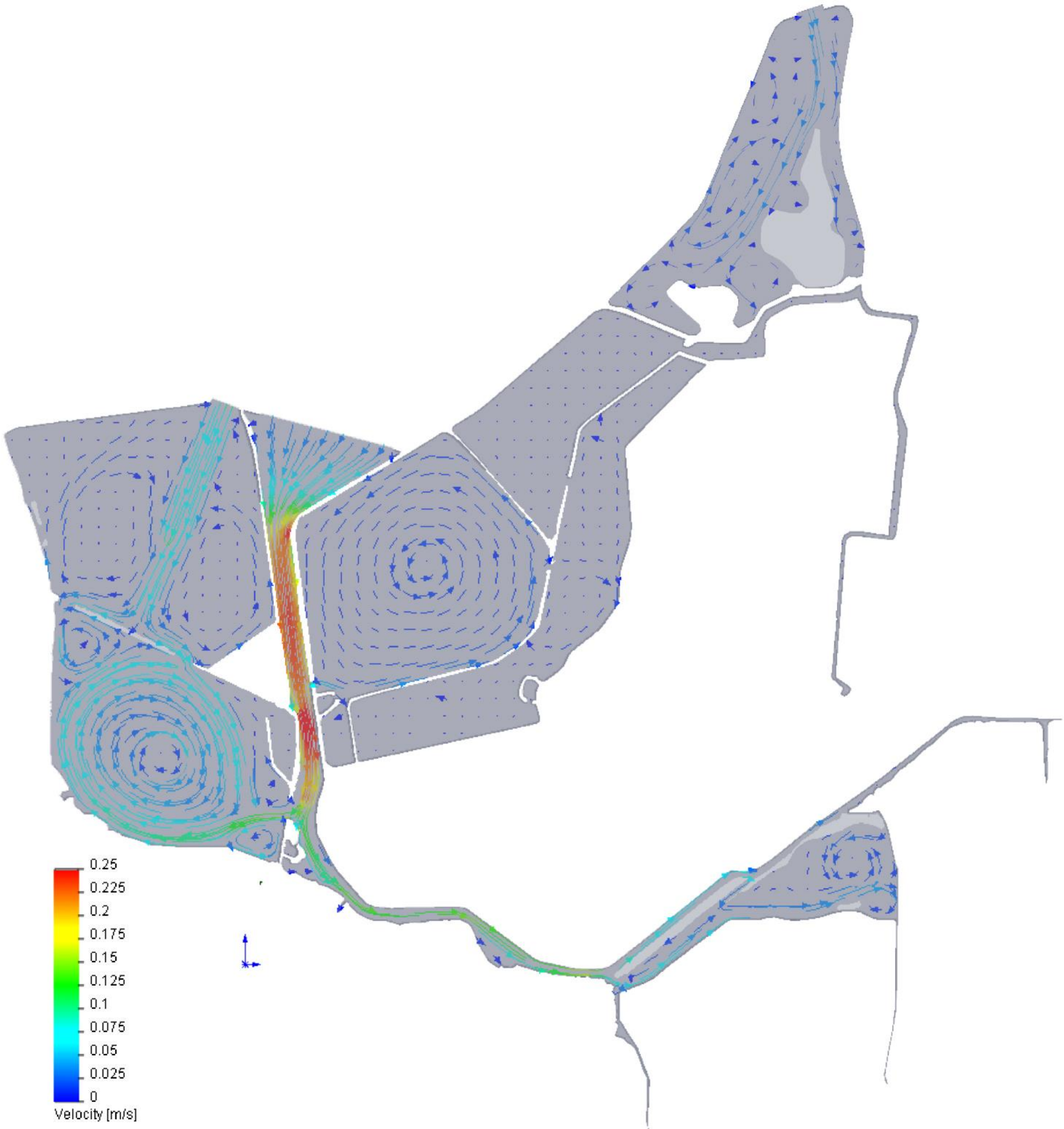


Figure 40: Subtidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

Figure 41 gives the flow trajectories and depth averaged tidal currents for the Subtidal Alternative computed by the TIDE_FEM model during spring ebbing tides on 18 September 2009. The wetted area of the floodplain tidal basin is significantly reduced relative to the flood tide area in Figure 40, due to the fact that the grading plan allows for almost complete drainage at mean low water tidal stages. In Figure 41, creeping flow drains from the remnant dendritic channel of the floodplain basin, forming a feeder current in the upper river channel with speeds on the order of -0.01 m/sec, or (-0.03 ft/sec). This feeder current evacuates the tidal basin and then accelerates 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. (We adopt the convention of negative velocities for ebb tide flows and positive velocities for flood tide flows). Ebb flow in the channel then accelerates further to -0.091 m/sec (-0.298 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. In Pond #15 during ebb tide flow at mean low water level, the eastern half of the basin is completely drained and exposed, while a week feeder current evacuates the western half 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 inlet of Pond #15, and is far below the threshold scour speed of the sediments along the bank of the Chula Vista Wildlife Reserve.

In Figure 42, tidal current speeds at the mouth of the Otay River for the Subtidal Alternative are simulated throughout an entire spring-neap tidal. These currents (plotted in red) are compared the threshold scour speeds for native river bed channel sediments as derived from the Hjulstrom Curve in Figure 24b based on grain size data in Figure 24a. These thresholds of incipient scour appear as red dashed lines for flood (positive) and ebb flow (negative) velocity sign conventions. It is apparent that ebb and flood flow velocities throughout a spring/neap cycle never reach the thresholds of incipient scour, where maximum flood flow velocity at the mouth of the Otay River is +0.339 ft./sec, while maximum ebb flow velocity reaches only – 0.298 ft./sec under the Subtidal Alternative. These flood and ebb flow maximums are consistent with the progressive vector simulations in Figures 40 & 41. Figure 43 gives the corresponding spring/neap velocity time series at the inlet to Pond 15 of the Subtidal Alternative. Because of the large non-equilibrium cross section engineered for this inlet, velocities are considerably less than at the mouth of the Otay River. For Pond 15, maximum flood flow velocity at the inlet is +0.206 ft./sec, while maximum ebb flow velocity reaches only – 0.181 ft./sec, slightly less than the Pond-15 results of the Intertidal Alternative (due to smaller tidal prism), and well below the threshold scour speeds for the native sediments estimated to be +/- 0.66 ft./sec from the the Hjulstrom Curve in Figure 24b. Tidal current speeds between 0.27 ft/ sec (0.08 m/sec) and 0.66 ft/sec would lead to bed load transport but not erosion. Erosion and scour would only occur for tidal currents that exceed 0.66 ft/sec, while currents less 0.27 ft/sec would yield deposition. Therefore the mouth of the Otay River would be in steady state equilibrium that is neither depositional nor erosional under the Subtidal Alternative. However, the inlet to Pond 15 under the Subtidal Alternative could be depositional if there is an active sediment source nearby. However no such source appears to exist, other than perhaps very minimal and undocumented sediment yield from the Palomar Ditch during occasional El Nino floods. Littoral sediment transport by waves is generally de minimis due to the limited fetch across South San Diego Bay, and the inlet to Pond 15 is sheltered from direct wave exposure by the causeway of the Chula

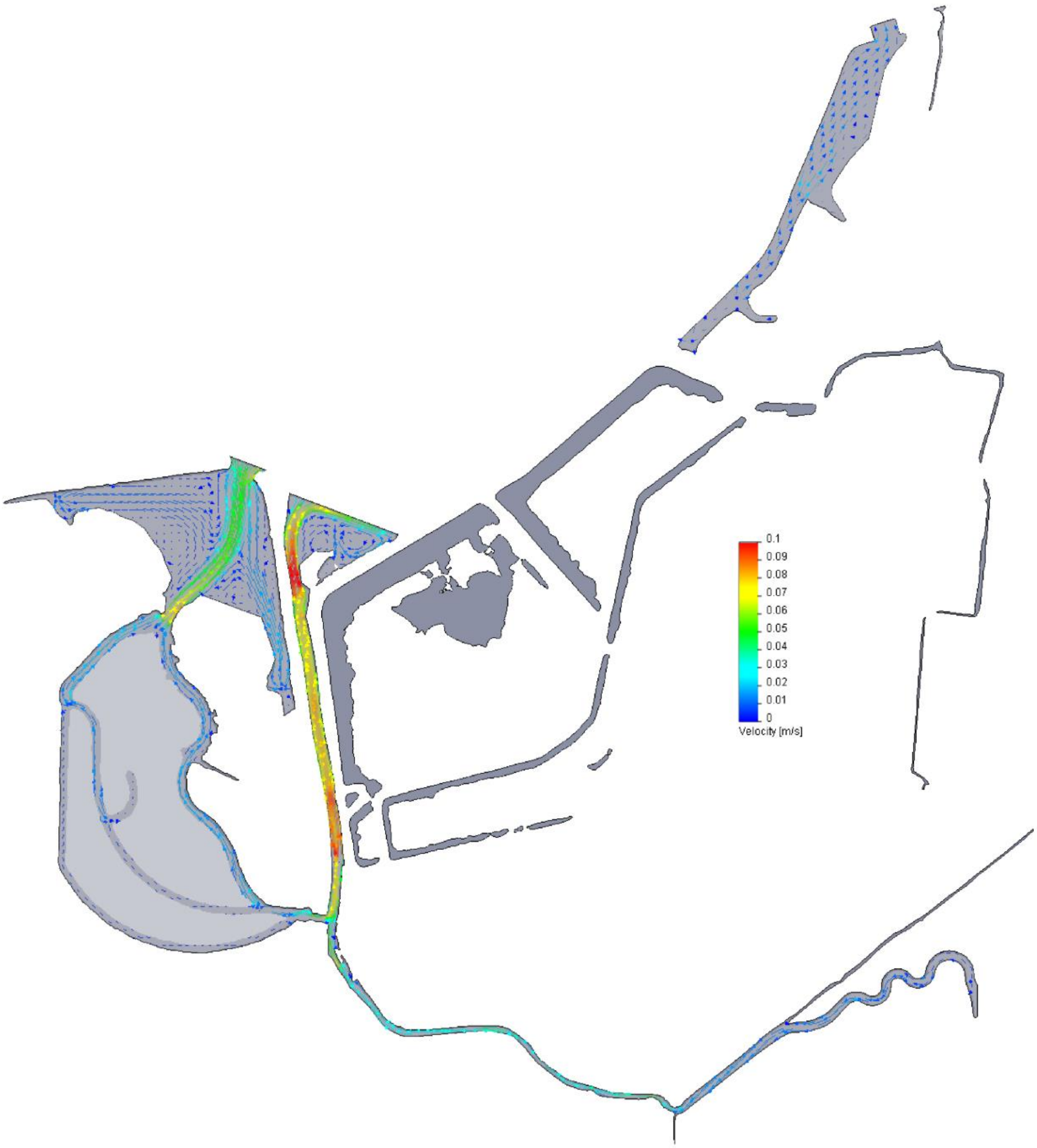


Figure 41: Subtidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

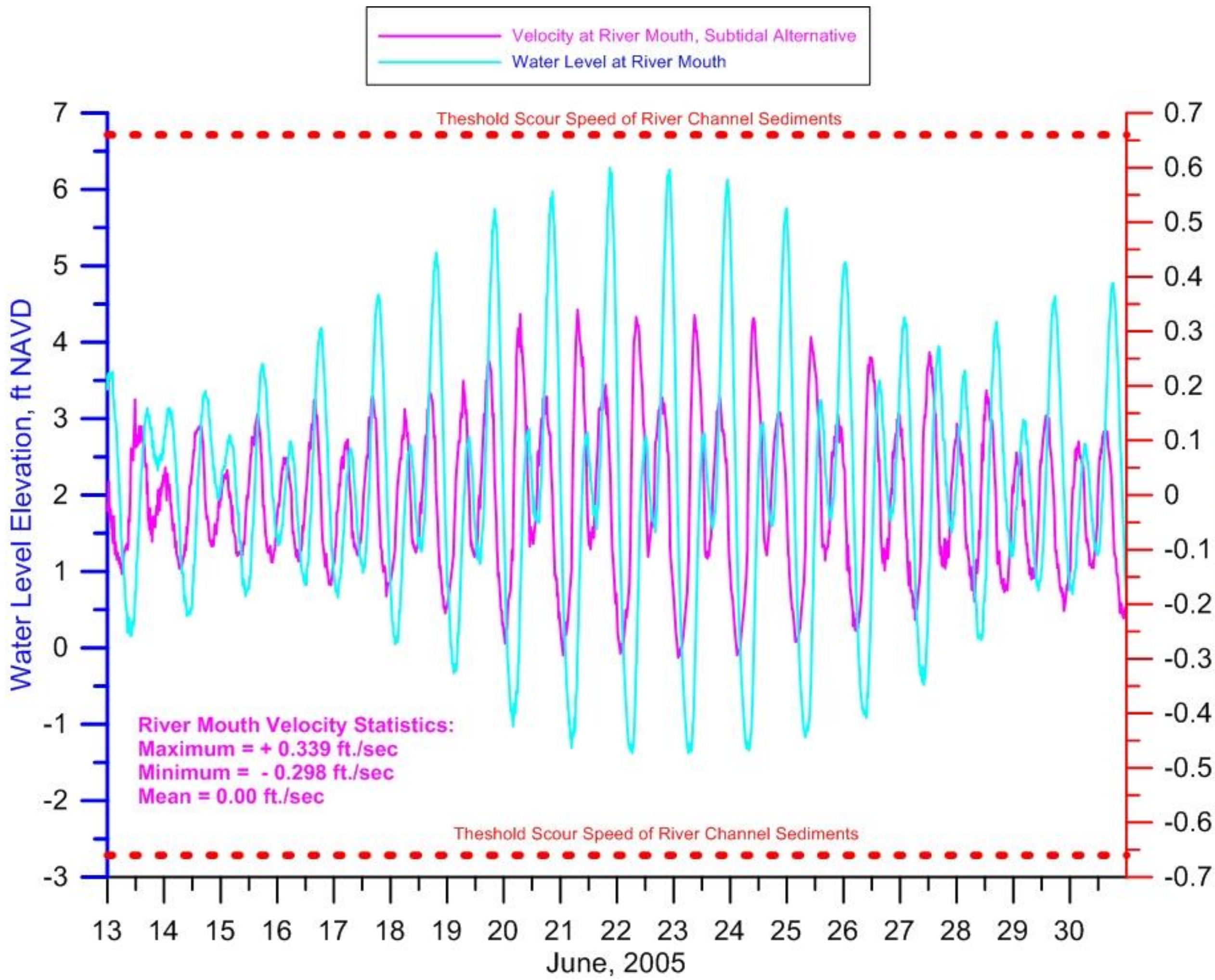


Figure 42: Tidal current speeds at the mouth of the Otay River as computed in magenta for the Subtidal Alternative throughout a spring-neap tidal cycle shown in cyan. Threshold scour speeds for native river bed channel sediments shown as red dashed lines for flood and ebb flow conditions.

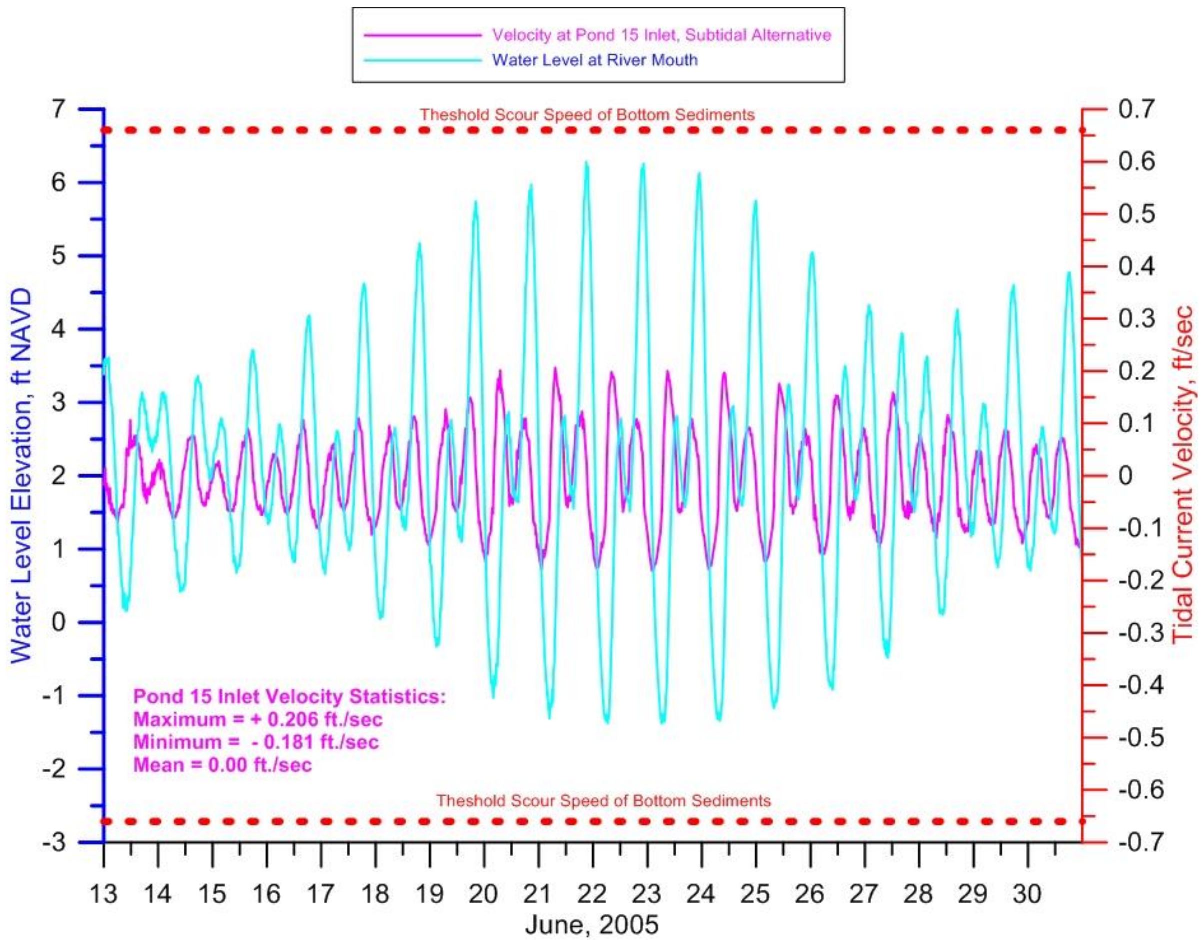


Figure 43: Tidal current speeds at the inlet to Pond 15 as computed in magenta for the Subtidal Alternative throughout a spring-neap tidal cycle shown in cyan. Threshold scour speeds for native river bed channel sediments shown as red dashed lines for flood and ebb flow conditions.

Vista Nature Reserve (cf. Figure 1).

Therefore, we conclude both source water inlets to the tidal basins of the Subtidal Alternative are stable and immune to closure or restriction by sedimentation under dry weather tidal exchange. Inlet sedimentation due to influxes of wave driven long-shore transport of sand (as occurs on the open coast), does not occur in the fetch limited environment of South San Diego Bay. The mouth of the Otay River supplying source water to the floodplain tidal basin is in a dynamic steady-state equilibrium that is neither depositional nor erosional, while the inlet toPond 15 will remain in a non-equilibrium stationary state (as-built) in the absence of a local sediment sources or adequate fluid forcing by waves and currents to import sediment from more distant sources.

Water elevations in the Subtidal Alternative floodplain basin are shown in Figure 44 for spring tides that occurred during 14-18 September, 2009, the same time period used for the model calibration with the proxy tidal system at San Dieguito Lagoon in Figure 20. Figure 44 provides a comparison between the water levels in the Subtidal Alternative floodplain tidal basin as predicted by the model (magenta trace) versus the actual San Diego Bay water level measurements (cyan) reported by the Otay Sonde. The Subtidal Alternative floodplain tidal basin water level variations in red are found to lag the Bay water levels by as much as 26 minutes at higher high water (HHW) levels on flooding tides while this phase lag averages 2.42 hours at lower low water (LLW) level during ebb tides. These phase lags are an unavoidable consequence to frictional impedance and depth limited tidal propagation speeds down the 7,000 ft long channel that connects the floodplain tidal basin with the Bay. Lower low water levels in the Subtidal Alternative floodplain tidal basin are as much as 1.28 ft above South Bay water levels at the mouth of the Otay River due to the grading design which allows the floodplain basin to fully drain at LLW. The auto spectra of the water levels in the floodplain tidal basin of the Subtidal Alternative are nearly indistinguishable from the spectra found for the Intertidal alternative in Figure 33.

The hydroperiod function (used to calculate the habitat acreage creation of the Subtidal Alternative) is calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. Using the methods detailed in Sections 3.2 and 3.4 for providing long-term, locally relevant tidal forcing for the model, the hydroperiod functions are calculated at present and future sea levels for the Subtidal Plan floodplain basin in Figure 45 and for the Pond #15 basin in Figure 46. The elevation breaks (zonation) between the different wetland habitat types from the hydroperiod curves are summarized in Tables 7 and Tables 8. The elevations for the habitat breaks in these figures and tables are applied to the KTUA grading designs and yield the acreages of habitat creation listed in Table 9 at present sea level, and at 2050 sea levels in Table 10. Comparing Table 5 from Section 5.2 with Table 9 below, it is apparent that the Intertidal Alternative creates an additional 1.37 acres of habitat in 2018 than does the Subtidal Alternative.

For all possible sea level scenarios, the elevation limit of subtidal habitat in the floodplain basin (Figure 45) is limited by existing bars, hummocks and other channel bottom features at the inlet and inside the branch channel into this basin that create an inlet sill at 0.0 ft NAVD 88. The Subtidal Alternative calls for no construction dredging of the existing Otay River channel so as not to disrupt existing habitat residing down-river from the inlet to the proposed floodplain basin.

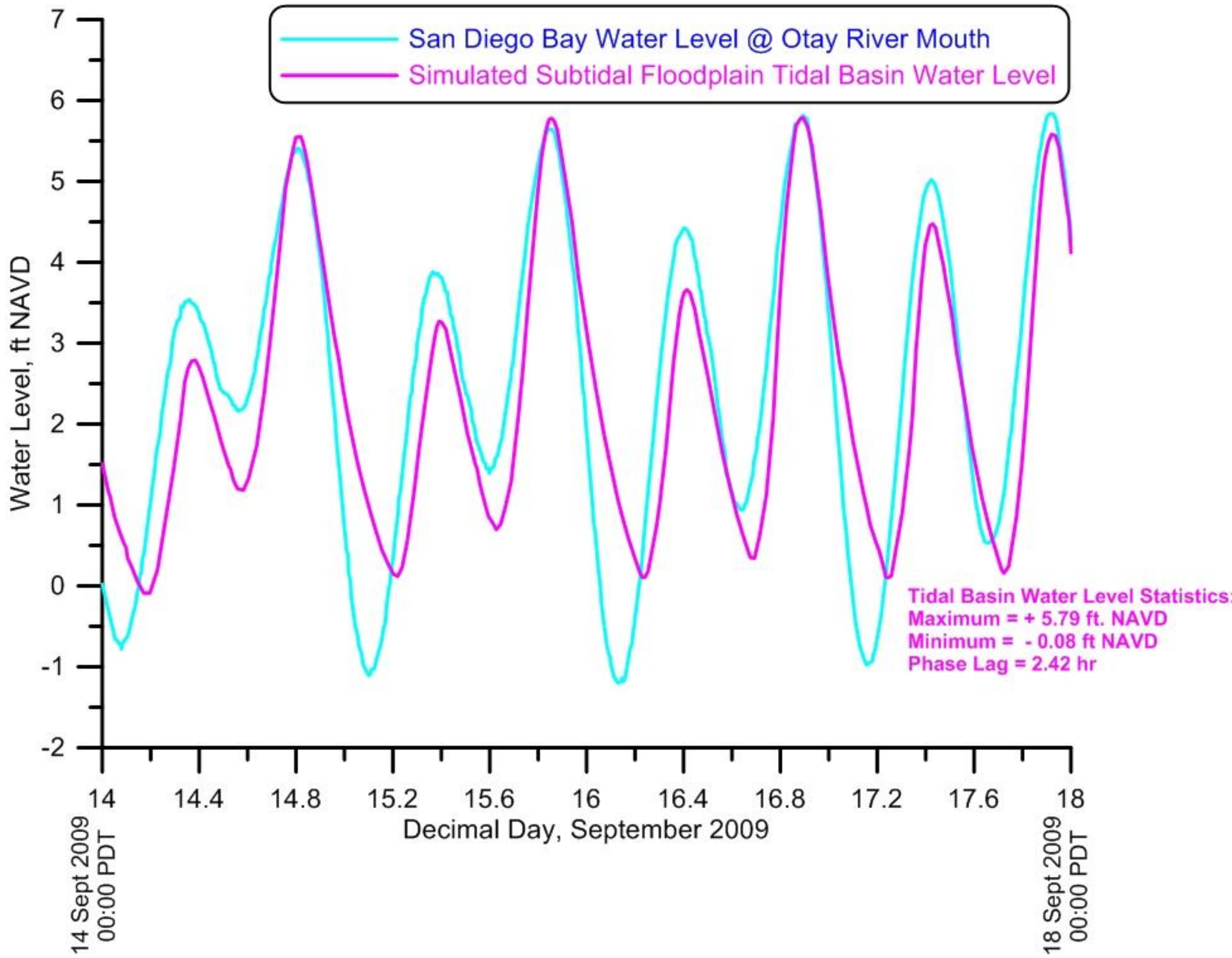


Figure 44: Water level elevations at the mouth of the Otay River (cyan) compared to model simulation of Subtidal Alternative floodplain basin water levels (magenta) during spring tides, 14-18 September 2009.

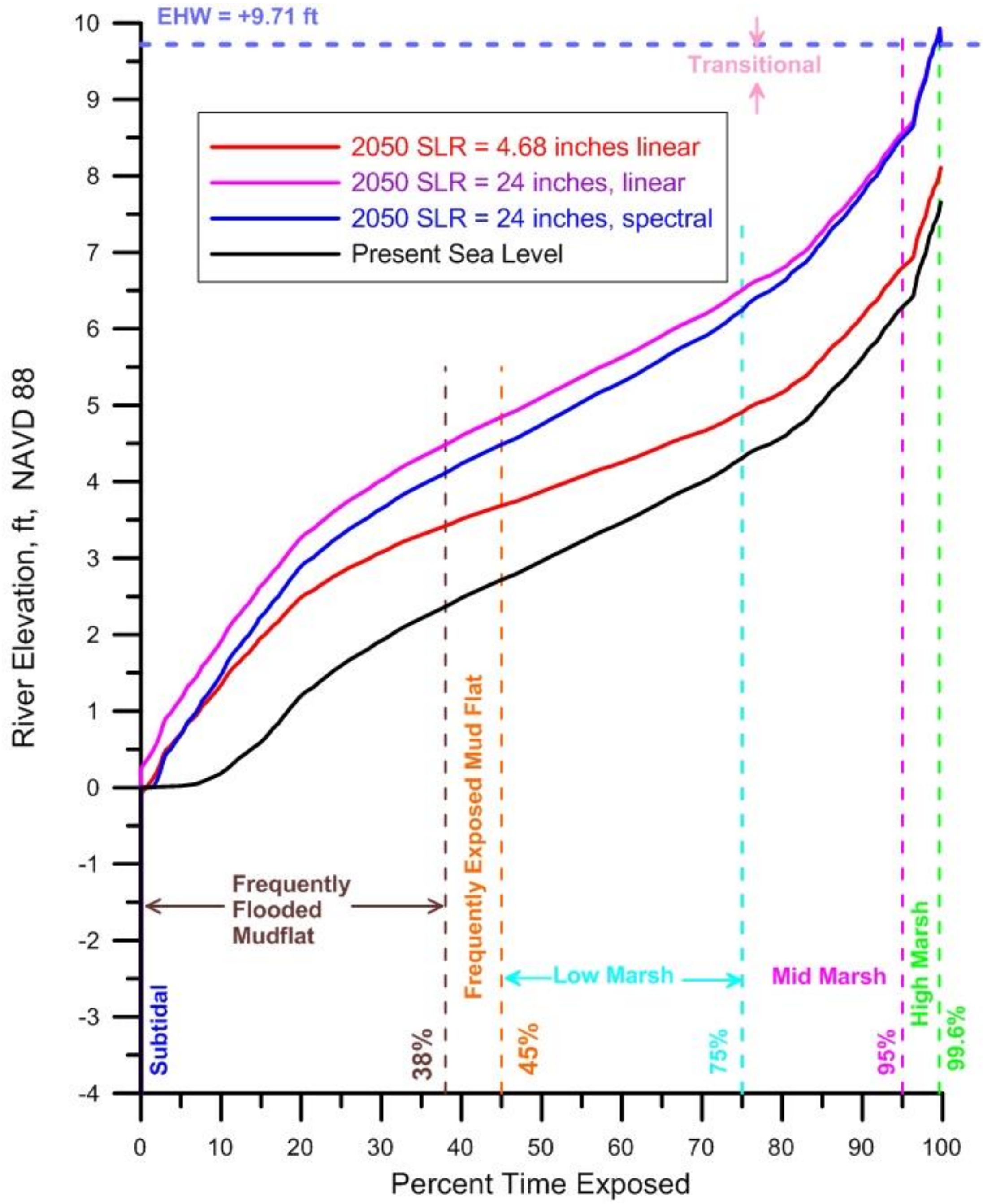


Figure 45: Hydroperiod Function for Subtidal Alternative, Otay Floodplain Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261

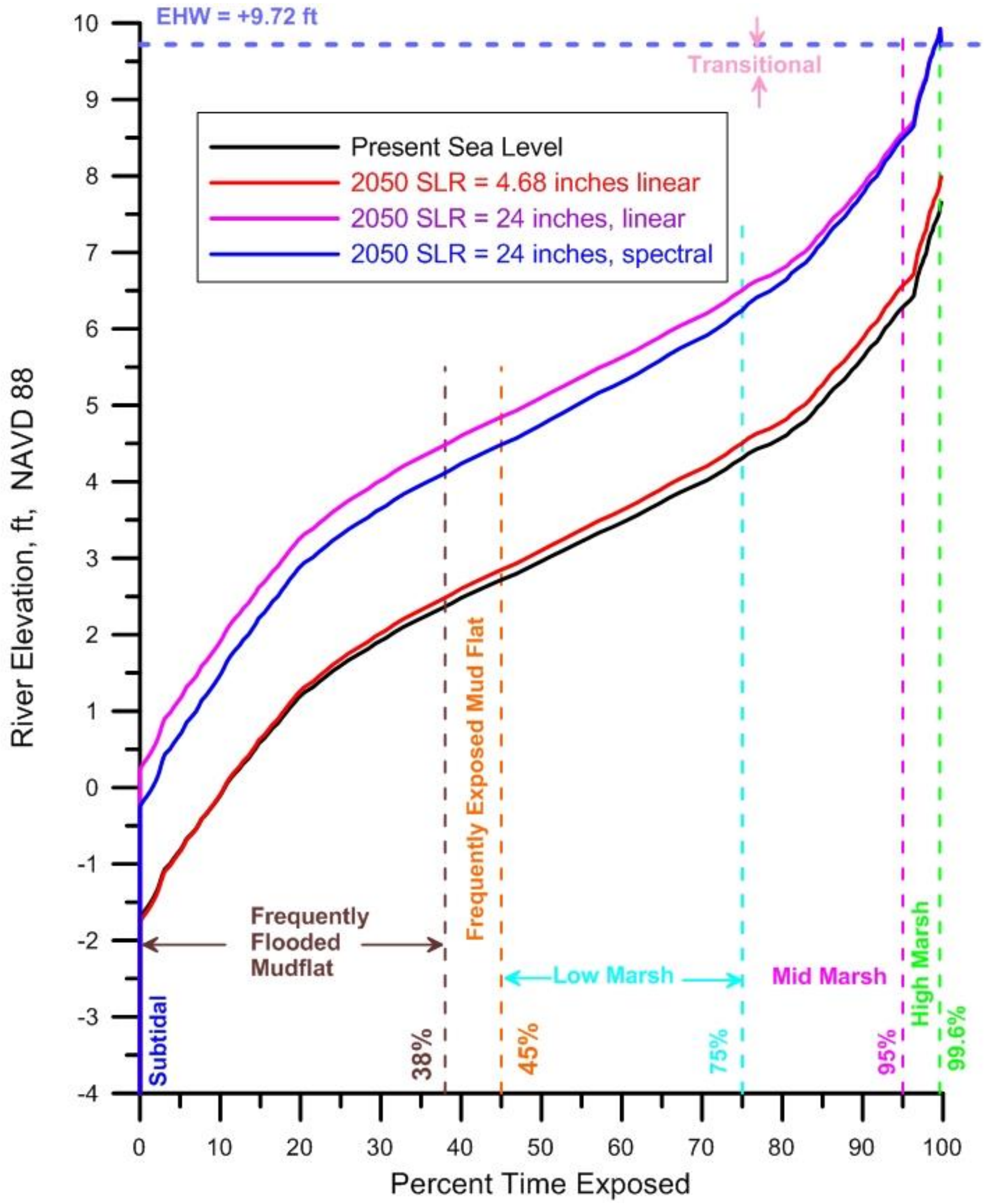


Figure 46: Hydroperiod Function for the Subtidal Alternative Pond #15 Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261.

Table 7: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.38 ft.	3.40 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.52 ft.	6.25 ft.
Mid Marsh	6.27 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.10 ft.	9.71 ft.	9.71 ft.

Table 8: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.20 ft.
Frequently Flooded Mud Flat	2.35 ft.	2.50 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table 9: Subtidal Alternative Predicted Habitat Distribution, acres, 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.17
Mudflat – Frequently Flooded	5.26	14.70
Mudflat – Frequently Exposed	1.79	1.32
Low Marsh	8.64	11.77
Mid Marsh	7.90	33.25
High Marsh	1.64	11.78
Total Salt Marsh	29.71	82.00
Transitional	0.45	2.15
Total Created Habitat	**29.26**	**79.85**

Table 10: Subtidal Alternative Predicted Habitat Distribution, acres, 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.0
Mudflat – Frequently Flooded	110.01	15.28
Mudflat – Frequently Exposed	1.70	1.58
Low Marsh	5.43	12.68
Mid Marsh	6.71	41.20
High Marsh	0.52	3..06
Total Created Habitat	**29.85**	**82.80**

That existing down-river habitat consists of additional mud flat residing below – 0.0 ft NAVD 88 and subtidal habitat below -1.01 ft NAVD 88 (cf. Section 4). Low tide drainage of the Pond # 15 (see Figure 46) is constrained by the tidal muting of the South Bay Shelf (cf. Sections 3.2 & 3.4), which varies with sea level. At present sea level, Pond # 15 will not drain below – 1.65 ft. NAVD 88, producing the subtidal footprint shown in Figure 41. However, with a moderate amount of sea level rise, the linear SLR = 4.68 in. solution indicates a moderate improvement in drainage to – 1.70 ft NAVD 88. If sea level were to rise by 2 ft. according to the maximum sea level rise prediction in 2050, the available tidal range is not sufficient to prevent a rise in subtidal elevations in Pond # 15. This amount of sea level rise will raise the elevations of the zonation of all habitat types (Figure 46). This upward displacement of wetland zonation is largest for the linear superposition scenario, because the spectral correction scenario predicts a larger tidal range of about 1.0 ft. Under the 24 in. spectral sea level rise scenario at 2050, intertidal wetland habitat would begin at an elevation of -0.20 ft NAVD, and the mud flat habitat would reside about 0.4 ft. to 0.5 ft. lower than under the linear super-position scenario; while the low marsh habitat would reside about 0.25 ft. lower than under the linear super-position scenario. Therefore there are some apparent differences between the habitat mix predictions of these two sea-level rise prediction methods; although both give the same estimate of the maximum elevation of high salt marsh wetland zonation in both of the proposed basins of the Subtidal Alternative (cf. Tables 7 & 8).

6.3) Residence Time of the Subtidal Alternative: A discussion at the beginning of Section 5.3 details the calculus of residence time and how it represents the average amount of time source water spends in a particular tidal system. Figure 47 gives the TIDE_FEM hydrodynamic simulations of the time for dilution of old water in each of the tidal systems (inlet channel + tidal basin) of the Subtidal Alternative. Figure 47 presents the model results of residence time of South Bay water in the tidal basins of the Subtidal Alternative for the Otay River floodplain basin (blue) and the Pond #15 basin (red). Residence time of South Bay water is 2.5 days in the floodplain basin and 3 days in the Pond#15 basin. Residence time in the floodplain basin is 0.5 days longer than for the Intertidal Alternative in Section 5.3 because a residual of 29 acre ft. in the subtidal channel of the Subtidal Alternative fails to drain at mean lower low water levels. Regardless, the residence time numbers for the Subtidal Alternative are rather good for marginalizing potential dissolve oxygen depletion, although the DO of South Bay water can become quite low during evaporative summer time conditions (cf. Section 3,3). Maximum diurnal tidal prisms at present sea levels are 100 acre ft. (4.4 million cubic ft.) for the proposed Otay River floodplain basin; and 335 acre ft. (14.6 million cubic ft.) for the proposed Pond #15 basin.

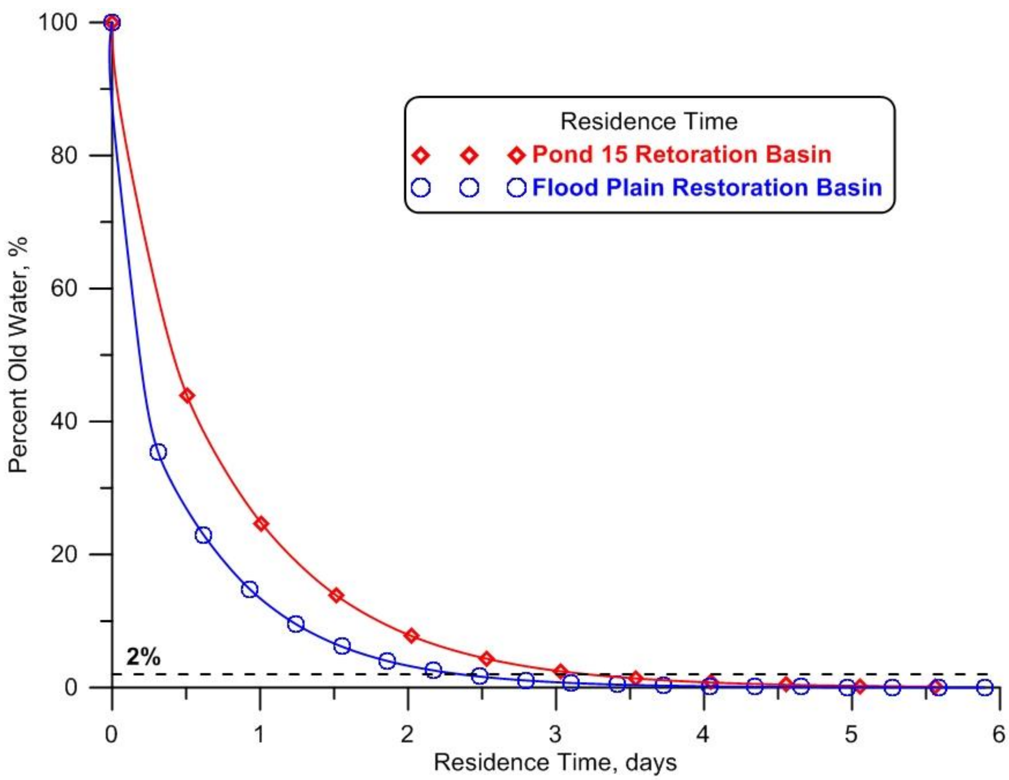


Figure 47: Residence time of South Bay water in the tidal basins of the Subtidal Alternative: Otay River floodplain basin (blue); Pond #15 basin (red).

7.0) Summary and Conclusions:

This study employs a well-tested and peer-reviewed hydrodynamic model to evaluate the tidal hydraulics the Intertidal Alternative and the Subtidal Alternative for the Otay River Estuary Restoration Project (ORERP). Both alternatives involve restoration of a portion of the Otay River Floodplain Site and Pond 15 Site to native habitat by lowering the existing ground elevations in the Otay River Floodplain Site and using the excavated soils from the Otay River Floodplain Site as fill material in the Pond 15 Site.

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). The analysis is based on updated bathymetry provided by Wetlands Research Associates (WRA) and latest updates to San Diego Bay tides for the 1983-2001 tidal epoch supported by Otay Sonde tidal elevation measurements at the mouth of the Otay River. The computer models used in this study are 2-dimensional finite element types, built from some well-studied and proven computational methods and numerical architecture that have been successful in predicting shallow water tidal propagation. Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a calibration proxy for the restoration alternatives because of morphologic similarities: in particular, both the San Dieguito and restoration sites have a long “goose-neck” feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). The hydroperiod functions were calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

The elevation breaks (zonation) between the different wetland habitat types from the modeled hydroperiod curves are summarized below in Tables S-1 and S-2 for the Intertidal Alternative; and in Tables S-3 and S-4 for the Subtidal Alternative. The elevations for the habitat breaks in these tables are applied to the KTUA grading designs and yield the acreages of habitat creation listed in Table S-5 for the Intertidal Alternative at present sea level, and at 2050 sea levels in Table S-6.The companion set of habitat creation acres for the Subtidal Alternative are listed in Table S-7 at present sea level, and in Table S-8 at 2050 sea levels. Comparing Tables S-5 and S-7, it is apparent that the Intertidal Alternative creates an additional 1.37 acres of habitat in 2018 than does the Subtidal Alternative. For all possible sea level scenarios, the elevation limit of subtidal habitat in the floodplain basin of both restoration alternatives is limited by existing bars, hummocks and other channel bottom features at the inlet and inside the branch channel into this basin. These channel bottom features create an inlet sill at 0.0 ft NAVD 88. However, if sea level were to rise by 2 ft. according to the maximum sea level rise prediction in

2050, the available tidal range is not sufficient to prevent a rise in subtidal elevations in Pond # 15 of either restoration alternative. This amount of sea level rise will raise the elevations of the zonation of all habitat types. This upward displacement of wetland zonation is largest for the linear superposition scenario of sea level rise, because the spectral correction scenario predicts a larger tidal range of about 1.0 ft. Under the 24 in. spectral sea level rise scenario at 2050, intertidal wetland habitat would begin at an elevation of between -0.25 ft. and -0.20 ft NAVD, and the mud flat habitat would reside about 0.4 ft. to 0.5 ft. lower than under the linear super-position scenario; while the low marsh habitat would reside about 0.25 ft. lower than under the linear super-position scenario. Therefore there are some apparent differences between the habitat mix predictions of these two sea-level rise prediction methods; although both give the same estimate of the maximum elevation of high salt marsh wetland zonation in both of the proposed basins of the restoration alternatives.

From model simulations of tidal currents throughout complete spring-neap tidal cycles, it is concluded that both source water inlets to the tidal basins of the Intertidal and Subtidal Alternatives are stable and immune to closure or restriction by sedimentation under dry weather tidal exchange. (Wet-weather conditions are addressed in a companion study, Everest, 2014). Inlet sedimentation due to influxes of wave driven long-shore transport of sand (as occurs on the open coast), does not occur in the fetch limited environment of South San Diego Bay. The mouth of the Otay River that supplies source water to the floodplain tidal basin is in a dynamic steady-state equilibrium that is neither depositional nor erosional; while the inlet to Pond 15 will remain in a non-equilibrium stationary state (as-built) in the absence of a local sediment sources or adequate fluid forcing by waves and currents that might otherwise import sediment from more distant sources.

Table S-1: Elevations of Upper Limits of Habitat Breaks Intertidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.40 ft.	3.40 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.55 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.05 ft.	9.71 ft.	9.71 ft.

Table S-2: Elevations of Upper Limits of Habitat Breaks in the Intertidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.25 ft.
Frequently Flooded Mud Flat	2.40 ft.	2.50 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table S-3: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.38 ft.	3.40 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.52 ft.	6.25 ft.
Mid Marsh	6.27 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.10 ft.	9.71 ft.	9.71 ft.

Table S-4: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.20 ft.
Frequently Flooded Mud Flat	2.35 ft.	2.50 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table S-5: Intertidal Alternative Predicted Habitat Distribution, acres 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0.00	9.53
Mudflat – Frequently Flooded	4.45	16.36
Mudflat – Frequently Exposed	0.70	1.57
Low Marsh	10.34	15.73
Mid Marsh	10.99	34.47
High Marsh	3.23	5.61
Total Marsh	29.26	80.68
Transitional	0.45	2.59
Total Created Habitat	**29.71**	**83.27**

Table S-6: Intertidal Alternative Predicted Habitat Distribution, acres 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0	9.35
Mudflat – Frequently Flooded	8.84	17.06
Mudflat – Frequently Exposed	2.21	1.85
Low Marsh	7.91	17.32
Mid Marsh	10.36	35.38
High Marsh	0.52	2.87
Total Created Habitat	**29.84**	**83.83**

Table S-7: Subtidal Alternative Predicted Habitat Distribution, acres, 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.17
Mudflat – Frequently Flooded	5.26	14.70
Mudflat – Frequently Exposed	1.79	1.32
Low Marsh	8.64	11.77
Mid Marsh	7.90	33.25
High Marsh	1.64	11.78
Total Salt Marsh	29.71	82.00
Transitional	0.45	2.15
Total Created Habitat	**29.26**	**79.85**

Table S-8: Subtidal Alternative Predicted Habitat Distribution, acres, 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.0
Mudflat – Frequently Flooded	110.01	15.28
Mudflat – Frequently Exposed	1.70	1.58
Low Marsh	5.43	12.68
Mid Marsh	6.71	41.20
High Marsh	0.52	3..06
Total Created Habitat	**29.85**	**82.80**

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Final: 20 January 2016

Technical Note on Possible Tidal Hydraulics Impacts of the Otay River Estuary Restoration Plan (ORERP) on Nestor Creek and the Upper Otay River Intertidal Zone

by: Scott A. Jenkins, Ph. D

ABSTRACT: The output of tidal hydraulics modeling results detailed in Appendix D of the draft EIR were re-evaluated to consider potential project impacts on areas outside the project boundaries, specifically Nestor Creek and the upper reach of the Otay River intertidal zone up-river from the Bayshore Bikeway Bridge**.** Based on comparisons of hydroperiod functions pre- and post-project, it is concluded that either restoration alternative under the ORERP (the *Intertidal* or *Subtidal Alternatives*) have a negligible effect on tidal inundation in the upper reach of the Otay River; and result in a slight reduction of tidal muting and improvement in high water tidal inundation of Nestor Creek.

1.0) Introduction: This technical note is a response to the following comment (4.3.1) on the draft EIR for the Otay River Estuary Restoration Plan (ORERP) that was made by the U.S. Army Corps of Engineers (USACE).

> *4.3.1 Impacts on Habitat and Vegetation Communities; direct impacts; Habitat and Vegetation Communities/Jurisdictional Waters; What about the indirect impacts to Nestor Creek or the Otay River based on altering the elevations and hydrology near these areas? Will there be a hydrologic change that could alter the functioning of waters?*

Responses to this comment are based on numerical tidal hydraulics modeling in the existing Otay River floodplain and on modeling of the tidal exchange in the floodplain after construction of either of two restoration alternatives for the ORERP, namely: *The Intertidal Plan*, and *The Sub-tidal Plan.* The details of the tidal hydraulics modeling are found in Appendix-D of the draft EIR. Appendix-D is entitled, "Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan," 113 pp. Because Nestor Creek and the intertidal reaches of the upper Otay River floodplain are outside the project boundaries of the ORERP, the discussion in the EIR Appendix-D did not explicitly discuss tidal exchange in these areas, although Nestor Creek and the upper Otay River were both included in the model domain. In the following sections we will re-visit those outer reaches of the model domain and elaborate on tidal exchange in the Nestor Creek and the intertidal reaches of the upper Otay River floodplain to provide a quantitative response to the USACE comment (4.3.1).

2.0) Review of Methodology: The EIR tidal hydraulics analysis (Appendix-D) employed a well-tested and peer-reviewed hydrodynamic model (TIDE_FEM) to evaluate the tidal hydraulics of both the existing Otay River floodplain as well as the Intertidal Alternative and the Subtidal Alternative for the Otay River Estuary Restoration Project (ORERP). The model, analysis methods, and supporting data bases used were the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). The analysis of the existing Otay River floodplain was based on updated bathymetry provided by Wetlands Research Associates (WRA) and latest updates to San Diego Bay tides for the 1983-2001 tidal epoch after spectrally correcting that record to the mouth of the Otay River using tidal elevation measurements from the Otay River Sonde. The TIDE_FEM computer model used in this study are 2-dimensional finite element types, built from some well-studied and proven computational methods and numerical architecture that have been successful in predicting shallow water tidal propagation. Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was used to calibrate the TIDE_FEM tidal hydraulics model. San Dieguito Lagoon was selected as a calibration proxy for the restoration alternatives because of morphologic similarities: in particular, both the San Dieguito and restoration sites have a long “goose-neck” feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). The hydroperiod functions were calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

3.0) Existing Conditions, Nestor Creek and Upper Otay River Intertidal Zone:

The TIDE_FEM bathymetric computational mesh was initialized for the updated Otay River Floodplain bathymetry derived from the 2011 WRA precision GPS surveys (Figure 1). The TIDE_FEM computational mesh is nested in the farfield of south San Diego Bay, and was subjected to 30 years of historic tidal forcing using the 1980-2009 period of record at the Navy Pier in San Diego Bay, after spectrally correcting that record to the mouth of the Otay River as detailed in Section 3.2 of Appendix-D of the draft EIR. For the purposes of the present analysis, we select six nodal points in the computational mesh to serve as control points for evaluating the hydroperiod functions both pre- and post-project in Nestor Creek and the intertidal zone of the Otay River. These control pints are shown by the stars in Figure 1, all of which are located upriver from the Bayshore Bikeway Bridge and feeder channel to the proposed Floodplain Basin of the ORERP.

Peak flooding currents during spring tides (using 18 September 2009 as a proxy) were simulated in the existing river channel in Figure 2, while ebbing currents during spring tides are found in Figure 3. These progressive vector diagrams show that flooding spring tidal currents are about 0.1 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 Ponds 10 and 11). Further upriver, 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) into the complex dendritic system of channels in the upper reaches of the intertidal zone of the Otay River and Nestor Creek. During ebb spring tides, Figure 3 shows that Nestor Creek completely drains while limited tidal inundation remains in the shallow SW to NE subtidal reach of the upper Otay River floodplain immediately upriver from the Bayshore Bikeway Bridge.

The hydroperiod function is derived from large numbers of simulations like those in Figures 2 and 3 to find the percentage of exposure for each elevation potentially subjected to tidal inundation throughout the full range of South Bay water level variation. The hydroperiod function is used to discriminate pre- and post-project changes in the tidal inundation of the upper

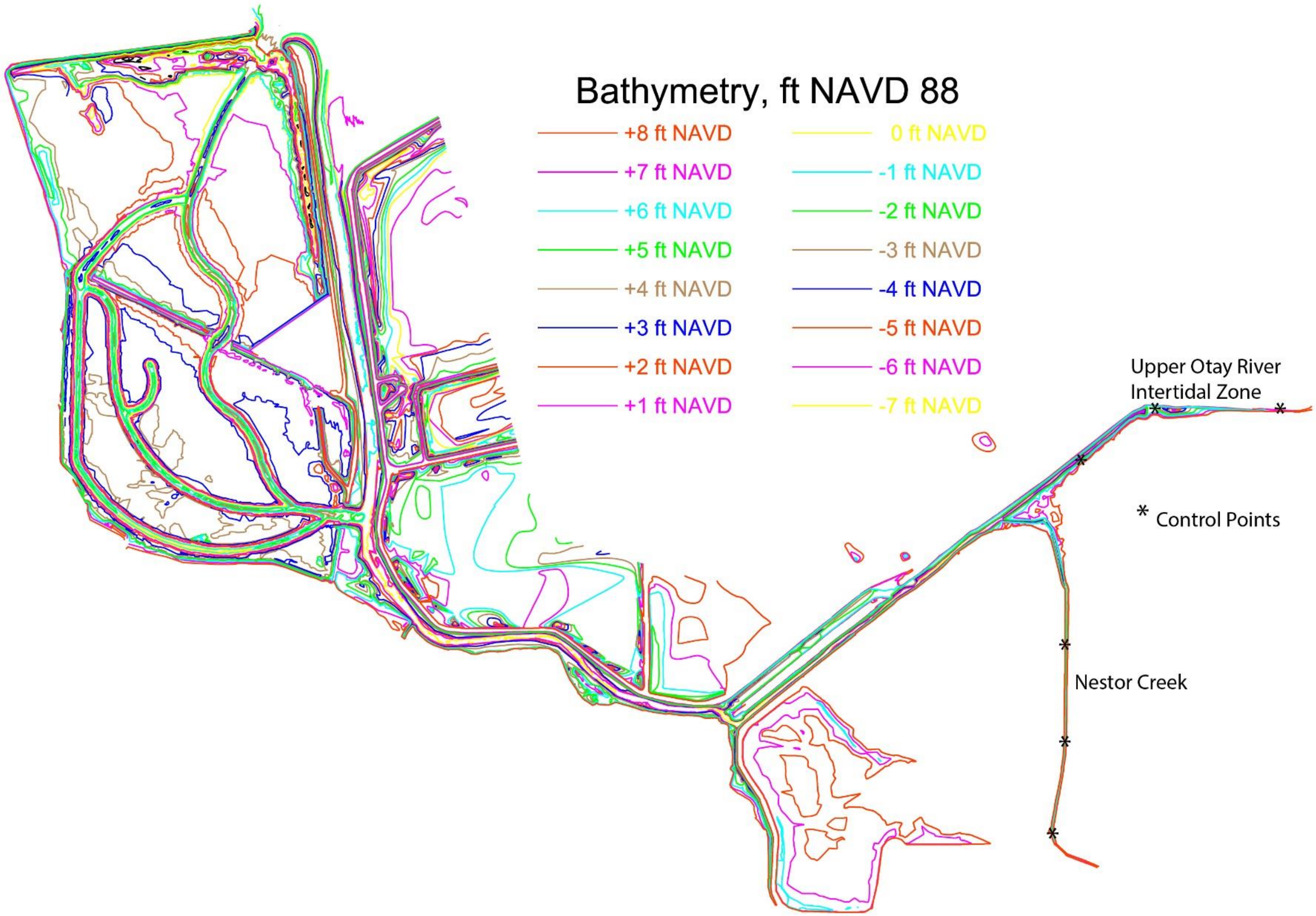

Figure 1: The updated Otay River Floodplain bathymetry derived from the WRA (2011) precision GPS survey. Control points for evaluating tidal exchange pre- and post-project in Nestor Creek and the tidally influenced upper Otay River are designated by stars.

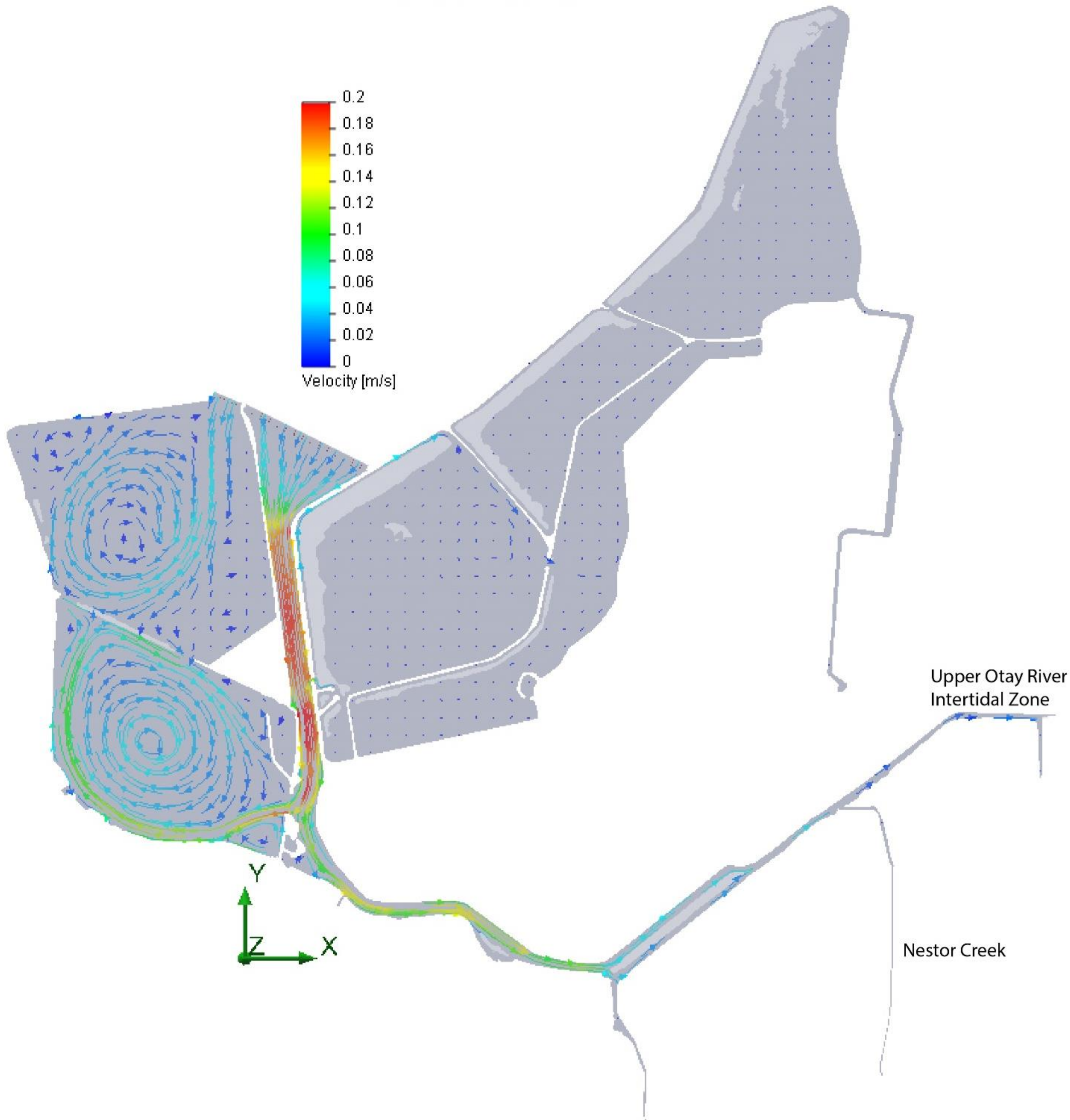

Figure 2: Hydrodynamic simulation of progressive vector flow distribution at 30 min time integration during maximum flood flow during spring tides for the existing lower Otay River and salt pond system based on 2011 WRA bathymetric survey and the 1983-2001 tidal epoch for San Diego Bay tides.

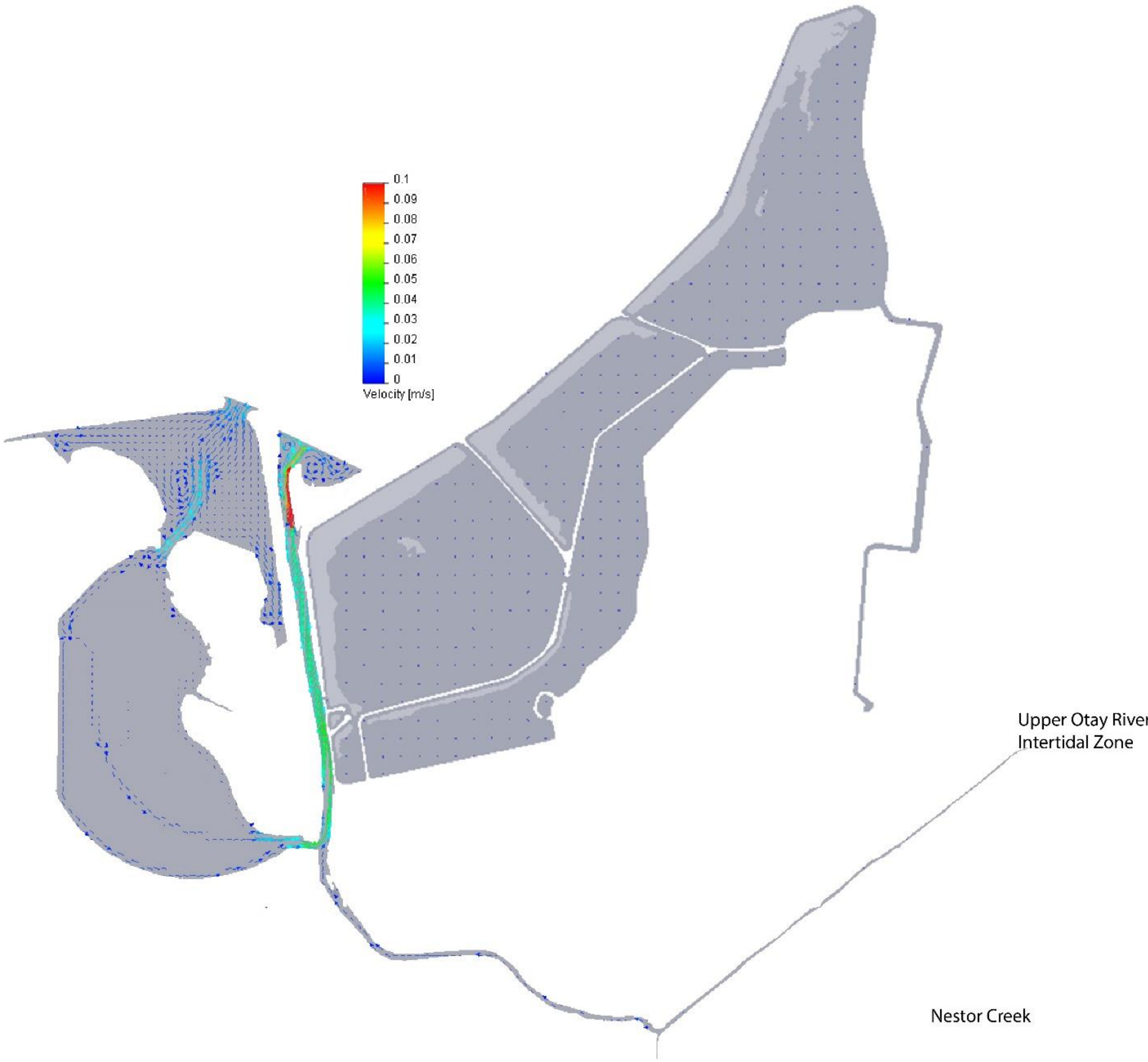

Figure 3: Hydrodynamic simulation of progressive vector flow distribution at 30 min time integration during maximum ebb flow during spring tides for the existing lower Otay River and salt pond system based on 2011 WRA bathymetric survey and the 1983-2001 tidal epoch for San Diego Bay tides.

Otay River and Nestor Creek. The computations involved N_o = 2,629,800 time steps, each 6 minutes in length, in order to sweep the 30 year period of record of San Diego Bay water levels spectrally corrected to the mouth of the Otay River. At each time step the water elevations at the control points in Figure 1, $\hat{\eta}$, were calculated. Conditional if statements and counting loops inserted into the TIDE_FEM code would count the number time steps, *N*, for which the average lagoon water elevation was less than a particular elevation, Z_i. The percent time that elevation Z_i was exposed over the period of record was calculated as:

$$E_i = \frac{100\%}{N_o} \sum N(\hat{\eta} < Z_i) \qquad (1)$$

Equation (1) gives the hydroperiod function at each control point in Figure 1. These are ensemble averaged and the elevations divided among the various sub-tidal and intertidal habitat types based on biological the surveys biological surveys discussed in Section 2 above. The various degrees of exposure for each of these habitat types were determined to be:

TABLE 1: Exposure Levels for Hydroperiod Habitat Breaks

Subtidal Exposure < 0%;
0% < **Frequently Flooded Mud Flat Exposure** < 38%
38% < **Frequently Exposed Mud Flat Exposure** < 45%;
45% < **Low Salt Marsh Exposure** < 75%
75% < **Mid Salt Marsh Exposure** < 95%
95% < **High Salt Marsh Exposure** < 99.6%
99.6% < **Transitional Exposure** < 100%

Figure 4 below gives the hydroperiod functions that were determined by this analysis for the existing upper and lower reaches of the Otay River flood plain, and for Nestor Creek. Here the lower reach of the Otay River extends from the mouth of the Otay River to the Bayshore Bikeway Bridge, site of the legacy railroad bridge where the inlet to the feeder channel of the proposed ORERP Floodplain Basin is located. The upper reach extends from the Bayshore Bikeway Bridge upriver to the furthest point of high water tidal inundation. Comparing the black and red curves in Figure 4 reveals a small degree of high-water tidal muting occurs in the upper reaches in the existing Otay River relative to the lower reach; with extreme high water inundation (EHW) in the upper reach occurring at +7.45 ft NAVD 88, or about 0.25 ft lower than in the lower reach below the Bayshore Bikeway Bridge. Close inspection of Figure 1 reveals that this is attributable to hydraulic control exerted by the Bayshore Bikeway Bridge, whose abutments and channel hardening create a choke point with an associated complex sand bars immediately up-river from Bayshore Bikeway Bridge. These bars create a sill at 0.0 ft NAVD 88 which also limits drainage of the upper reach. Consequently, intertidal habitat in the upper reach does not extend below 0.0 ft NAVD under existing conditions; whereas in the lower reach, intertidal mud flat resides below – 0.0 ft NAVD and subtidal habitat below -1.01 ft NAVD. High water tidal inundation in Nestor Creek is further muted with EHW reaching only 7.0 ft NAVD 88 under existing conditions. This muting begins with the choke point and sand bars at

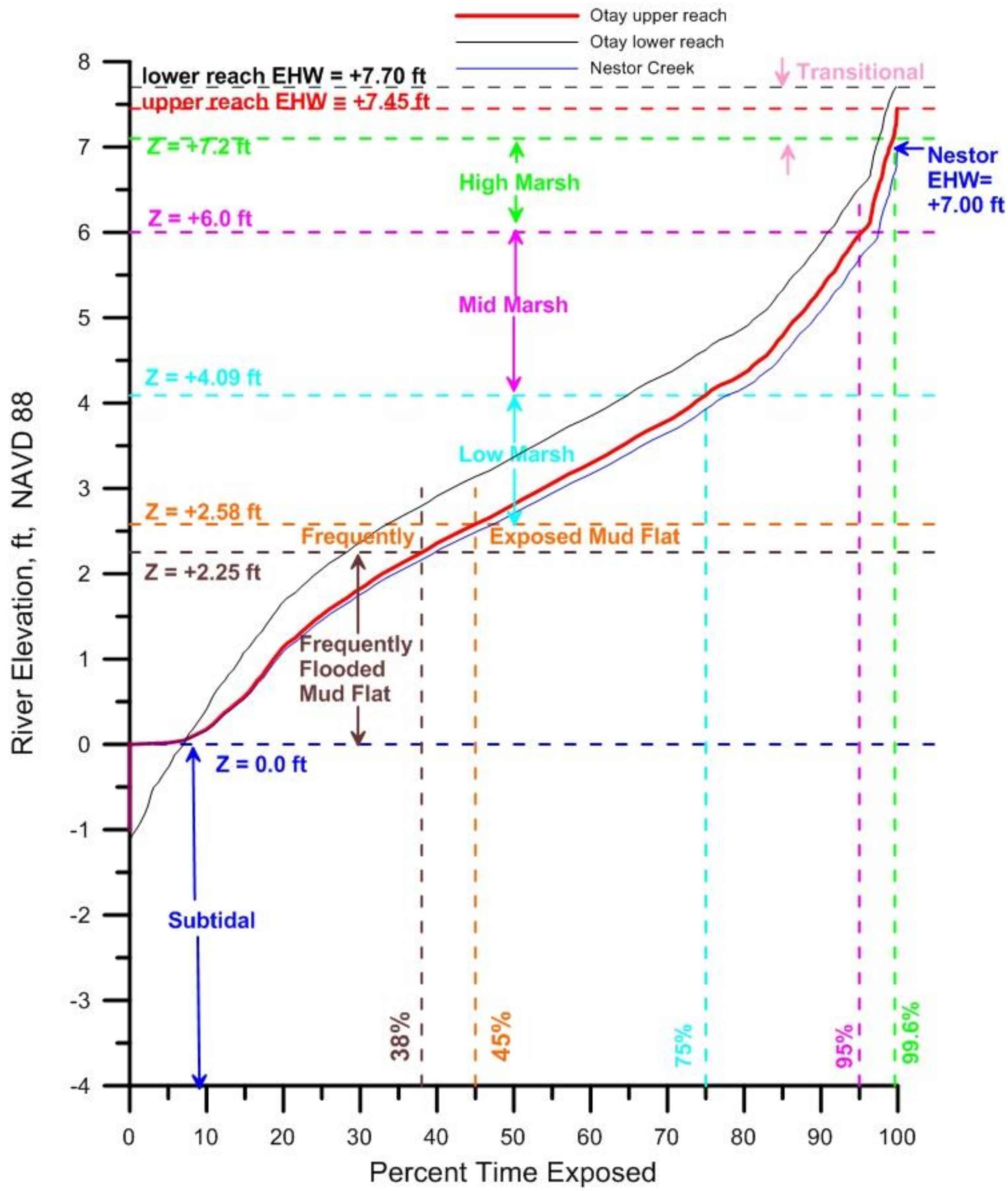

Figure 4. Hydroperiod functions of the existing Otay River lower reach (black), existing Otay River upper reach (red), and existing Nestor Creek (blue) based on WRA 2011 bathymetric survey applied to water level data from NOAA tide gage #941-0170, for tidal epoch 1983-2001, with spectral correction from Otay River Sonde. Mannings roughness: n_0 = 0.0261

the Bayshore Bikeway Bridge and is further exacerbated by the narrow, shallow channel of Nestor Creek which does not extend below 0.0 ft NAVD 88 under existing conditions and is as high as + 1.0 ft NAVD 88 in its backwater reaches. Consequently Nestor Creek completely drains during most ebb tide cycles.

4.0) Post-Project Conditions, Nestor Creek and Upper Otay River Intertidal Zone:

Figure 5 gives the flow trajectories and depth averaged tidal currents for the Intertidal Alternative computed by the calibrated TIDE_FEM model during spring flooding tides, using 18 September 2009 as a proxy. Velocities of tidal currents are portrayed according to the color coded velocity scale appearing in the lower left corner of the figure. Maximum flooding spring tidal currents at the mouth of the Otay River (in the neighborhood of the Otay Sonde) 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 & 11 to 0.2 m/sec (0.66 ft/sec) where the channel has scoured under existing conditions to equilibrium depths on the order of -2.0 ft NAVD. After passing Pond 10, currents decelerate and then increase to 0.17 m/sec (0.55 ft/sec) near the choke point at the Bayshore Bikeway Bridge, before entering the floodplain tidal basin; where tidal currents entering the tidal basin initially form a well-defined jet at the west bank with speeds of about 0.08 m/s (0.26 ft/sec). This entry jet quickly diverges into a complex set of clockwise rotating eddies that populate the interior of the tidal basin. Eddy speeds in the tidal basin are on the order of 0.02 m/sec (0.07 ft/sec), insufficient to transport fine sand but 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. The lower reach of Nestor Creek has been incorporated along the east bank of the Floodplain Basin, thereby widening the channel cross section of Nestor Creek by a factor of 35 to 52; while the upper reach extends beyond of the southeast corner of the Floodplain Basin. The high water footprint of the upper reach of Nestor Creek under the Intertidal Alternative in Figure 5 appears larger relative to existing conditions in Figure 2, suggesting an improvement in high water tidal inundation under post-project conditions. On the other hand, the high water footprint of the upper reach of the Otay River intertidal zone under the Intertidal Alternative in Figure 5 appears about the same as existing conditions in Figure 2. In the lower reach of the Otay River, flood tide currents are swifter post-project than existing conditions, but generally remain below the threshold scour speeds for the native sediments, based on estimates from the Hjulstrom Curve.

Figure 6 gives the flow trajectories and depth averaged tidal currents for the Intertidal Alternative computed by the TIDE_FEM model during spring ebbing tides on 18 September 2009. The wetted area of the floodplain tidal basin is significantly reduced relative to the flood tide area in Figure 28, due to the fact that the grading plan allows for almost complete drainage at mean low water tidal stages. In Figure 6, creeping flow drains from the remnant dendritic channel of the floodplain basin, forming a feeder current in the upper river channel with speeds on the order of -0.01 m/sec, or (-0.03 ft/sec). This feeder current evacuates the tidal basin and then accelerates 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. (We adopt the convention of negative velocities for ebb tide flows and positive velocities for flood tide flows). Ebb flow in the channel then accelerates further to -0.09 m/sec (-0.289 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. Again, ebb tide currents in the lower reach of the Otay River, are swifter post-project than existing conditions, but generally remain below the threshold scour

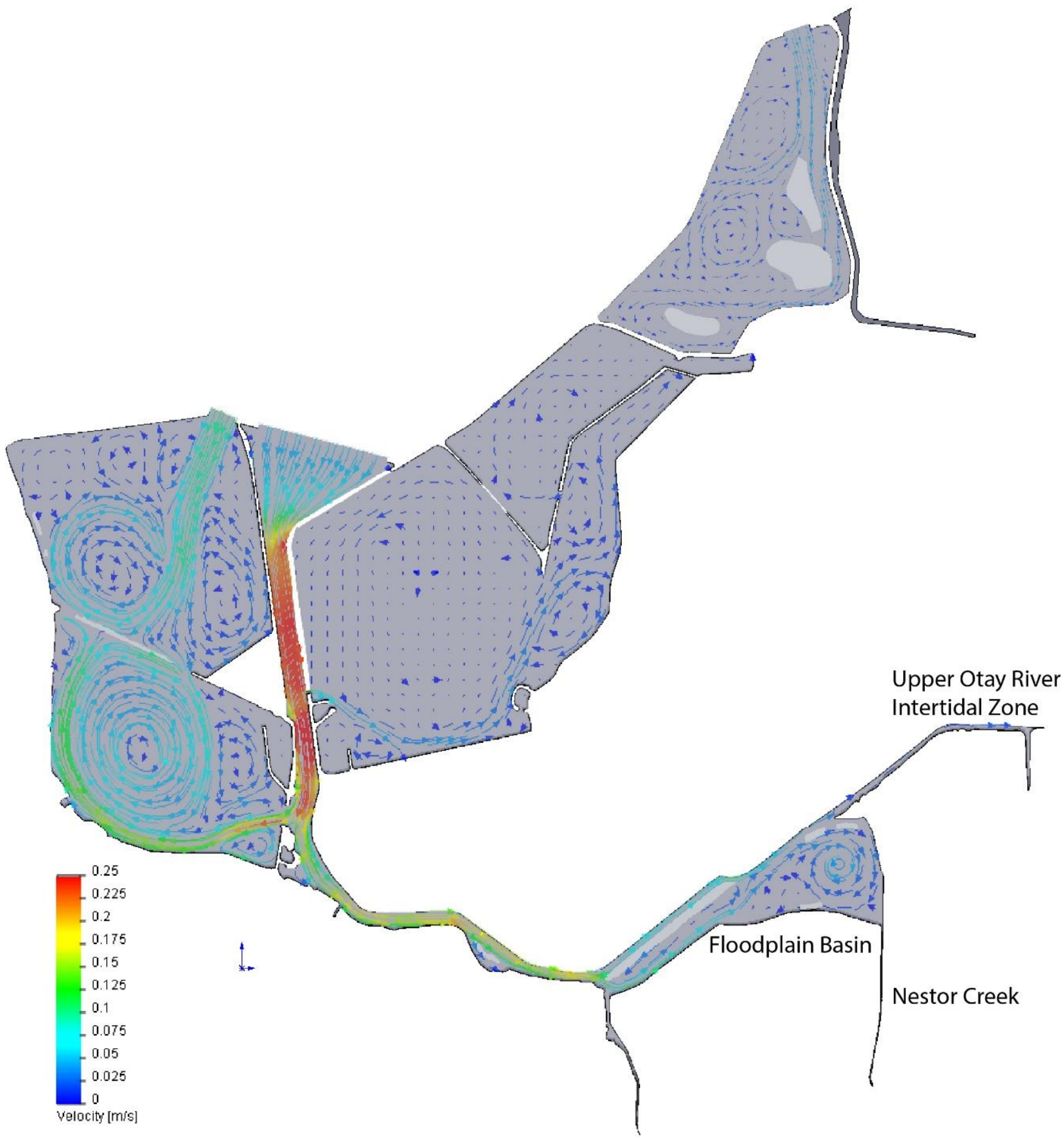

Figure 5: Intertidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

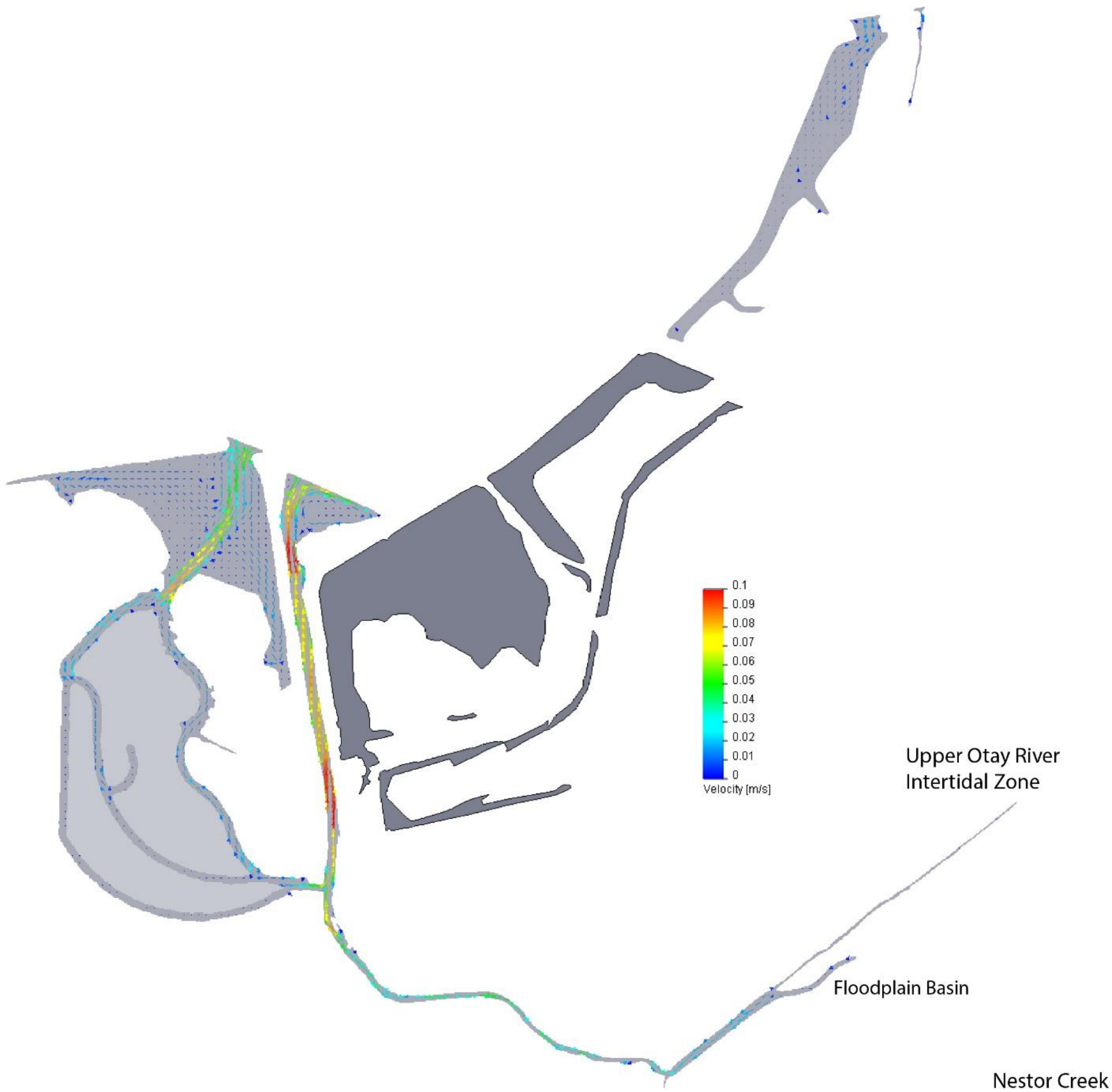

Figure 6: Intertidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

speeds for the native sediments, based on estimates from the Hjulstrom Curve. The low water footprint of Nestor Creek under the Intertidal Alternative in Figure 6 is completely vacated, the same as for existing conditions in Figure 3. The low water footprint of the upper reach ot the Otay River under the Intertidal Alternative in Figure 6 is about the same as for existing conditions in Figure 3, other than for a slight widening at the merge with the feeder channel for the Floodplain Basin.

Figure 7 gives the hydroperiod functions for the upper Otay River intertidal zone and for Nestor Creek under the post-project conditions for the ORERP Intertidal Alternative, as calculated by the procedures reviewed in Section 3. At the resolution of the model, the hydroperiod function for the upper reach of the Otay River in Figure 7 is unchanged from that reported for existing conditions in Figure 4, where both pre- and post-project tidal inundation produce the same extreme high water levels at 7.45 ft. NAVD 88, and both have the same habitat zonations and basement levels of intertidal habitat at 0.0 ft NAVD 88. The reason for this is that hydraulic control for both pre- and post-project conditions in the upper reach is established by the choke point at the Bayshore Bikeway Bridge, a feature that is unchanged by post-project conditions, at least within the rigid-boundary approximations of the TIDE_FEM model. On the other hand, the hydroperiod function for the Nestor Creek in Figure 7 reveals a small degree of reduction in high-tide muting as a result of the Intertidal Alternative, with post project EHW reaching 7.2 ft NAVD 88, or about 0.2 ft higher salt water inundation than existing conditions. The reason for this reduction in the high tide muting of Nestor Creek is that the post project conditions significantly increase its channel cross section, and thereby reduce the frictional damping of high water tidal elevations in Nestor Creek. Both pre- and post-project tidal inundation produce the same basement levels of intertidal habitat at 0.0 ft NAVD 88, while the post-project conditions increase the zonation elevation band for high marsh by about 0.3 ft.

Figure 8 gives the flow trajectories and depth averaged tidal currents for the Subtidal Alternative computed by the calibrated TIDE_FEM model during spring flooding tides, using 18 September 2009 as a proxy. Velocities of tidal currents are portrayed according to the color coded velocity scale appearing in the lower left corner of the figure. Maximum flooding spring tidal currents at the mouth of the Otay River (in the neighborhood of the Otay Sonde) 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 & 11 to 0.2 m/sec (0.66 ft/sec) where the channel has scoured under existing conditions to equilibrium depths on the order of -2.0 ft NAVD. After passing Pond 10, currents decelerate and then increase to 0.17 m/sec (0.55 ft/sec) near the choke point at the Bayshore Bikeway Bridge, before entering the floodplain tidal basin; where tidal currents entering the tidal basin initially form a well-defined jet at the west bank with speeds of about 0.08 m/s (0.26 ft/sec). This entry jet quickly diverges into a complex set of clockwise rotating eddies that populate the interior of the tidal basin. Eddy speeds in the tidal basin are on the order of 0.02 m/sec (0.07 ft/sec), insufficient to transport fine sand but 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. The lower reach of Nestor Creek has been incorporated along the east bank of the Floodplain Basin, thereby widening the channel cross section of Nestor Creek by a factor of 35 to 52; while the upper reach extends beyond of the southeast corner of the Floodplain Basin. The high water footprint of the upper reach of Nestor Creek under the Subtidal Alternative in Figure 8 appears larger relative to existing conditions in Figure 2, suggesting an improvement in high water tidal inundation under post-project conditions. On the other hand, the high water footprint of the upper reach of the Otay

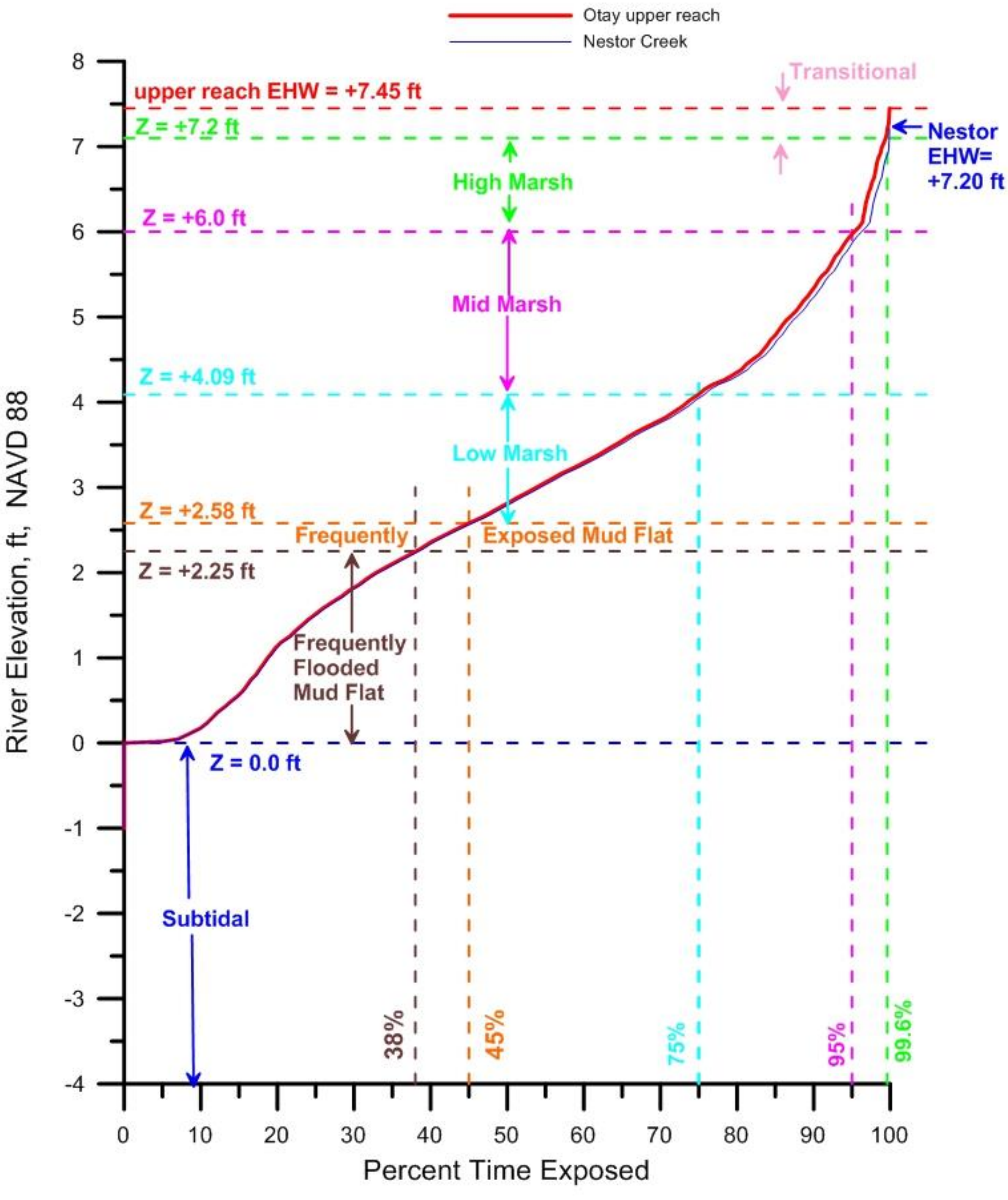

Figure 7. Post-project hydroperiod functions of the Otay River upper reach (red) and Nestor Creek (blue) for the ORERP Intertidal Alternative based on WRA 2011 bathymetric survey applied to water level data from NOAA tide gage #941-0170, for tidal epoch 1983-2001, with spectral correction from Otay River Sonde. Mannings roughness: n_0 = 0.0261

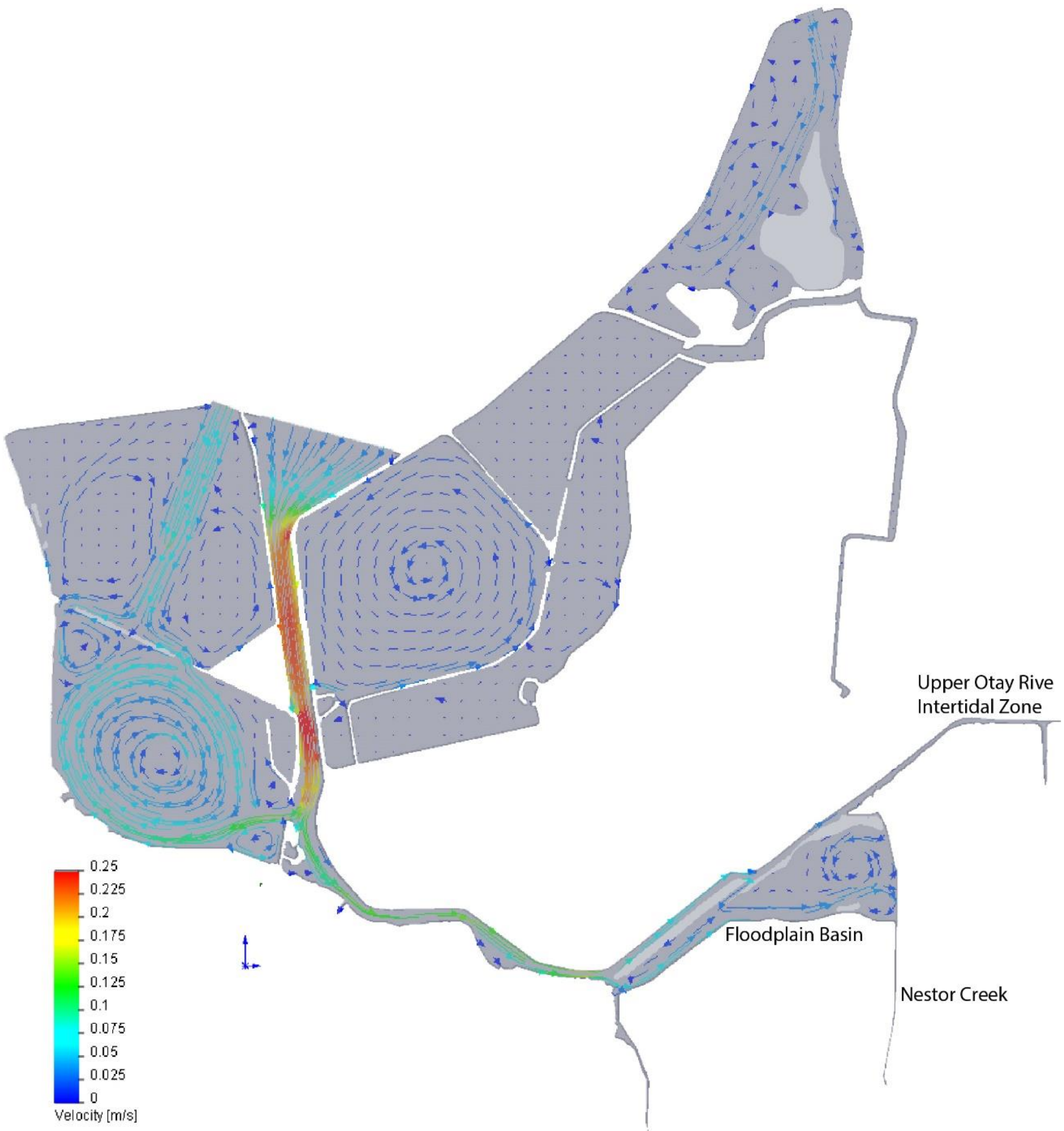

Figure 8: Subtidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

River intertidal zone under the Subtidal Alternative in Figure 8 appears about the same as existing conditions in Figure 2. In the lower reach of the Otay River, flood tide currents are swifter post-project than existing conditions, but generally remain below the threshold scour speeds for the native sediments, based on estimates from the Hjulstrom Curve.

Figure 9 gives the flow trajectories and depth averaged tidal currents for the Subtidal Alternative computed by the TIDE_FEM model during spring ebbing tides on 18 September 2009. The wetted area of the floodplain tidal basin is significantly reduced relative to the flood tide area in Figure 9, due to the fact that the grading plan allows for almost complete drainage at mean low water tidal stages. In Figure 9, creeping flow drains from the remnant dendritic channel of the floodplain basin, forming a feeder current in the upper river channel with speeds on the order of -0.01 m/sec, or (-0.03 ft/sec). This feeder current evacuates the tidal basin and then accelerates 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. (We adopt the convention of negative velocities for ebb tide flows and positive velocities for flood tide flows). Ebb flow in the channel then accelerates further to -0.09 m/sec (-0.289 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. Again, ebb tide currents in the lower reach of the Otay River, are swifter post-project than existing conditions, but generally remain below the threshold scour speeds for the native sediments, based on estimates from the Hjulstrom Curve. The low water footprint of Nestor Creek under the Subtidal Alternative in Figure 9 is completely vacated, the same as for existing conditions in Figure 3. The low water footprint of the upper reach ot the Otay River under the Subtidal Alternative in Figure 9 is about the same as for existing conditions in Figure 3, other than for a slight widening at the merge with the feeder channel for the Floodplain Basin.

Figures 8 and 9 indicate that flood and ebb velocities and inundation footprints in the Otay River and Floodplain Basin for the Subtidal Alternative are about the same as for the Intertidal Alternative in Figures 5 and 6. This is due to the fact that there is very little difference in the grading designs for the two alternatives, and neither alternative involves any dredging of the existing Otay River channel. The only difference in grading design is that the Subtidal Alternative has a subtidal channel graded down to -2.0 ft NAVD, but the tidal prisms of the two alternatives is about the same; 100 acre-ft. for the Subtidal Alternative as compared to 98 acre-ft. for the Intertidal Alternative. Consequently the hydroperiod functions for the upper Otay River intertidal zone and for Nestor Creek under the post-project conditions for the ORERP Subtidal Alternative in Figure 10 are essentially the same as those for the Intertidal Alternative in Figure 7. Under the Subtidal Alternative, the hydroperiod function for the upper reach of the Otay River in Figure 10 is unchanged from that reported for existing conditions in Figure 4, where both pre- and post-project tidal inundation produce the same extreme high water levels at 7.45 ft. NAVD 88, and both have the same habitat zonations and basement levels of intertidal habitat at 0.0 ft NAVD 88. Again, the reason for this is that hydraulic control for both pre- and post-project conditions in the upper reach is established by the choke point at the Bayshore Bikeway Bridge, a feature that is unchanged by post-project conditions. On the other hand, the hydroperiod function for the Nestor Creek in Figure 10 reveals a small degree of reduction in high-tide muting as a result of the Subtidal Alternative, with post project EHW reaching 7.2 ft NAVD 88, or about 0.2 ft higher salt water inundation than existing conditions. The reason for this reduction in the high tide muting of Nestor Creek is that the post project conditions significantly increase its channel cross section, and thereby reduce the frictional damping of high water tidal elevations in Nestor Creek. Both pre- and post-project tidal inundation produce the same basement levels of

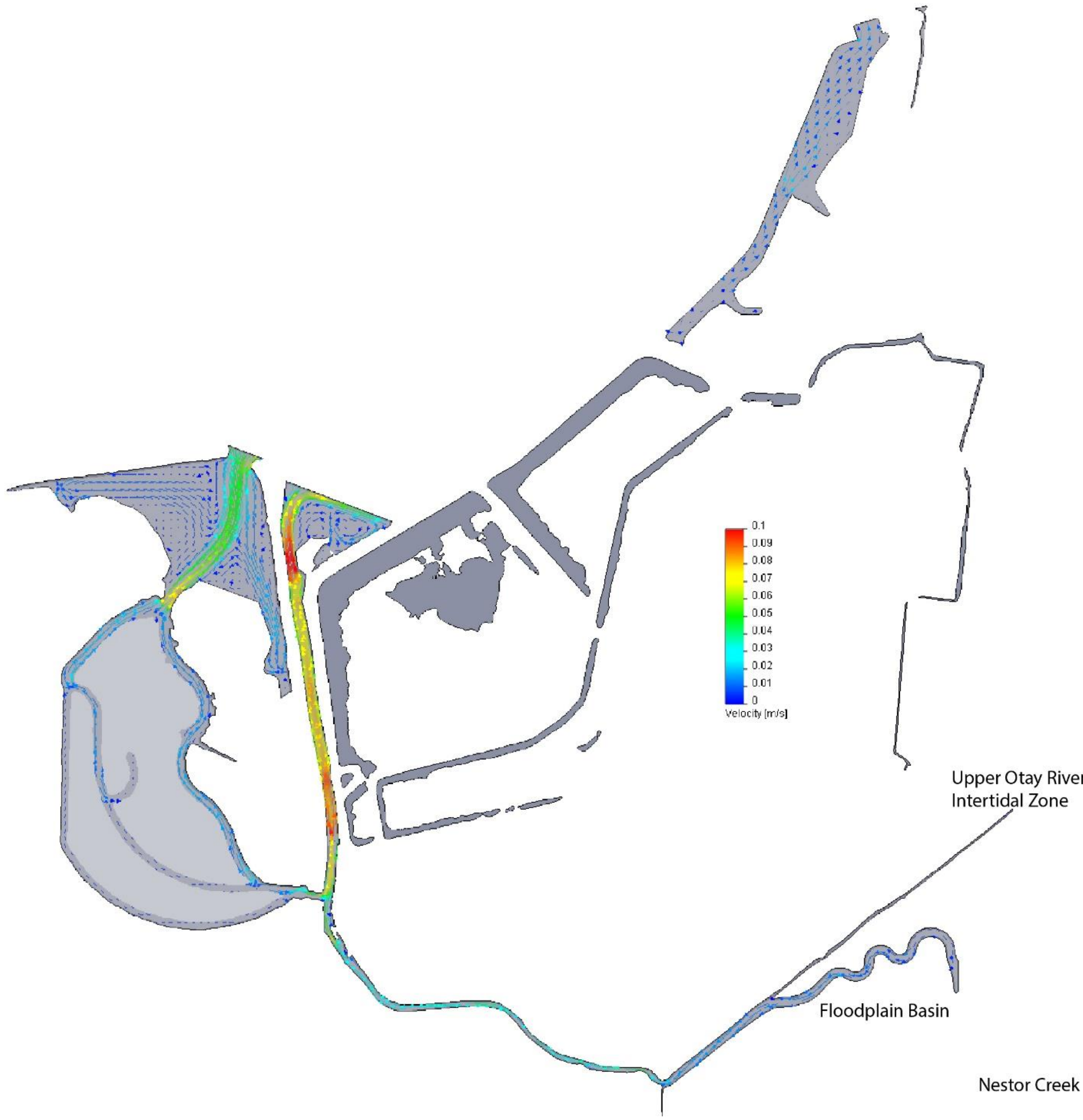

Figure 9: Subtidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

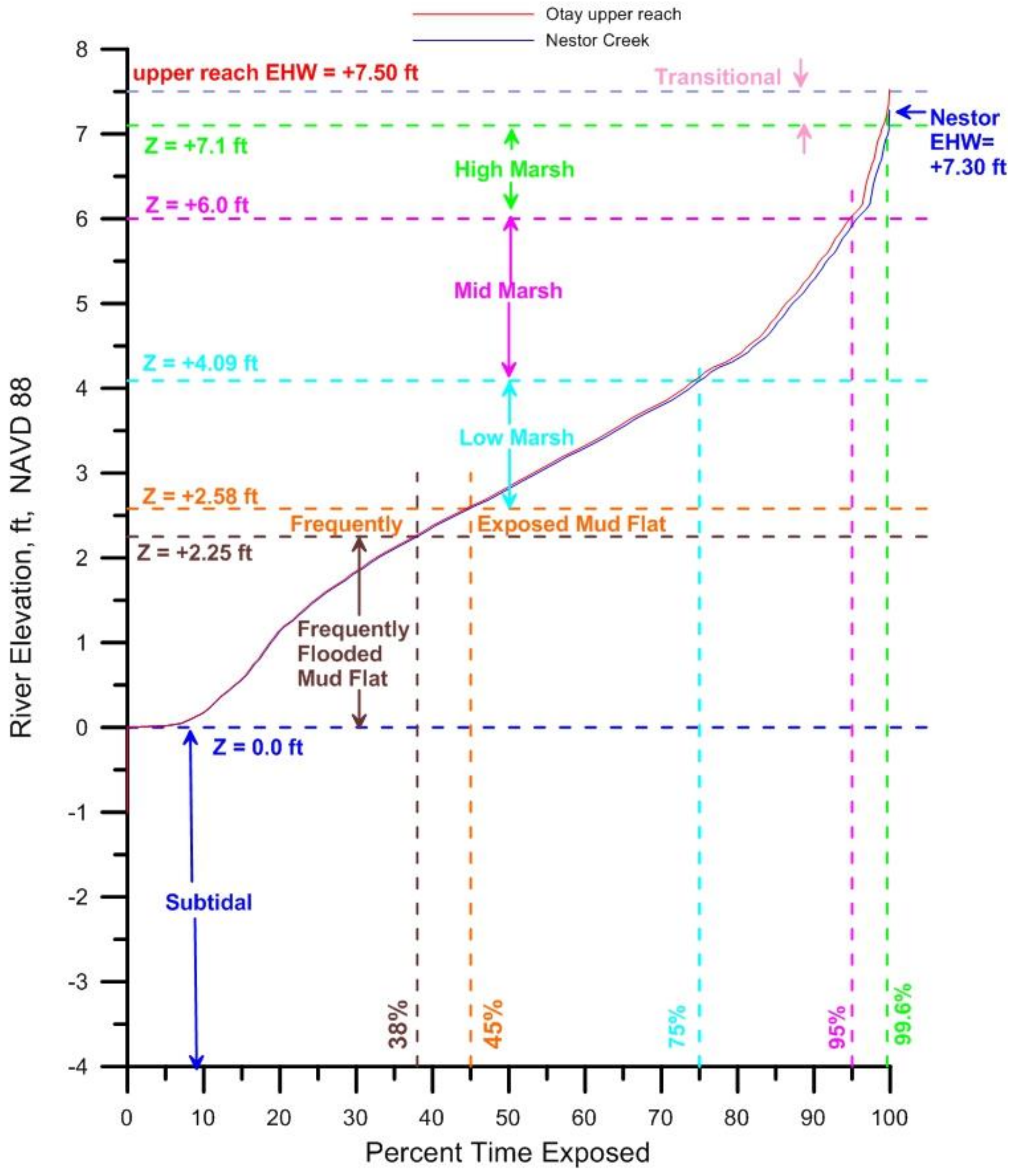

Figure 10. Post-project hydroperiod functions of the Otay River upper reach (red) and Nestor Creek (blue) for the ORERP Subtidal Alternative based on WRA 2011 bathymetric survey applied to water level data from NOAA tide gage #941-0170, for tidal epoch 1983-2001, with spectral correction from Otay River Sonde. Mannings roughness: n_0 = 0.0261

intertidal habitat at 0.0 ft NAVD 88, while the post-project conditions increase the zonation elevation band for high marsh by about 0.3 ft.

5.0) References:

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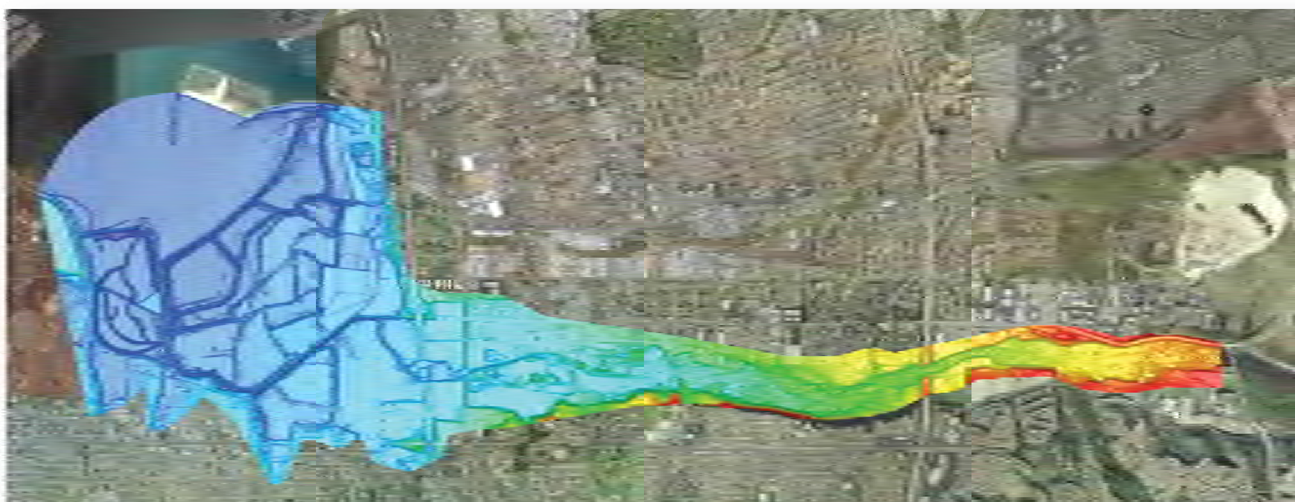
APPENDIX H

Fluvial Hydraulics Study

Otay River Estuary Restoration Project

FLUVIAL HYDRAULICS STUDY



Prepared for
Poseidon Water LLC

Prepared by
Everest International Consultants, Inc.

April 2016

EVEREST

Otay River Estuary Restoration Project

Fluvial Hydraulics Study

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April 2016

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LIST OF ACRONYMS

%	Percent
2-D	Two-dimensional
Alt	Alternative
Ave	Avenue; Average
Blvd	Boulevard
CCC	California Coastal Commission
CDP	Coastal development permit
cfs	cubic feet per second
CO-CAT	California Climate Action Team
COPC	California Ocean Protection Council
DEM	Digital Elevation Model
Everest	Everest International Consultants, Inc.
Exist.	Existing
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
ft	feet
hr	hour
I-5	Interstate Highway 5
in	inch
km^2	square kilometer
m^3	Cubic meter
max	maximum
MHHW	mean higher high water
mi^2	square mile
MLLW	mean lower low water
MLMP	Marine Life Mitigation Program
MLW	mean low water

mm	millimeter
MTL	mean tide level
N	north
NAVD88	North American Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
NOAA	National Oceanic and Atmospheric Administration
NRC	National Research Council
NTDE	National Tidal Datum Epoch
ORERP	Otay River Estuary Restoration Project
ORF	Otay River Floodplain
PMP	Parametric Mean Periodic
Poseidon	Poseidon Water LLC
Refuge	South San Diego Bay National Wildlife Refuge
S	south
SLR	Sea level rise
SR	State Route
USACE	United States Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
yd^3	Cubic Yard
yr	year

1. INTRODUCTION

1.1 BACKGROUND

Poseidon Water LLC (Poseidon) is currently constructing a desalination plant near the ocean in Carlsbad, California in the western portion of Agua Hedionda Lagoon. To obtain a coastal development permit (CDP) for the desalination plant from the California Coastal Commission (CCC), Poseidon was required to develop and implement a Marine Life Mitigation Program (MLMP). One of the components of the MLMP was the planning, design, construction, operation, management, and monitoring of a coastal wetlands restoration project that would mitigate for the impacts to marine fish associated with operation of the desalination plant. Poseidon selected the Otay River Floodplain (ORF) located within the South San Diego Bay National Wildlife Refuge (Refuge) as the site for this restoration project, which is now known as the Otay River Estuary Restoration Project (ORERP). The ORERP will involve earthwork (cut and fill) within the floodplain to create the subtidal, unvegetated intertidal (mudflat), and vegetated coastal salt marsh habitats required under the MLMP. Earthwork within a floodplain has the potential to cause significant adverse impacts to flood conditions compared to the conditions that exist at present (existing conditions). Poseidon retained Everest International Consultants (Everest) to conduct a fluvial (riverine) hydraulic study to address the potential for the ORERP to cause significant adverse impacts to flooding. The purpose, objectives, methods, results, conclusions, and recommendations of the fluvial hydraulics study are summarized in this report.

1.2 PURPOSE

The purpose of the study summarized in this report was to determine whether the proposed alternatives that comprise the ORERP would result in significant adverse impacts to flooding and to develop mitigation measures to eliminate such significant adverse impacts.

1.3 OBJECTIVES

The following objectives were identified to achieve the study purpose.

- Estimate flood water levels and extent under existing and proposed conditions.
- Evaluate the impact of future projections of sea level rise on flood water levels.
- Evaluate the impact of erosion under existing and proposed conditions.
- Estimate fluvial sediment transport potential under existing and proposed conditions.

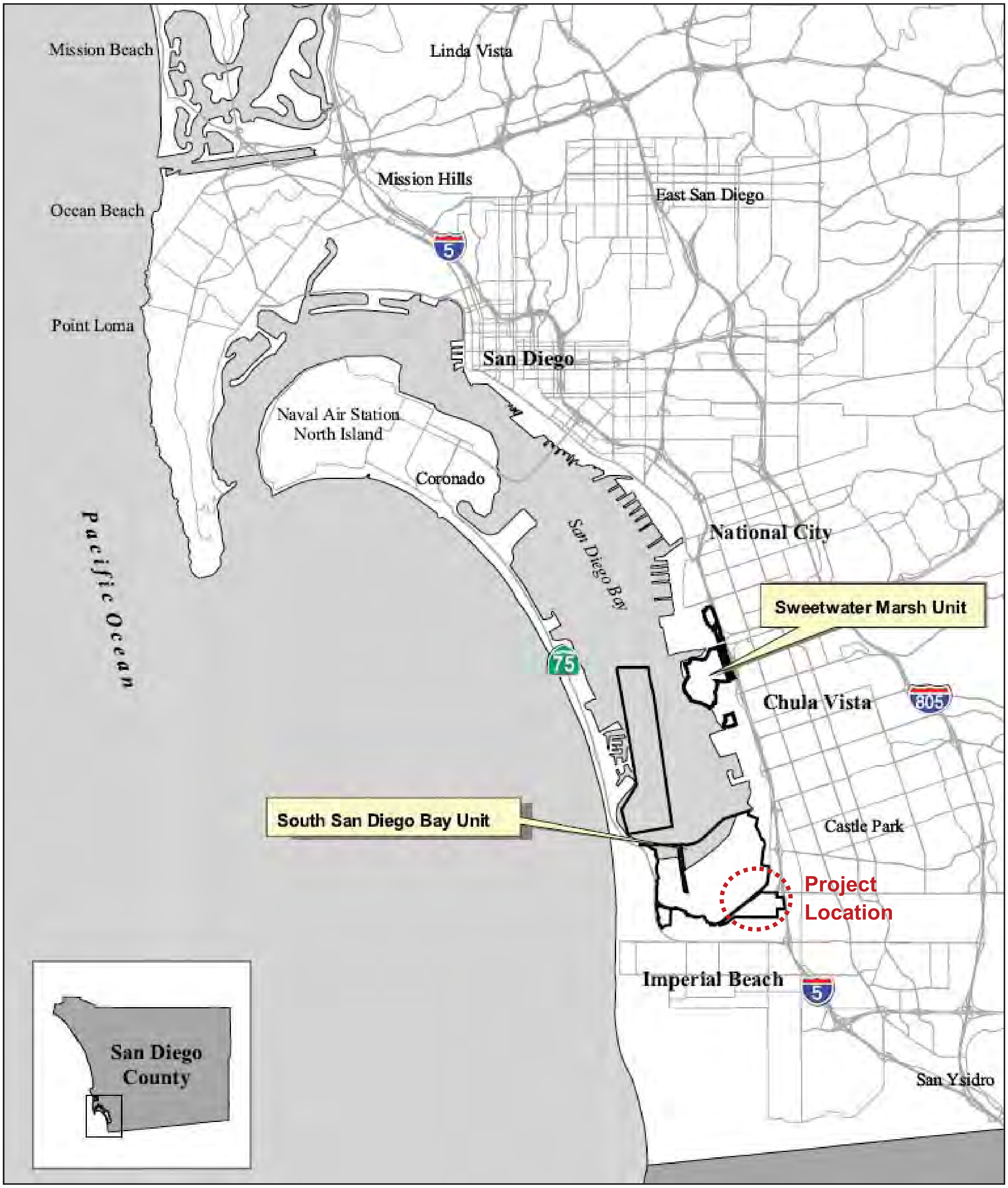
2. EXISTING CONDITIONS DESCRIPTION

A sufficient description of both the existing and proposed restoration physical conditions was necessary to perform the flood hydraulic analysis. The types of information that are crucial to these analyses are topography and bathymetry (existing and proposed conditions), ocean water levels, and surface runoff in the rivers (floods). These data were collected from field surveys conducted for this project as well as as-built drawings and other published reports gathered from the USFWS and National Oceanic and Atmospheric Administration (NOAA).

2.1 PROJECT LOCATION

The project is located at the southern end of San Diego Bay within the Refuge, as shown in Figure 2.1. The Refuge is managed by the U.S. Fish and Wildlife Service (USFWS) and consists of the Sweetwater Marsh Unit and South San Diego Bay Unit. The refuge is located about ten miles north of the United States and Mexico border in San Diego County, California and is surrounded by the Cities of National City, Chula Vista, San Diego, Imperial Beach, and Coronado.

The ORF site is situated within the Otay River Floodplain located within the Refuge South San Diego Bay Unit, as depicted in Figure 2.2. In the figure, the approximate limits of the South San Diego Bay Unit are indicated by the orange lines. The South San Diego Bay Unit extends from the ORF through the salt ponds and into San Diego Bay. The salt ponds are a system of diked evaporations ponds that covers approximately 1,060 acres. Three of the salts ponds (Ponds 10A, 10, and 11) are the site of the Western Salt Ponds Restoration Project, as indicated by the green lines. The proposed ORERP will involve earthwork in two of the existing salt ponds, Pond 20A within the ORF and Pond 15.



Source: USFWS 2006

Figure 2.1 Project Location and Vicinity

Image: Google Earth Pro

Figure 2.2 Proposed ORERP Area

2.2 OTAY RIVER

The Otay River originates in the Cleveland National Forest along Dulzura Creek, as shown in Figure 2.3. Tributaries include Hollenbeck Canyon Creek, Jamul Creek, and Proctor Valley Creek. Flows from the upper watershed are cutoff by two reservoirs that are a part of the City of San Diego water supply system. The Upper Otay Reservoir, which is the smaller of the two reservoirs, is located at the end of Procter Valley Creek. The upper reservoir is connected to the Lower Otay Reservoir formed by Savage Dam below the Dulzura and Jamul Creek confluence. Essentially all flows from the upper 68% of the watershed are impounded by the Lower Otay Reservoir. The upper watershed is largely comprised of undeveloped lands in unincorporated areas of San Diego County. The terrain is characterized by higher elevations and steep mountain slopes that are prone to wildfires.

The Otay River runs approximately 11 miles from Savage Dam to San Diego Bay. The river flows westward from Savage Dam through primarily undeveloped lands. The natural creek channel is transected by the South Bay Expressway (SR 125) and connected to several tributaries including Salt Creek, O'Neal Canyon Creek, Johnson Canyon, and Dennery Canyon. Downstream of the I-805, the watershed becomes urbanized and the river is heavily vegetated with sections of riprap banks. Major tributaries include Poggi Canyon Creek and Nestor Creek, which connect with the Otay River near the I-805 and I-5 bridges, respectively.

2.3 OTAY RIVER FLOODPLAIN AND ESTUARY

The Otay River conveys flows from the I-5 Bridge through the Otay River Floodplain and estuarine portion of the Otay River, as illustrated in Figure 2.4. The river channel extends northwest until reaching the salt ponds between Ponds 50 and 51 and then turns westward along the salt pond perimeter and then southwest along the Bayshore Bikeway (adjacent to Ponds 48, 22, and 20). Nestor Creek runs northward along the east edge of Pond 20A and joins the Otay River near Pond 20. The river is channelized between the salt pond dikes. After the confluence with Nestor Creek, the Otay channel is divided by a bike path bridge into two parallel segments along Pond 22. The Otay River then turns northwest beneath a second bike path bridge and then converges back into a single channel. The river continues along Pond 23 and then north along the Western Salt Pond Restoration until discharging into San Diego Bay.

The ORF and estuary area is generally flat ranging from 18 to -5 ft, NAVD88. The existing topography and bathymetry are illustrated in Figure 2.5. The existing bathymetry includes the Western Salt Ponds Restoration Project which will convert former salt ponds to approximately 230-acres of restored habitat area. The restoration site was opened tidal exchange in August 2011.

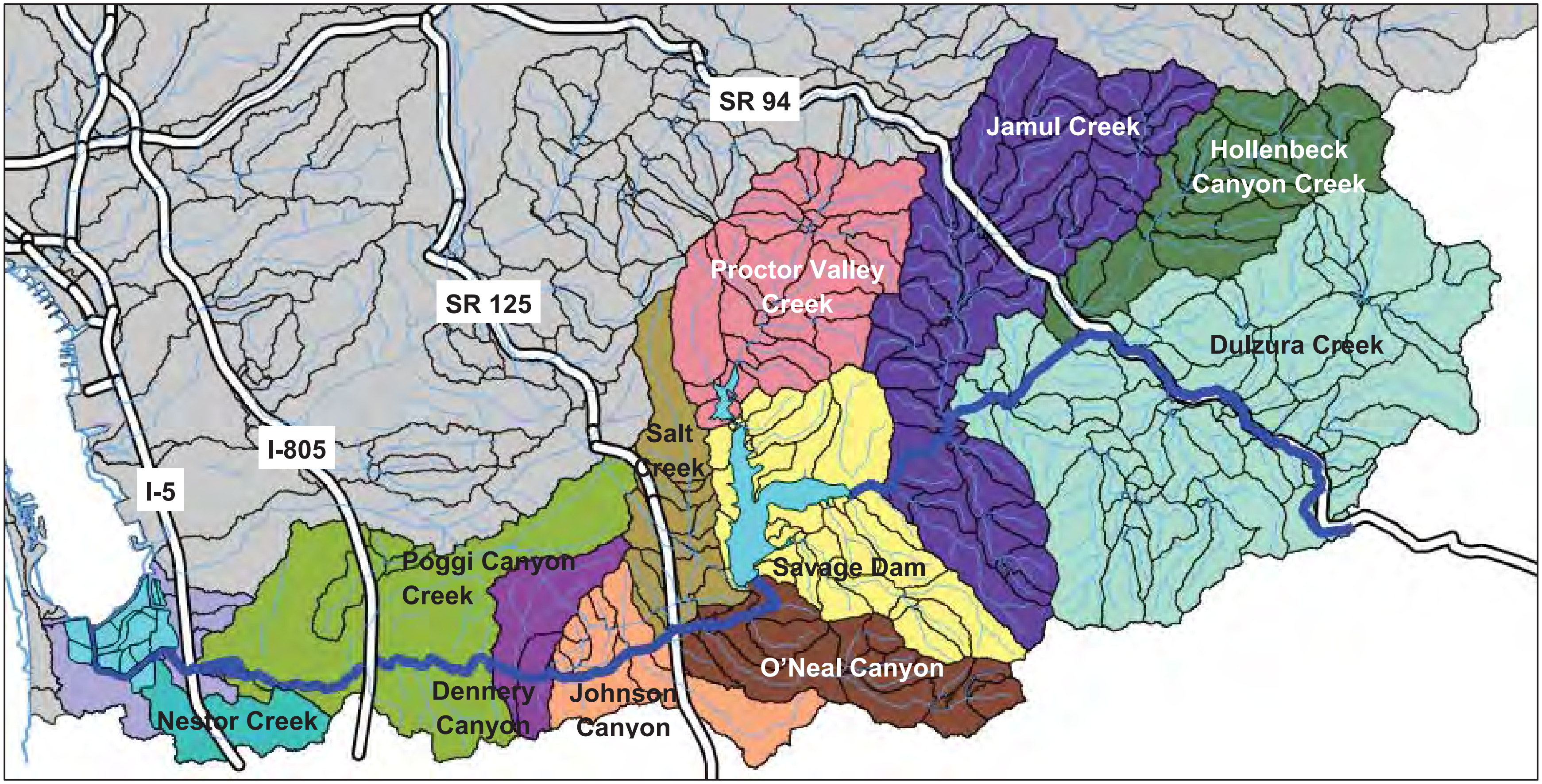


Figure 2.3 Otay River Watershed

Image: Google Earth Pro

Figure 2.4 Otay River Floodplain

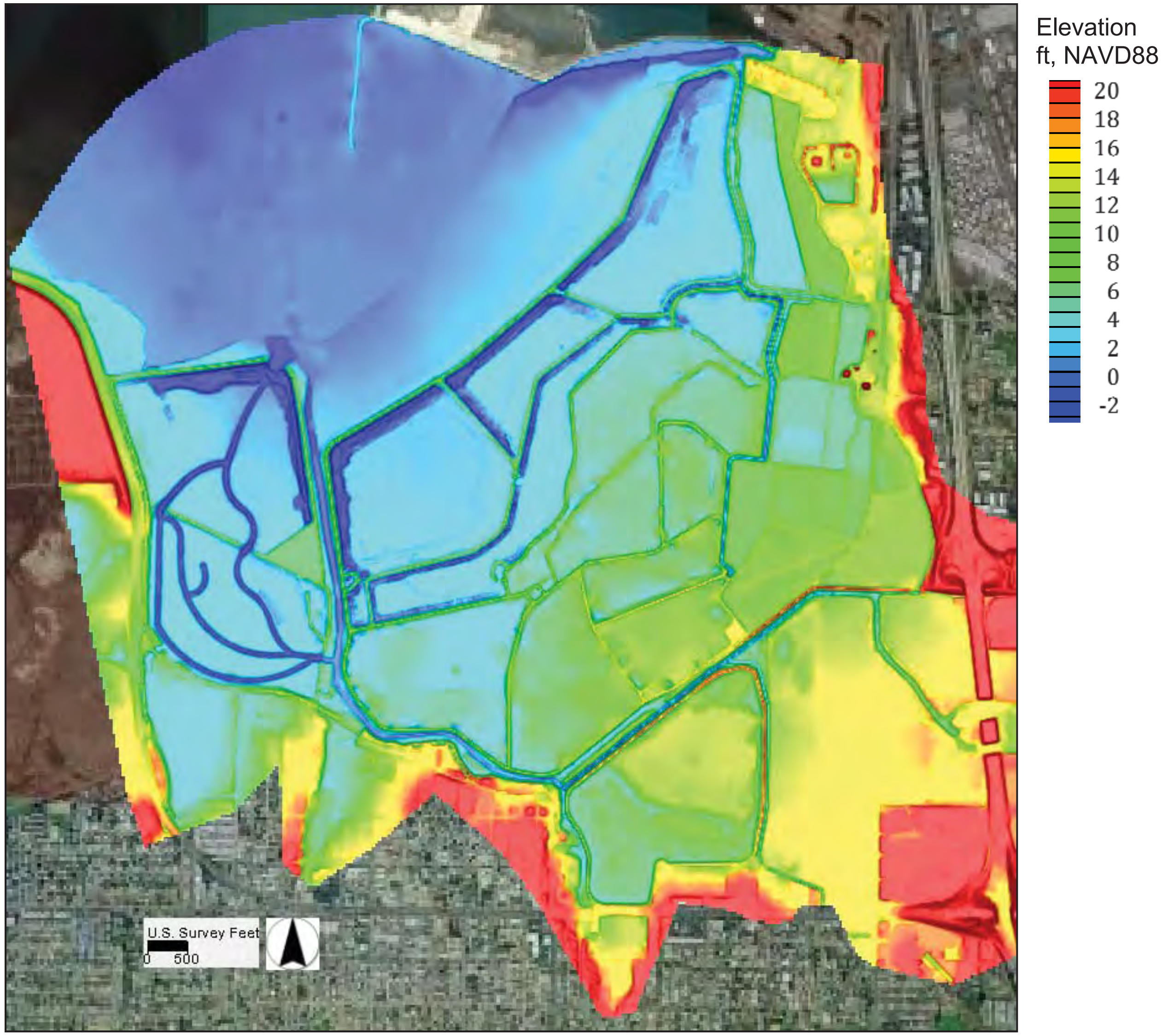


Figure 2.5 Existing Topography and Bathymetry

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 conditions in San Diego Bay are of the mixed, semi-diurnal type with two high and two low daily peaks. The mean tide range for San Diego Bay is 5.72 ft (NOAA 2007). Tidal influence extends from San Diego Bay towards the floodplain near Ponds 48 and 50. Fluvial flows from the Otay River pass through the ORF and can overtop the levees surrounding the salt ponds. For large floods, a portion of flood waters can be diverted through the salt ponds, filling the ponds and eventually overtopping the levees into San Diego Bay. Tide and flood water levels are discussed in greater detail in Section 4.3.

Sediment characteristics within the lower Otay River range from sandy gravel to clayey fine sand (GEOCON 1985). Boring data on sediment conditions in the floodplain area are available from GEOCON (1985), Geotechnics (2000), and USDA (2007).

3. PROPOSED PROJECT DESCRIPTION

3.1 OVERVIEW

The Otay River Estuary Restoration Project (ORERP) is located within the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (Refuge), in San Diego County, California. Restoration activities would occur at two separate non-contiguous locations within the Refuge: (i) the Otay River Floodplain (ORF) Site and (ii) the Pond 15 Site. The approximately 79-acre ORF Site is located west of Interstate 5 (I-5) between Main Street to the north and Palm Avenue to the south. The Pond 15 Site consists of an approximately 85-acre solar salt pond located in the northeast portion of the Refuge, to the northwest of the intersection of Bay Boulevard and Palomar Street in Chula Vista.

The ORERP would involve excavation of a portion of the ORF Site and fill of the Pond 15 Site to create elevations suitable for subtidal, intertidal mudflat, intertidal coastal salt marsh, and transitional habitats as well as associated uplands. Restoration conducted in the ORF Site would be limited to the portion of the floodplain located west of the Nestor Creek, as shown in Figure 3.1 and Figure 3.3. Within this portion of the ORF Site the ground would be lowered to elevations suitable to support the target wetland habitats and wetland-associated upland habitats. In addition, the existing dike running through Pond 20A would be removed and the flood protection functionality of this feature would be replaced through construction of a levee along the southern boundary of this portion of the ORF Site. No restoration activities would be conducted in the former agricultural areas east of Nestor Creek, but this area would be available and could be used for staging construction activities. In addition to the work in the ORF Fill and Pond 15 Site, a portion of the existing dike between Salt Ponds 22 and 23 would be raised two feet to offset potential project-induced flood impacts at Bayside Park in Imperial Beach. An analysis was conducted to identify potential mitigation measures to offset these potential project-induced flood impacts. This analysis is provided in Appendix A. Besides earthwork, the restoration project might include slope armoring (e.g., riprap) to protect the Bayshore Bikeway Bridge. A conceptual design for this slope protection is provided in Appendix B.

Two restoration alternatives were developed for the project. The first alternative is known as the Intertidal Alternative and the second alternative is known as the Subtidal Alternative. Both alternatives occupy the same footprint and achieve between 19.2 to 20.9 acres of net restoration in the ORF Site. In comparison to the Intertidal Alternative, the Subtidal Alternative would provide a deeper open water channel/area within the ORF Site. In addition, the Subtidal Alternative would provide higher elevations within the Pond 15 Site due to the additional fill material associated with the deeper excavation within the ORF Site. The two restoration alternatives are described below.

3.2 INTERTIDAL ALTERNATIVE

3.2.1 Habitat Distribution

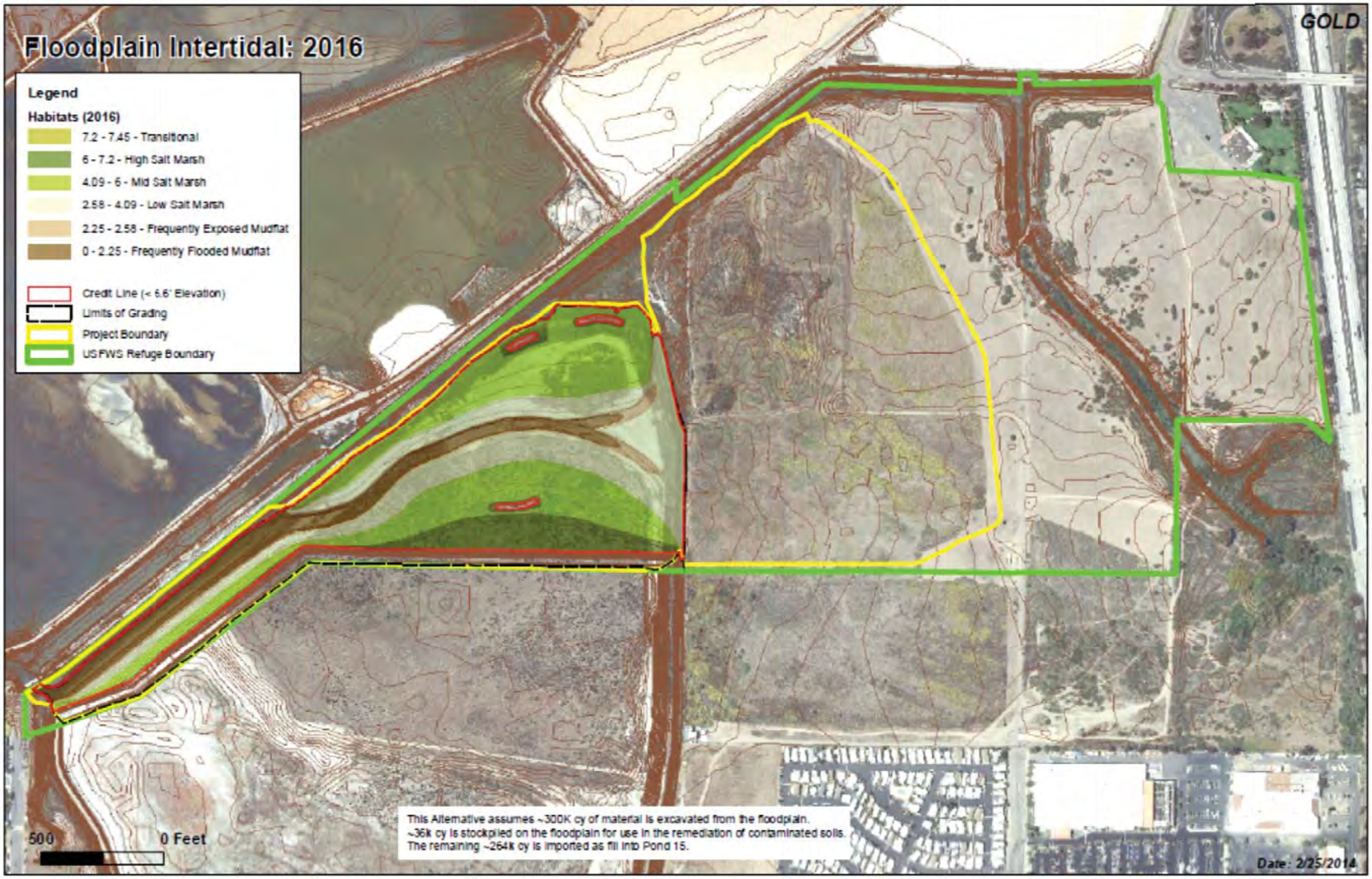
The Intertidal Alternative is composed of approximately 20% intertidal mudflat and 80% intertidal salt marsh as shown in Figures 3.1 and 3.2. Under this alternative no subtidal habitat is proposed within the ORF Site. This alternative would involve excavation and grading of the ORF Site (Figure 3.1) to create approximately 37.0 acres of tidally influenced habitats, consisting of 7.3 acres of intertidal mudflat and 29.6 acres of intertidal coastal salt marsh habitat. The Pond 15 Site (Figure 3.2) would be filled to create approximately 83 acres of tidally influenced habitats composed of 9.8 acres of subtidal habitat, 18.1 acres of intertidal mudflat, and 55.3 acres of intertidal salt marsh below +6.6 ft NAVD88. Both the ORF Site and the Pond 15 Site would be planted with a mix of native wetland vegetation that would mature into low marsh, mid marsh, and high marsh vegetative communities. The intertidal areas and unvegetated mudflat would provide foraging habitat for adult and juvenile fish.

3.2.2 Mitigation Credit

The Intertidal Alternative would provide adequate mitigation credit to meet the MLMP requirement of 66.4 acres. With a functional lift of 0.75 in the Pond 15 Site, this alternative would provide 60.5 acres of mitigation credit within the Pond 15 Site. When impacts to existing wetlands are subtracted, the Intertidal Alternative would provide 59.4 acres of mitigation credit within the Pond 15 Site. After calculating the impacts to existing wetlands, approximately 20.9 acres of mitigation credit would be provided under this alternative within the ORF Site. Therefore, the Intertidal Alternative would provide a total of approximately 80.3 acres of wetlands for mitigation credit or about 13.8 more acres than the 66.4 acres required by the MLMP.

3.2.3 Earthwork

The Intertidal Alternative would involve the excavation of 320,000 cubic yards (yd^3) of soil from the ORF Site. Approximately 21,100 yd^3 of this soil, assuming it is suitable, would be used to construct the levee along the southern boundary this portion of the ORF Site. Approximately 295,179 yd^3 of the excavated soil would be transported to and placed within the Pond 15 Site as beneficial reuse to raise the ground to elevations suitable to create tidal wetlands and associated upland habitats. Any remaining material would be transported to the portion of the ORF Site east of Nestor Creek where it would be stockpiled for future use by the U.S. Fish and Wildlife Service (FWS). If suitable material cannot be found onsite to construct the levee along the southern boundary, then 21,100 yd^3 of suitable material would be imported and the 21,100 yd^3 of soil excavated from the ORF Site would be transported to the stockpile location.



Source: KTUA

Figure 3.1 Intertidal Alternative – ORF Site

Source: KTUA

Figure 3.2 Intertidal Alternative – Pond 15 Site

3.3 SUBTIDAL ALTERNATIVE

3.3.1 Habitat Distribution

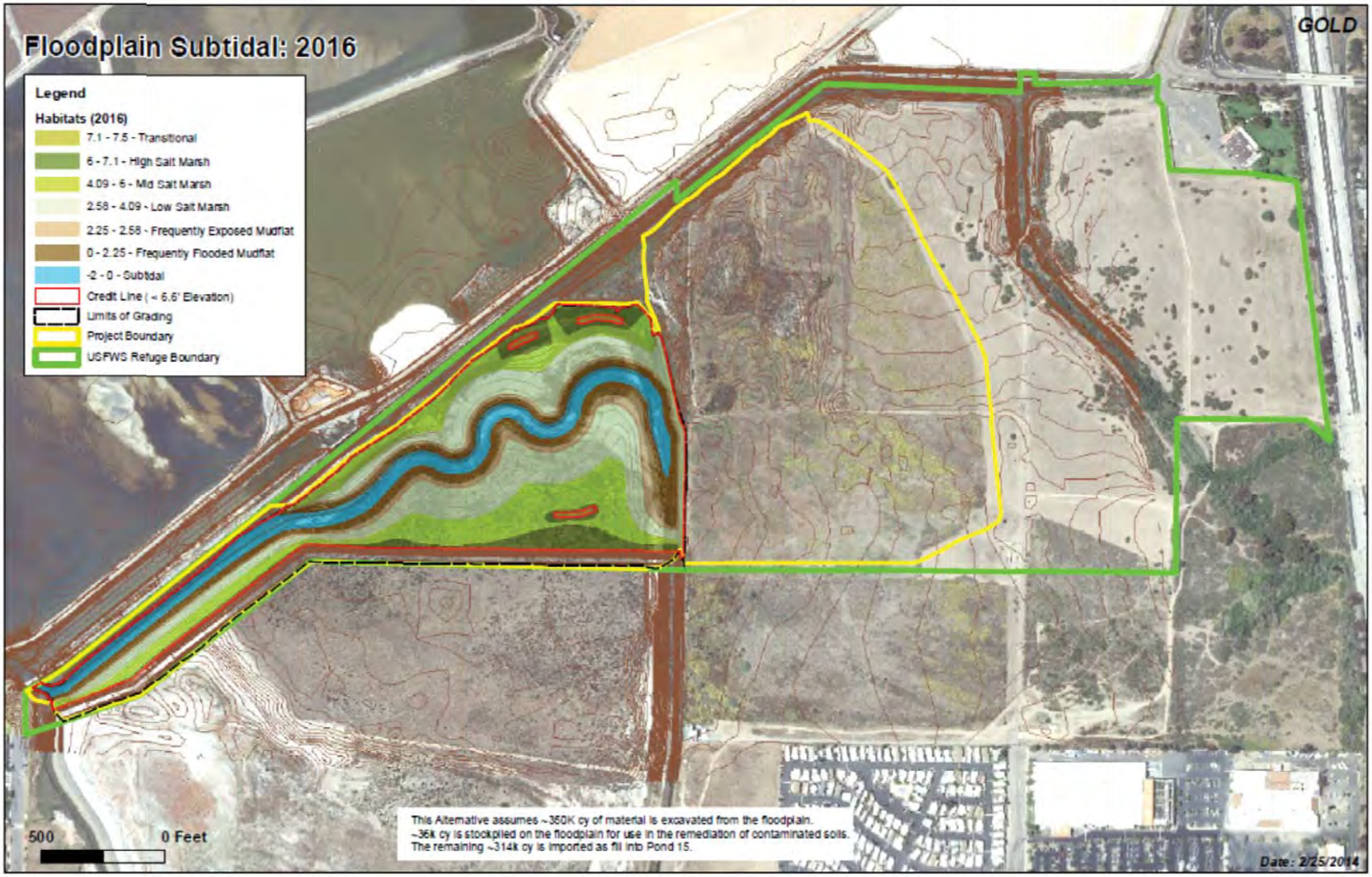
The Subtidal Alternative is composed of approximately 19% subtidal, 18% intertidal mudflat, and 63% intertidal salt marsh, as shown in Figures 3.3 and 3.4. This alternative would involve excavation and grading of the ORF Site (Figure 3.3) to create approximately 37.0 acres of tidally influenced habitats consisting of 5.2 acres of subtidal habitat, 8.1 acres of intertidal mudflat, and 23.5 acres of intertidal coastal salt marsh habitat. Filling of the Pond 15 Site (Figure 3.4) would result in 79.9 acres of tidally influenced habitats composed of 9.2 acres of subtidal habitat, 16.1 acres of intertidal mudflat, and 56.5 acres of intertidal salt marsh below +6.6 ft NAVD88. Both the ORF Site and the Pond 15 Site would be planted with a mix of native wetland vegetation that would mature into low marsh, mid marsh, and high marsh vegetative communities. The subtidal areas would provide spawning and foraging habitat, and the unvegetated mudflat would provide foraging habitat for adult and juvenile fish.

3.3.2 Mitigation Credit

The Subtidal Alternative would provide adequate mitigation credit to meet the MLMP requirement of 66.4 acres. With a functional lift of 0.75 in the Pond 15 Site, the Subtidal Alternative would provide 59.9 acres of mitigation credit within the Pond 15 Site. When impacts to existing wetlands are subtracted, the Subtidal Alternative would provide 57.5 acres of mitigation credit within the Pond 15 Site. Approximately 20.9 acres of mitigation credit would be provided under this alternative within the ORF Site. Therefore, the Subtidal Alternative would provide a total of approximately 78.3 acres of wetlands for mitigation credit or about 11.9 more acres than the 66.4 required by the MLMP.

3.3.3 Earthwork

The Subtidal Alternative would involve the excavation of 370,000 cubic yards (yd^3) of soil from the ORF Site. Approximately 21,600 yd^3 of this soil, assuming it is suitable, would be used to construct the levee along the southern boundary this portion of the ORF Site. Approximately 312,000 yd^3 of the excavated soil would be transported to and placed within the Pond 15 Site as beneficial reuse to raise the ground to elevations suitable to create tidal wetlands and associated upland habitats. Any remaining material would be transported to the portion of the ORF Site east of Nestor Creek where it would be stockpiled for future use by the USFWS. If suitable material cannot be found onsite to construct the levee along the southern boundary then 21,600 yd^3 of suitable material would be imported and the 21,600 yd^3 of soil excavated from the ORF Site would be transported to the stockpile location.



Source: KTUA

Figure 3.3 Subtidal Alternative – ORF Site

Source: KTUA

Figure 3.4 Subtidal Alternative – Pond 15 Site

4. STUDY APPROACH

4.1 OVERVIEW

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. The flood impact analyses focused on changes to flood water levels associated with proposed conditions. The erosion impact analysis evaluated project-induced velocity changes as a surrogate for erosion (scour) potential.

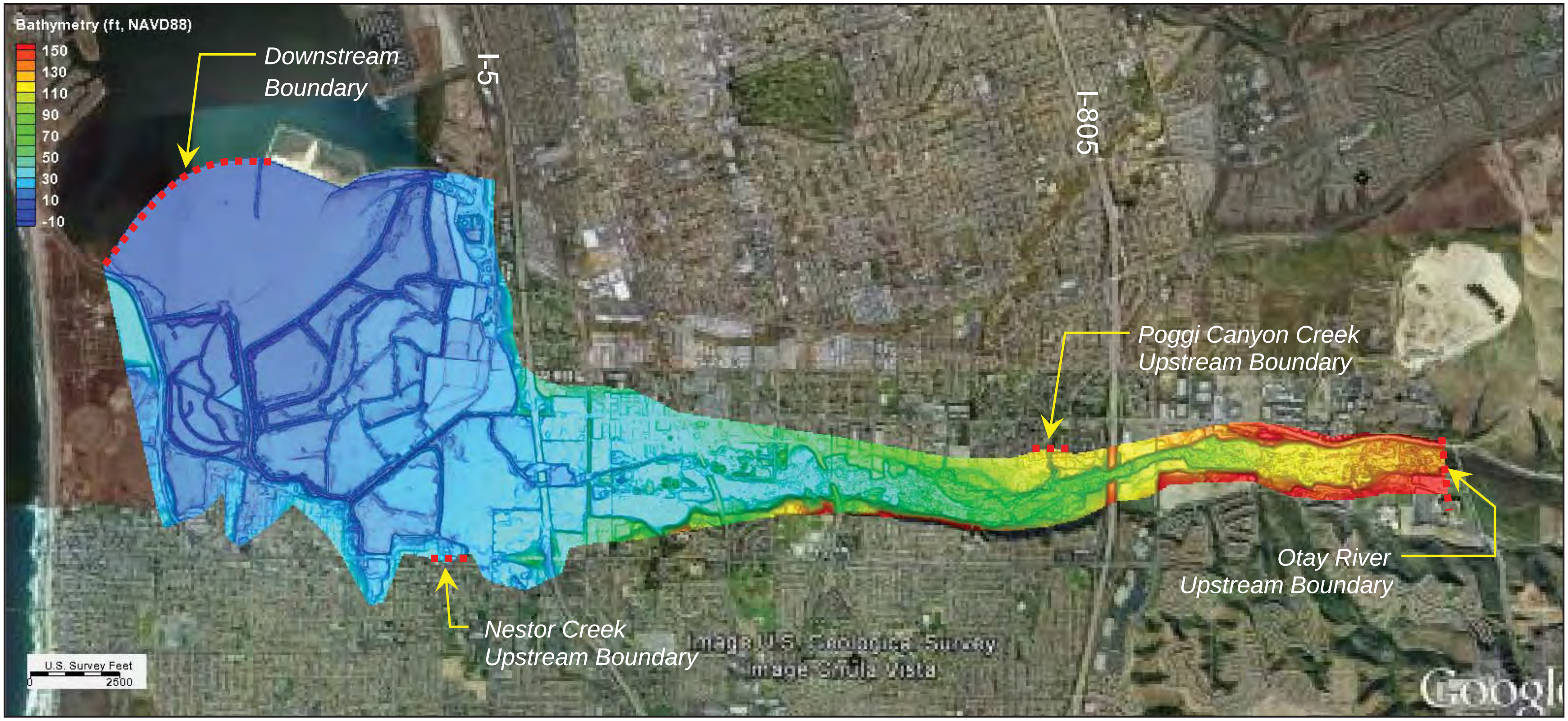
The two-dimensional (2-D) hydrodynamic model TUFLOW was selected for the fluvial hydraulic analysis because the model accounts for all the necessary analysis components – tidal fluctuations, flood flows, grading changes, water control structures (e.g., open channels, culverts, pipes, and weirs), levees, and salt pond configurations. TUFLOW is a finite difference model designed for tidal and fluvial hydraulics in rivers, estuaries, coastal bays, floodplains, and urban areas.

The fluvial sedimentation analysis was conducted to identify potential impacts regarding fluvial sediment delivery and sedimentation associated with the proposed project. 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.

4.2 MODEL SETUP

Model grids were developed for existing conditions and the two proposed alternatives. The model grid for existing conditions was created first. Model grids for the two proposed alternatives were then generated by modifying the existing conditions grid based on the proposed grading of the alternatives. Hence, all three grids have the same spatial extent and are the same outside of the proposed project area, including the Otay River and Western Salt Ponds (Ponds 10A, 10, and 11).

The model domain for existing conditions is shown in Figure 4.1. The model grid consists of a 40 ft by 40 ft grid. The model domain extends from upstream boundary of Otay River at Otay Valley Road to San Diego Bay at the downstream boundary. The model domain includes bridges and culverts as well as input locations for Poggi Canyon and Nestor Creek flows. Details for the model development are provided below.



Aerial Image: Google Earth Pro

Figure 4.1 Model Domain for Existing Conditions

4.2.1 Existing Conditions

The lower portion (floodplain) of the model domain for existing conditions downstream of the I-5 Bridge is shown in Figure 4.2. The model floodplain was selected to include higher elevations sufficient for anticipated flood water levels. Bathymetry and topography for existing conditions were compiled from various sources as summarized in Table 4.1. Elevations for the Otay River were based on a 2011 survey. In the floodplain area and salt ponds, elevations were obtained from a May 2000 survey. This data was updated based on additional surveys in 2011 and 2012. Bathymetry for Ponds 10A, 10, and 11 was based on the design and as-built surveys from the Western Salt Pond Restoration Project, which was constructed in 2011. Bathymetry for Salt Ponds 12 – 15 was surveyed in 2012. Additional bathymetry data was obtained from the NOAA DEM database.

Table 4.1 Bathymetry and Topography Data Sources

AREA	DATA	SOURCE
Otay River	Otay River survey	NWS 2011
Salt Ponds	Sweetwater Marsh and South San Diego Bay Units CCP Topographic Survey	DU 2001
Western Salt Ponds	Western Salt Pond Restoration Project	2011 Survey
Salt Ponds 12 – 15	Salt Ponds 12 -15 Survey	NWS 2012
Other	NOAA DEM Database	NOAA

The model also incorporates several bridges and culverts in the ORF (ORF). Flows beneath the I-5 Bridge and bike path crossings are obstructed from the bridge piers and deck which reduce the cross sectional area for flow, and were simulated as flow constrictions with a blockage factor. Blockage of the I-5 Bridge was estimated based on as-built drawings of the bridge. For the two bike path crossings, the blockages were approximated based on visual observations of the bridges. There are culverts located between Ponds 10 and 10A and along the river channel downstream of the bike path crossings. These culverts were simulated as a one-dimensional structure defined based on the culvert diameter and invert elevation.

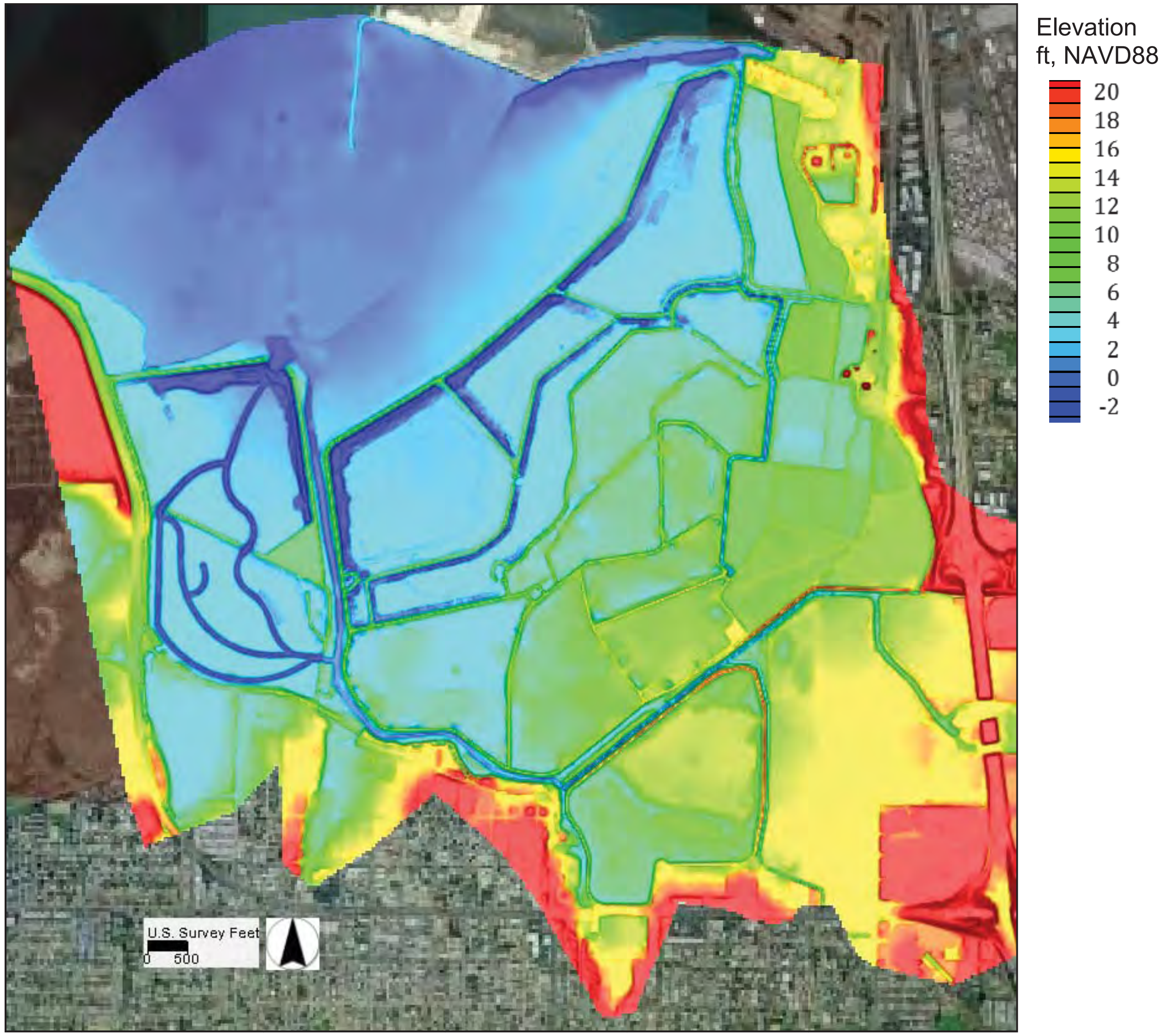


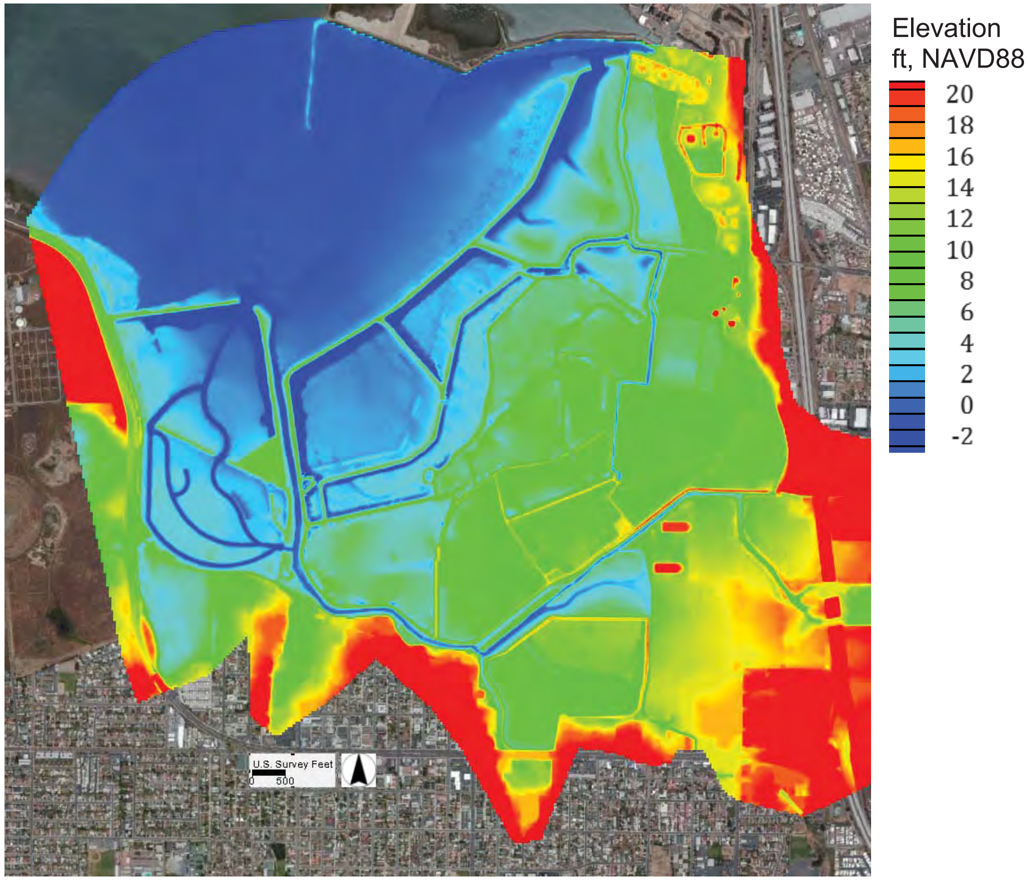
Figure 4.2 Model Bathymetry for Existing Conditions

4.2.2 Intertidal Alternative

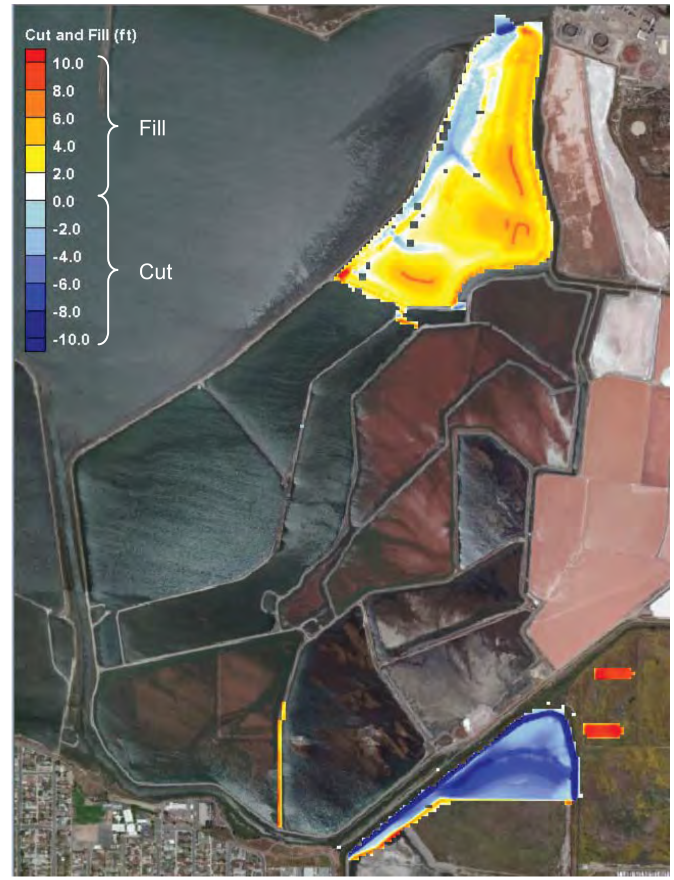
The model grid for the Intertidal Alternative was created by modifying the existing conditions bathymetry based on the proposed grading and sediment placement for this alternative as described previously in Section 3.2. The model bathymetry for the Intertidal Alternative and the change in bathymetry from existing condition are provided in Figure 4.3. In the figure, the left panel shows the bathymetry under the Intertidal Alternative. Modifications to the bathymetry include grading within the ORF, stockpiles within the ORF, and Pond 15. The bathymetry changes from existing conditions are shown in the right panel. In the figure, locations with reductions in elevation (cut) are shown in blue while locations with increases in elevation (fill) are shown in yellow, orange, and red, which are primarily located in Pond 15.

4.2.3 Subtidal Alternative

For the Subtidal Alternative, the existing model grid bathymetry was modified based on the proposed grading and sediment placement described previously in Section 3.3. The model bathymetry and the change in bathymetry for the Subtidal Alternative are shown in Figure 4.4. The bathymetry under the Subtidal Alternative is depicted in the left panel and the changes in bathymetry from existing conditions are provided in the right panel. Under the Subtidal Alternative, a subtidal channel and associated intertidal habitats will be constructed within the portion of the ORF west of Nestor Creek and sediment will be placed Pond 15 as well as within the two stockpile areas located within the portion of the ORF east of Nestor Creek.

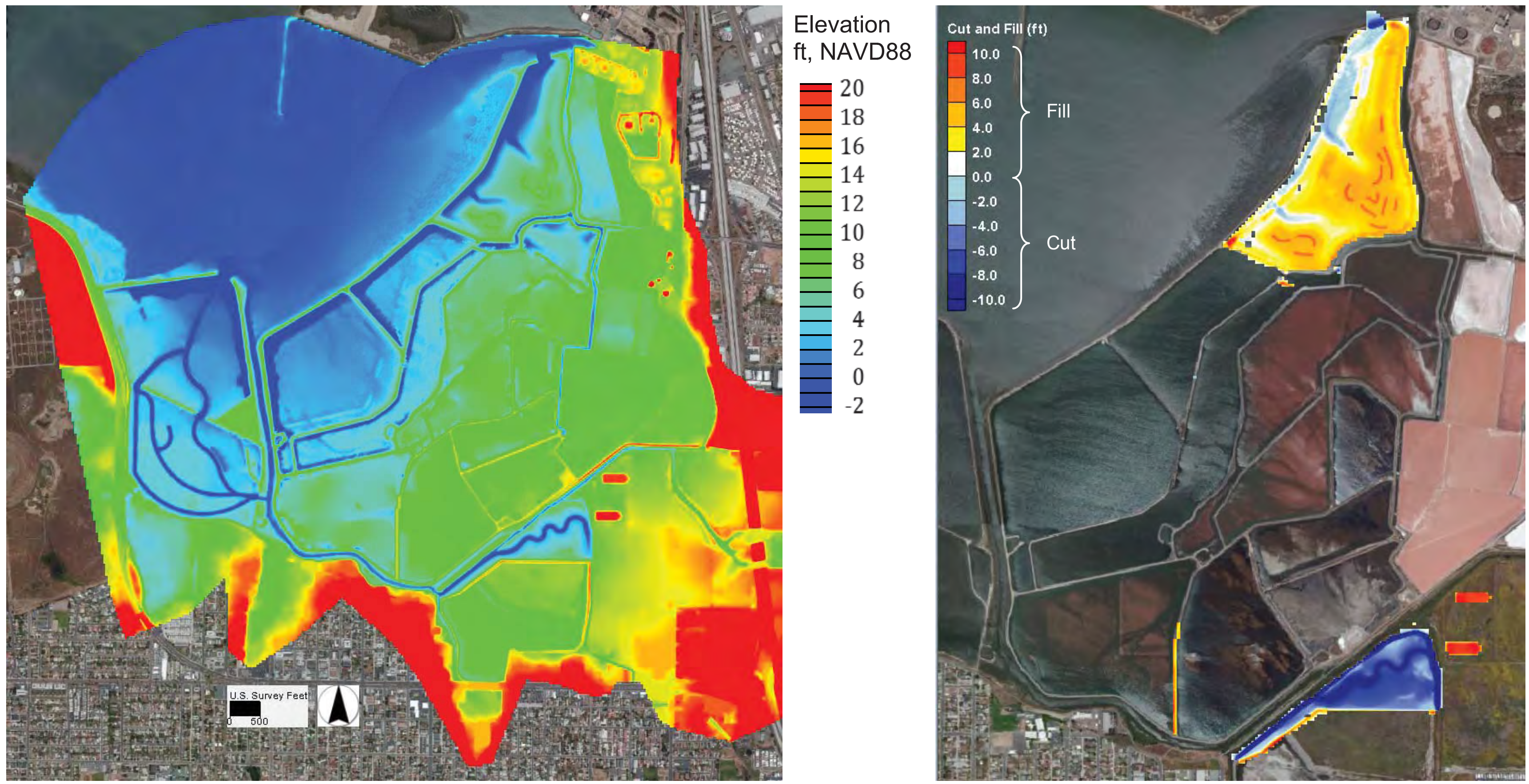


(a) Model Bathymetry



(b) Bathymetry Changes (Compared with Existing Conditions)

Figure 4.3 Model Bathymetry and Bathymetry Changes for Intertidal Alternative



(a) Model Bathymetry

(b) Bathymetry Changes (Compared with Existing Conditions)

Figure 4.4 Model Bathymetry and Bathymetry Changes for Subtidal Alternative

4.3 MODEL BOUNDARY CONDITIONS

4.3.1 Downstream Boundary Conditions

Since the Otay River is hydraulically linked to San Diego Bay, tidal input from San Diego Bay was used in the analysis. The nearest recording water level gage operated by NOAA is located at the Navy Pier in downtown San Diego (9410170). Tidal datums for San Diego relative to Mean Lower Low Water (MLLW) and NAVD88 are listed in Table 4.2.

Table 4.2 San Diego Bay Tidal Datums for the 1983 – 2001 Tidal Epoch

DATUM	ELEVATION (FT, MLLW)	ELEVATION (FT, NAVD88)
Highest Observed Water Level (1/27/1983)	8.14	7.71
Mean Higher High Water (MHHW)	5.72	5.29
Mean High Water (MHW)	4.99	4.56
Mean Tide Level (MTL)	2.96	2.53
National Geodetic Vertical Datum (NGVD) 1929	2.51	2.08
Mean Low Water (MLW)	0.94	0.51
North American Vertical Datum (NAVD) 1988	0.43	0.00
Mean Lower Low Water (MLLW)	0.00	-0.43
Lowest Observed Water Level (12/17/1937)	-3.09	-3.52

Source: NOAA 2007

A synthetic tidal series, referred to as a parametric mean periodic (PMP) tide, was developed for the downstream boundary condition. This time series was developed by fitting a sinusoidal curve to consecutive MHHW, MLLW, MHW, and MLW water surface elevations shown in Table 4.2 over a 24-hour period, and repeating for the modeling duration. This PMP tide, as shown in Figure 4.5, is representative of the mixed diurnal, semi-diurnal tide conditions found in San Diego Bay. The highest observed tide shown in Table 4.2 was not used for flood impact analysis because the probability of having a 100-year flood event which has only a one percent chance of occurring in any given year to enter the ORF during the highest observed tide is extremely small. The use of MHHW which statistically represents a water level that is higher than about 95 percent of all the water levels in a 19-year tidal epoch is considered sufficiently conservative for flood impact analysis.

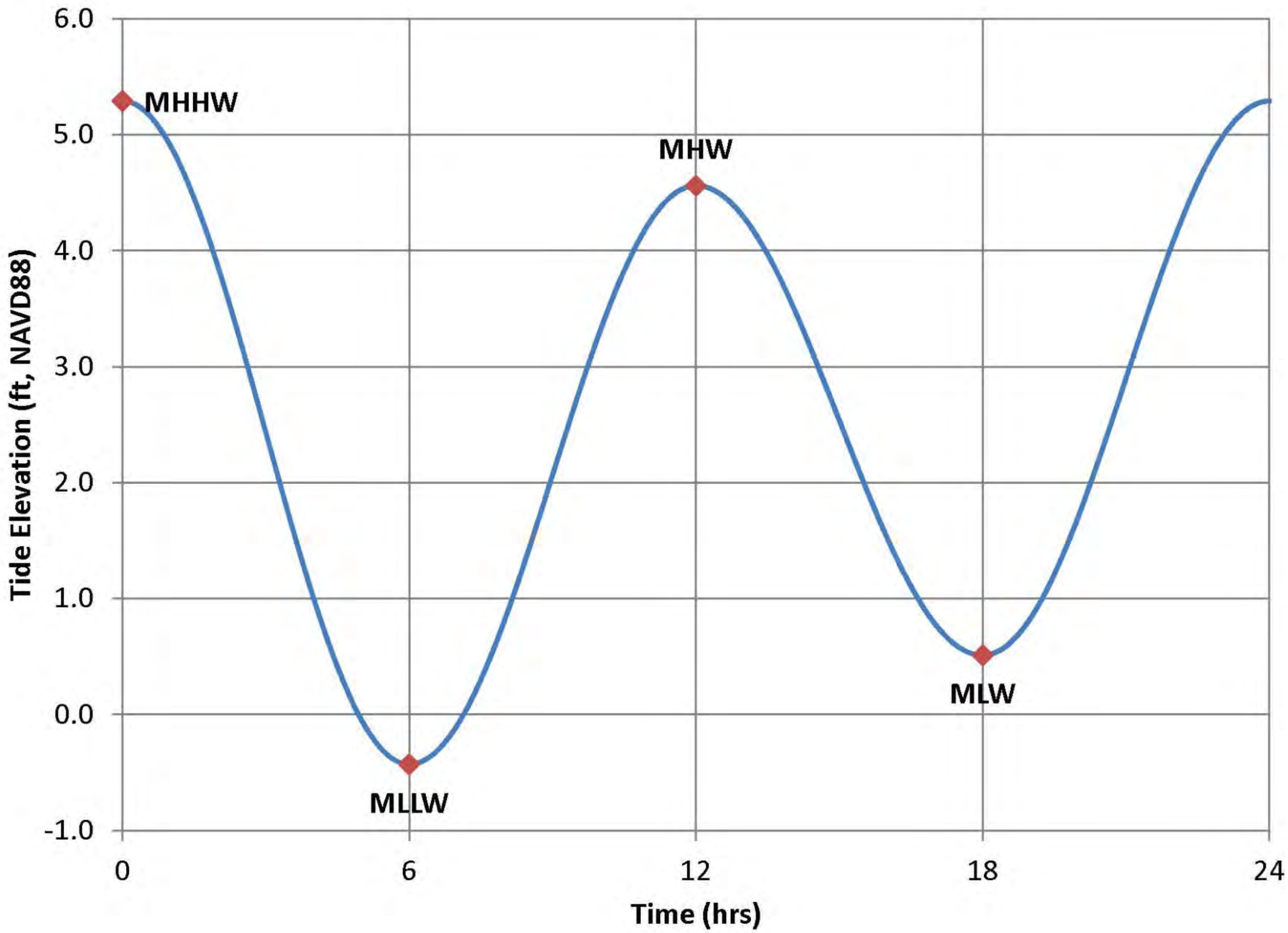


Figure 4.5 Parametric Mean Periodic Tide in San Diego Bay

4.3.2 Upstream Boundary Conditions

Upstream boundary conditions for the Otay River, Poggi Canyon Creek, and Nestor Creek were specified as flood hydrographs with given return periods (e.g., 100-year). The return period peak discharges for the Otay River, Poggi Canyon Creek, and Nestor Creek are summarized in Table 4.3. Peak discharges of the 10-, 50-, and 100-year return periods for the Otay River and Poggi Canyon Creek were obtained from the Federal Emergency Management Agency (FEMA) peak discharge estimates (FEMA 2006). For Nestor Creek, the 10- and 50-year return period peak flows were obtained from a prior hydrodynamic modeling analysis (PWA 2003) and the 100-year return period from the FEMA estimate (FEMA 2006). For all three streams, the 15- and 25-year peak flows were interpolated based on the flows associated with the other return periods.

Simplified assumptions were made to develop the flood hydrographs. The return period peak flows were applied to a simple triangular hydrograph to produce a theoretical flood hydrograph. The peak flow was assumed to occur 12 hours after flow initiation, returning to no flow after 24 hours. This is a simplified method originally applied for the salt ponds by PWA (2003) and also adopted for an earlier study evaluating the Otay River Floodplain (Everest 2007). For example, the 100-year flood hydrographs, as shown in Figure 4.6, were developed with peak flows corresponding to the 100-year peak flows provided in Table 4.3. In the figure, the flood hydrographs are shown with two different vertical axes due to the differences in flow. The 100-year flood hydrograph for the Otay River is shown based on the left vertical axis with a peak flow of 22,000 cfs. The smaller flood hydrographs for Poggi Canyon Creek and Nestor Creek are shown with the right vertical axis with peak flows of 1,400 and 1,093 cfs, respectively. These 100-year flood hydrographs were used for the flood impact analyses described in Section 5. Other return period flood hydrographs were used for the erosion analysis discussed in Section 6.

Table 4.3 Return Period Peak Discharges

RETURN PERIOD	OTAY RIVER AT OTAY VALLEY RD	POGGI CANYON CREEK	NESTOR CREEK
10-Year	1,200[A]	220[A]	730[B]
15-Year	2,700[C]	320[C]	770[C]
25-Year	5,500[C]	520[C]	850[C]
50-Year	12,000[A]	930[A]	990[B]
100-Year	22,000[A]	1,400[A]	1,093[A]

Peak discharges in cubic feet per second (cfs)
Source: [A] FEMA 2006; [B] PWA 2003; [C] Interpolated

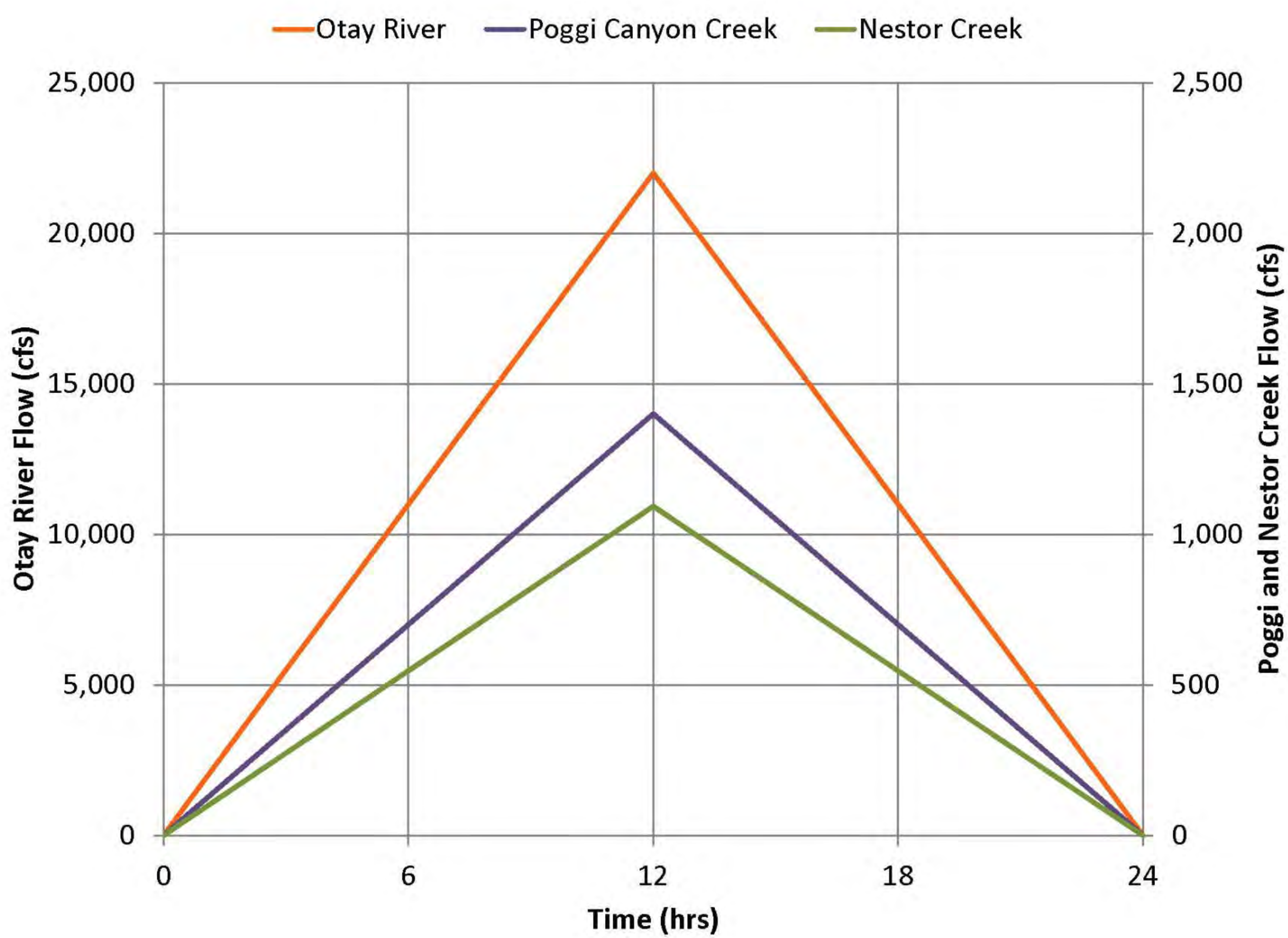


Figure 4.6 100-Year Return Period Flood Hydrographs

5. FLOOD IMPACT ANALYSES

5.1 APPROACH

The flood impact analysis was conducted to assess the impacts of the Otay River Estuary Restoration Project (ORERP) alternatives on flooding associated with the 100-year flood. Flood modeling was conducted to determine the flow pattern and water elevations during flood conditions. The results of the flood modeling under the 100-year event are summarized in Section 5.2 for existing conditions as well as the proposed project alternatives. The results under existing conditions were compared to the results under the ORERP alternatives to assess the project-induced differences as summarized in Section 5.3. An analysis of flood impacts to the Bayshore Bikeway was conducted and the results are discussed in Section 5.4. The potential impacts to erosion based on changes in flood velocities are discussed as part of the erosion analysis in Section 6.

5.2 FLOOD MODELING

The TUFLOW model was used to simulate hydrodynamic conditions of the 100-year flood for Existing Conditions as well as the Intertidal Alternative and Subtidal Alternative. Development of the flood hydrographs for Otay River, Poggi Canyon Creek, and Nestor Creek was previously discussed in Section 4.3.2. For the 100-year flood impact analyses, the flood hydrographs were timed so that the peak of the flow would coincide with MHHW to simulate high water flooding conditions, as shown in Figure 5.1. The 100-year flood hydrograph was simulated to start at hour 12 with peak occurring at hour 24 and MHHW. This timing of the flood hydrograph also allowed a spin-up period (12-hours) for the numerical model to establish hydrodynamic conditions for tidal flows. Initial water elevations were specified as 5.29 ft, NAVD88, corresponding to MHHW for tidally influenced areas including San Diego Bay and the Western Salt Ponds. An initial water elevation of 5.29 ft, NAVD88 was also specified for Ponds 12 – 15, which typically have some water. Initial water depths for these ponds ranged from 1 to 4 ft. The remaining salt ponds were assumed to be dry.

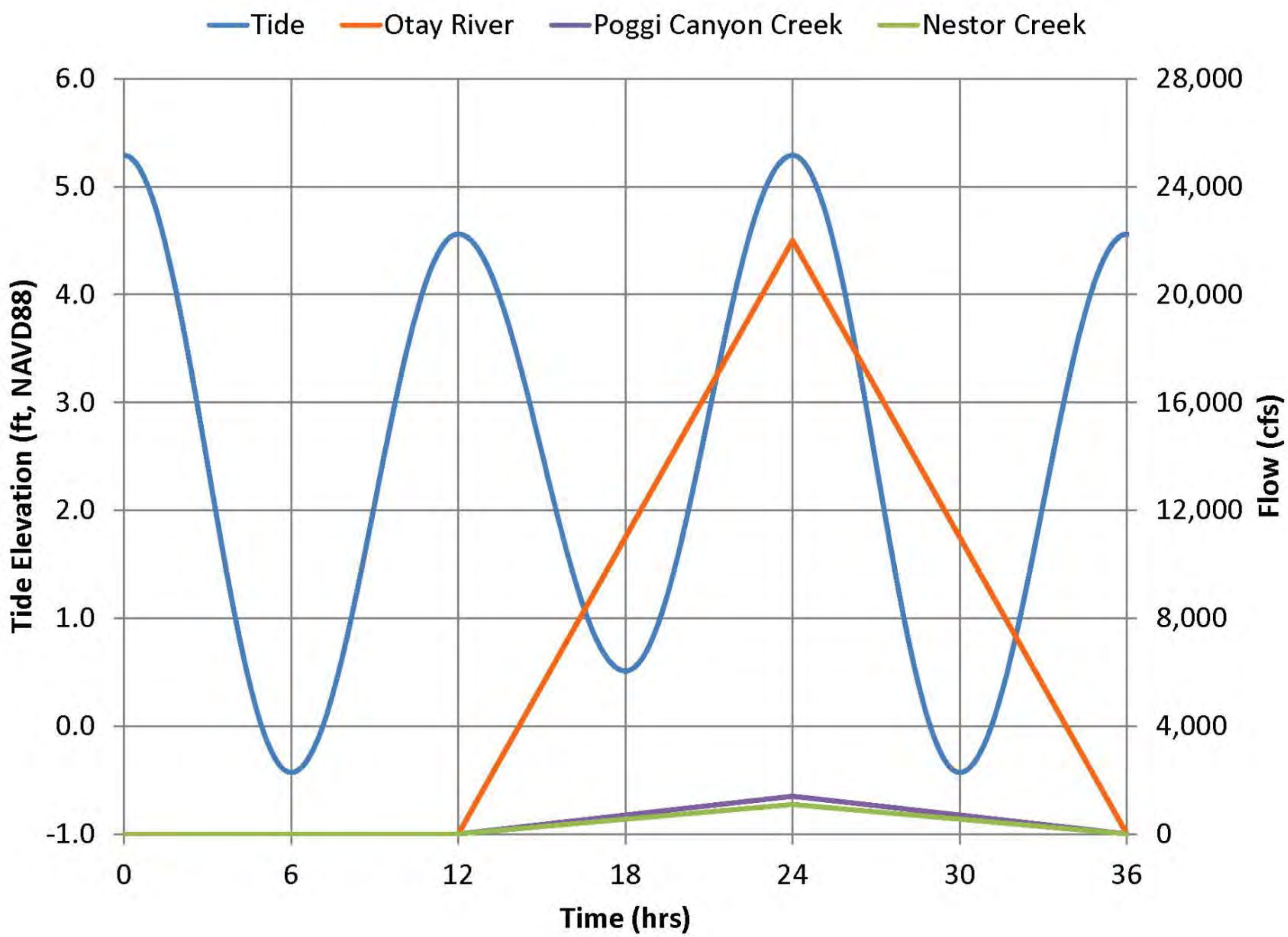


Figure 5.1 Parametric Mean Periodic Tide and 100-Year Flood Hydrographs

5.2.1 Existing Conditions

The 100-year flood was simulated to establish water elevations under Existing Conditions. Since the timing of the peak water elevation varies by location, results of the flood elevations are represented by the maximum water elevation that occurs at any point in time over the 36-hour simulation period. The spatial plot of the maximum water elevations over the entire model domain is provided in Figure 5.2. In general, the maximum water elevations follow the overall topography. Higher water elevations occur along the upper elevations along the Otay River and decrease towards the lower elevations in the ORF and salt ponds. The maximum water elevations also indicate the spatial extent of the flood inundation along the Otay River and ORF below the I-5 Bridge. The maximum water elevation was also compared with the FEMA 100-year flood map in Figure 5.3. The comparison shows that the spatial extent of the flood inundation for Existing Conditions is similar to the FEMA 100-year flood map with the exception of the Western Salt Ponds. The FEMA model represents the historical condition of Ponds 10a, 10, and 11, which were hydraulically separated from the Otay River and San Diego Bay by levees. The current model (TUFLOW) better represents the existing conditions since these three ponds were restored in 2011 resulting in hydraulic connectivity created by breaching the levees to restore tidal exchange between the ponds, San Diego Bay, and Otay River.

To illustrate the movement of the flood flow through the ORF, snapshots of the water elevations during the 100-year flood are provided in Figure 5.4. The color scale for the water elevations was selected to highlight the flood flows as indicated by the light blue to red areas. Water elevations below MHHW are shown by the blue areas, representing primarily tidal water elevations. A map of the salt ponds is provided in the lower right panel, next to the color scale. In the figure, snapshots of the water elevations in the ORF (downstream of the I-5 Bridge) are shown sequentially starting from the upper left panel, which depicts flood flows from the Otay River and Nestor Creek entering the ORF. The inset in the upper left panel indicates the timing of the five snapshots relative to the Otay River flood hydrograph. The arrival of the flood from the Otay River into the ORF occurs approximately six hours after the start of the hydrograph. This lag reflects the travel time from Otay Valley Road down to the ORF. Flows from the Otay River enter the ORF beneath the I-5 Bridge and move along the river channel towards Ponds 50 and 51. Flows from Nestor Creek move along the east edge of Pond 20A. Flood waters from Otay River and Nestor Creek continue to increase and inundate the ORF and then start to overtop levees as shown in the upper middle panel. Flows overtop the levees near the southeast corner of Pond 20A. Flood waters first enter the salt pond area through Pond 51 and start to inundate the ponds. The flood waters fill Ponds 50-54 and continue moving through the salt ponds into Ponds 41-43, 46, and 48. Farther downstream, flood flows overtop the bike path and levees at Ponds 20 and 22. At the bike path bridge, flows split westward to San Diego Bay or southward along the west side of Pond 20A. Three hours after the arrival of the flood (upper right panel), flood waters continue to inundate Ponds 20A, 20, and 22, as well as Ponds 40-48. In the lower left panel, the water elevations show the continued movement of the flood waters into the center portion of the salt ponds through Ponds 23-27. By nine hours after the arrival of

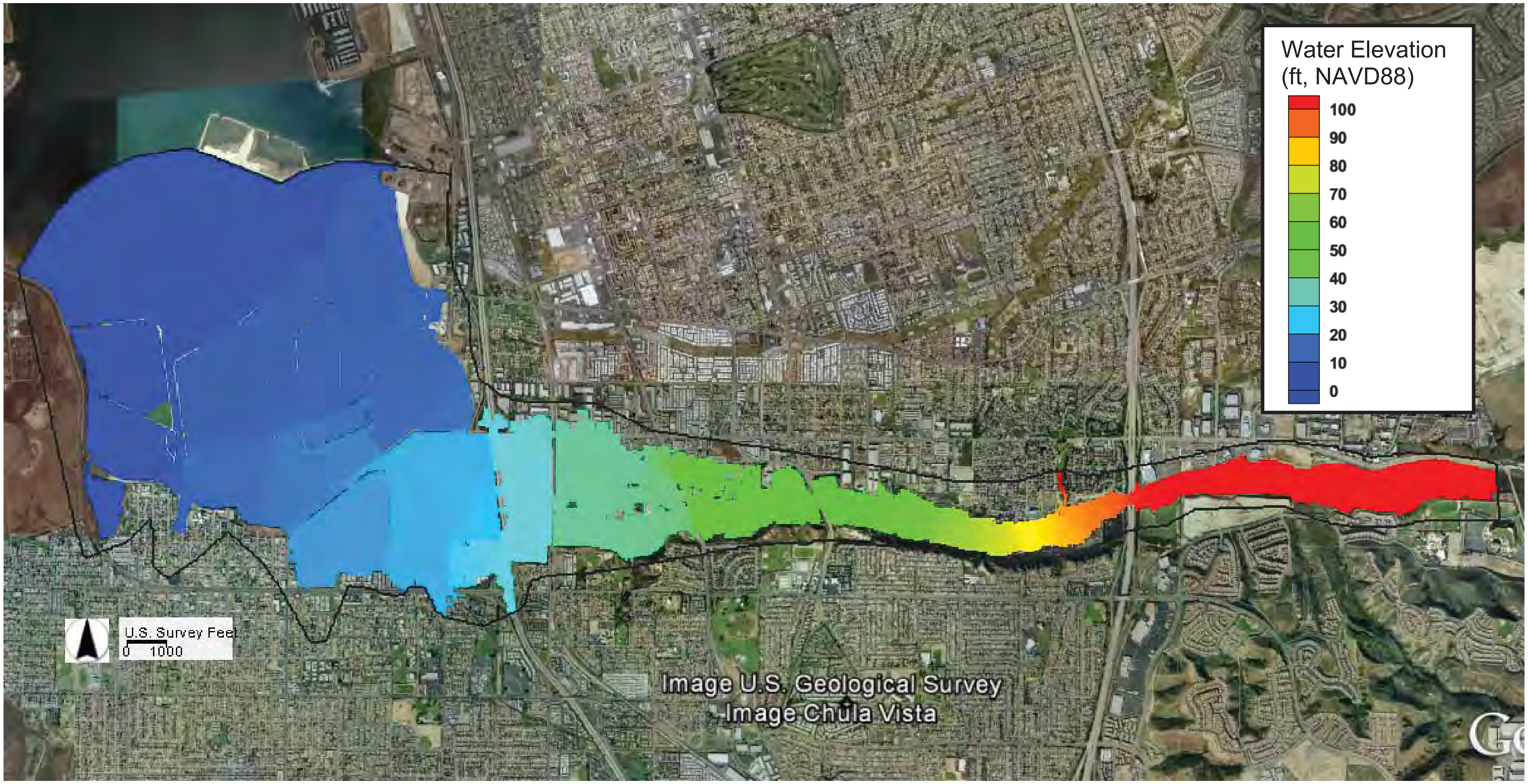


Figure 5.2 100-Year Flood Maximum Water Elevations for Existing Conditions

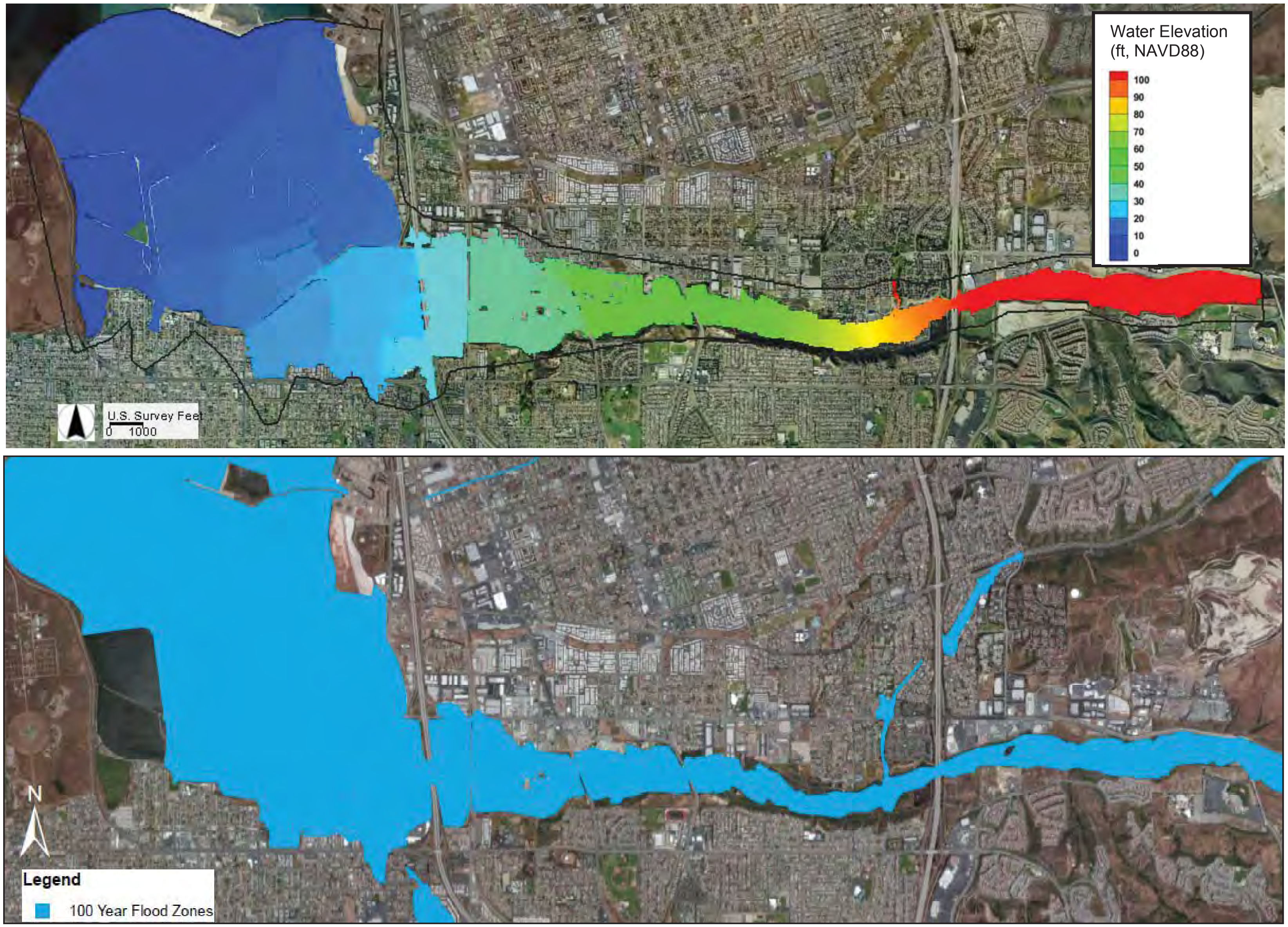


Figure 5.3 Existing Conditions Comparison with FEMA 100-Year Flood Map

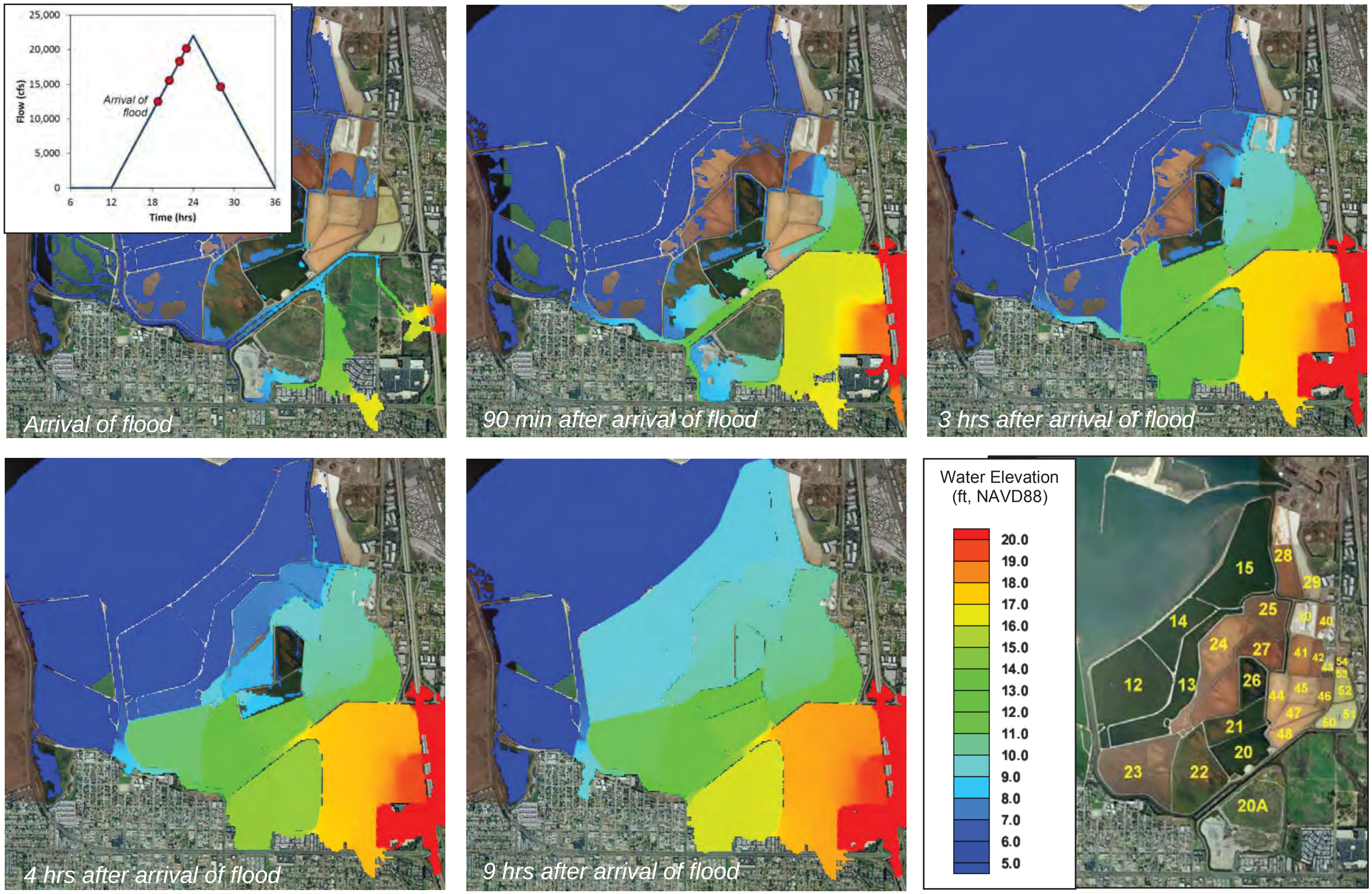


Figure 5.4 100-Year Flood Water Elevations for Existing Conditions

the flood, flood waters inundate the remaining ponds (Ponds 12-15, 21, 26, and 28), as shown in the lower middle panel. Under Existing Conditions, the 100-year flood will inundate the ORF and salt ponds and are generally dissipated in the tidally influenced areas.

5.2.2 Intertidal Alternative

The 100-year flood was simulated for the Intertidal Alternative to establish water elevations. Maximum water elevations for the Intertidal Alternative, provided in Figure 5.5, show a general gradation from upstream to downstream. The flood inundation based on the maximum water elevations show a similar spatial extent as Existing Conditions. For the Intertidal Alternative, flood elevations upstream from the I-5 Bridge are the same as Existing Conditions. Hence, the Intertidal Alternative does not adversely impact flood conditions upstream of the I-5 Bridge.

Water elevations at different times during the 100-year flood for the Intertidal Alternative are provided in Figure 5.6. Snapshots of the water elevations are shown in the same manner as previously shown for Existing Conditions. Water elevations at the arrival of the flood from the Otay River in the ORF are shown in the upper left panel. The darker blue areas indicate tidally influenced areas including the proposed wetland area, which receives flood waters from Nestor Creek. Flood flows inundate the ORF, as depicted in the upper middle panel, then overtop the levees into the salt ponds. Flood waters enter the salt ponds through Pond 51 and subsequently fill Ponds 50-54, and 46. Flood waters also flow over the bike path and levee into Pond 22. At three hours after the arrival of the flood (upper right panel), flood waters inundate Ponds 20A and 23, while flows through Pond 51 inundate Ponds 40-43 and 48. Flows continue to inundate the salt ponds from the west side into Ponds 12-14, 24, and 27 and also from the east side into Ponds 44, 45, 47 (lower left panel). Flow waters also fill Ponds 20 and 21. By nine hours after the arrival of the flood, flood waters inundate the remaining ponds (Ponds 25, 26, 28, 29, and 30), as shown in the lower middle panel. Differences in the flow pattern of the Intertidal Alternative compared with Existing Conditions are discussed in Section 5.2.4.

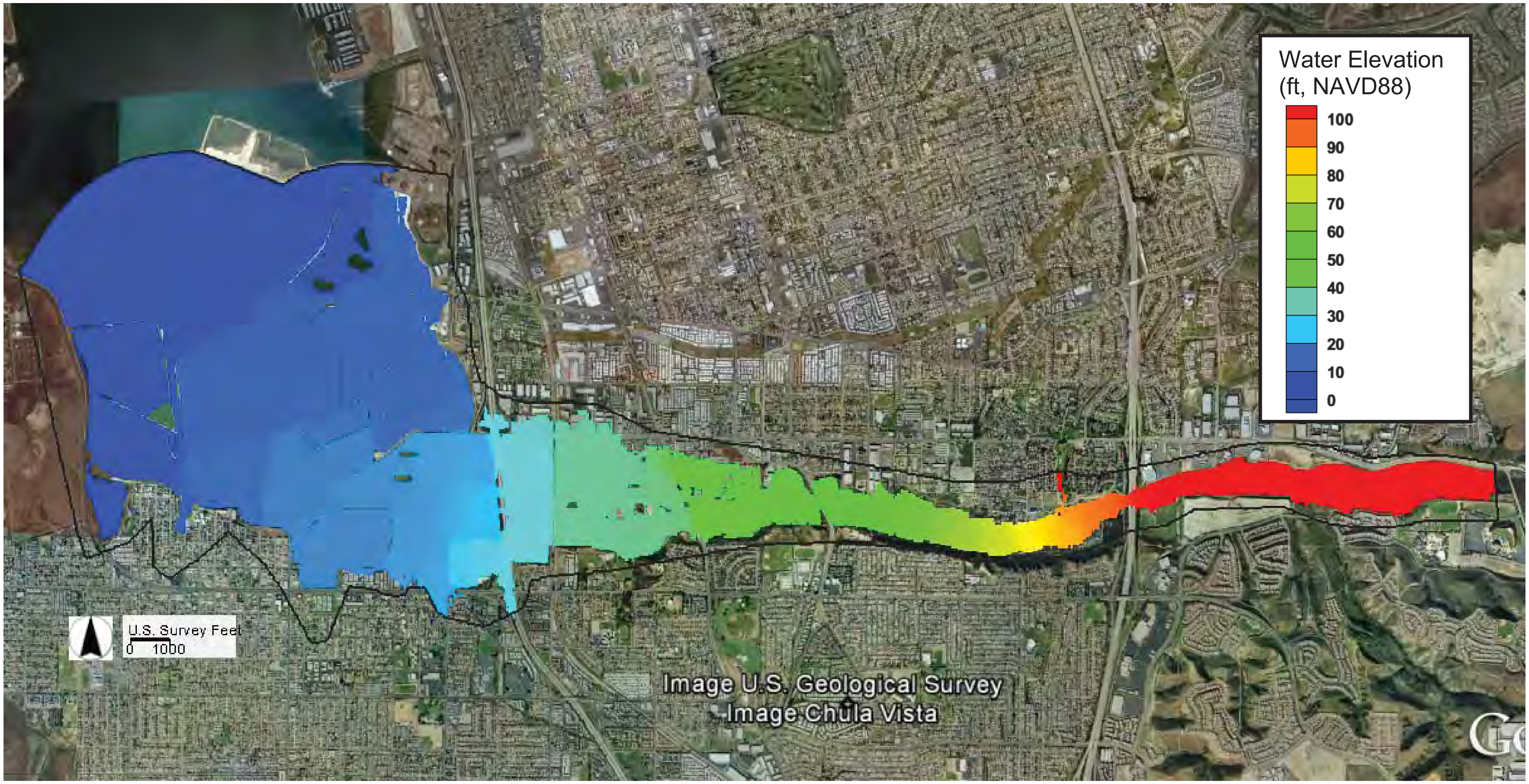


Figure 5.5 100-Year Flood Maximum Water Elevations for Intertidal Alternative

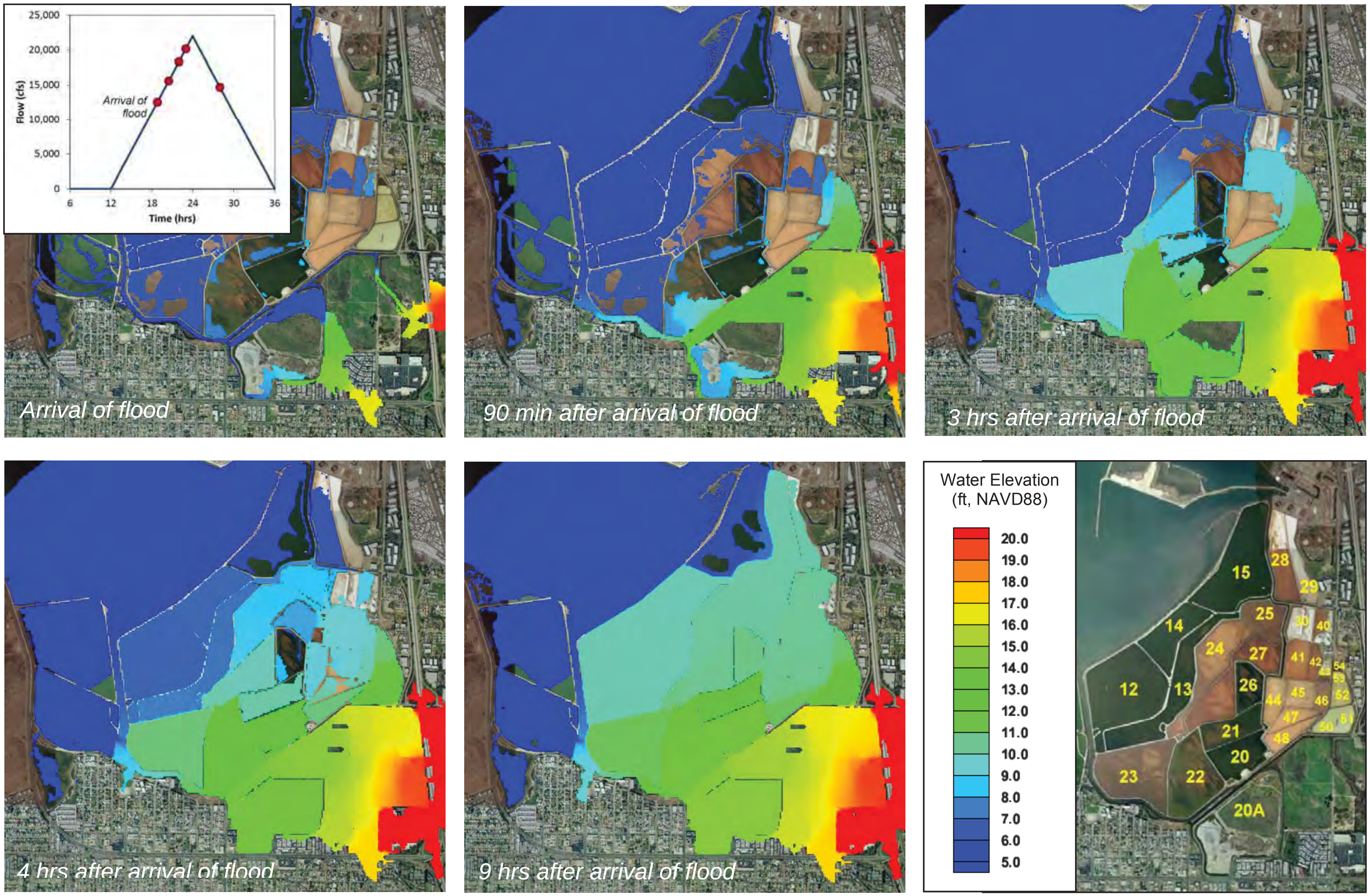


Figure 5.6 100-Year Flood Water Elevations for Intertidal Alternative

5.2.3 Subtidal Alternative

The 100-year flood was simulated for the Subtidal Alternative to establish water elevations. The overall flood modeling results for the Subtidal Alternative are provided in Figure 5.7. The flood results for the Subtidal Alternative are similar to the Intertidal Alternative. The maximum water elevations show a general gradation from upstream to downstream with a similar spatial extent as Existing Conditions. Flood elevations along the Otay River upstream of the I-5 Bridge are the same for the Subtidal Alternative as for Existing Conditions. Hence, the Subtidal Alternative does not adversely impact flood conditions upstream of the I-5 Bridge.

Water elevations during the 100-year flood for the Subtidal Alternative are shown in Figure 5.8. The movement of the flood flows through the project area and salt ponds is similar to the Intertidal Alternative. Flood waters entering the ORF are shown in the upper left panel. Water elevations continue to increase in these areas until overtopping of the levees into Ponds 51 and 22, as seen in the upper middle panel. Three hours after the arrival of the flood, Ponds 23 and 20A becomes inundated (upper right panel). The flood waters continue through the salt ponds along the west and east sides before inundating the center ponds, as illustrated in the lower left panel. The flood eventually inundates all of the salt ponds except for Pond 15, as shown in the bottom middle panel. Differences in the flow pattern of the Subtidal Alternative compared with Existing Conditions are discussed in Section 5.2.4.

5.2.4 Comparison of Alternatives

In general, the proposed alternatives redistribute the 100-year flood flows through the salt ponds resulting in changes to the flood elevations. This redistribution of flood flows is best illustrated by comparing water elevations at two different times during the flood – approximately 90 minutes and 4 hours after arrival of the flood. In Figure 5.9, the three top panels show snapshots of water elevations approximately 90 minutes after the arrival of the flood as the flood flows move into the salt ponds for Existing Conditions, Intertidal Alternative, and Subtidal Alternative; and water elevations about four hours after the arrival of the flood flows are compared in the lower three panels. In each panel, the flood pattern is emphasized by the white arrows, which show the general direction of flow. For Existing Conditions, the flood inundates the ORF and then enters the salt ponds from Ponds 51, 20, and 22, as indicated by the three arrows. Under the proposed alternatives, flood flows would be altered by expanding the flows through the project area. As a result, flood elevations in the ORF would be reduced and flows enter the salt ponds from Ponds 51 and 22. Changes in the flow pattern through the salt ponds under the proposed alternatives are illustrated in the lower three panels. For Existing Conditions, flood waters move through the salt ponds from Ponds 51, 20, and 22 with more

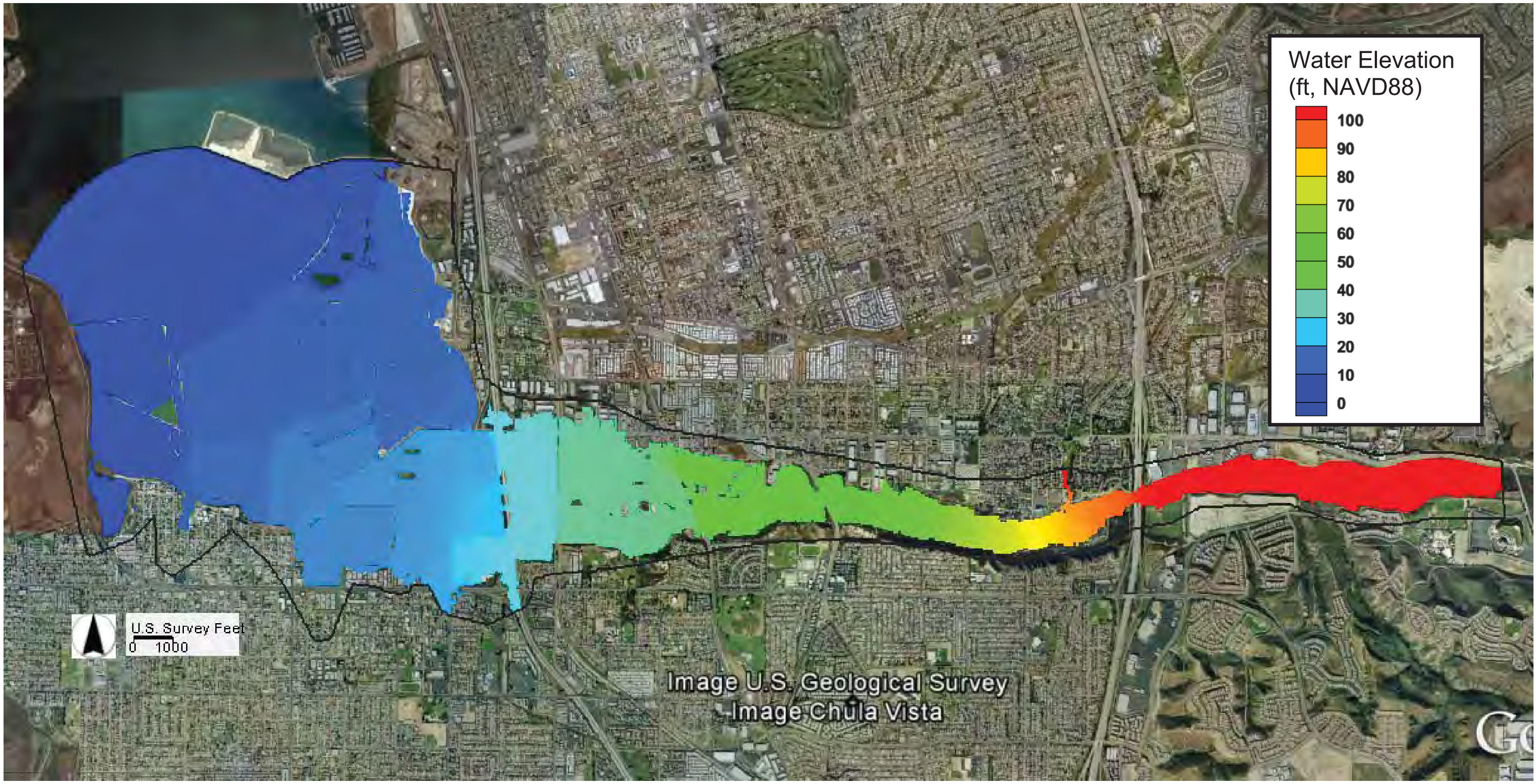


Figure 5.7 100-Year Flood Maximum Water Elevations for Subtidal Alternative

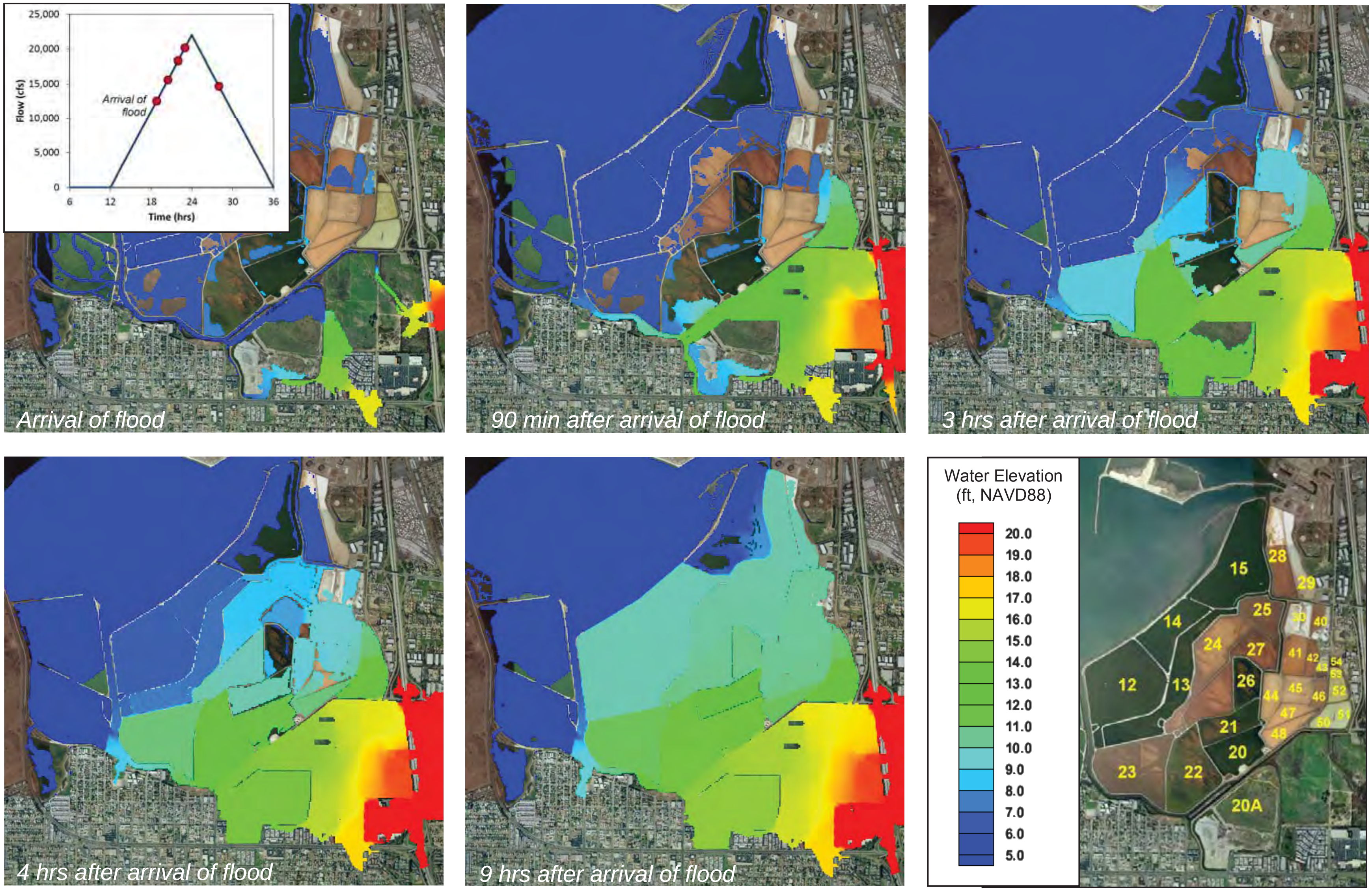


Figure 5.8 **100-Year Flood Water Elevations for Subtidal Alternative**

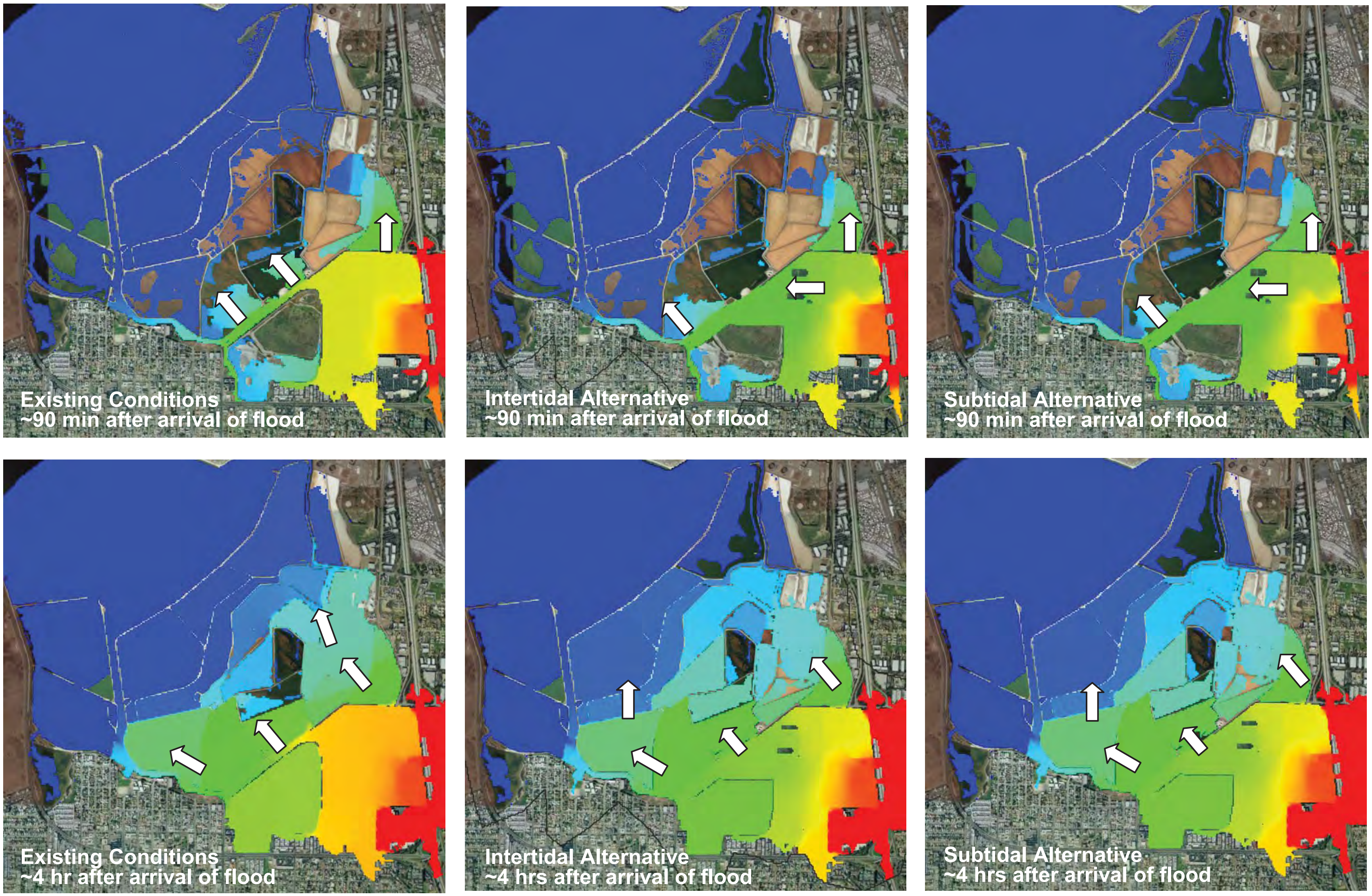


Figure 5.9 Comparisons of 100-Year Flood Water Elevations

flows from Pond 51. Under the proposed alternatives, a greater amount of flooding occurs from the west side of the salt ponds entering from Pond 22. This is highlighted by the two white arrows on the west side of the salt ponds. This results in higher water elevations in Ponds 12 – 14. Lower flows through the center of the salt ponds (Pond 20) are indicated by the lower water elevation compared to Existing Conditions. On the east side of the salt ponds (Pond 51), Existing Conditions show a larger inundated area compared to the alternatives also indicating lower flows. The increase in flood elevations in Ponds 12 – 14 is discussed further below.

Flood elevations were evaluated based on the maximum water elevations that occurred over the 100-year flood event. The maximum water elevations downstream of the I-5 Bridge for Existing Conditions, Intertidal Alternative, and Subtidal Alternative are compared in Figures 5.10. These results are the same as previously shown for the entire model domain in Figures 5.2, 5.5, and 5.7, but the color scale has been changed to highlight the differences in water elevations for the area downstream of the I-5 Bridge. Comparisons between Existing Conditions and the proposed alternatives show differences in the spatial extent of flooding and flood elevations. The flooding of the residential area along Palm Avenue (south of Pond 20A) under Existing Conditions is eliminated under either alternative. Additional flooding would occur for both alternatives at Pond 29, which is not flooded under Existing Conditions. Differences in flood elevations from Existing Conditions are apparent in the ORF and project areas (area south of the bike path). Both alternatives would result in lower water elevations in the ORF and project areas compared to Existing Conditions. Lower water elevations were also found in Pond 15, which is isolated from the flood waters under the alternatives. Higher water elevations for the alternatives are shown in Ponds 12 – 14 and 28. Under Existing Conditions, flood waters overtop the levees into San Diego Bay along Ponds 12, 14, and 15. Under the alternatives, overtopping of the levees into San Diego Bay occurs only along Ponds 12 and 14. Overtopping of the Ponds 12 and 13 levees adjacent to the Otay River occur under the alternatives. For Pond 23, flow over the levees into the river was determined for Existing Conditions and the alternatives. These changes in flood elevations are attributed to the redistribution of flows through salt ponds.

5.3 FLOOD IMPACTS

Flood impacts of the proposed alternatives focused on the differences in the maximum flood elevations from Existing Conditions. The differences, as shown in Figure 5.11, were calculated as the maximum flood elevation for the alternative less the maximum flood elevation for Existing Conditions. In the figure, the white areas indicate no change in maximum water elevation from Existing Conditions. Positive values indicate higher flood elevations for the alternative compared to Existing Conditions, while negative values indicate lower flood elevations. Yellow areas indicate higher flood elevations under the proposed alternatives compared to Existing Conditions. The highest increases in flood elevations are found in Ponds 12 – 14 and 28. Increases in flood elevations are also determined for the bike path along Pond 22. The yellow

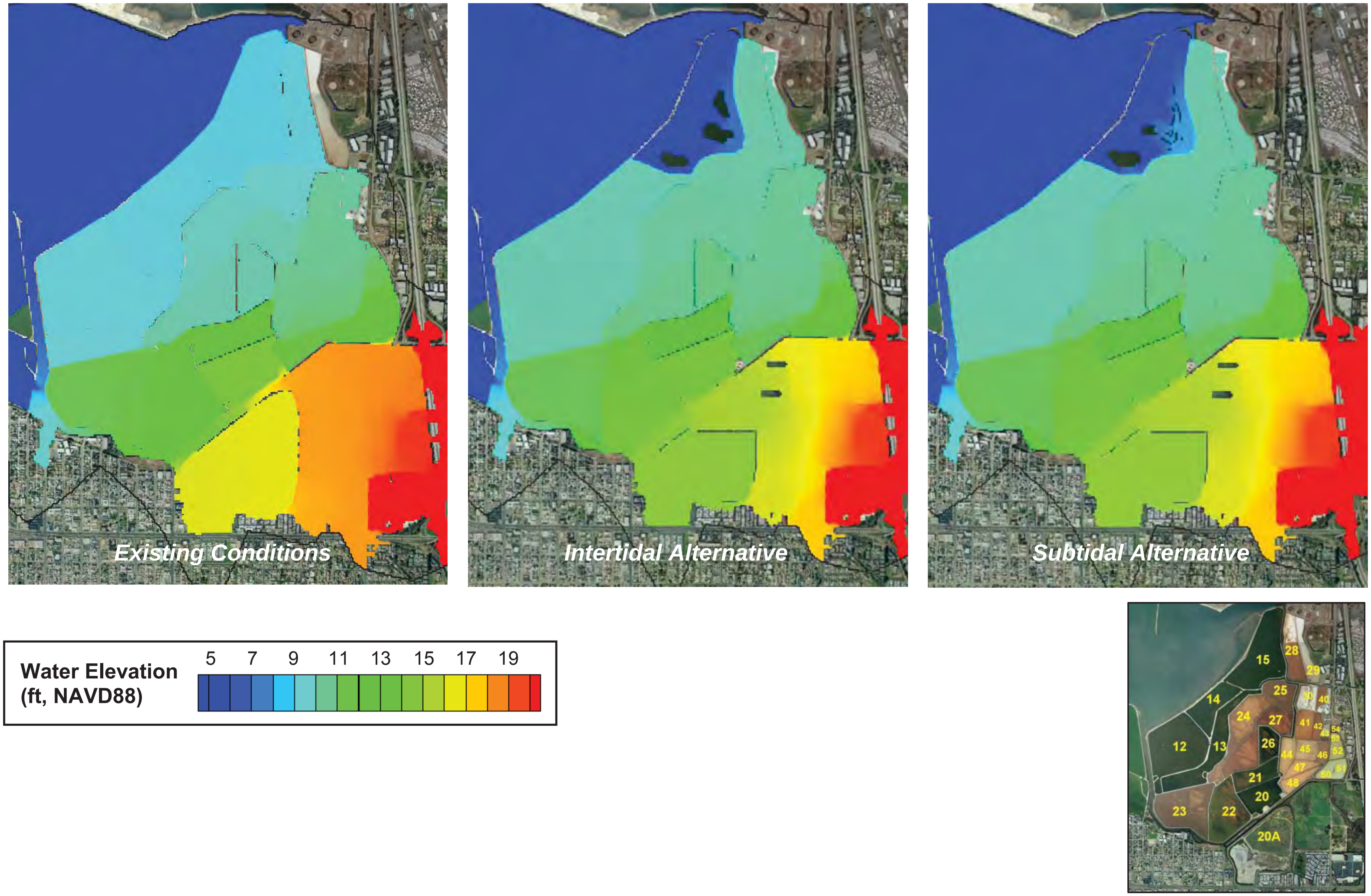


Figure 5.10 Comparisons of 100-Year Flood Maximum Water Elevations

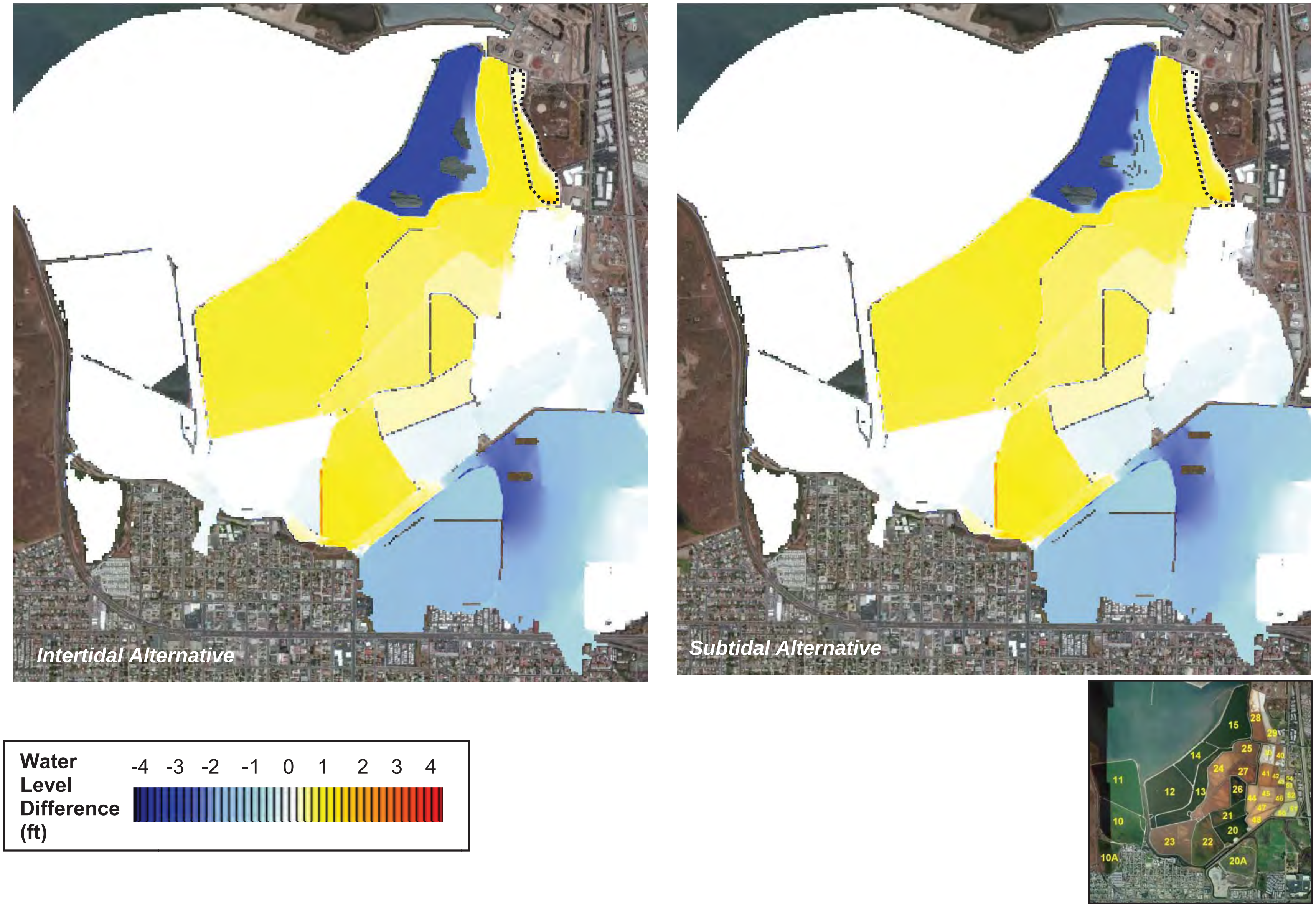


Figure 5.11 100-Year Flood Impacts – Change in Maximum Water Elevations when Compared with Existing Conditions

area in Pond 29 (outlined in dotted lines) is an area flooding occurs under the alternatives but not under Existing Conditions. The water elevation difference for that area is calculated as the difference in water elevation between the alternatives and the ground elevation of the existing condition. In the figure, lighter blue areas indicate reductions in flood elevations, which primarily occur in the floodplain and project areas. Reductions in flood elevations are also observed within Pond 15 as well as the levee between Pond 15 and San Diego Bay. The darker blue indicates areas that are flooded under Existing Conditions, but are no longer flooded under the alternative such as the stockpiles, Pond 15, and the residential area near Palm Avenue.

Comparisons between the Intertidal and Subtidal Alternatives show similar flood impacts in the salt ponds for both alternatives. The Subtidal Alternative results in higher flood elevations for the south end of the bike path along Pond 22.

5.3.1 Salt Ponds 14 and 28

As mentioned previously, the proposed alternatives will result in higher flood elevations compared to Existing Conditions in Ponds 12 to 14, 28, and 29 due to changes in the flow distribution through the salt ponds. The higher levees around Pond 15 under the proposed alternatives also contribute to the higher water elevations by reducing the flood area. The higher water elevations result in higher flows over the Pond 12 and 14 levees into San Diego Bay as well as higher flows into Ponds 28 and 29. Examples of the increase in flood elevations at Ponds 14 and 28 are provided in Figure 5.12. Time series of water elevations during the 100-year flood are shown for Existing Conditions (blue line), Intertidal Alternative (orange line), and Subtidal Alternative (green line). The black-dashed line indicates the average levee elevation so water elevations above this line indicate overtopping of the levee. Water elevations in Pond 14 are compared in the top panel. The elevation of the levee between Pond 14 and San Diego Bay ranges from 7.5 to 9.5 ft, NAVD88, with an average of about 8.5 ft, NAVD88. A portion of the levee is overtopped under Existing Conditions, while essentially the entire length of the levee would be overtopped under the proposed alternatives. For Pond 28 shown in the lower panel, water elevations for Existing Conditions is lower than the levee elevation between Pond 28 and Pond 29, but under the proposed alternatives, flood elevations at Pond 28 would be higher than the levee between Pond 28 and Pond 29. Hence, as discussed earlier, Pond 29 is not flooded under existing alternatives but would be flooded with the proposed alternatives.

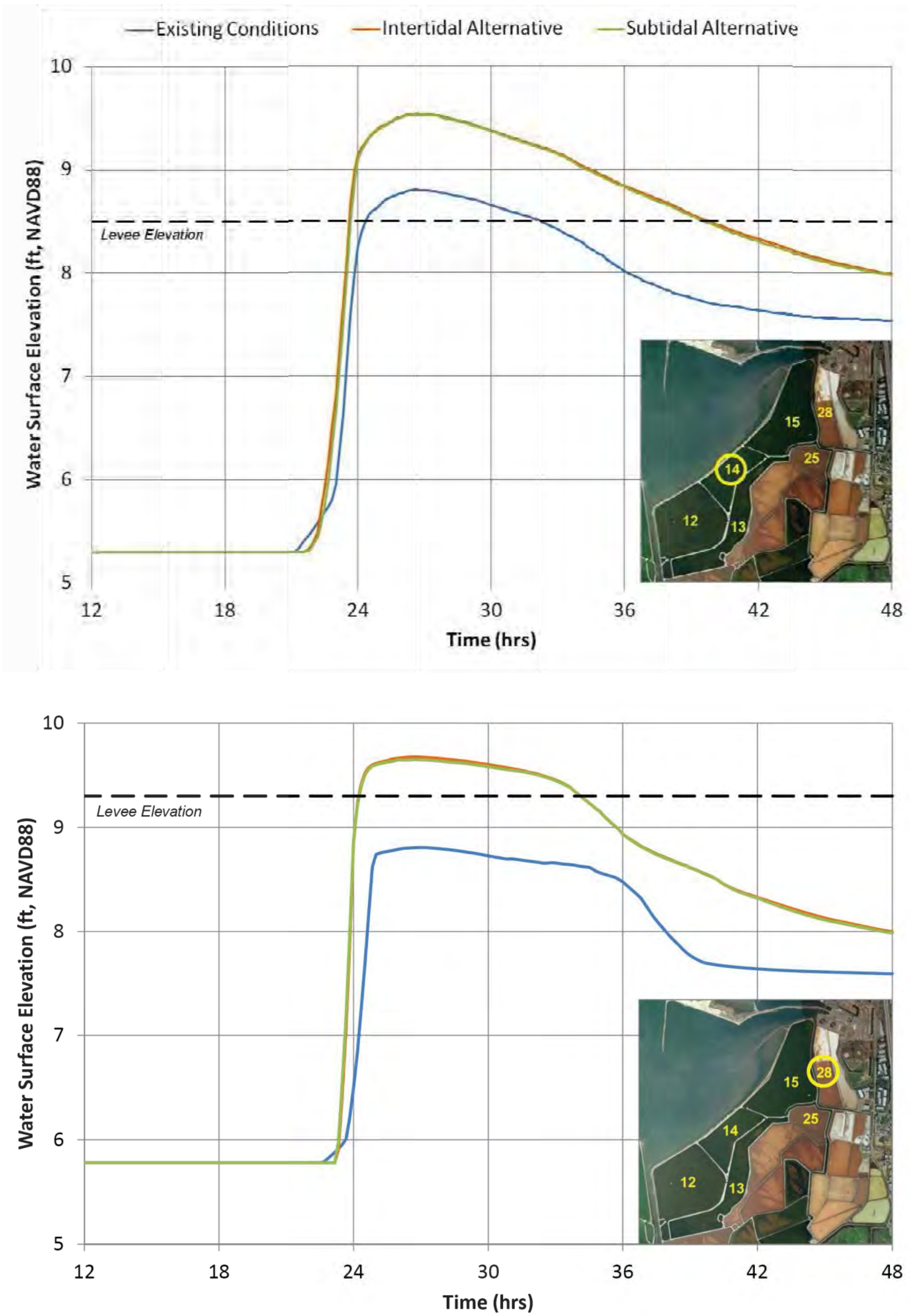


Figure 5.12 100-Year Flood Elevations at Ponds 14 and 28

5.4 BIKE PATH IMPACTS

The 100-year flood modeling described previously showed changes along the bike path in the maximum 100-year flood elevation due to the redistribution of flows under the proposed alternatives. A closer look of the changes to the maximum flood elevations along the south end of the bike path is shown in Figure 5.13. The inset photo shows the extent of the changes for each alternative. In the figure, the yellow area indicates higher flood elevations compared to Existing Conditions, while blue areas indicate lower flood elevations. In general, the 100-year flood elevations would decrease at the center portion of the bike path along Pond 20, but increase at the southern end of the bike path along Pond 22. The higher flood elevations are due to the redistribution of the flood flows. Flood flows that would overtop into Pond 20 under Existing Conditions would be diverted downstream into the wetland area and Pond 22. Although the proposed alternatives would increase flood elevations for the 100-year flood, flood impacts would be reduced for smaller floods events.

Additional flood simulations were conducted to further evaluate potential flooding impact of the bike path due to the proposed alternatives. Flood impacts were evaluated in terms of when flood water levels would exceed the bike path elevation in addition to changes in flood water levels from existing condition during the 100-year flood event. Additional flood modeling was conducted for the 10-, 15-, 25-, and 50-year return period floods to determine the minimum flood size that would result in flooding of the bike path. These additional floods were simulated in the same manner as the 100-year flood with flood hydrographs developed for each return period as discussed previously in Section 4.3.2. It was determined that depending on the location, flooding along the bike path would begin between the 10-year and 15-year flood under existing condition. However, as illustrated in Figure 5.14, with the proposed alternatives, flooding of the bike path would not occur up to the 15-year flood event. In Figure 5.14, water elevations for the 15-year and 100-year floods at three locations along the bike path under existing and with project alternative conditions are compared. The three locations for the comparison of water elevations are shown in the inset at the bottom of the figure. Time series of water elevations for the 15-year flood are shown in the upper three panels and the corresponding water elevations for the 100-year flood are contained in the lower three panels. In the figure, time series for Existing Conditions, Intertidal Alternative, and Subtidal Alternative are indicated by the blue, orange, and green lines, respectively. The black-dashed line is the ground elevation of the bike path at each location. As shown in the figure, at Location 1, flood elevations under the proposed alternatives would be higher than Existing Conditions for both the 15- and 100-year floods. At Location 2, flood elevations would be reduced under proposed conditions for the 15-year flood, whereas, flood elevations would be higher than Existing Conditions for the 100-year flood. At Location 3, both the 15- and 100-year flood elevations for the proposed alternatives would be less than Existing Conditions.

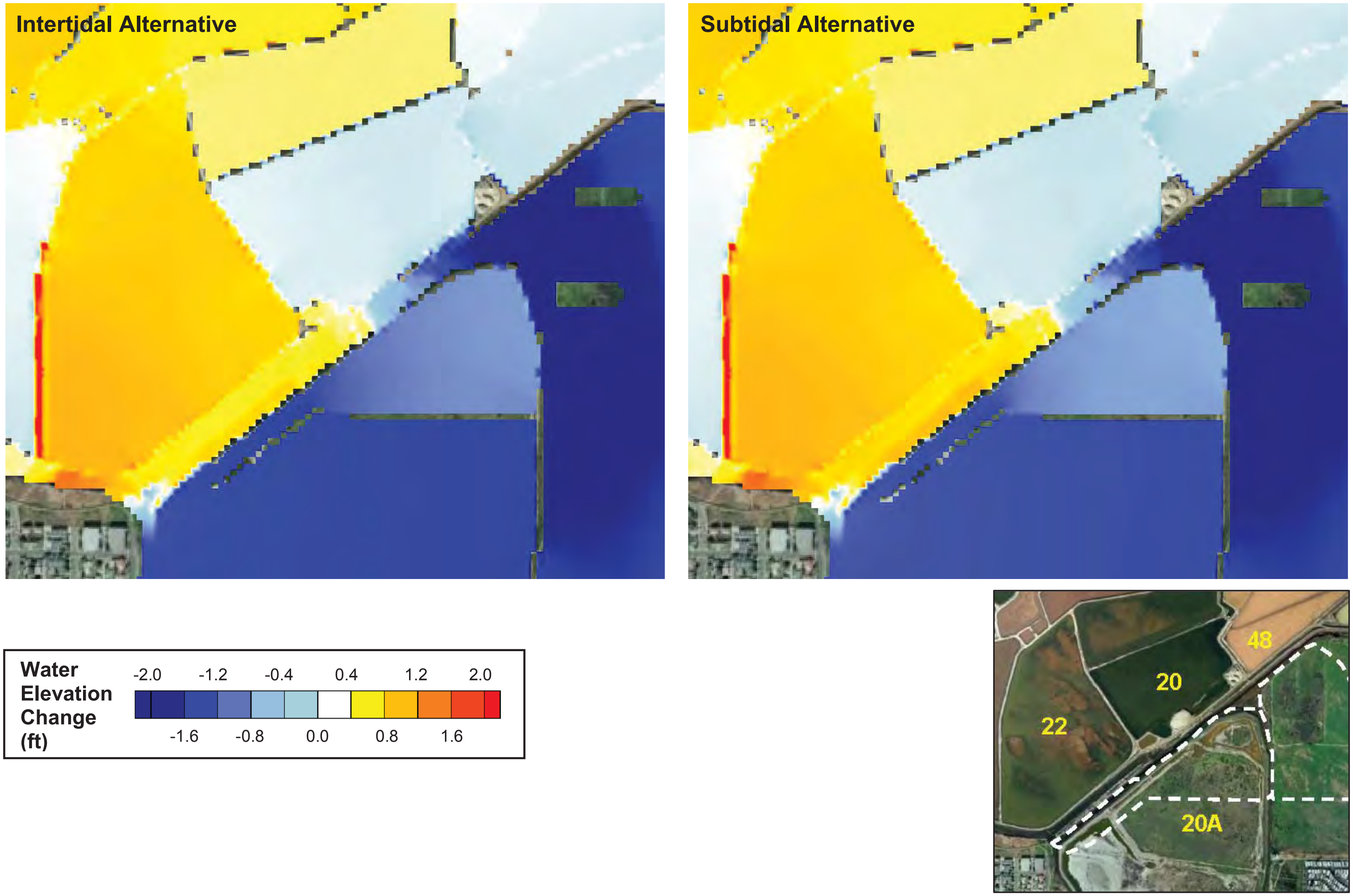


Figure 5.13 100-Year Flood Impacts along Bike Path

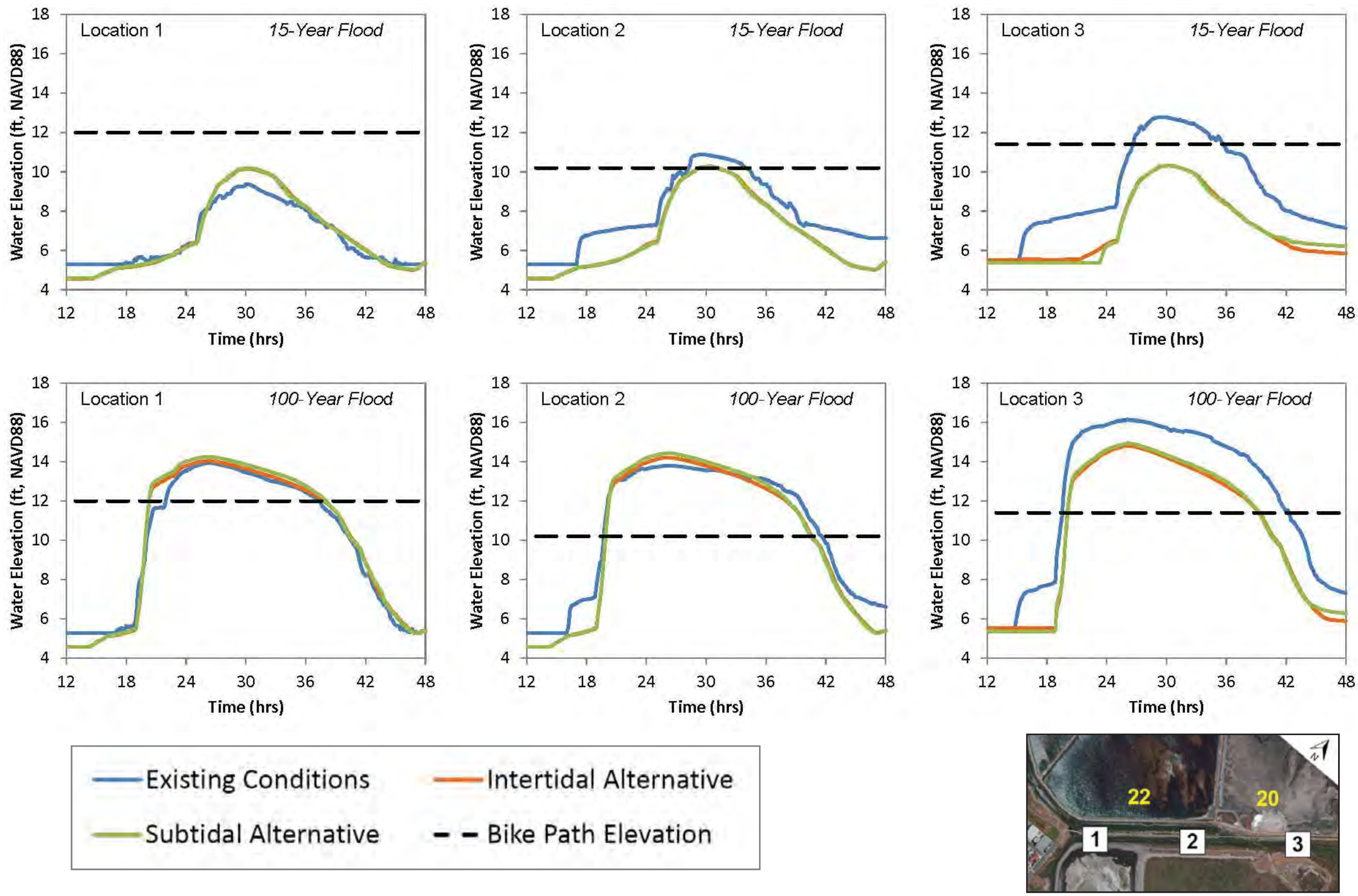


Figure 5.14 15-Year and 100-Year Flood Elevations along Bike Path

Flooding of the bike path occurs when water levels exceed the bike path elevation and overtops the bike path. In Figure 5.14, water elevations above the black-dashed line indicate flooding of the bike path. The bike path would be flooded by a 100-year event under both existing and proposed conditions. However, the proposed alternatives would reduce flooding of the bike path for a 15-year flood event. No flooding occurs for the 15-year flood event at Location 1 under both existing and proposed conditions, but at the other two locations, the proposed alternatives would alleviate flooding of the bike path for the15-year flood event. In summary, the proposed alternatives would not alleviate flooding of the bike path for extreme flood events (e.g., 100-year flood), but would prevent flooding of the bike path for smaller and more frequent flood events (e.g., 15-year flood).

5.5 SUMMARY

Flood modeling was conducted to establish the flow pattern and water elevations during flood events. The flood impact analysis was conducted for the 100-year flood from the Otay River, Poggi Canyon Creek, and Nestor Creek. Flood conditions were simulated for Existing Conditions, Intertidal Alternative, and Subtidal Alternative and then compared to evaluate changes in flow pattern and maximum water elevations. For Existing Conditions, the flood inundates the ORF and then enters the salt ponds from Ponds 51, 20, and 22. The salt ponds are filled from primarily the west and east sides before overtopping the levees into San Diego Bay. Under the alternatives, flood flows are redistributed through the project area and enter the salt ponds through Ponds 51 and 22. A greater amount of flooding occurs from the west side of the salt ponds compared to the east side inundating all the ponds except for Pond 15, which is isolated from flood flows. Higher flood elevations in the northern portion of the salt ponds results in greater flows overtopping into San Diego Bay along Ponds 12 and 14 as well as greater flows into Ponds 28 and 29.

Reductions in flood impacts were determined for the ORF and project areas, Pond 20A, Pond 20, and Pond 15. Along the bike path, the proposed alternatives would reduce flood elevations at the north end of the bike path adjacent to Pond 48. In general, the proposed alternatives would not change flood elevations in tidally influence areas, including the Western Salt Pond Restoration area (formerly Ponds 10A, 10, and 11). Flood impacts of the proposed alternatives were determined for Ponds 12, 13, 14, 28, and 29. Increases in 100-year flood elevations were also found for the south end of the bike path along Pond 22.

Additional flood simulations for flood events with different return periods were conducted to assess flood impacts in terms of flooding of the bike path. The proposed alternatives would not alleviate flooding of the bike path for extreme flood events (e.g., 100-year flood), but would prevent flooding of the bike path for smaller flood events (e.g., 15-year flood).

6. EROSION IMPACT ANALYSIS

6.1 APPROACH

The erosion impact analysis was conducted to identify erosion (scour) associated with the proposed alternatives. In addition to water levels, the flood model TUFLOW provided velocities during flood conditions. The erosion of sediment is dependent primarily on the water velocity and sediment grain size. In general, higher velocities will correspond with greater erosion. Erosion impacts were qualitatively assessed based on change in velocities under the proposed conditions compared to Existing Conditions. Areas with lower velocities than Existing Conditions are expected to have reduced erosion, while areas with higher velocities are expected to have greater erosion. The velocity results for the 100-year flood flow are presented in Section 6.2. Erosion impacts are discussed in Section 6.3, including impacts along the bike path.

6.2 VELOCITY RESULTS

6.2.1 Existing Conditions

The 100-year flood modeling was used to establish flood velocities under Existing Conditions. Results of the flood velocities are represented by the maximum velocity that occurs at any point in time over the 36-hour simulation period. The spatial plot of the maximum velocities over the entire model domain is provided in Figure 6.1. In general, the highest velocities occur along the Otay River channel and levees. Higher velocities, as indicated by the red color, are shown along the entire stretch of the Otay River from the I-5 Bridge to San Diego Bay. These velocities range from about 7 to 10 ft/sec. Similarly, higher velocities are observed along the salt pond levees attributed to the flood flows overtopping the levees. Higher velocities also occur along the levee separating Ponds 14 and 15 with San Diego Bay due to overtopping of the levees.

6.2.2 Intertidal Alternative

The maximum velocities over the entire model domain for the Intertidal Alternative are provided in Figure 6.2, which shows the highest velocities occurring along the river channel and levees. In the upper portion of the Otay River, maximum velocities for the Intertidal Alternative are similar to Existing Conditions indicating the alternative would not cause any erosion impacts upstream of the I-5 Bridge.

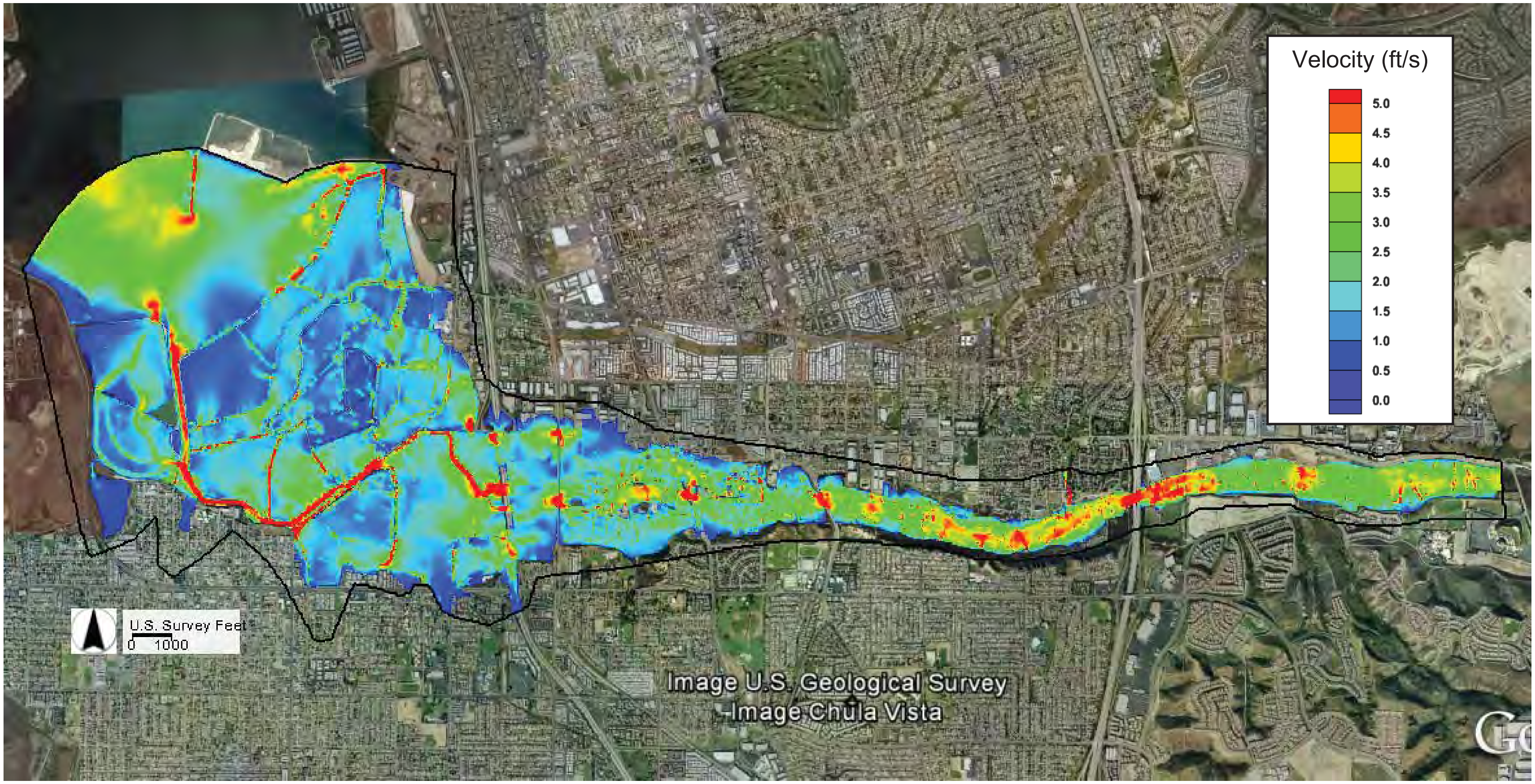


Figure 6.1 100-Year Flood Maximum Velocities for Existing Conditions

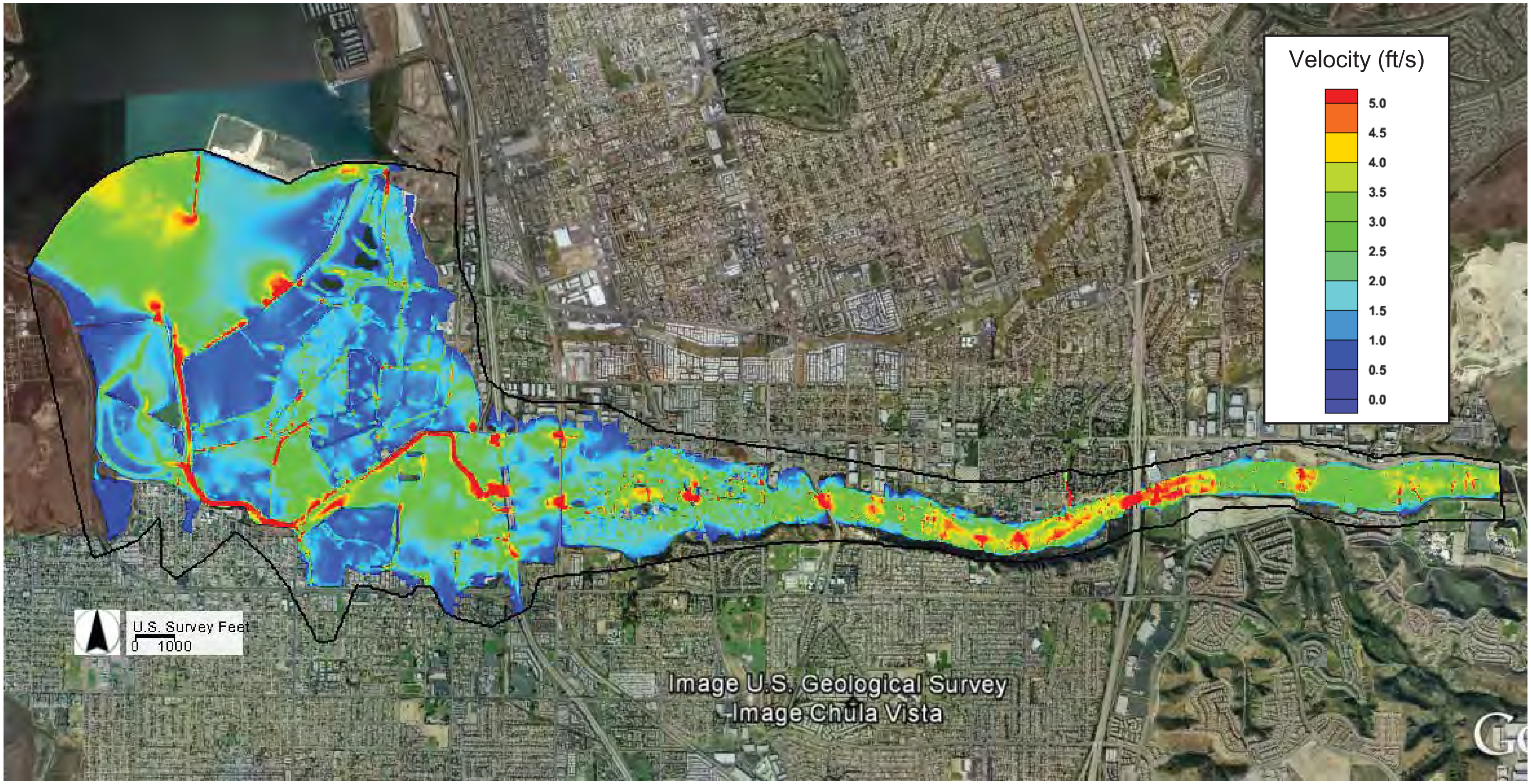


Figure 6.2 100-Year Flood Maximum Velocities for Intertidal Alternative

A comparison of maximum flood velocities downstream of the I-5 Bridge for Existing Conditions and Intertidal Alternative is provided in Figure 6.3. In the figure, the color scale has been selected to differentiate the high and low velocities. Flood velocities under the Intertidal Alternative are similar in magnitude to Existing Conditions, but locations of higher and lower velocities differ. As expected, differences in the flood velocities are shown throughout the project area due to the changes in grading. Differences in flood velocities also occur along the bike path adjacent to Ponds 48, 20, and 22, coinciding with differences in flood elevations. High velocities are also observed between the stock pile areas. Along the pond levees separating the salt ponds and San Diego, differences in flood velocities are apparent. Under Existing Conditions, higher velocities occur along Ponds 14 and 15 due to overtopping of the levees. Under the Intertidal Alternative, lower velocities occur along Pond 15 since with the new tidal inlet, no overtopping occurs from Pond 15. However, higher velocities are shown along Ponds 12 and 14 under the Intertidal Alternative due to additional overtopping.

6.2.3 Subtidal Alternative

For the Subtidal Alternative, the maximum velocities during the 100-Year flood are shown in Figure 6.4. Similar to the Intertidal Alternative, the highest velocities occur along the Otay River channel and levees. Above the I-5 Bridge, maximum velocities are similar to Existing Conditions, indicating no erosion impacts.

A comparison of the velocities for the Subtidal Alternative and Existing Conditions in the ORF downstream of the I-5 Bridge is shown in Figure 6.5. Overall, flood velocities under the Subtidal Alternative are similar in magnitude to Existing Conditions, but locations of higher and lower velocities vary. Similar to the Intertidal Alternative, differences in flood velocities are apparent throughout the ORF and project areas due to changes in the grading. High velocities are also observed between the stock pile areas. Along the bike path, higher velocities occur at the south end of the bike path under Existing Conditions, but higher velocities occur at the north end under the Subtidal Alternative. Differences in flood velocities are also noticeable along the levees adjacent to San Diego Bay. Higher velocities mainly occur along Pond 15 under Existing Conditions, but occur along Ponds 12 and 14 under the Subtidal Alternative.

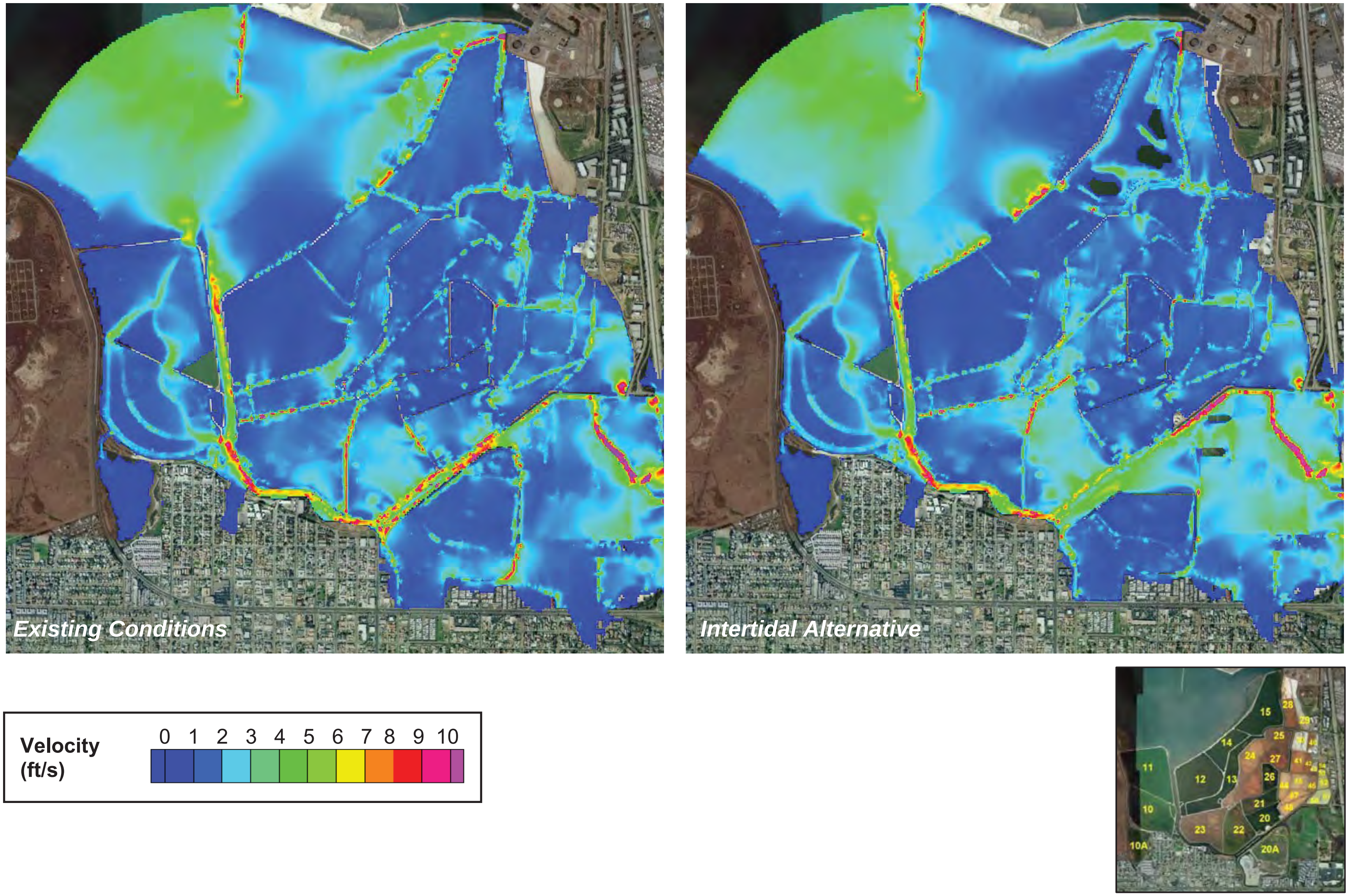


Figure 6.3 Comparison of 100-Year Flood Maximum Velocities for Intertidal Alternative

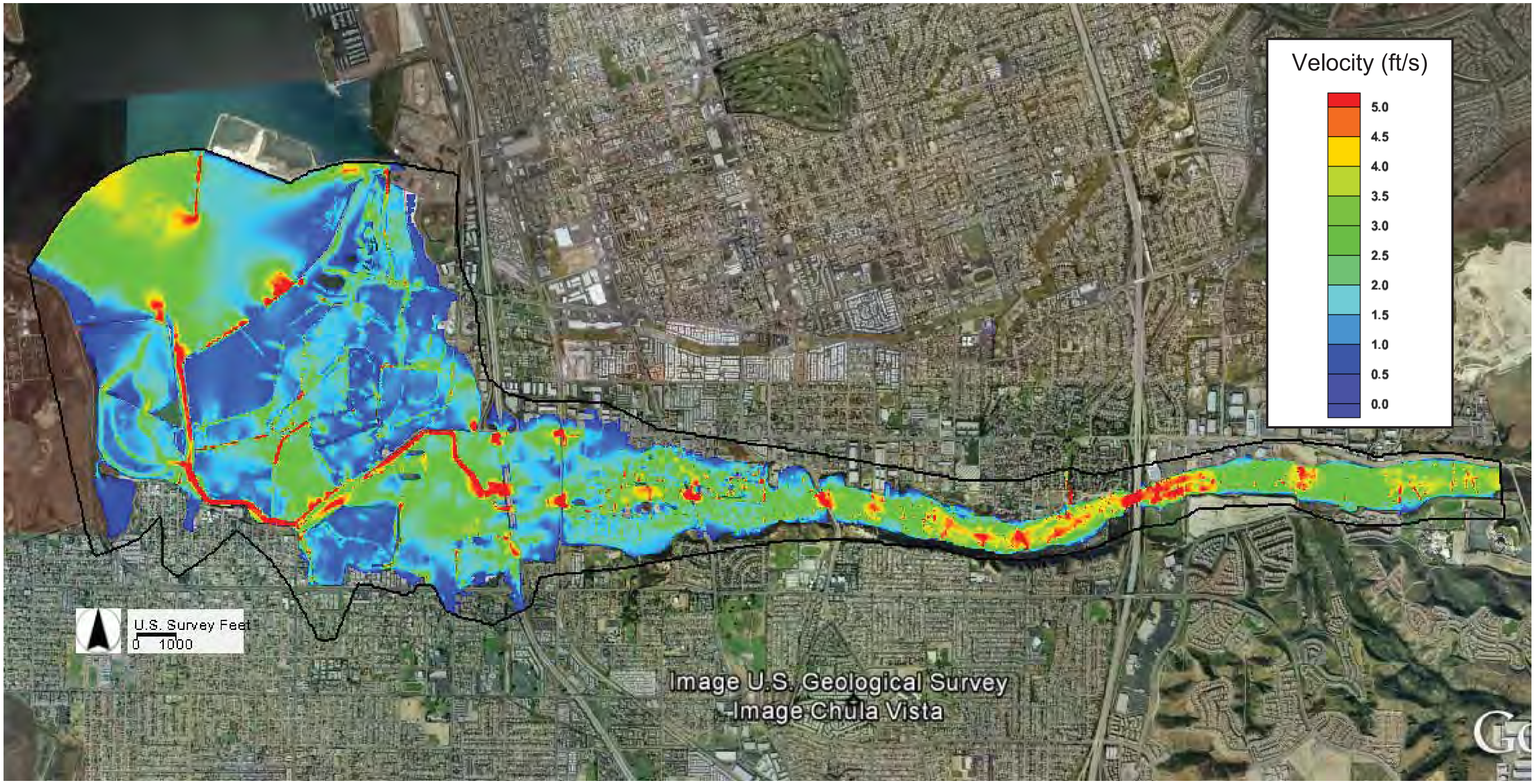


Figure 6.4 100-Year Flood Maximum Velocities for Subtidal Alternative

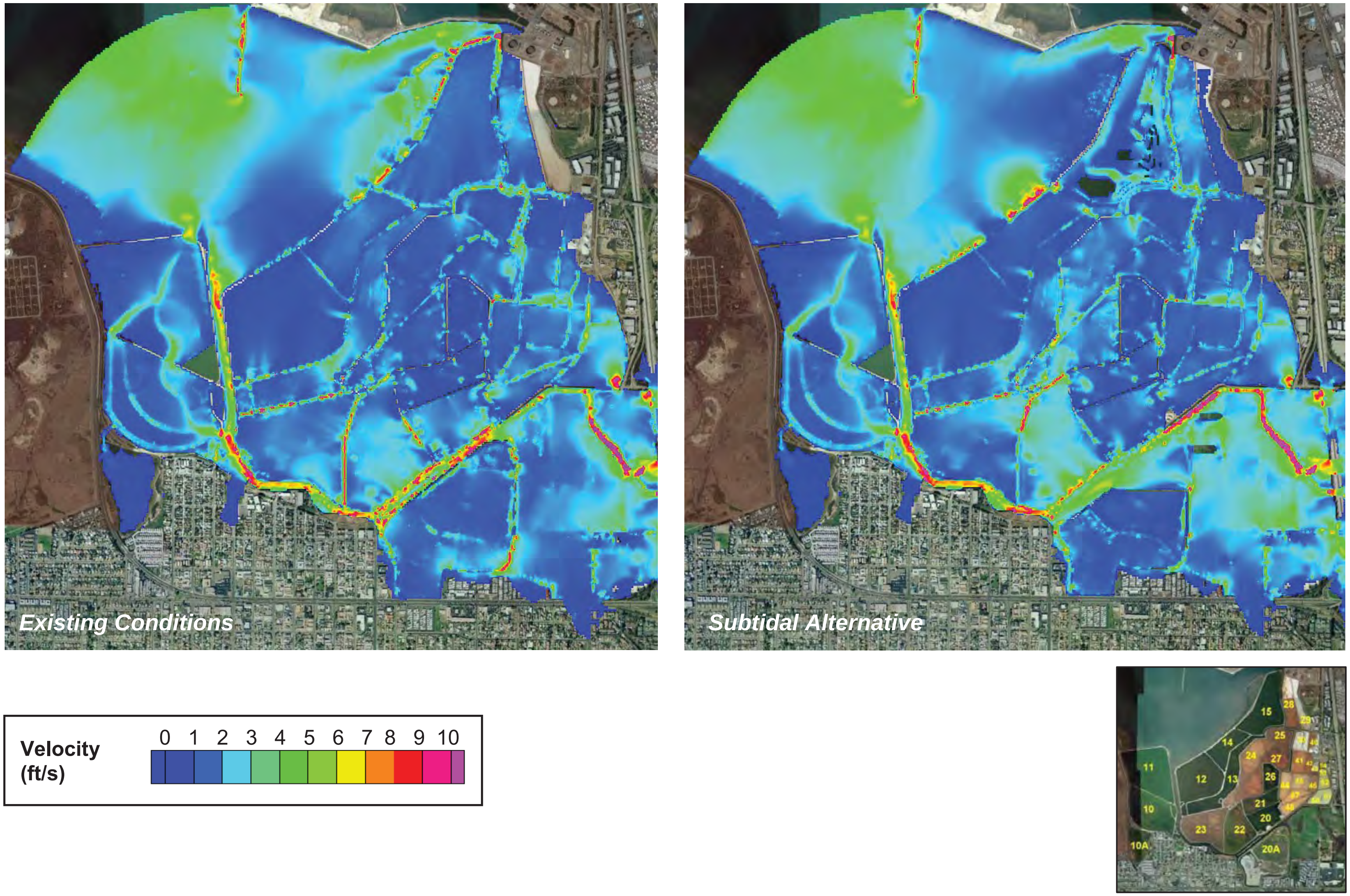


Figure 6.5 Comparison of 100-Year Flood Maximum Velocities for Subtidal Alternative

6.3 EROSION IMPACTS

To evaluate the erosion impacts, differences in the maximum velocity between the proposed alternatives and Existing Conditions were determined to identify areas with changes in erosion conditions, and the results are shown in Figure 6.6. In the figure, positive values indicate an increase in flood velocities, negative values indicate a decrease in flood velocities, and white-colored areas indicate little to no change in the maximum flood velocities compared to Existing Conditions. As shown in the figure, no changes in flood velocities were determined for the Western Salt Pond Restoration Project (formerly Ponds 10A, 10, and 11). In general, the areas with differences in flood velocities correspond to areas with changes in flood elevations. Blue colored areas indicate lower flood velocities for the proposed alternative compared to Existing Conditions resulting in the reduction of potential erosions. Decreases in flood velocities are found for the river channel along the project area, as well as in Ponds 20 and 15. Lower velocities are also generally observed along the east side of the salt ponds, corresponding to lower flows compared to Existing Conditions. The removal of Pond 15 from the flooded area also results in lower velocities along the Pond 15 levee. Areas with higher velocities for the alternatives are shown by yellow and red areas. Increases in velocity occur due to the redistribution of flows, as previously discussed in Section 5.2. The higher velocities indicate greater potential erosion conditions compared to Existing Conditions, and are further discussed below.

6.3.1 Project Area

As expected, changes in velocity were found throughout the ORF and project areas. Under the alternatives, the existing levee surrounding Pond 20A would be moved to allow tidal flows into the proposed wetland and also enabling flood flows to pass through the project area. Velocities along the existing levee would decrease, as indicated by the blue area surrounding Pond 20A in Figure 6.6. Based on the flood modeling, the proposed alternatives would decrease flood elevations throughout the ORF and project areas due to the expanded flood area, but increase flood velocities compared to Existing Conditions. A soil characterization study conducted for the ORF Site shows that an area east of Nestor Creek (see Figure 6.7) is contaminated with pesticides (Anchor QEA, 2013). Some of these pesticides concentrations reach levels that would be considered hazardous material from the standpoint of waste disposal at a landfill. In addition, some of these pesticides occur in the surface and near surface soils across this area. Consequently, potential project-induced erosion associated with increased flood velocities in this area is of particular concern.

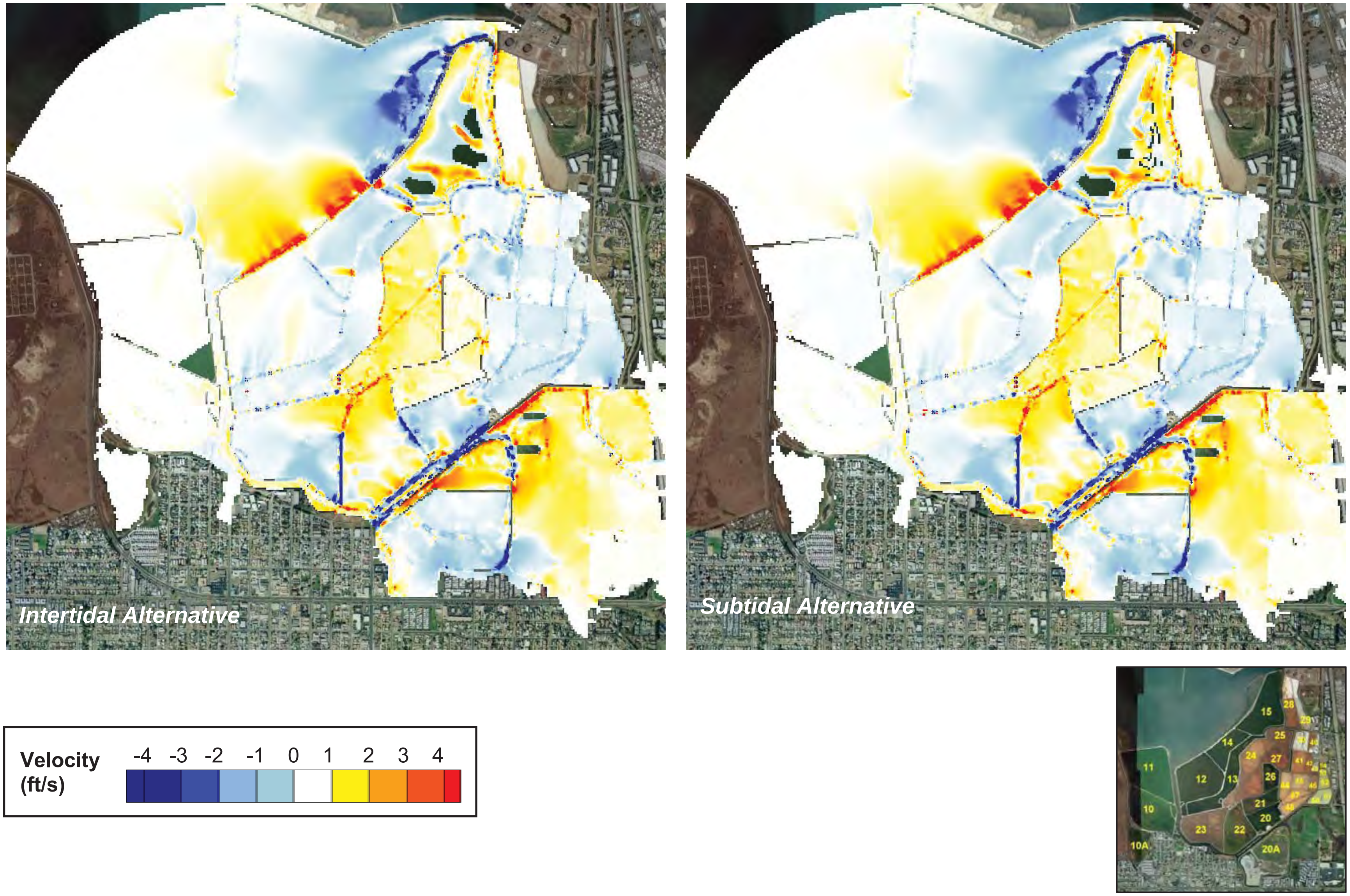


Figure 6.6 100-Year Flood Erosion Impacts based on Maximum Velocities

Figure 6.7 Area with DDTs Exceeding CCR22 Hazardous Waste Level

Based on the soil characterization study, the top three feet of the area with pesticide contamination is mainly composed of fine sand to coarse sand. According to the Hjulstrom curve (shown in Figure 6.8), soil composed of fine sand to coarse sand would start to erode when the water velocity reaches and exceeds 0.6 ft/s. To evaluate potential erosion for this area under the 100-year flood, the areas within the ORF Site with maximum flood velocities higher than 0.6 ft/s were identified under Existing Conditions and proposed conditions (Intertidal Alternative and Subtidal Alternative). The areas within the ORF Site with maximum flood velocities higher than 0.6 ft/s under Existing Conditions are shown in Figure 6.9. As shown in the figure, the entire area with contaminated soils would erode under the 100-year flood. Similar plots for areas with maximum flood velocities higher than 0.6 ft/s under the 100-year flood condition for the Subtidal Alternative and Intertidal Alternative are shown in Figure 6.10. As shown in the figure, the maximum flood velocities for the area with contaminated soils are all higher than 0.6 ft/s for both the Subtidal and Intertidal alternatives; hence, similar to Existing Conditions, erosion is likely to occur in this area under the 100-year flood condition. Comparing the flood velocities in this area under the Intertidal Alternative and Subtidal Alternative (Figure 6.10) with those under Existing Conditions (Figure 6.9), the maximum flood velocities in the area would be higher under proposed conditions (Intertidal Alternative and Subtidal Alternative).

The average times when flood velocities at the ORF site are higher than 0.6 ft/s during a 100-year event under Existing Conditions as well as the Intertidal Alternative and Subtidal Alternative were evaluated to assess the potential erosion impact of the proposed alternatives. The times when the flood velocities are higher than 0.6 ft/s were evaluated for seventeen locations at the ORF site (shown in Figure 6.11) by examining the time series of the velocities at each location. An example velocity time series for Location 56 is shown in Figure 6.12. In the figure, the top panel shows a comparison between the velocities under the Intertidal Alternative and Existing Conditions, while the bottom panel shows a comparison between the velocities under the Subtidal Alternative and Existing Conditions. As shown in the figure, the duration for flood velocities higher than 0.6 ft/s under Existing Condition is approximately 10.3 hours, and the corresponding times for the Intertidal Alternative and Subtidal Alternative are approximately the same at about 13.8 hours. The average times when flood velocities are higher than 0.6 ft/s at the ORF site based on an average across the 17 locations shown in Figure 6.11 is approximately 13.2 hours under Existing Conditions, 18.0 hours under the Intertidal Alternative, and 18.2 hours under the Subtidal Alternative. The results indicate that the proposed alternatives have the potential to increase erosion at the ORF site during a 100-year flood event.

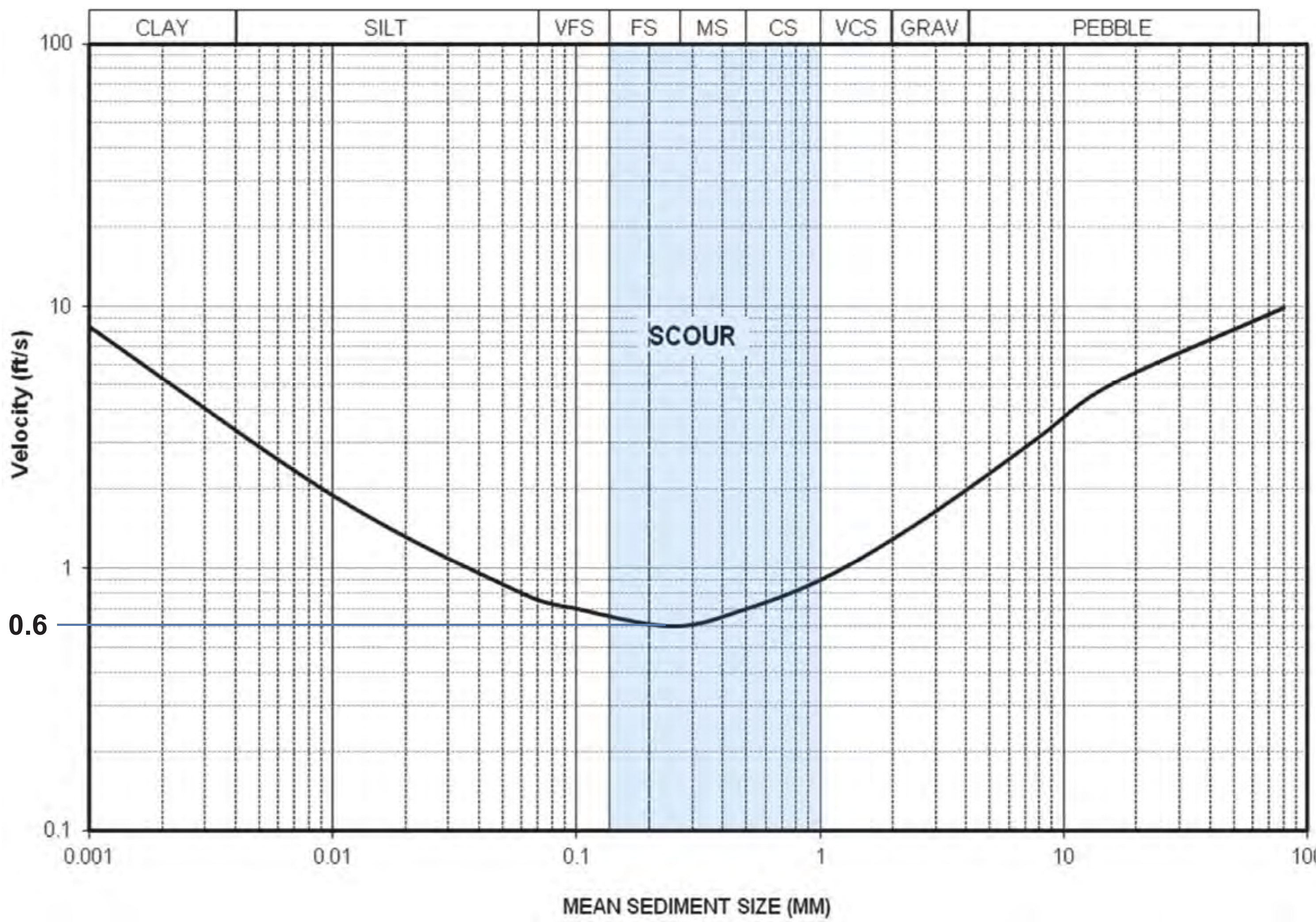


Figure 6.8 Hjulstrom Curve

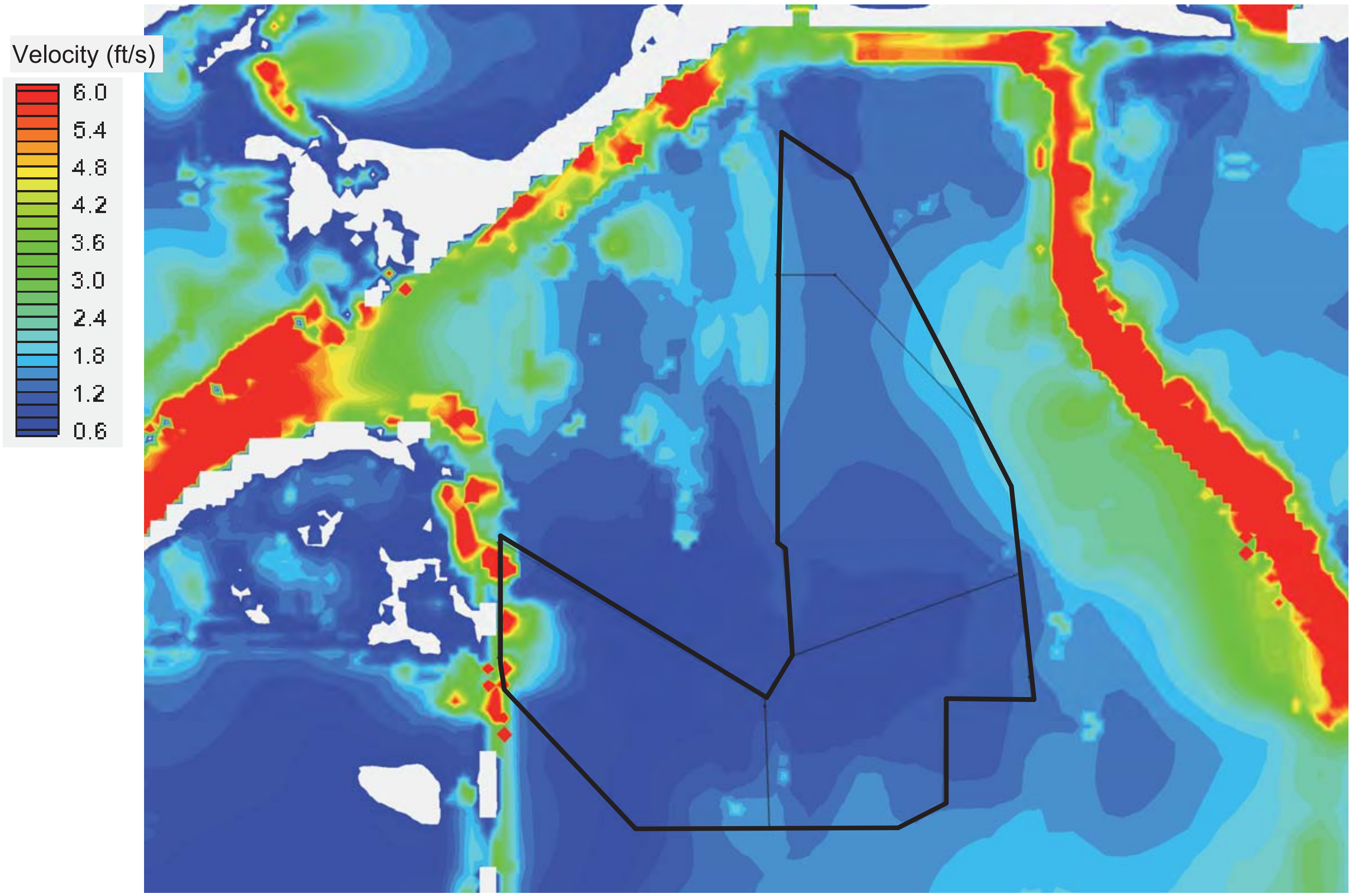
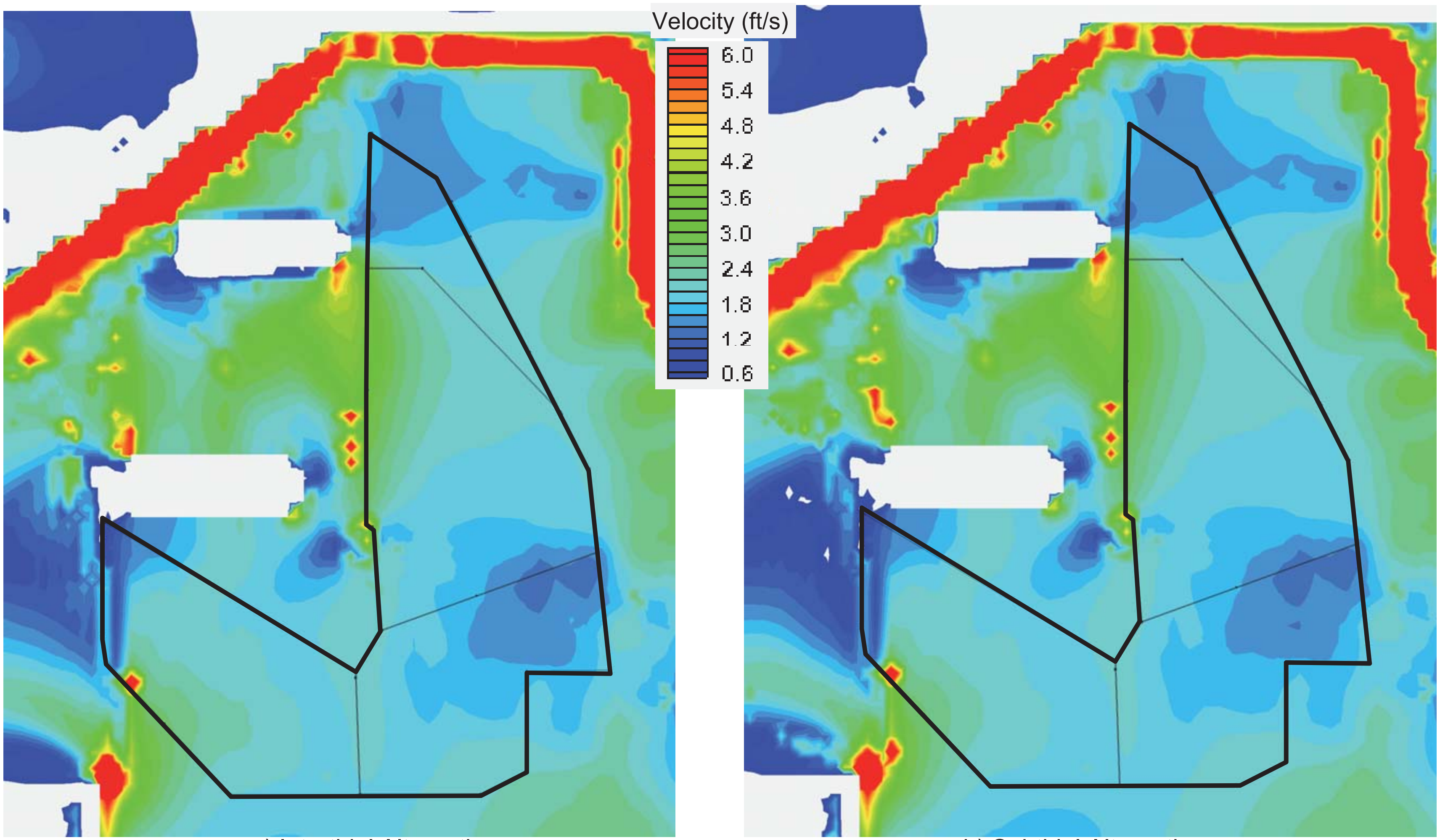


Figure 6.9 Area with 100-Year Flood Maximum Velocity Greater than 0.6 ft/s under Existing Conditions

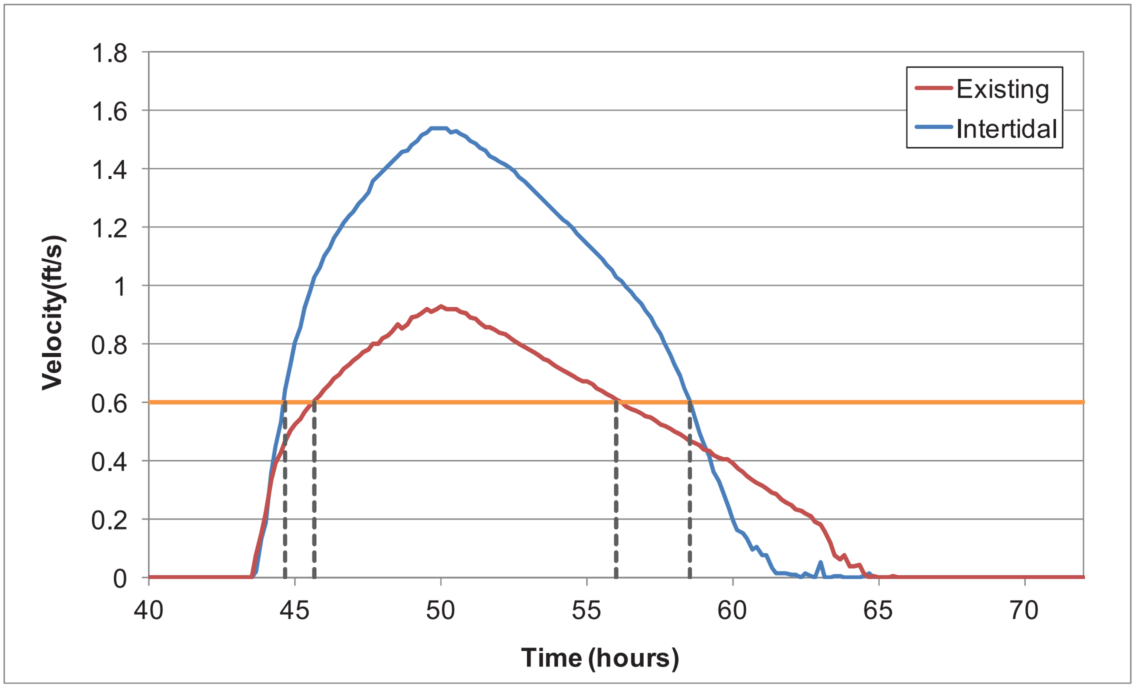


a) Intertidal Alternative

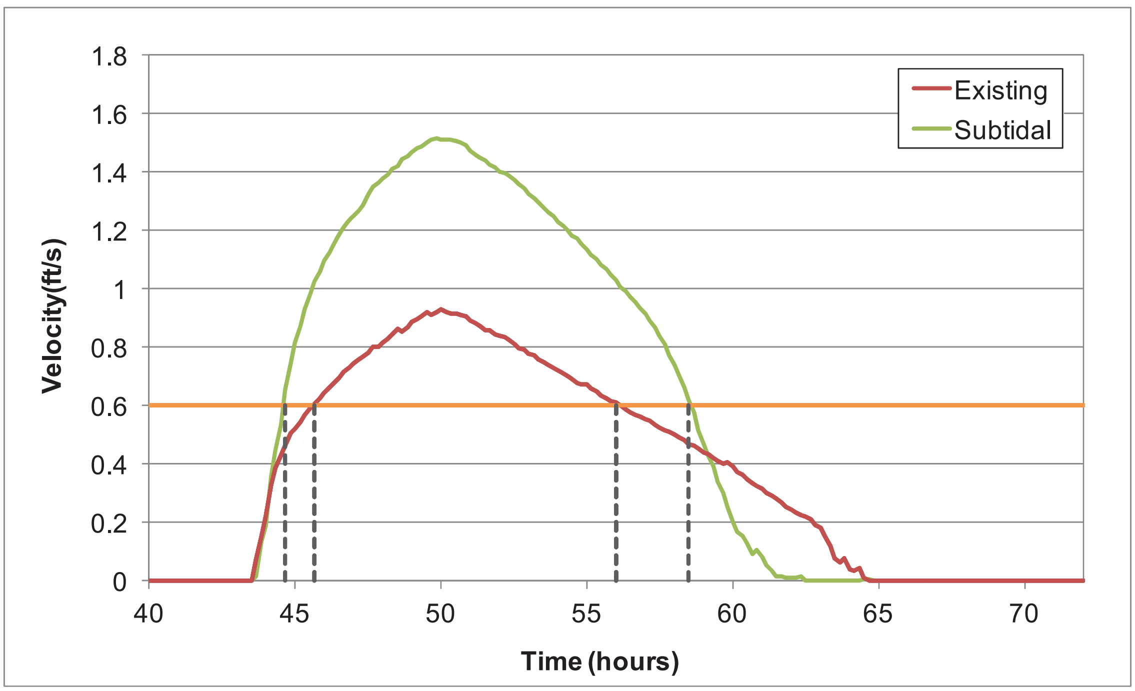
b) Subtidal Alternative

Figure 6.10 Area with 100-Year Flood Maximum Velocity Greater than 0.6 ft/s under Proposed Conditions

Figure 6.11 Locations for Calculating the Time Duration when Flood Velocities are Higher than 0.6 ft/s



a) Existing versus Intertidal



b) Existing versus Subtidal

Figure 6.12 Velocity Time Series at Location 56

While the proposed alternatives may increase erosion at the ORF site during a 100-year flood event, which by definition will occur once in 100 years (*i.e.,* 1% chance of occurring in any given year), the proposed alternatives may result in less erosion at the ORF site during more frequent smaller flood events (*e.g.,* 5-year flood event and 10-year flood event). The 5-year event will occur on the average once every 5 year (*i.e.,* 20% chance of occurring in any given year), while the 10-year flood event will occur on the average once every 10 years (*i.e.,* 10% chance of occurring in any given year). The areas within the ORF site with maximum flood velocities higher than 0.6 ft/s under Existing Conditions during a 5-year flood event and 10-year flood event are shown in Figure 6.13. As shown in the figure, most of the areas at the ORF Site have flood velocities less than 0.6 ft/s (indicated by the white areas) except along the western edge of the ORF site where flood water from Nestor Creek produces velocities higher than 0.6 ft/s. Similar velocity plots for the Intertidal Alternative and Subtidal Alternative are shown in Figures 6.14 and 6.15, respectively. As shown in the figures, with the proposed alternatives, the maximum velocities are less than 0.6 ft/s for almost the entire ORF site during the 5-year flood event and 10-year flood event. The results indicate that the proposed alternatives have the potential to decrease erosion at the ORF site during the more frequent smaller flood events (*e.g.,* 5-year flood event and10-year flood event).

In summary, the proposed Intertidal Alternative and Subtidal Alternative would potentially increase erosion at the ORF site during the 100-flood event, but would potentially decrease erosion during the more frequent, smaller flood events (*e.g.,* 5-year flood event and 10-year flood event). The overall potential impact of the proposed alternatives on erosion across the ORF 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.

If it is desired to minimize the potential erosion impact of the proposed alternatives across the ORF site during a 100-year flood event, vegetation can be planted at the site to increase friction (*i.e.,* Manning's coefficient) to slow down the flow. In addition to increasing friction, the roots of the vegetation would help bind the soil, making it less erodible (*i.e.,* the flood velocity for initiation of erosion would become higher than 0.6 ft/s). It was determined that if the Manning's coefficient is increased to 0.15 from the existing of 0.05 for the ORF site, the flood velocities for the proposed alternatives would be slowed down to approximately the same as those under Existing Conditions. Figure 6.16 shows the differences in maximum flood velocities between the proposed Intertidal Alternative and Subtidal Alternative with vegetation (*i.e.,* Manning's Coefficient of 0.15) and Existing Conditions. It can be seen from the figure that with the higher Manning's coefficient, the maximum flood velocities with the proposed alternatives are lower than those under Existing Conditions (the blue areas in the figure) for the eastern portion of the ORF site. For the area adjacent to Nestor Creek, the maximum velocities under the proposed alternatives would still be slightly higher (the yellow areas in Figure 6.16) than those under Existing Conditions. In general, the areas with reduced velocities (blue) are slightly larger than the areas with increased velocities (yellow). Hence, the erosion conditions at the ORF site

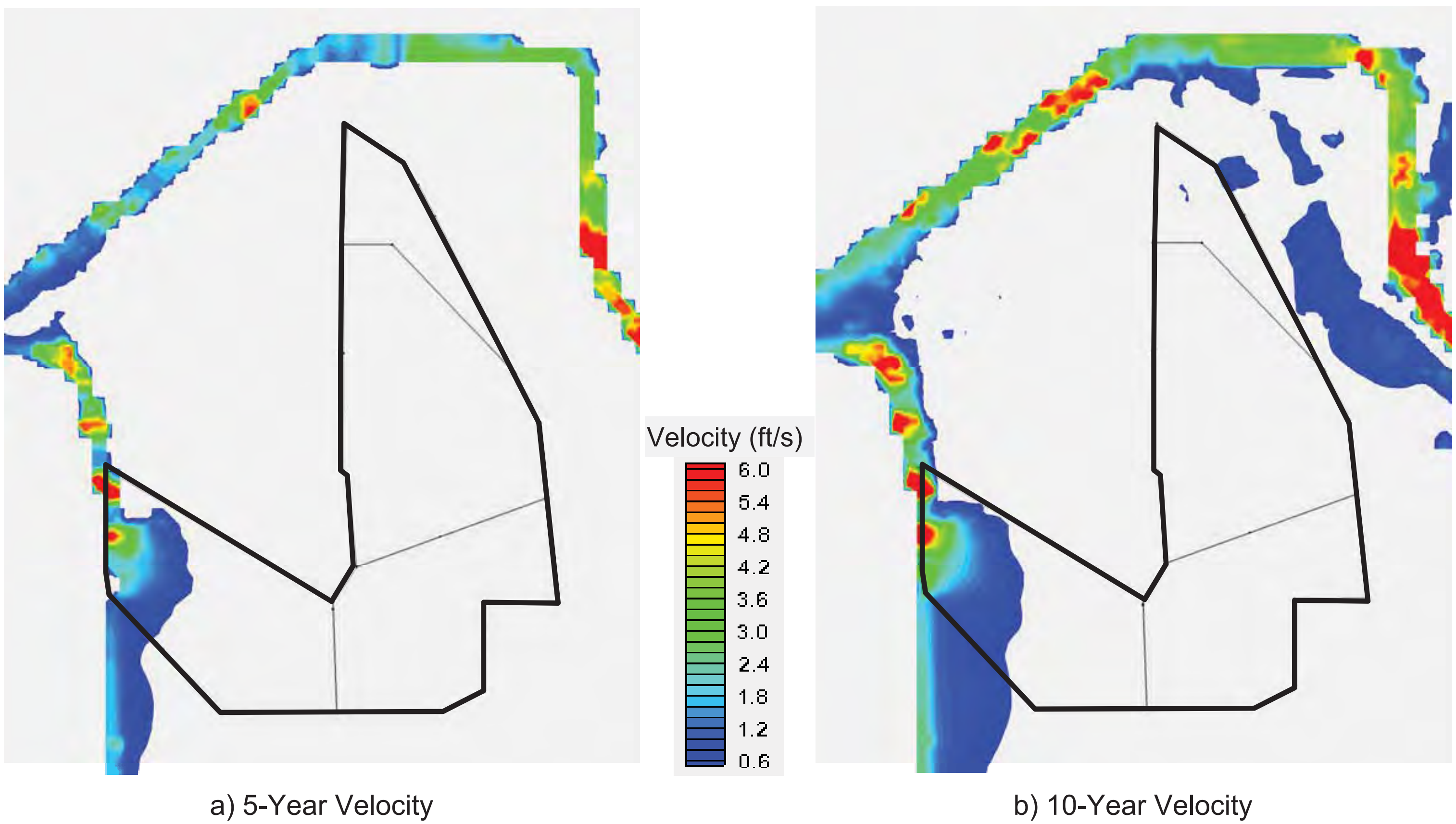
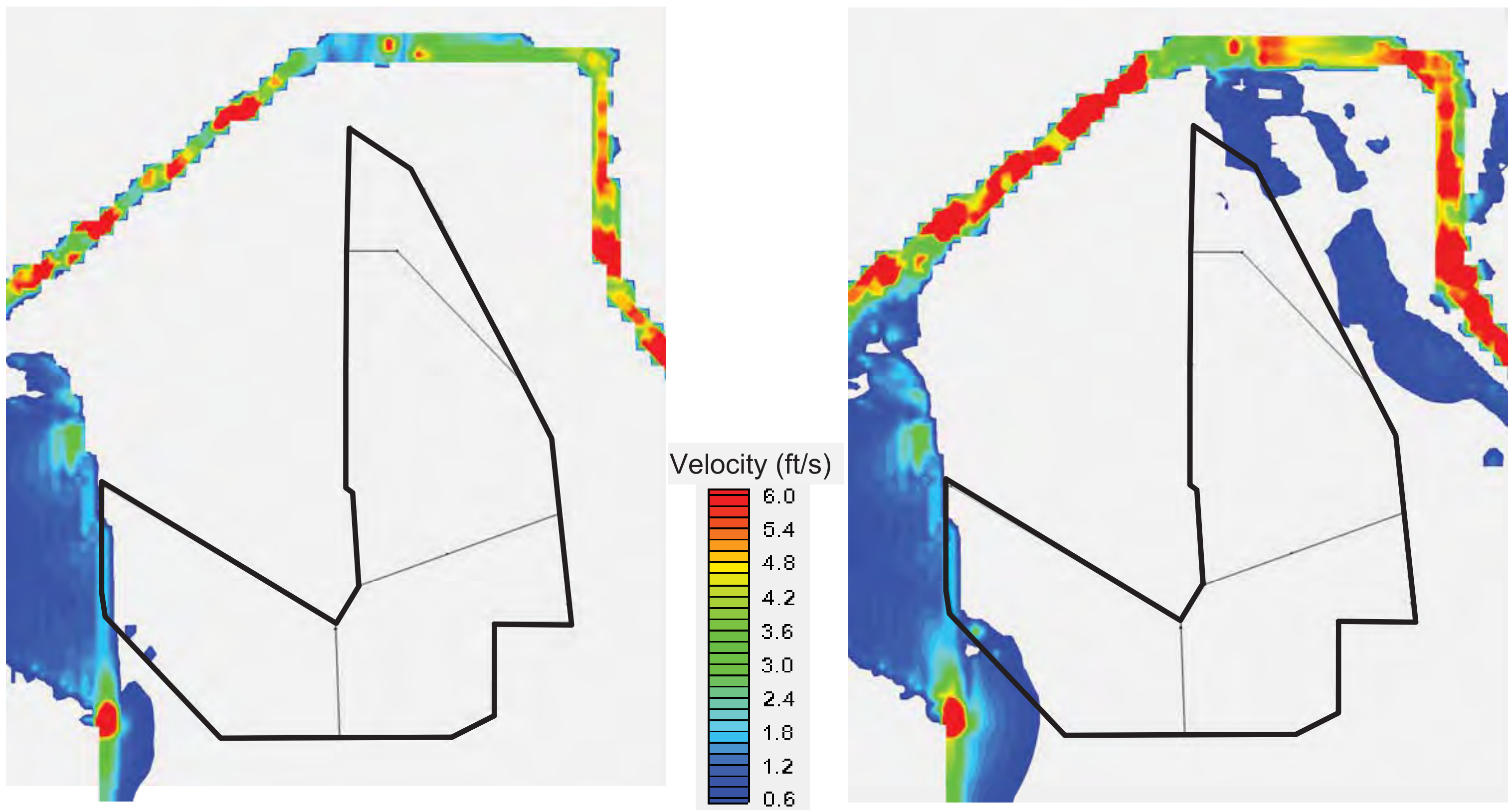


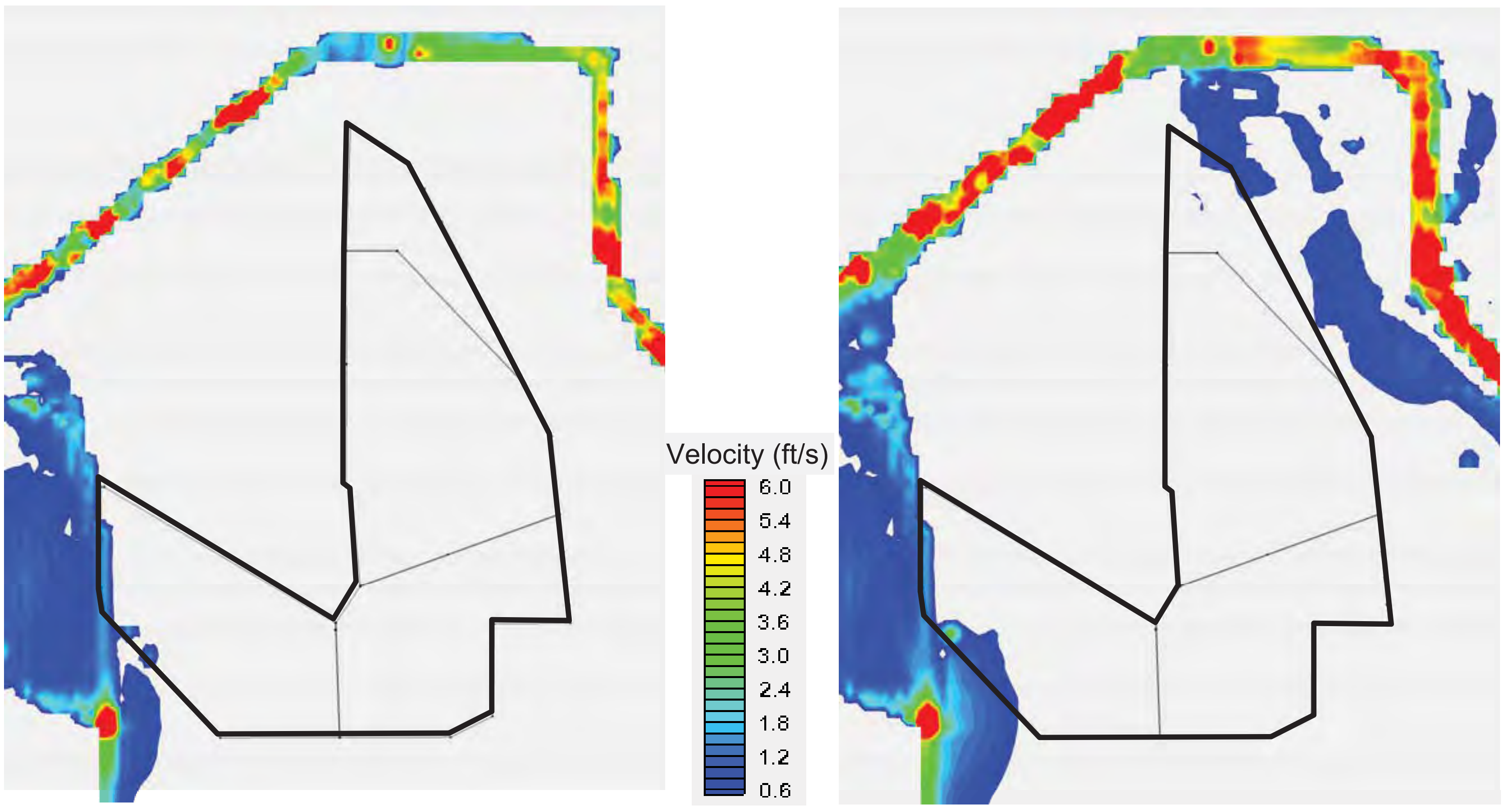
Figure 6.13 Maximum Velocity of ORF Site under Existing Conditions



a) 5-Year Velocity

b) 10-Year Velocity

Figure 6.14 Maximum Velocity of ORF Site under Intertidal Alternative Conditions



a) 5-Year Velocity

b) 10-Year Velocity

Figure 6.15 Maximum Velocity of ORF Site under Subtidal Alternative Conditions

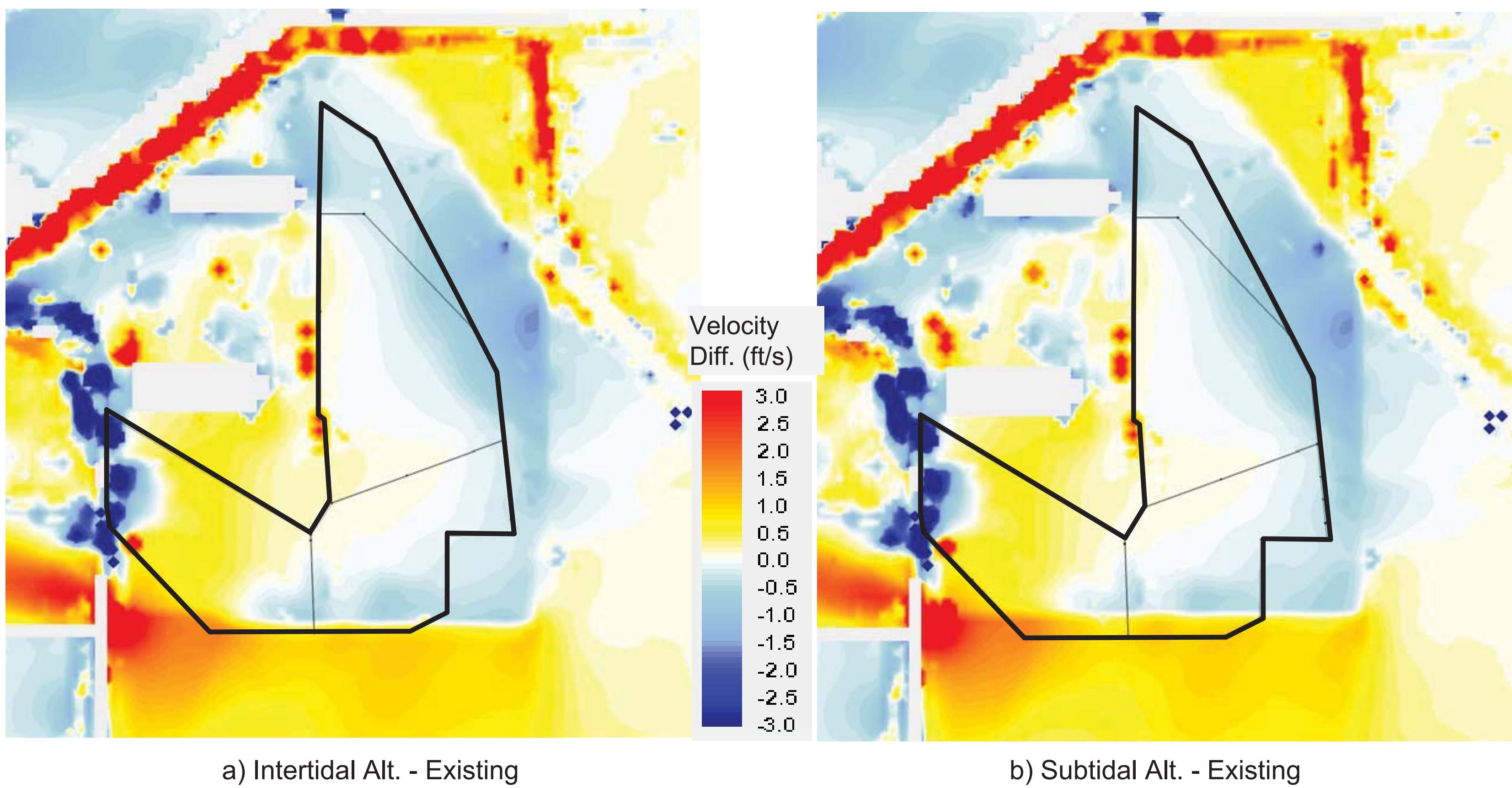


Figure 6.16 Difference in Maximum Velocity Between Proposed Conditions and Existing Conditions for a 100-Year Flood Event

under the 100-year flood event are likely to be similar between the proposed alternatives with vegetation and Existing Conditions.

Besides the project area, other areas with observable change in velocities include the areas along the bike path, Pond 15, and the levees along Ponds 12 and 14. Changes in velocity at these locations are further described below.

6.3.2 Bike Path

The proposed alternatives would result in changes to the flood velocities in the river channel along the bike path. A closer view of the differences in the maximum velocity along the bike path is provided in Figure 6.17. The northern portion of the bike path along Pond 48 is not flooded (i.e., flows do not overtop the bike path) under Existing or proposed conditions. In this area, higher velocities occur in the river channel along the bike path, while lower velocities occur in the river channel along the center and south portions of the bike path. Water elevations and velocities along the river channel near Pond 48 (Location A) for Existing Conditions, Intertidal Alternative, and Subtidal Alternative are compared in Figure 6.18. In the top panel, water elevations for the Intertidal (orange line) and Subtidal Alternative (green line) are lower compared to Existing Conditions (blue line). The corresponding velocities for the proposed alternatives, shown in the bottom panel, are higher than Existing Conditions due to the reduced water depth. These higher velocities in the river channel are similar in magnitude to velocities that occur at the center and south ends (adjacent to Pond 20 and 22) under Existing Conditions. In general, erosion impacts to the river channel along the north end of the bike path will be similar to erosion conditions currently occurring along the river channel at the south end of the bike path. In other words, the proposed alternatives would essentially shift the higher velocities along the river channel from the south portion of the bike path to the north portion of the bike path. A rock revetment could be placed along the northern portion of the bike path to prevent potential bank erosion caused by the increase in flood velocities associated with the proposed alternatives. Based on the 100-year flood velocities, a one-foot layer of 5-inch (D_{50}) rock would be sufficient to prevent erosion along the bank. A typical cross-section for this revetment and the proposed location are both shown in Figure 6.19.

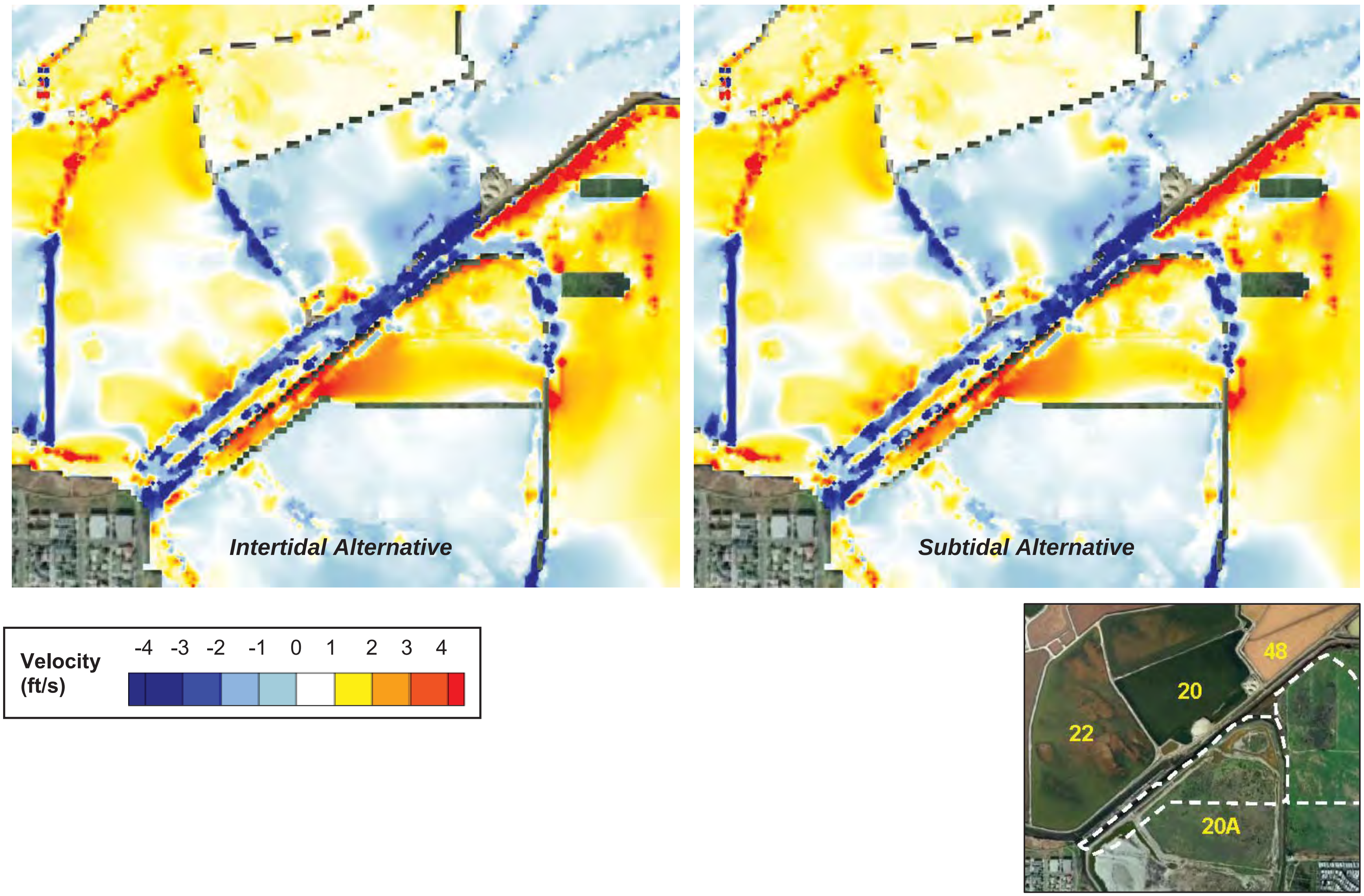


Figure 6.17 100-Year Flood Erosion Impacts along Bike Path

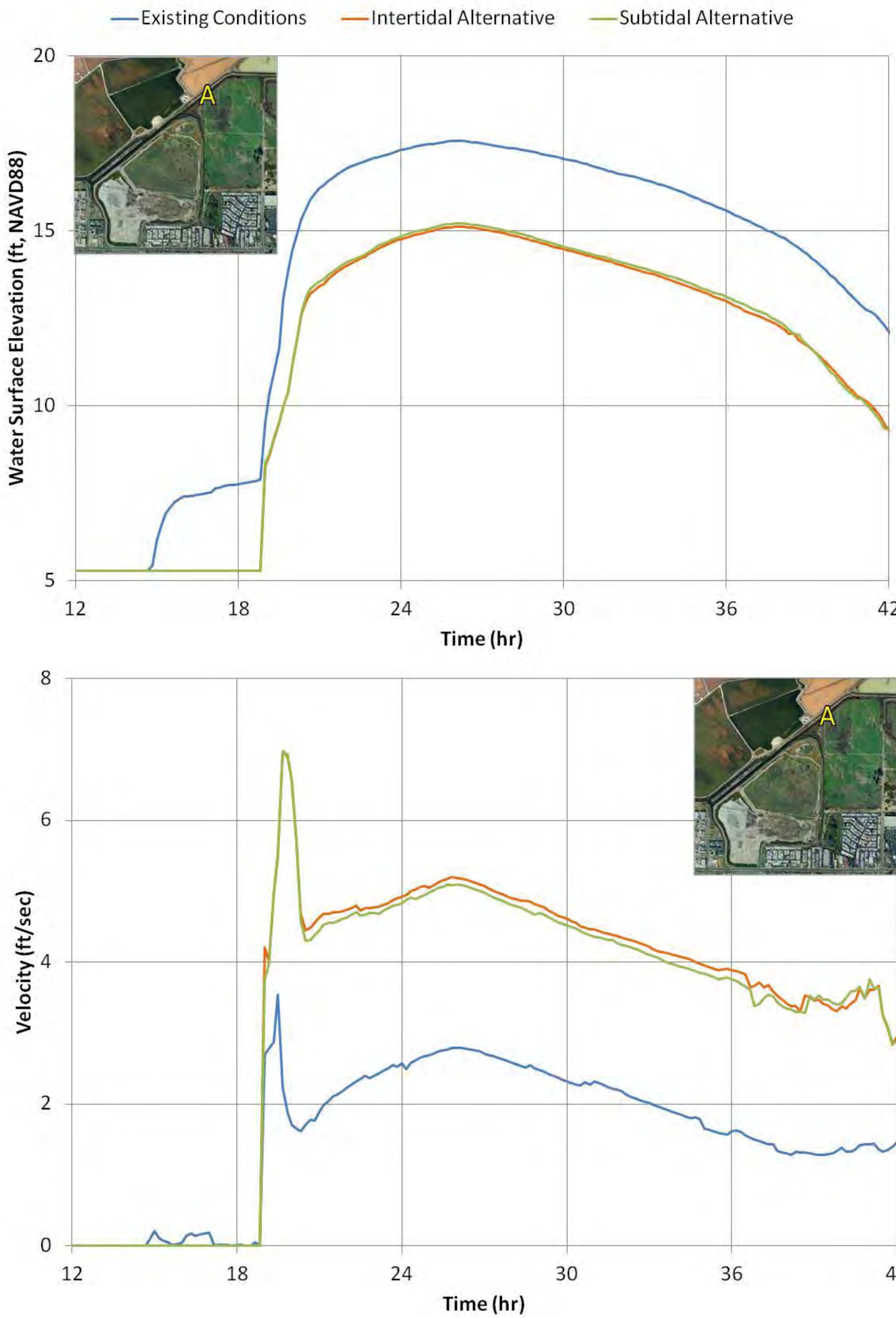


Figure 6.18 100-Year Flood Water Elevation and Velocity Comparisons at Location A

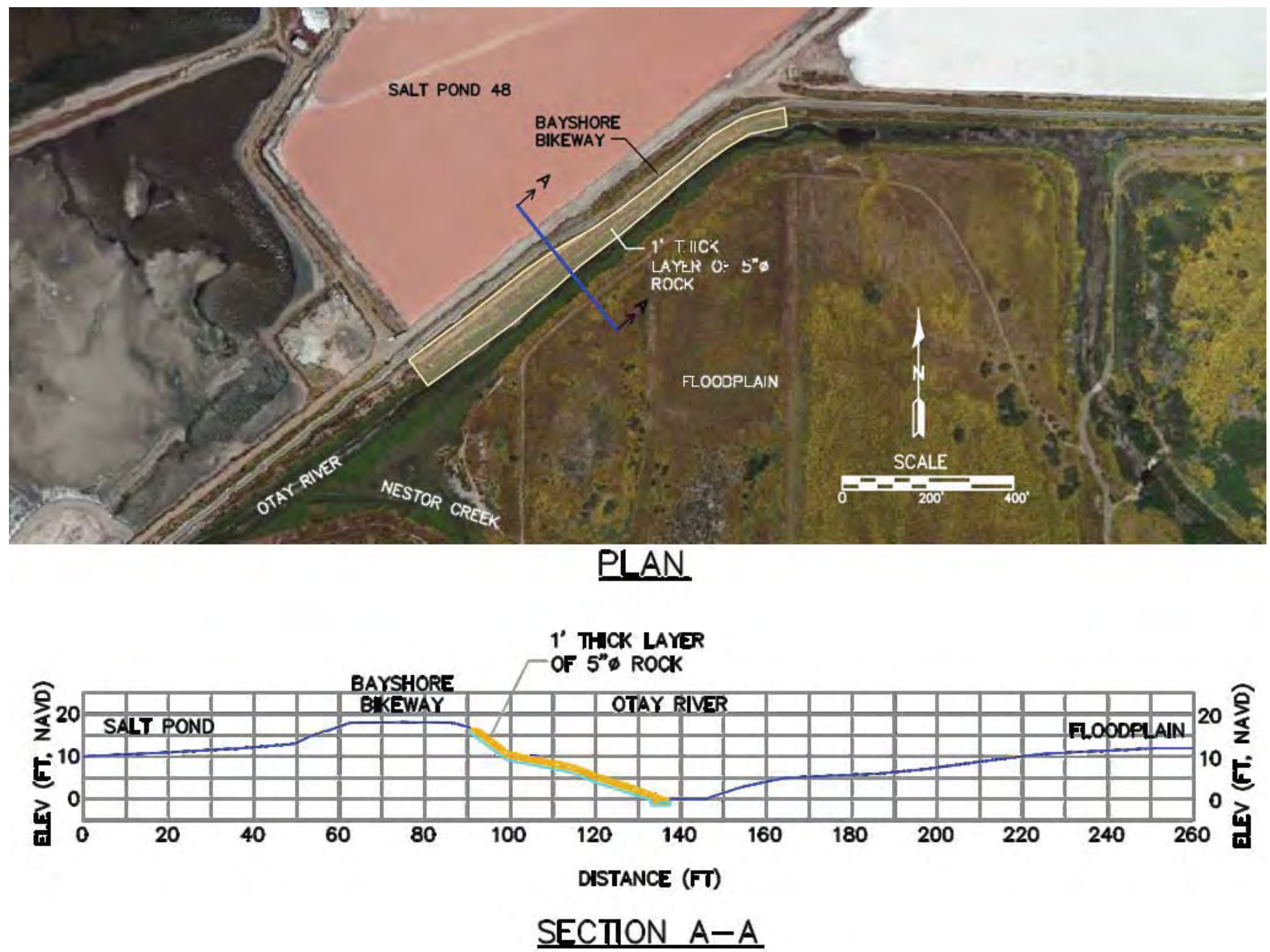


Figure 6.19 Proposed Revetment Location and Typical Cross-section

Along the central portion of the bike path along Pond 20, the bike path is overtopped into Pond 20 during the 100-year flood. Under the proposed alternatives, both flood elevations and velocities along the river channel and bike path are lower compared to Existing Conditions. Hence, no erosion impacts are anticipated in this stretch of the river channel or bike path.

Along the southern portion of the bike path, lower velocities in the river channel would occur under the proposed alternatives as compared to Existing Conditions. However, higher flood velocities were shown to occur along the bike path and Pond 22 levee. These higher velocities are attributed to the increase in flow over the bike path and levee. Water elevations and velocities of the flows overtopping the bike path (Location B) are compared in Figure 6.20. As shown in the figure, the increase I flow in this area would result in higher water elevations and velocities for both the Intertidal (orange line) and Subtidal Alternatives (green line) as compared to Existing Conditions (blue line).

6.3.3 Ponds 12, 14 and 15

Modifications to Pond 15 under the proposed alternatives would result in changes in velocities surrounding Pond 15, as illustrated in Figure 6.21. Differences in velocities occur along the levee separating the salt ponds and San Diego Bay. Lower velocities are shown along Pond 15 since flood flow no longer overtops the levees at Pond 15. Higher velocities are apparent along the levees of Ponds 12 and 14 due to higher flows overtopping of the levees into San Diego Bay. Under the proposed alternatives, flood elevations in Ponds 12 and 14 are higher due to the redistribution of flows through the salt ponds and diversion of flows around Pond 15, as previously discussed in Section 5.2.4. The higher flood elevations would cause an increase in flows and velocities across the levees into San Diego Bay. The proposed alternatives effectively shift the higher velocities due to flows overtopping the levee from Pond 15 to Ponds 12 and 14. The higher velocities may increase erosion along the levees for Ponds 12 and 14.

The isolation of Pond 15 from flood flows also increases flows into Ponds 28 and 29. Differences in velocities occur along the east side of Pond 15, as shown in Figure 6.21. Decreases in velocity are observed along the Pond 15 levee due to the raising of the levee under the proposed alternatives. Increases in velocity are shown to occur along the channel between Pond 15 and 28. However, the range in velocities occurring along this channel is the same for existing and proposed conditions, as shown previously in Figures 6.3 and 6.5. Erosion impacts along the channel between Ponds 15 and 28 are likely to be localized scour in limited areas of the channel. Increases in flow into Ponds 28 and 29 also result in higher velocities within the ponds, which may result in localized scour where flows overtop the levee.

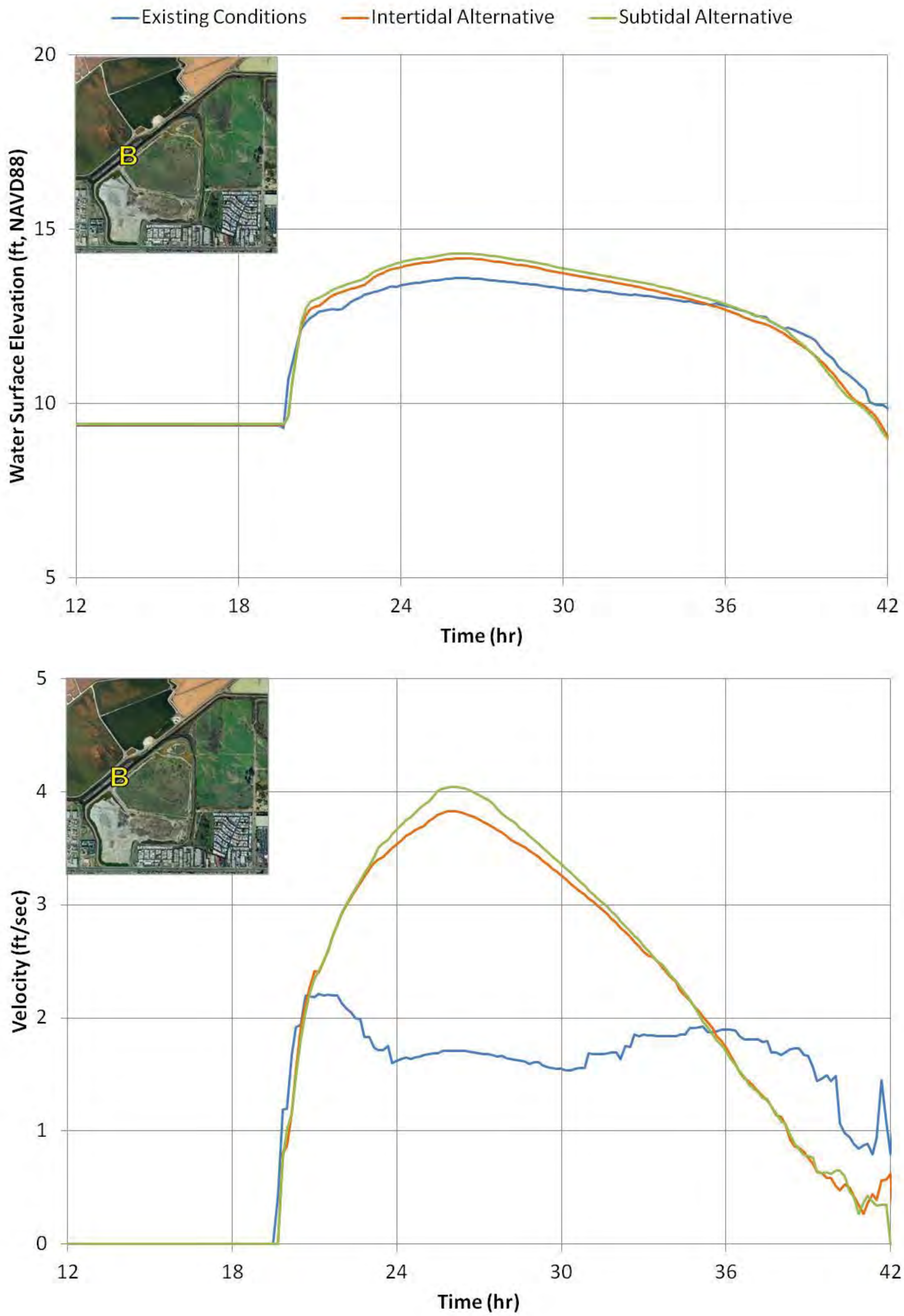


Figure 6.20 100-Year Flood Water Elevation and Velocity Comparisons at Location B

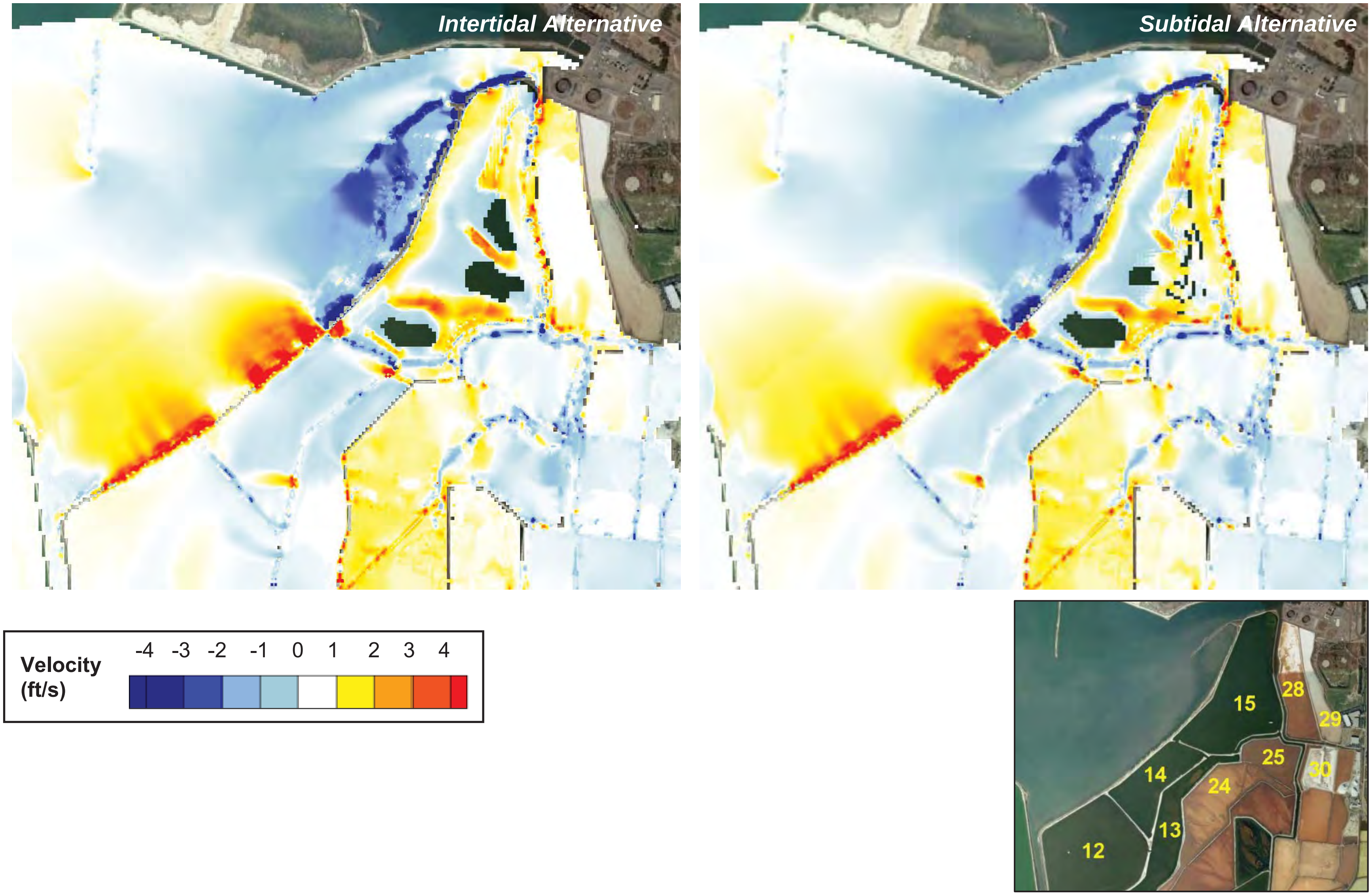


Figure 6.21 100-Year Flood Erosion Impacts near Pond 15

6.4 SUMMARY

Hydrodynamic modeling was conducted to establish flood velocities for Existing Conditions, Intertidal Alternative, and Subtidal Alternative. In general, the highest velocities occur along the river channel, as well as across levees when flow overtopping occurs. Under the proposed alternatives, the velocity distribution in the ORF (ORF) would be altered due to distribution of flood flows through the proposed alternatives. Differences in the maximum flood velocities between proposed alternatives and Existing Conditions were used to characterize and qualitatively evaluate potential erosion impacts. Areas with the same or lower velocities than Existing Conditions are expected to have no erosion impacts, while areas with higher velocities may have erosion impacts.

For most of the ORF, the proposed alternatives will not change flood velocities, including tidally influence areas such as the Western Salt Pond Restoration Project (formerly Ponds 10A, 10, and 11). In general, no erosion impacts are expected within most of the salt ponds. Decreases in erosion impacts were determined for Ponds 20 and Pond 15, as well the central portion of the bike path and river channel adjacent to the proposed wetland. Minor reductions in erosion impacts were determined for several ponds on the eastern side of the salt ponds.

The proposed alternatives divert flood flows through the project area resulting in higher velocities along the northern portion of the bike path. A rock revetment could be placed along this portion of the bike path embankment to mitigate the potential increase in bank erosion. High velocities were also predicted in areas east of Nestor Creek that contain highly contaminated soils. Based on the soil characteristics for the area, the soils are likely to erode under existing conditions during a 100-year flood.

The proposed alternatives will also result in erosion impacts along the levees separating the salt ponds and San Diego Bay. Under the proposed alternatives, Pond 15 would be isolated from the flood area, thereby increasing flood elevations in Ponds 12, 14 and 28. The overtopping of Pond 15 into San Diego Bay under Existing Conditions will be diverted to Ponds 12 and 14. The overtopping of the Pond 12 and 14 levees into San Diego Bay may increase erosion along the levees. Higher velocities that may result in localized scour were also determined along the levee between Ponds 15 and 28.

7. Fluvial Sedimentation Analysis

7.1 Approach

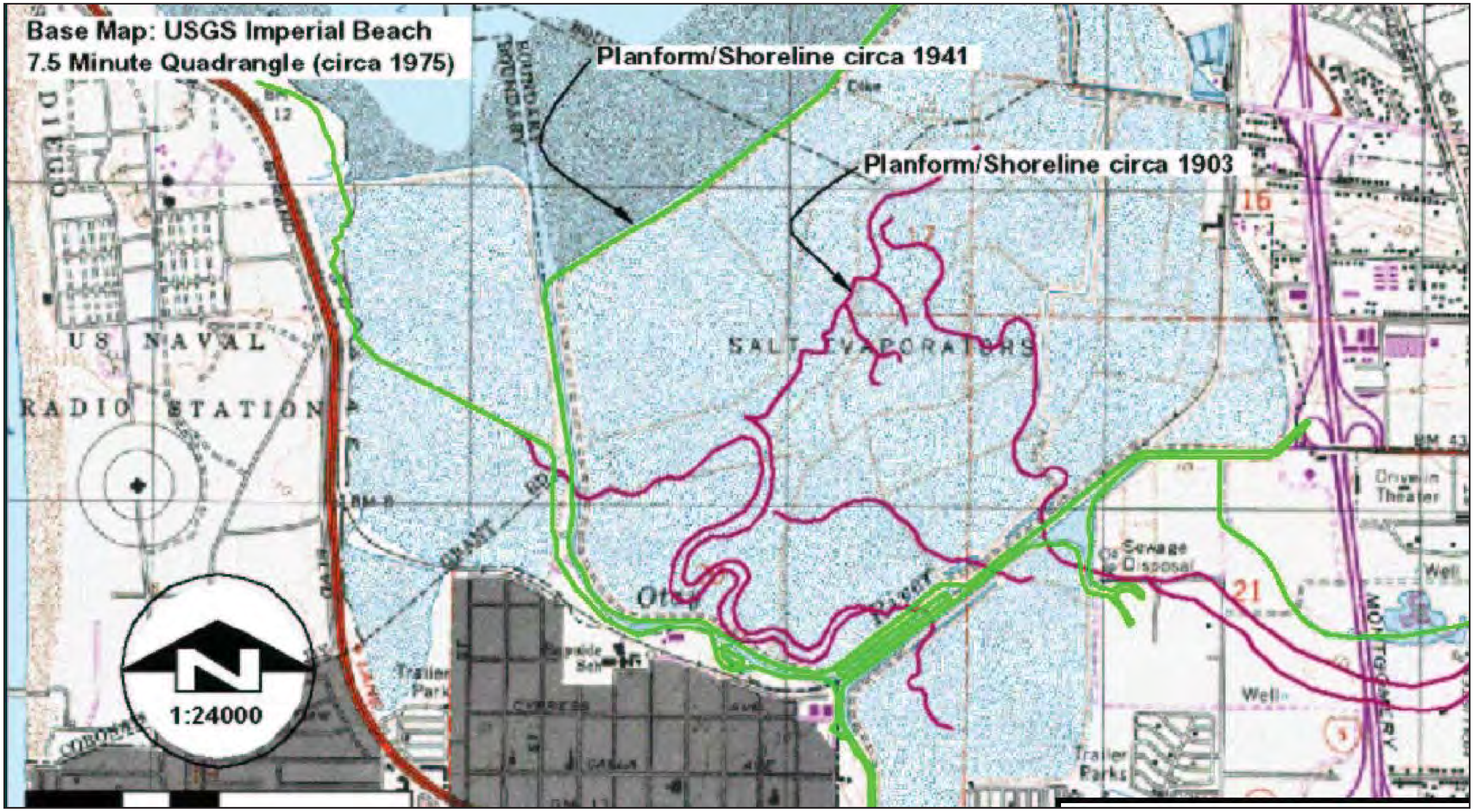
A fluvial sedimentation analysis was conducted to evaluate fluvial sediment delivery from the upstream watershed to the proposed wetlands and the subsequent rate of sedimentation in the proposed wetlands. Sedimentation at the mouth of the Otay River (where the Otay River meets San Diego Bay) associated with coastal processes (*e.g.,* tides, waves) is addressed in a companion study (Jenkins, 2014). The approach for the fluvial sedimentation analysis is summarized below.

1. Estimate the annual sediment loadings from the Otay River Watershed
2. Evaluate the portion of sediment loadings from the Otay River Watershed that will get to the proposed wetland area
3. Estimate the annual sedimentation rate in the wetland based on the portion of the sediment entering the wetland that is likely to settle in the wetland

7.2 Sediment Loading from Otay River Watershed

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 river bed, while finer sediment generally deposits within the river floodplain or delta that forms where the river meets San Diego Bay.

Historically, the downstream end of the Otay River was a typical river delta with multiple pathways to San Diego Bay. This “natural” river configuration was altered by the channelization of the river that has occurred through the construction of dikes and levees for salt ponds and agriculture practices (Aspen 2006 and River Partners 2008). Changes in the river configuration are illustrated in Figure 7.1 based on a comparison of the river in 1903 and 1941. In the figure, the historical delta features are indicated by the magenta lines showing the river planform circa 1903. The river floodplain contained multiple meandering channels leading to San Diego Bay. The channelized river is shown by the green lines based on the river alignment circa 1941. The river pathway has been confined along the edges of the floodplain, which is similar to the current condition of the river. Changes to the lower end of the Otay River are also illustrated by maps of the floodplain area circa 1902, 1930, 1950, and 1978 provided in Figure 7.2. The earlier maps circa 1902 and 1930 show the delta formation along San Diego Bay. The 1950 and 1978 maps show salt ponds and/or agricultural areas in the former river delta.



Source: Aspen 2006

Figure 7.1 Historical Changes to the Otay River

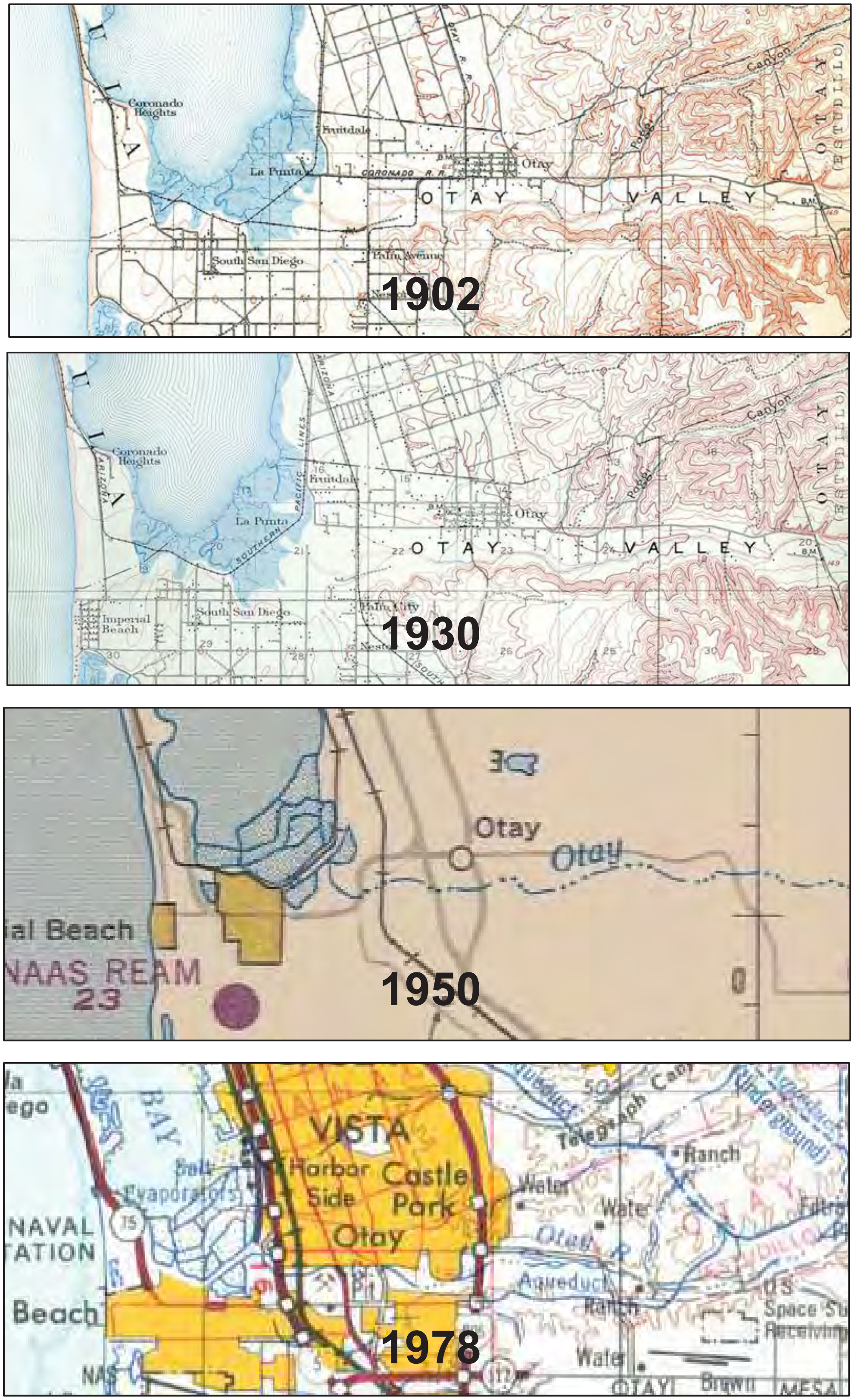


Figure 7.2 Historical Maps of the Otay River near San Diego Bay

Today, essentially all flows and associated sediment from the upper 68% of the watershed are impounded at the Upper and Lower Otay Reservoirs, which are a part of the City of San Diego water supply system. The Upper Otay Reservoir is located at the end of Procter Valley, retaining water and sediment from Proctor Valley Creek. Flows overtopping the upper reservoir are connected to the lower reservoir via a spillway. The Lower Otay Reservoir forms behind Savage Dam, collecting water and sediment from Dulzura Creek, Hollenbeck Canyon, and Jamul Creek. The lower reservoir also receives water from Cottonwood Creek via Morena Dam and Barrett Diversion Dam as well as the Second San Diego Aqueduct.

The Lower Otay Reservoir was originally created in 1897 with water impounded behind a rock-fill structure with a steel core. A series of large storms in January 1916 resulted in failure of the original dam. The catastrophic flood that included loss of life resulted in the destruction of bridges and structures along the canyon and stripping of vegetation and sediment down to bedrock. The flood wave was estimated to be 100-ft high near the dam and 20-ft high in the lower canyon with a peak discharge of 37,400 cfs (USGS 1918), which exceeds the estimated 100-year flood event. The dam was reconstructed between 1917 and 1919 as a gravity-arch dam and renamed Savage Dam, which still stands today.

Savage Dam has reduced sediment delivery by retaining nearly all sediment from the upper watershed resulting in a sediment deficit to the lower river. Sources of fluvial sediments are limited to the 46-mi^2 watershed below the Lower Otay Reservoir. Hence, the sedimentation impact analysis was geographically limited to this region.

Fluvial sediment loading from the Otay River Watershed below the Lower Otay Reservoir was determined from prior studies. Two different methods were analyzed resulting in a range of sediment loadings. The methods were empirically based and account for drainage area and watershed conditions. For Method 1, the sediment loading was determined from estimates for the San Diego River Watershed; and for Method 2, the sediment loading was obtained from a prior watershed loading estimate using a GIS-tool.

7.2.1 Method 1

For Method 1, sediment loading for the Otay River Watershed was estimated by scaling sediment loading estimates for the San Diego River. Given the geographical proximity and similar hydrologic conditions, the sediment loading for the Otay River Watershed was assumed to be proportional to the San Diego River Watershed based on drainage area. The San Diego River is located to the north of Otay River and extends from the Peninsular Ranges to the Pacific Ocean just south of Mission Bay. Similar to the Otay River Watershed, the upper portion of the San Diego River Watershed is controlled by two major reservoirs that cut off flows and sediment to the lower watershed. The San Diego River drainage area covers 432 mi^2 (1,119 km^2), of which 60% is controlled by the El Capitan Dam and San Vicente Dam. The El Capitan Dam was constructed in 1935 and is used by the City of San Diego for municipal uses and irrigation. The San Vicente Dam was constructed in 1943 and is also used by the City of San Diego for municipal uses.

Sediment loading from the San Diego River was previously estimated by Brownlie and Taylor (1981). Estimates were made using sediment rating curves developed from flow and sediment data collected along the river. As part of the study, annual sediment loads were estimated from 1913 to 1976 for actual and natural conditions, which indicated an average 90% reduction in sediment delivery due to the construction of the El Capitan and San Vicente Dams. Annual sediment loadings for the San Diego River (below the dams) showed a large variability from year to year, thus the average annual loading varied depending on the years selected for the average. In their report, Brownlie and Taylor (1981) provided average sediment loading between two time periods: (i) 1935 and 1956, and (ii) 1943 and 1956. Since the first time period overlaps the implementation of both dams in 1935 and 1943, only the average sediment loading for the second time period is used for this study. For that time period, the estimated average sediment load is1,585 yd^3/yr (1,212 m^3/yr).

Sediment loading for the Otay River Watershed was estimated by scaling the San Diego River sediment loading based on drainage area. A scale factor was calculated as the drainage area of the Otay River below the reservoir to the drainage area of the San Diego River below the reservoir. The resulting estimated sediment loading for the Otay River is 646 yd^3/yr (494 m^3/yr).

7.2.2 Method 2

The second estimate of sediment loadings was obtained from a previous estimate using the Otay Watershed Pollutant Loading (OWPL) Tool (Aspen 2006). The OWPL tool is an Excel spreadsheet setup to estimate annual pollutant loads from the Otay River Watershed and to evaluate best management practices (BMPs). It was developed using PLOAD, a GIS-based tool to calculate runoff volumes and pollutant loads for subwatersheds. The PLOAD calculations employ the EPA Simple Method, an empirical method for estimating pollutant loadings by land use based on drainage area, runoff coefficients, and pollutant event mean concentrations (EMCs). In the OWPL Tool, the Otay River Watershed below the Lower Otay Reservoir is delineated into nine subwatersheds that are individually characterized based on land use and mean annual precipitation. Land uses are used to define runoff coefficients and EMCs based on literature values.

As part of the OWPL tool development, annual loads were estimated for various pollutants including total suspended solids (TSS). The TSS EMCs were obtained from estimates determined by storm water monitoring in Los Angeles County (LACDPW 2000), except for agricultural land use, which was taken from Ackerman and Schiff (2003). Based on the OWPL tool, the annual sediment loading for the Otay River Watershed below the reservoirs was estimated to be 1,360 yd^3/yr (1,040 m^3/yr).

7.2.3 Summary

The estimated sediment loadings based on the above discussed two methods are used to define the likely range of sediment loadings from Otay River Watersheds, i.e. between 646 and 1,360 yd^3/yr. Overall, sediment loadings are relatively small since sediment from the upper portion of the watershed is not transported pass the Lower Otay Reservoir.

7.3 POTENTIAL SEDIMENT DELIVERY FROM OTAY RIVER TO PROPOSED WETLAND

Not all the sediment loadings from the Otay River Watershed will get to the proposed wetland since only portions of the discharge from the Otay River will go through the wetland. In addition depending on the sediment distribution in the sediment loads, some of the larger sediments will deposit along the river bed and only the fine sediments in suspension would be transported with the flow into the proposed wetland.

The total sediment loading generated from the watershed is comprised 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 estimate of sediment composition of 50% fines and 50% sands (Taylor 1981). A portion of the sediment load, primarily sands or gravels, will be primarily deposited within the river bed. Finer sediment material is more likely to stay in suspension and be transported with the river flow. Hence, as a first approximation, it is estimated that only about 50% of the estimated total sediment loadings from the watershed will stay in suspension, i.e. about 323 to 680 yd^3/yr.

Since only a portion of river flow and its associated suspended sediment would flow through the proposed wetland area, the suspended sediment load from the watershed to the proposed wetland area would actually be less than the above estimated 323 to 680 yd^3/yr. During flood events, a portion of the flow overtops the levees along the river and does not flow through the wetland. Based on TUFLOW model results, only about 15, 45 and 60 percent of the flood flow for the 25-, 50- and 100-year flood events will pass through the proposed wetland area. Since sediment loads in general are associated with flood events, based on the model results for the 25-, 50- and 100-year event, it is likely only about 50% of the estimated suspended sediment loads of 323 to 680 yd^3/yr would go through the proposed wetland area, i.e. the annual sediment load to the wetland would be in the range of 160 to 340 yd^3/yr.

7.4 POTENTIAL SEDIMENTATION RATE AT THE PROPOSED WETLAND

It is unlikely that all the suspended sediments passing through the proposed wetland will settle to the bed, but a conservative estimate of the sedimentation rate in the wetland is to assume all the suspended sediment would uniformly deposited over the proposed wetland area (29.62

acres). With this conservative assumption and the estimated annual suspended sediment load of 160 to 340 yd^3/yr, the estimated sedimentation rate in the proposed wetland area would be between 0.04 to 0.08 in/yr (1 to 2 mm/yr). If we assume only about half of the suspended sediment that passes through the proposed wetland would actually settle and stay in the wetland, the average annual sedimentation rate in the wetland would be of the order of 0.02 to 0.04 in/yr (0.5 to 1 mm/yr).

8. EFFECT OF SEA LEVEL RISE

8.1 OVERVIEW

On October 14, 2013, the California Coastal Commission (CCC) released the Draft Sea-Level Rise Policy Guidance for public comment (CCC, 2013). The draft guidance document was prepared by CCC staff to provide a theoretical framework for assessment of sea-level rise in Local Coastal Programs and Coastal Development Permits. The draft guidance policies recognize the science on sea-level rise is constantly evolving, but at the time of the report's publication, the best available science on sea-level rise in California is the 2012 *National Research Council (NRC) Report, Sea-Level Rise for the Coasts of California, Oregon and Washington: Past, Present and Future* (NRC, 2012). The NRC-recommended sea-level rise projections for Southern California (south of Cape Mendocino) are summarized in Table 8.1.

Table 8.1 Potential Sea Level Rise Ranges Using Year 2000 as the Baseline for Southern California (NRC Report 2012)

YEAR	RANGE OF SEA LEVEL RISE (INCHES)
2030	1.6 – 12
2050	5 – 24
2100	16.5 – 66

For this study, the potential effect of sea level rise (SLR) was evaluated for Year 2050 and 2100 using the upper bound of the projected SLR shown in Table 8.1, i.e. 24 inches for Year 2050 and 66 inches for Year 2100. It was assumed that the tide properties remain the same in the future, and SLR effectively simply raise the PMP tide described in Section 4.3.1 uniformly by 24 inches and 66 inches in Year 2050 and 2100, respectively. The resulted PMP tides used as downstream boundary condition for flood modeling for Year 2050 and 2100 are shown in Figure 8.1. In the figure, the timing for the arrival of the 100-year flood from Otay River, Poggi Canyon Creek and Nestor Creek at the upstream boundaries relative to the downstream PMP tides are also shown.

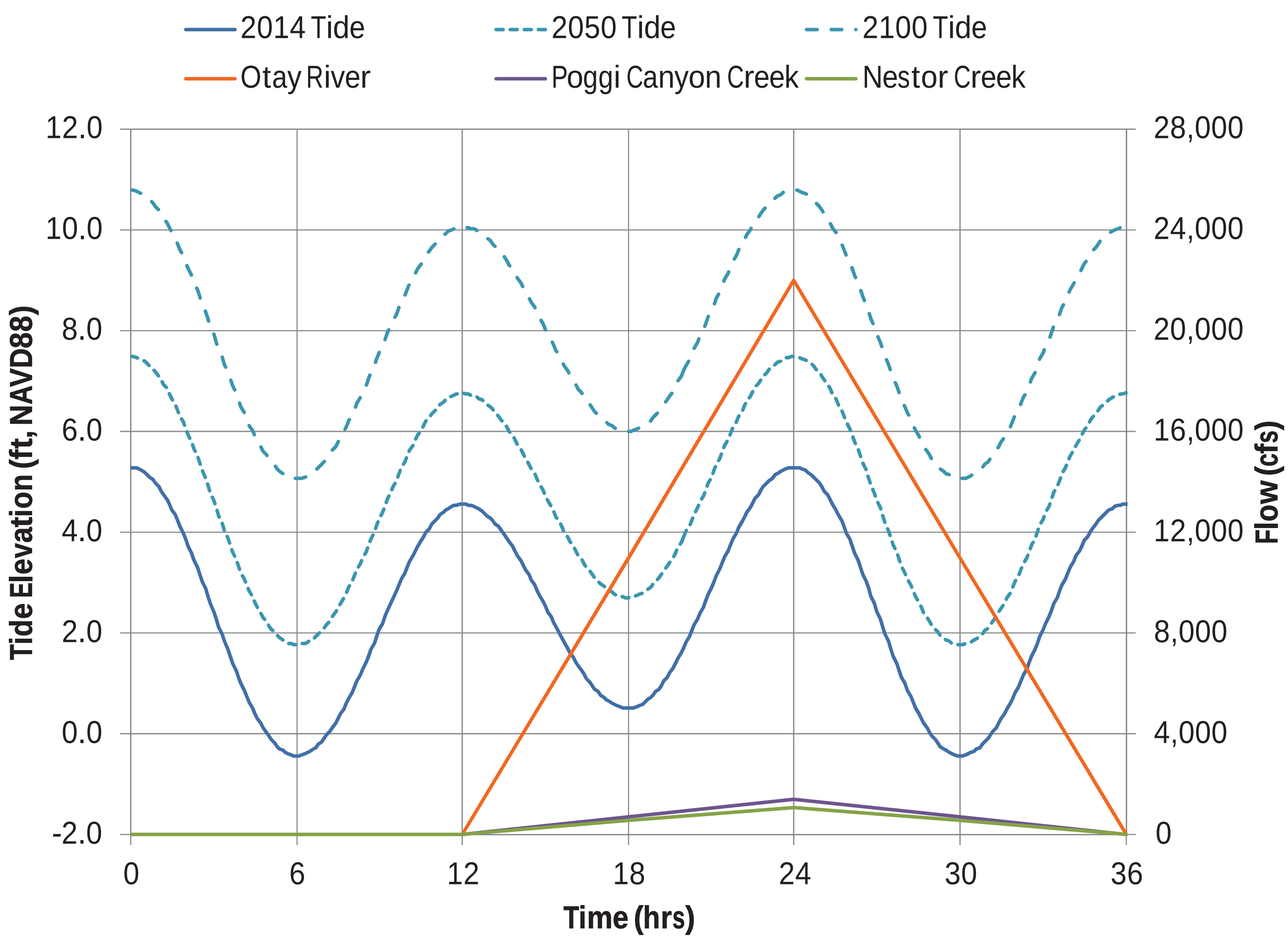


Figure 8.1 Parametric Mean Periodic Tides in Years 2050 and 2100 and 100-Year Flood Hydrographs

8.2 FLOOD MODELING RESULTS

8.2.1 Existing Conditions

The spatial plots of maximum water elevations for the entire model domain for current, year 2050 and 2100 sea levels under Existing Conditions are shown in Figure 8.2. As shown in the figure, there is no noticeable difference in the extent and flood elevations upstream of I-5 Bridge for Year 2050 and 2100 compared with current sea level condition and minor difference in the ORF. To better illustrate the difference in flood elevations for areas in the ORF, the maximum water elevations for the ORF are shown in Figure 8.3 with a different color scale that allows a better comparison for this area. As shown in the figure, the only difference in the maximum water elevations in the ORF between Year 2050 and current condition is at the restored Salt Ponds 10 and 11 which are connected to San Diego Bay. With only a 2-ft rise in SLR for Year 2050, the maximum tide water levels are still lower than the levees of the salt ponds; hence there is no change in the flood water elevations during the 100-year flood. However, for Year 2100 with a 5.5 ft rise in SLR, the tide elevations will be higher than the salt pond levees; hence the salt pond will be inundated as illustrated in Figure 8.3.

8.2.2 Flood Impact with Proposed Conditions (Intertidal and Subtidal Alternatives)

The spatial plots of maximum water elevations for the entire model domain for Existing Conditions and with proposed alternatives with Year 2050 SLR are compared in Figure 8.4. With the color scale that can show water elevations for the entire domain, there is no noticeable difference in the extent and flood elevations for the Existing Conditions and proposed alternatives. To better illustrate any potential impact of the proposed alternative to flood levels in the ORF, the maximum water elevations downstream of the I-5 Bridge are compared in Figure 8.5 with a color scale that can show smaller differences. Similar to the results shown in Figure 5.10 for current sea level, the proposed alternatives would result in slightly lower maximum flood water elevations near the proposed wetland areas compared to Existing Conditions. In Year 2050, with a 2-ft SLR, there is still no flooding at Pond 29 under Existing Conditions. However, as expected, since Pond 29 would be flooded under the proposed alternatives with current sea level, there would be increased flooding in Pond 29 in Year 2050.

Similar comparisons of maximum water elevations for Existing Conditions and under proposed alternatives for Year 2100 with 5.5-ft SLR are shown in Figures 8.6 and 8.7. The impacts of the proposed alternatives in 2100 would still be confined to areas near the proposed wetland location. However, with a 5.5-ft SLR in Year 2100, Pond 29 would be inundated even under Existing Conditions.

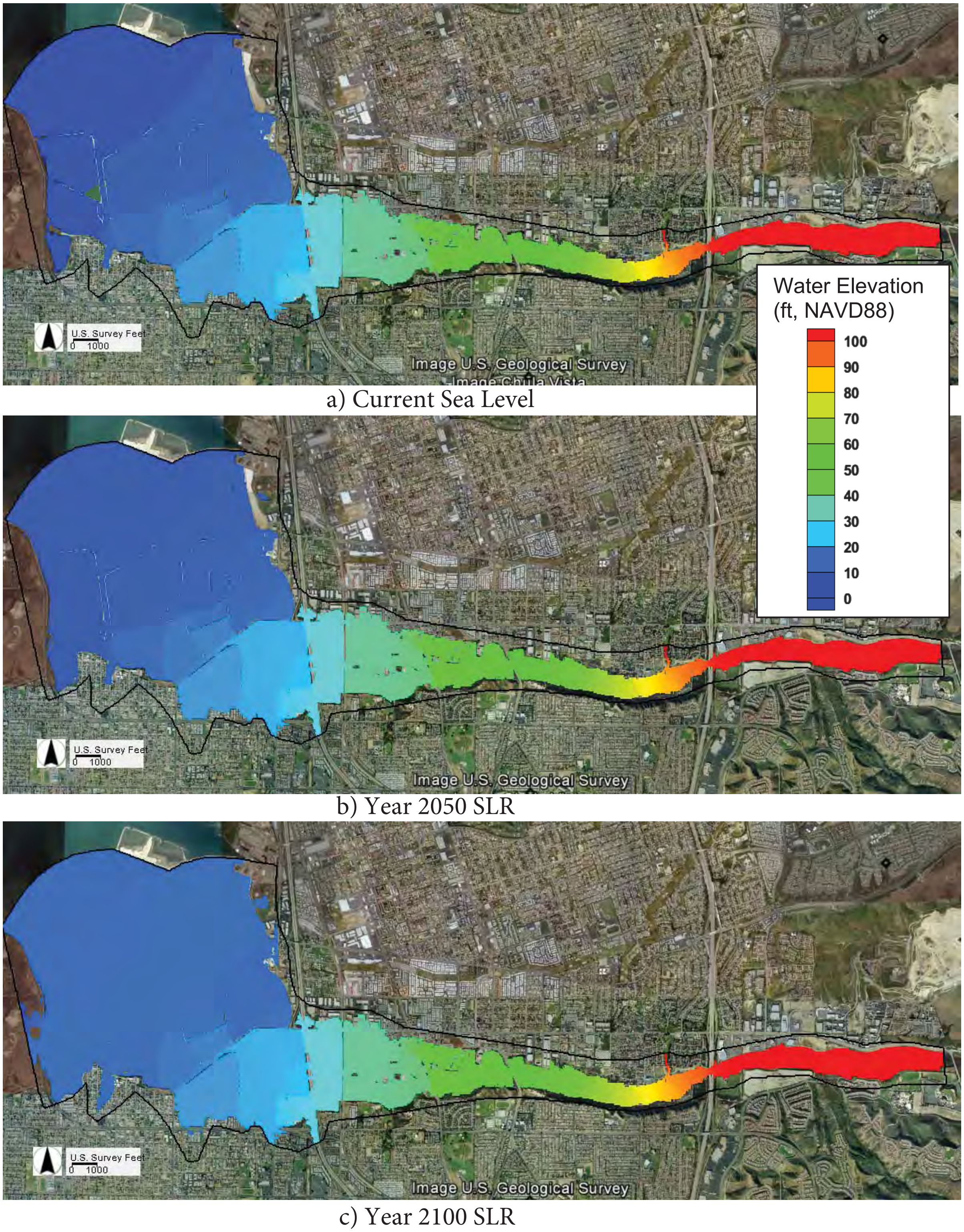


Figure 8.2 100-Year Flood Maximum Water Elevations under Existing Conditions for Current Sea Level, 2050 and 2100 SLR Scenarios

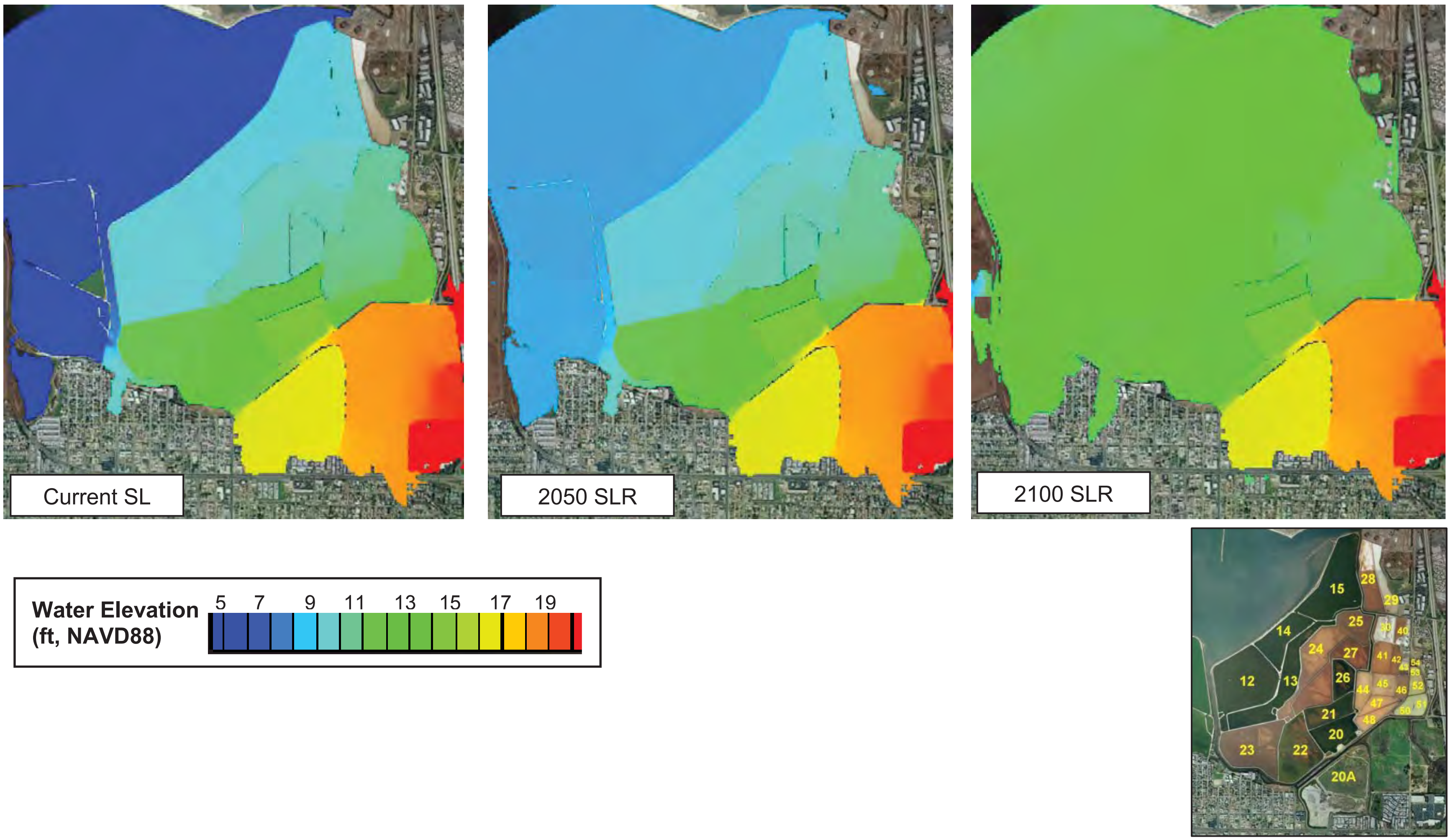


Figure 8.3 100-Year Flood Maximum Water Elevations in Floodplain under Existing Conditions for Current Sea Level, 2050 and 2100 SLR Scenarios

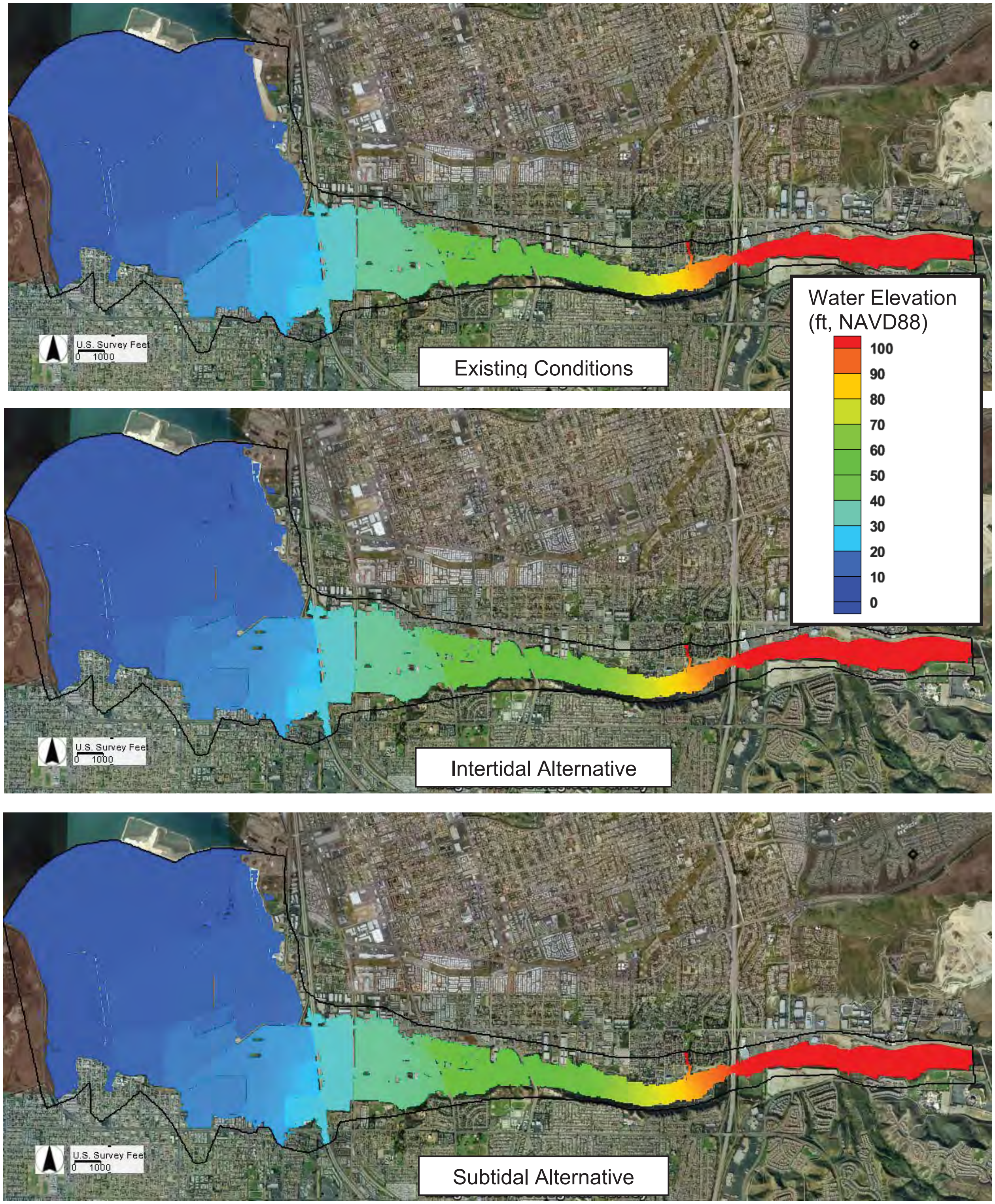


Figure 8.4 100-Year Flood Maximum Water Elevations under Existing and Proposed Conditions for 2050 SLR Scenario

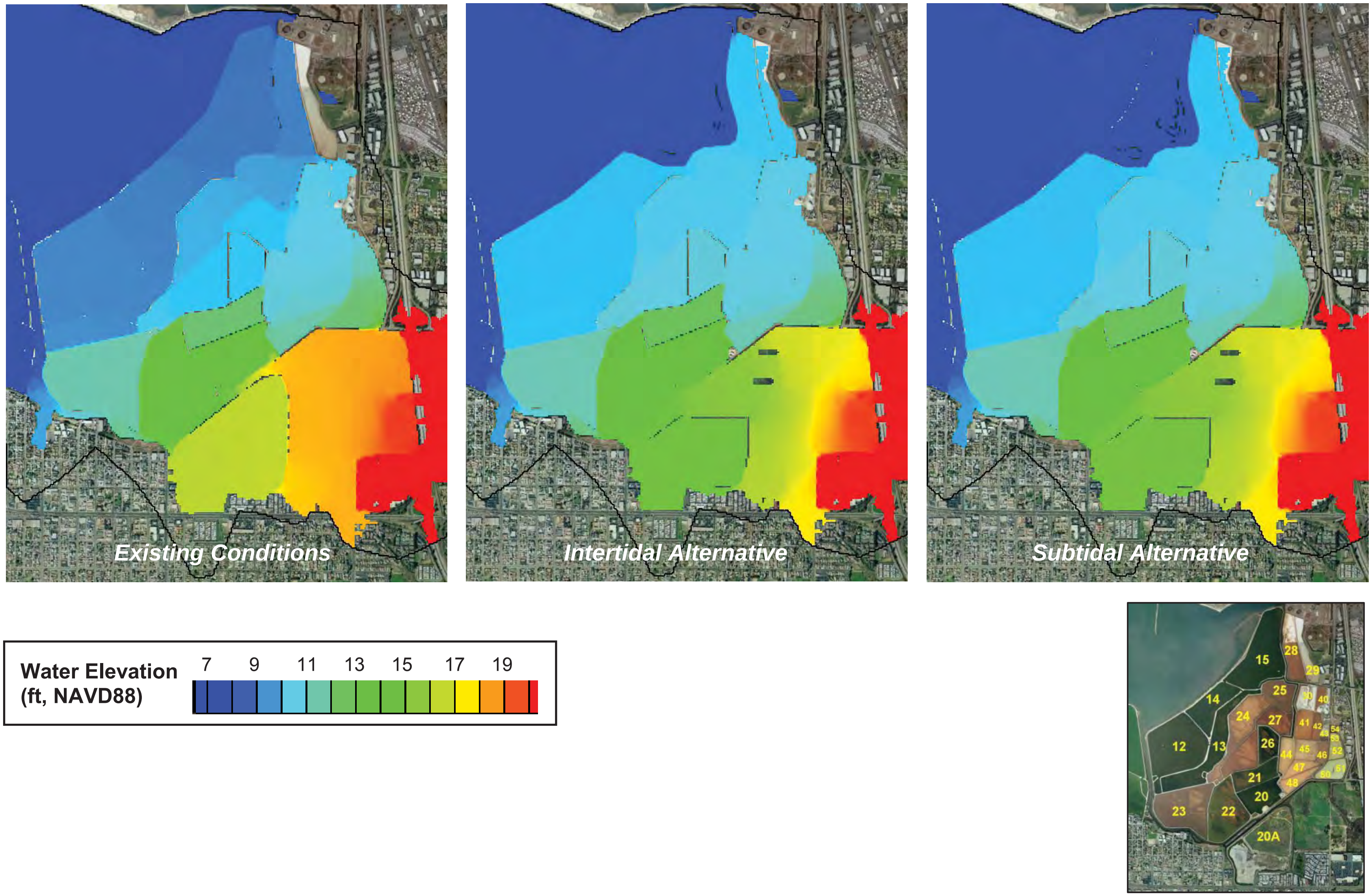


Figure 8.5 Comparison of 100-Year Flood Maximum Water Elevations in Floodplain under 2050 SLR Scenario

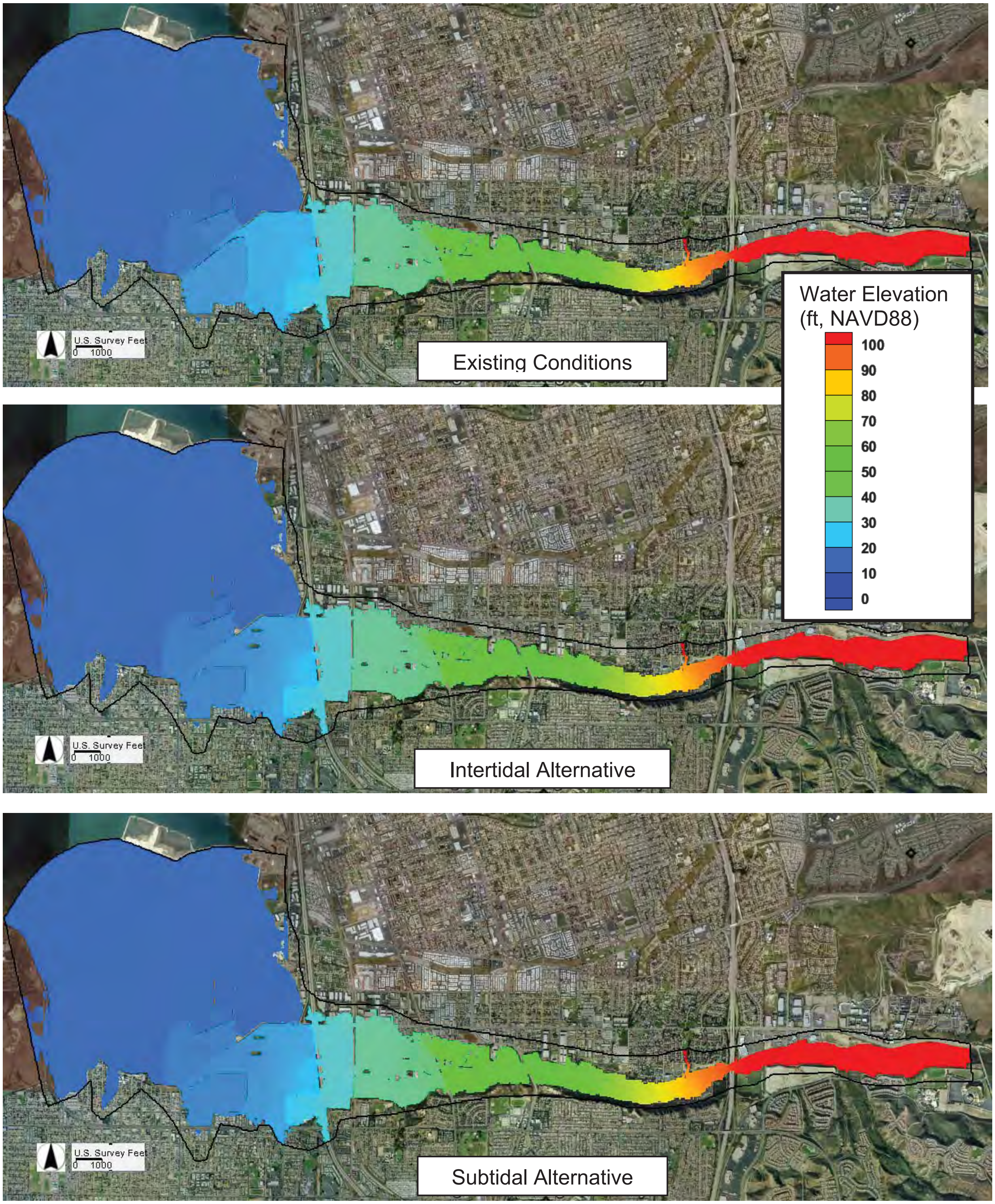


Figure 8.6 100-Year Flood Maximum Water Elevations under Existing and Proposed Conditions for 2100 SLR Scenario

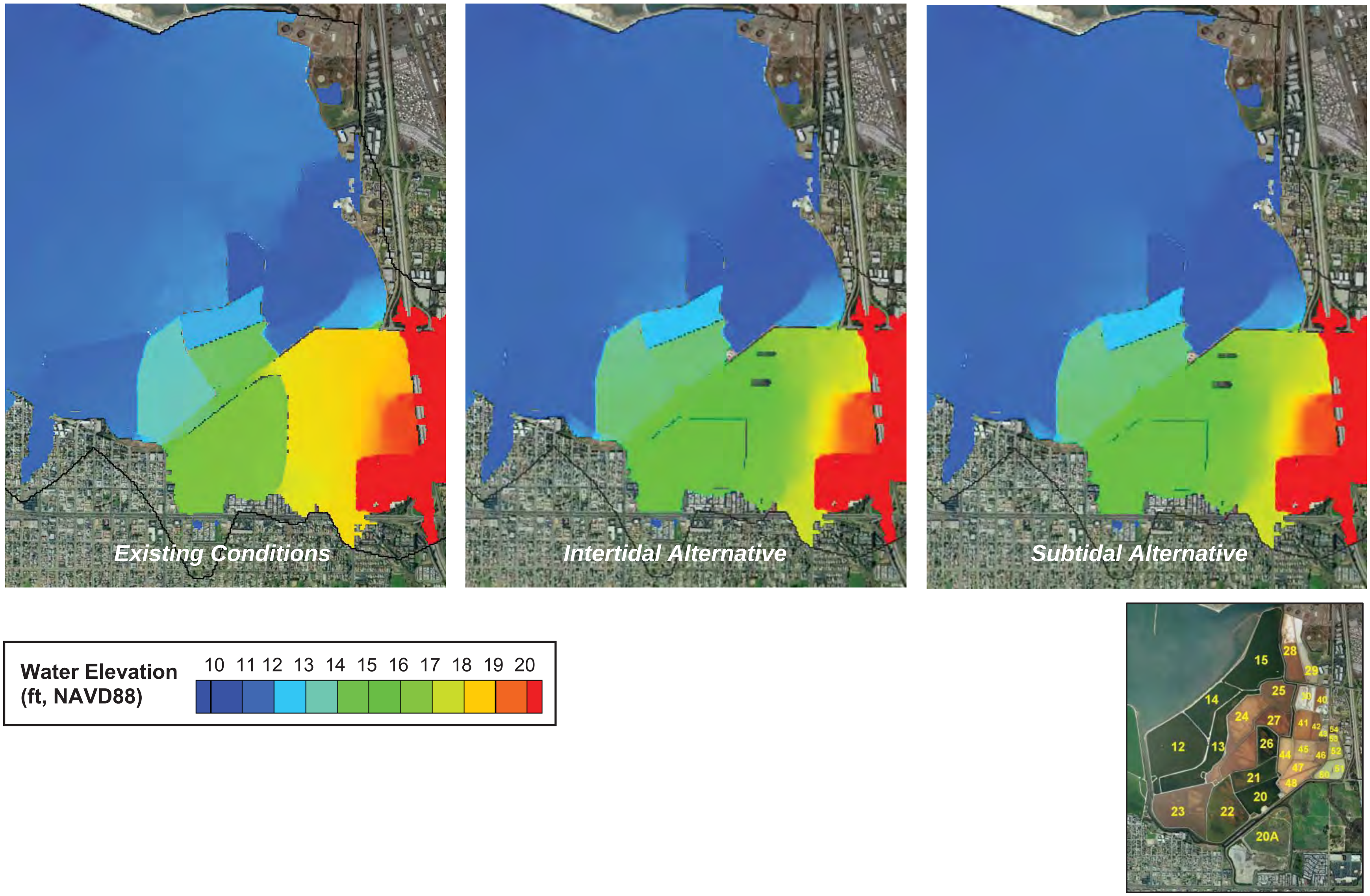


Figure 8.7 Comparison of 100-Year Flood Maximum Water Elevations in Floodplain under 2100 SLR Scenario

9. CONCLUSIONS AND RECOMMENDATIONS

1. Flood impacts of the ORERP are localized and mainly in the vicinity and downstream of the project area (e.g. along the bike paths and in the salt ponds). The ORERP would not have any flood impact to areas upstream of the I-5 Bridge.

2. Along the bike path, for the 100-year flood event, the ORERP would reduce flood elevations at the north end of the bike path adjacent to Pond 48, but increase flood elevations for the south end of the bike path along Pond 22. However, the ORERP would reduce the frequency of flooding along the bike path for smaller flood events. Under existing conditions, flooding would occur along the bike path for flood events with return period of between 10 and 15 years. With the ORERP, flooding along the bike path would not occur up to the 15-year return period flood event.

3. During a 100-year flood event, the ORERP would cause increase in flood elevations at Ponds 12, 13, 14, and 28 compared to Existing Conditions. The increase in flood elevations in Pond 28 would cause overtopping of the levee between Ponds 28 and 29, resulting in flooding of Pond 29 which would not be flooded under Existing Conditions.

4. For most of the ORF, the ORERP would not change flood velocities, including tidally influence areas such as the Western Salt Pond Restoration Project (formerly Ponds 10A, 10, and 11). In general, no erosion impacts are expected within most of the salt ponds. Decreases in erosion impacts were determined for Ponds 20 and Pond 15, as well the central portion of the bike path and river channel adjacent to the proposed wetland.

5. The ORERP would cause higher flows and velocities along the southern portion of the bike path, in the areas between the stock piles, and the levees separated Ponds 12 and 14 from San Diego Bay. The increase in flood velocities may increase local scours in those areas. Additional hydraulic analyses are recommended as part of the final design of the ORERP to determine whether scouring would be a problem. If it is determined that scouring could be a problem for those areas, proper scour protections should be considered in those areas as part of the final design.

6. The potential sedimentation rate at the proposed wetland areas were determined to be low, of the order of 0.02 to 0.04 in/yr (0.5 to 1 mm/yr). The effect of the sedimentation to the wetland is likely to be more than offset by future sea level rise.

7. Under Existing Conditions, the effects of sea level rise (SLR) to flood elevations during a 100-year flood event are confined to the tidally influenced salt pond areas. In Year 2050, with a projection of 2 ft SLR, only Ponds 10A, 10 and 11 (which were recently restored to have tidal connection with San Diego Bay) would have an increase in flood elevations during a 100-year flood compared to current sea level. In Year 2100, with a projected 5.5 ft SLR, the salt ponds would be inundated.

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APPENDIX A FLUVIAL ANALYSIS AT BAYSIDE PARK, IMPERIAL BEACH

APPENDIX A

FLUVIAL ANALYSIS AT BAYSIDE PARK, IMPERIAL BEACH

A.1. INTRODUCTION

This appendix summarizes the study conducted for the area in the City of Imperial Beach, where preliminary study results indicated that there would be increase in potential flood impacts as a result of the Otay River Estuary Restoration Project (ORERP). This study area is denoted in yellow in Figure A.1. It is referred to as the Bayside Park area in this appendix. This area is located on the southern bank of the Otay River, near the Salt Pond 23, which is located north of the Otay River. A storm drain constructed under the bikeway connects the study area to the Otay River, as depicted in Figure A.2. The fluvial analysis for the Bayside Park area includes the evaluation of several options to alleviate the flood impacts caused by ORERP. Based on this study and the recommendation of the City staff and the project team members, one of the options has been adopted as part of the proposed feature of ORERP.

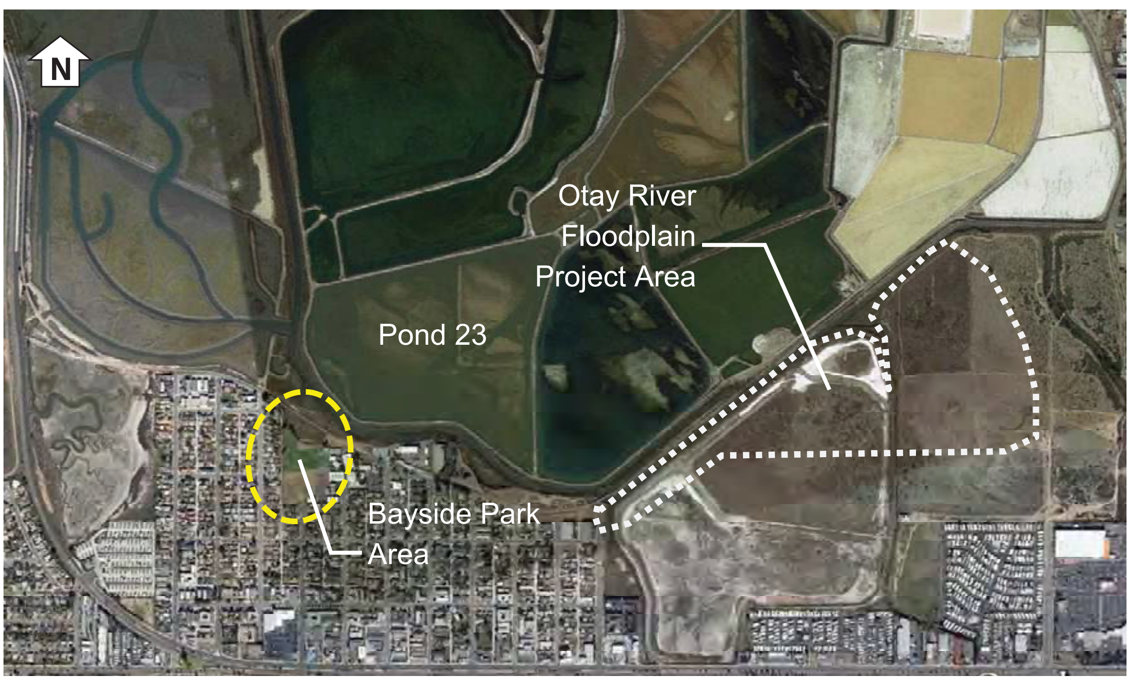


Image: Google Earth Pro

Figure A.1 Bayside Park Study Area

Figure A.2 Photos of Bayside Park Study Area

The fluvial modeling for the Existing Conditions, Intertidal Alternative and Subtidal Alternative are discussed in the main report. The flood impacts of a 100-year storm in the study area were evaluated based on the maximum water elevation results generated from the fluvial model simulations. In all simulations, i.e., the existing conditions and proposed conditions, the results indicate that the area in the vicinity of Bayside Park in the City of Imperial Beach was flooded during a 100-year storm.

The maximum water elevations for the Existing Conditions and for the Subtidal Alternative are presented in Figure A.3 and Figure A.4 respectively. At the location of the Bayside Park area, the maximum water elevation during a 100-year storm under Existing Conditions is 9.2 ft, NAVD88, and that under the Subtidal Alternative is 9.4 ft, NAVD88. The flood elevation result of the Intertidal Alternative is the same as that for Subtidal Alternative at this location. There is an increase of 0.2 ft in flood elevation under the proposed ORERP project conditions.

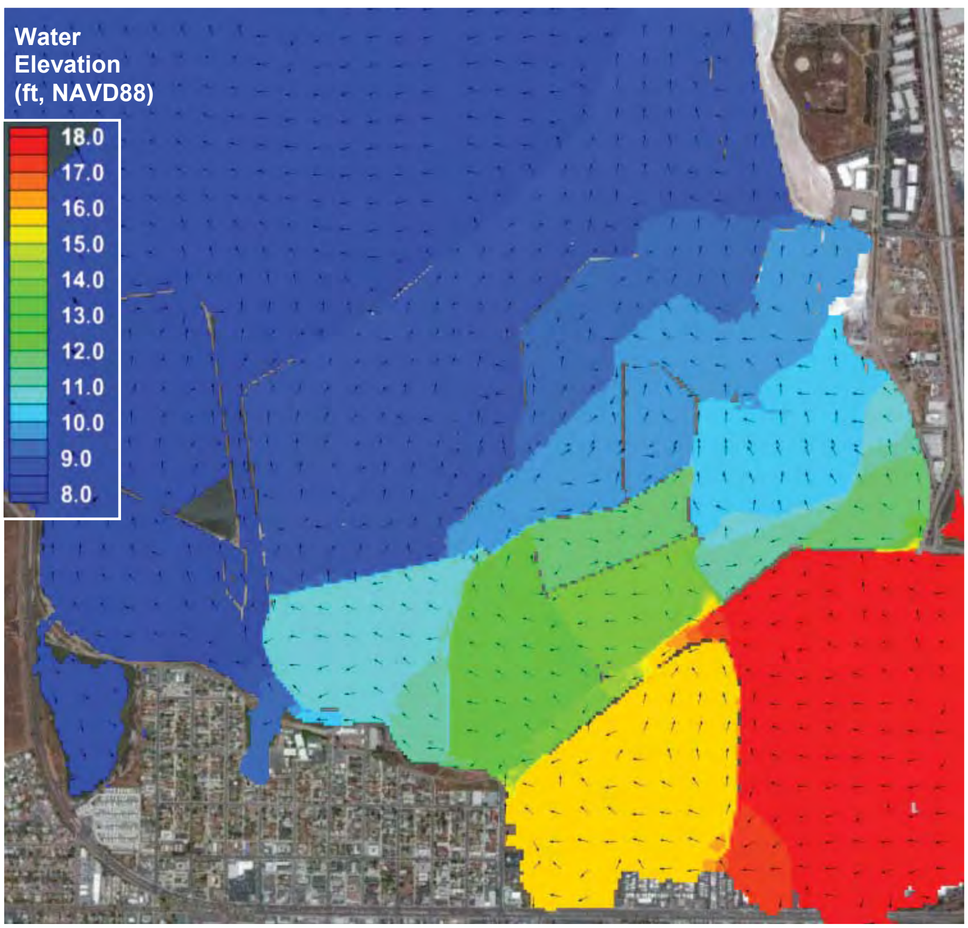


Figure A.3 100-Year Flood Water Elevations for Existing Conditions

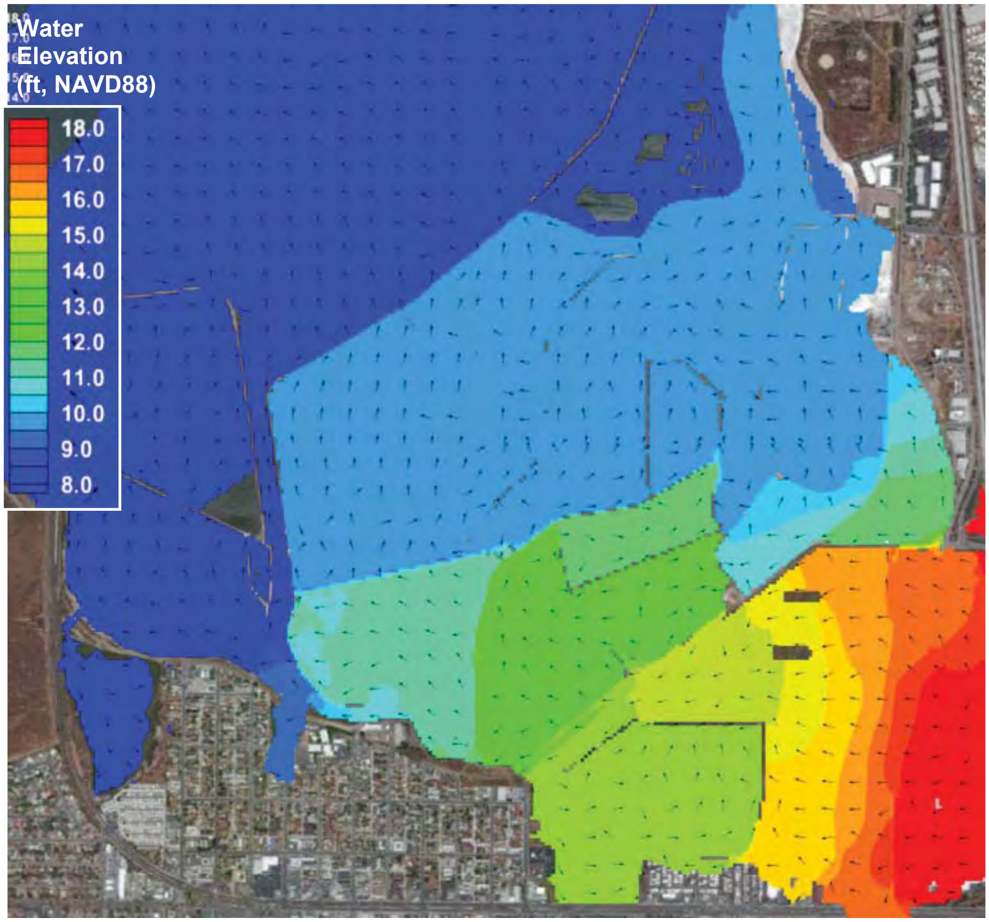


Figure A.4 100-Year Flood Water Elevations for Subtidal Alternative

A.2. FLOOD IMPACT REDUCTION EVALUATION

Several options were evaluated as potential ways to reduce the increased flood impact in the Bayside Park area. The three options that were evaluated with TUFLOW models are outlined below.

Option 1 – Lower Pond 48 Levee by 4 Feet

Option 1 involves the lowering of the top of the levee on the southern border of Pond 48 (south side of bikeway) from approximately 18 ft, NAVD88 to 14 ft, NAVD88 for a length of 800 feet. The goal of Option 1 is to divert flood flow towards Pond 48 from Otay River such that the flood flow reaching the Bayside Park area would be reduced. Approximately 4,500 CY of material would be removed in this modification. Figure A.5 shows the schematic of the levee modification of Option 1.

Figure A.5 Option 1

Option 2 – Raise Ponds 22 and 23 Levee by 2 Feet

Option 2 involves the raising of the top of the levee between Ponds 22 and 23 by two feet, from an elevation of approximately 11 ft to 13 ft NAVD88 for a length of 1,400 ft. The goal of Option 2 is to divert flood flow away from Pond 23 and Bayside Park neighborhood and towards the northern salt ponds. Approximately 11,500 CY of fill material will be brought in for this modification. Figure A.6 shows the schematic of the levee modification for Option 2.

Figure A.6 Options 2 and 3

Option 3 – Raise Ponds 22 and 23 Levee by 1 Foot

Option 3 is similar to Option 2, the difference is that the levee elevation is increased by one foot instead of two feet. Under Option 3, the top of the levee between Ponds 22 and 23 would be raised from an elevation of approximately 11 ft to 12 ft NAVD88 for a length of 1,400 ft. The goal of Option 3 is to divert the flood flow away from Pond 23 and Bayside Park neighborhood. The diverted flow is expected to be less in Option 3 than in Option 2. Approximately 6,500 CY of fill material will be brought in for this modification. Figure A.6 shows the schematic of the levee modification for Option 3.

A.3. FLUVIAL MODELING AND RESULTS

The three options were evaluated using the TUFLOW model grids set up for the ORERP Project. A model simulation for the 100-year storm event was conducted for each of the three options for the Subtidal and Intertidal Alternatives respectively. The water elevations at the Bayside Park area were extracted from the model results and are listed in the following table. The maximum water elevations along the Otay River were plotted and shown in Figure A.7 and A.8 for the Subtidal and Intertidal Alternative respectively. It can be seen that the maximum water elevations in the Bayside Park area is reduced for all the proposed options. Among the three options, Option 2, in which the levee between Ponds 22 and 23 are raised by 2 feet, provides the most flood reduction in the Bayside Park area.

Table A.1 100-Year Flood Maximum Elevations in Bayside Park

SCENARIO	MAXIMUM WATER ELEVATION (FT, NAVD88)
Existing Conditions	9.2
Proposed Conditions *	9.4
Option 1 *	**9.2**
Option 2 *	**9.1**
Option 3 *	**9.2**

** Same results for both Subtidal Alternative and Intertidal Alternative*

A.4. SUMMARY

The results of the analysis were presented to the City of Imperial Beach and other project team members. Based on these results, Option 2 has been selected to be included as one of the proposed features for the Subtidal and Intertidal Alternatives. Option 2 eliminates the project flood impact and reduces the flood elevation of a 100-year storm to 9.1 ft, NAVD88, which is slightly lower than the existing flood elevation of 9.2 ft, NAVD88.

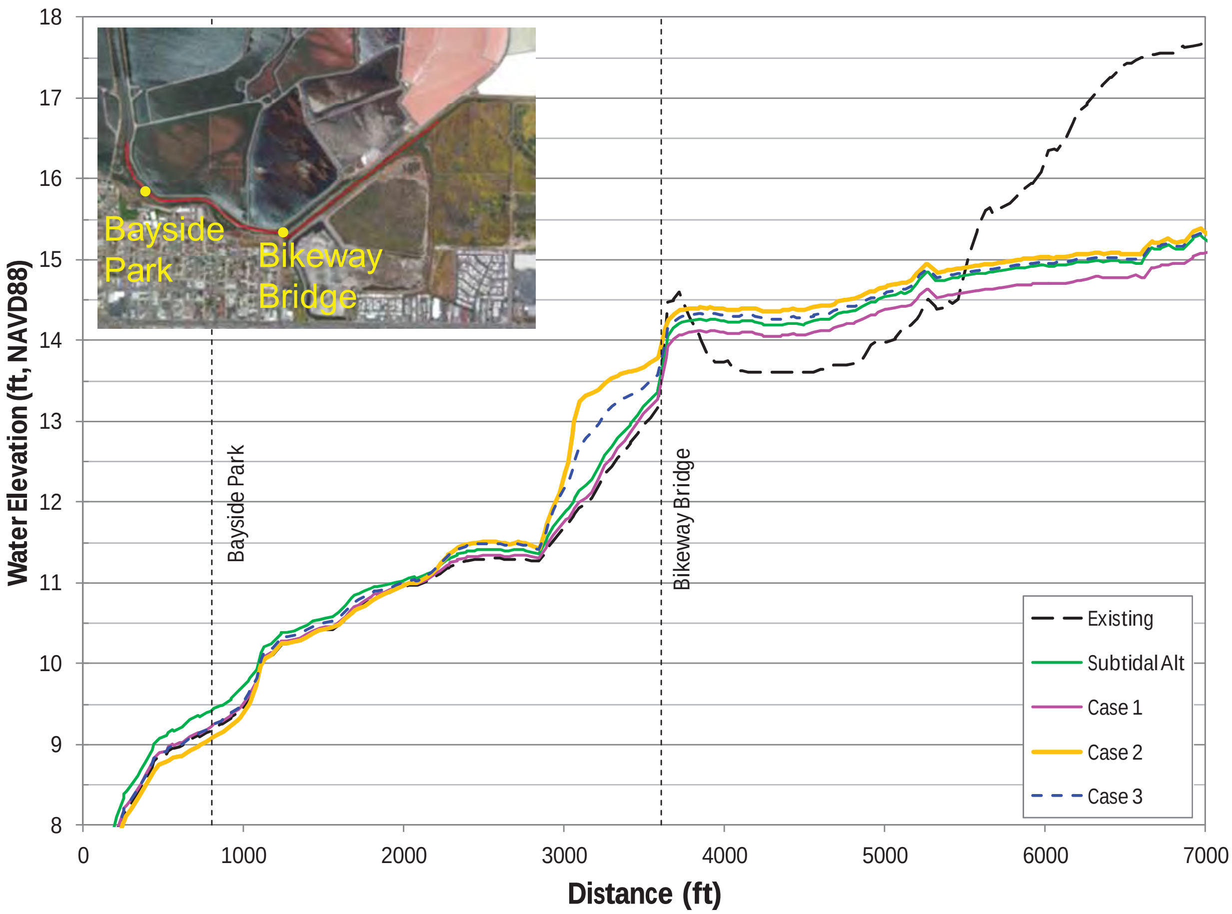


Figure A.7. Subtidal Alternative Maximum Water Elevation Profiles

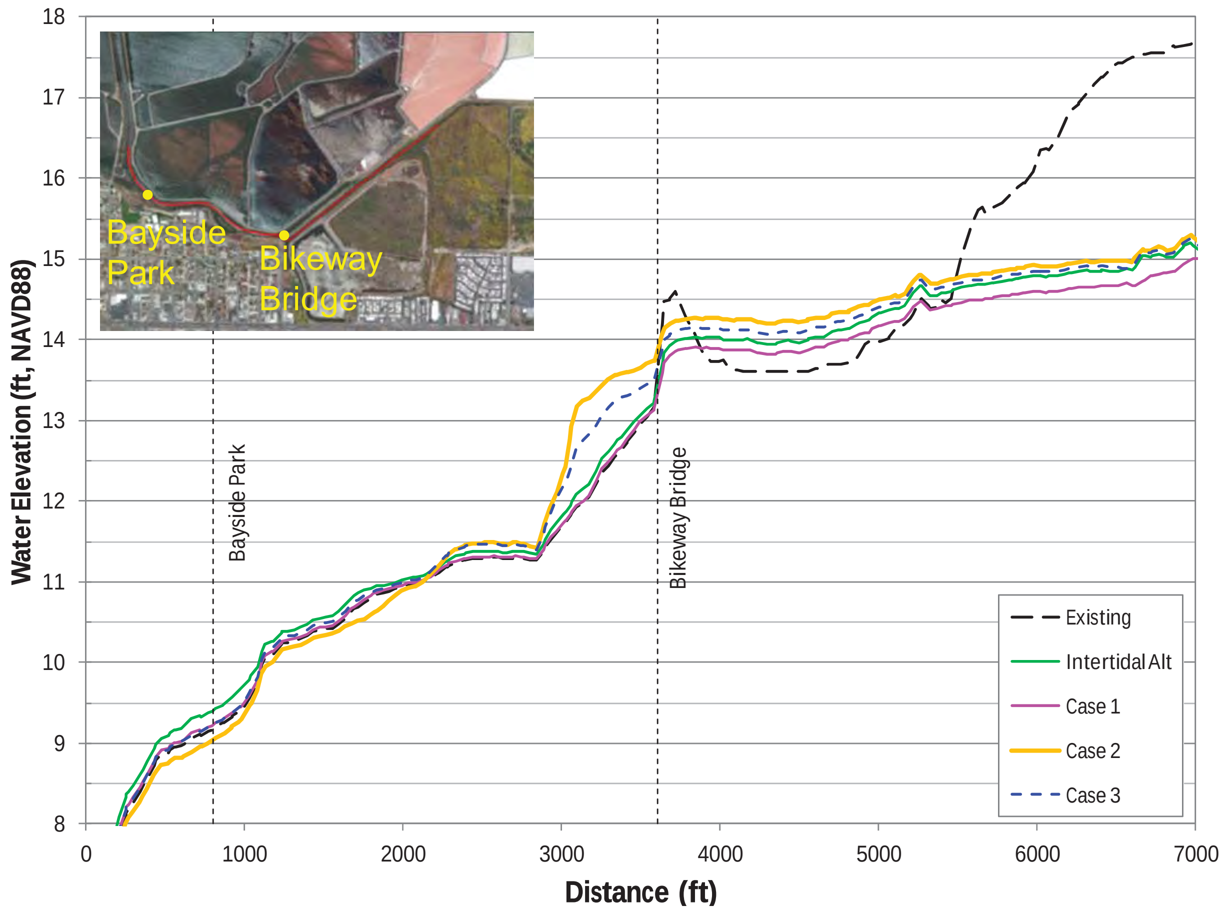


Figure A.8. Intertidal Alternative Maximum Water Elevation Profiles

APPENDIX B EROSION PROTECTION FOR THE SOUTH BAYSHORE BIKEWAY BRIDGE

APPENDIX B

EROSION PROTECTION FOR THE SOUTH BAYSHORE BIKEWAY BRIDGE

B.1. INTRODUCTION

The TUFLOW model results indicate velocities at the south abutment and channel bed at the South Bayshore Bikeway Bridge (bridge) during the 100-year flood event could be high enough to cause erosion along the slopes of the south abutment and channel bed under the bridge. This appendix provides a summary of a conceptual design to provide scour protection for the south abutment and the channel of the bridge.

B.2. ABUTMENT PROTECTION

The conceptual design considers the use of rock riprap to protect the south abutment and adjacent bank area of the bridge from scour. The protection design is based on 100-year flood conditions under the Subtidal Alternative, for which TUFLOW model results shows higher velocities along the south abutment of the bridge compared to the velocities under the Intertidal Alternative.

Riprap Size

The conceptual design follows the guidelines of the Hydraulic Engineering Circular No. 23 (HEC-23) published by the Federal Highway Administration (FHWA 2009). Followed the guidelines for HEC-23, an Isbash equation was used to estimate the riprap size for erosion protection at the south abutment of the bridge

$$\frac{D_{50}}{y} = \frac{K}{(S_s-1)}\frac{V^2}{gy}$$ (1a—for Froude number, Fr ≤ 0.80)

$$\frac{D_{50}}{y} = \frac{K}{(S_s-1)}\left[\frac{V^2}{gy}\right]^{0.14}$$ (1b—for Fr > 0.80)

where:

D_{50} = Median rock diameter, ft
V = Average velocity at the abutment, ft/s
S_s = Specific gravity of rock riprap

g = Gravitational acceleration, 32.2 ft/s^2
y = Depth of flow at the abutment, ft
K = Abutment shape coefficient; value depends on whether or not Fr is greater than 0.80, and whether the abutment is of a spill-through or vertical wall shape
Fr = Froude Number based on the velocity and depth adjacent to and upstream of the abutment = $V/(gy)^{1/2}$ where V is the velocity

Parameters used with Equation 1a and 1b are summarized in Table B.1.

Table B.1 Abutment Protection Design Parameters

PARAMETER	SELECTED VALUE	SOURCE/ BASIS FOR SELECTED VALUE
V	8.0 ft/s	TUFLOW model results near the south abutment
S_s	2.65	Average riprap specific weight cited within various literature sources (165 lb/ft^3), and average freshwater density (62.4 lb/ft^3)
y	5.5 ft	TUFLOW model results near the south abutment
Fr	0.60	Calculated from TUFLOW model results
K (Fr ≤ 0.80)	0.89	Eq. 14.1 of HEC-23 for a spill-through abutment
K (Fr > 0.80)	0.61	Eq. 14.2 of HEC-23 for a spill-through abutment

Since the riprap size depends on velocity and water depth, the TUFLOW time series results were examined at multiple locations near the south abutment of the bridge to look for a combined velocity and water depth that may result in the largest rock size for scour protection. The estimated rock size (D_{50}) for scour protection under the 100-year flood is one foot, i.e., Class III riprap.

Riprap Extent

Following the HEC-23 guidance, the riprap apron should extend from the toe of the abutment into the bridge waterway by approximately 25 feet. The downstream riprap coverage should extend back from the abutment by approximately 25 feet as well. The abutment slope should be protected two feet above the expected high water elevation for the design flood, which is higher than low chord of the bridge. Hence, the vertical extent of the abutment riprap is up to the low chord of the bridge.

Riprap Layer Thickness

Following the HEC-23 criteria, assuming the riprap will be placed underwater, the riprap layer thickness should be greater than or equal to the larger of 1.5*D_{100} and 2.25*D_{50}. Given a D_{50} of 1 foot (Class III riprap), maximum allowable D_{100} is 2 ft (based on Table 4.1 of HEC-23). Hence, a riprap thickness of 3 ft is used for the conceptual design.

B.3. CHANNEL BED PROTECTION

Rock riprap will also be used to protect the channel bed from scour. Like the abutment protection design, the channel bed protection design is based on 100-year flood conditions under the Subtidal Alternative.

Riprap Size

Channel bed riprap size was estimated based on fluvial conditions using a design equation in the Hydraulic Engineering Circular No. 11 (HEC-11) published by the Federal Highway Administration (FHWA 1989).

$$D_{50} = 0.001\frac{C\,(V_a{}^3)}{(d_{avg}{}^{0.5}K_1{}^{1.5})} \qquad (2)$$

where:

- D_{50} = Median riprap particle size
- C = Correction factor, C_{sg}*C_{sf}
- C_{sg} = Correction factor for the specific gravity (S_s) of the rock riprap, $\frac{2.12}{(S_s-1)^{1.5}}$
- C_{sf} = Correction factor for the stability factor (SF) to be applied, $\left(\frac{SF}{1.2}\right)^{1.5}$
- V_a = Average velocity in the main channel, ft/s
- d_{avg} = Average flow depth in the main flow channel, ft
- K_1 = Side slope correction factor, $\left[1-(\frac{sin^2\theta}{sin^2\varphi})\right]^{0.5}$
- θ = Bank angle with the horizontal
- φ = Riprap material's angle of repose

Parameters used with Equation 2 are summarized in Table B.2 below.

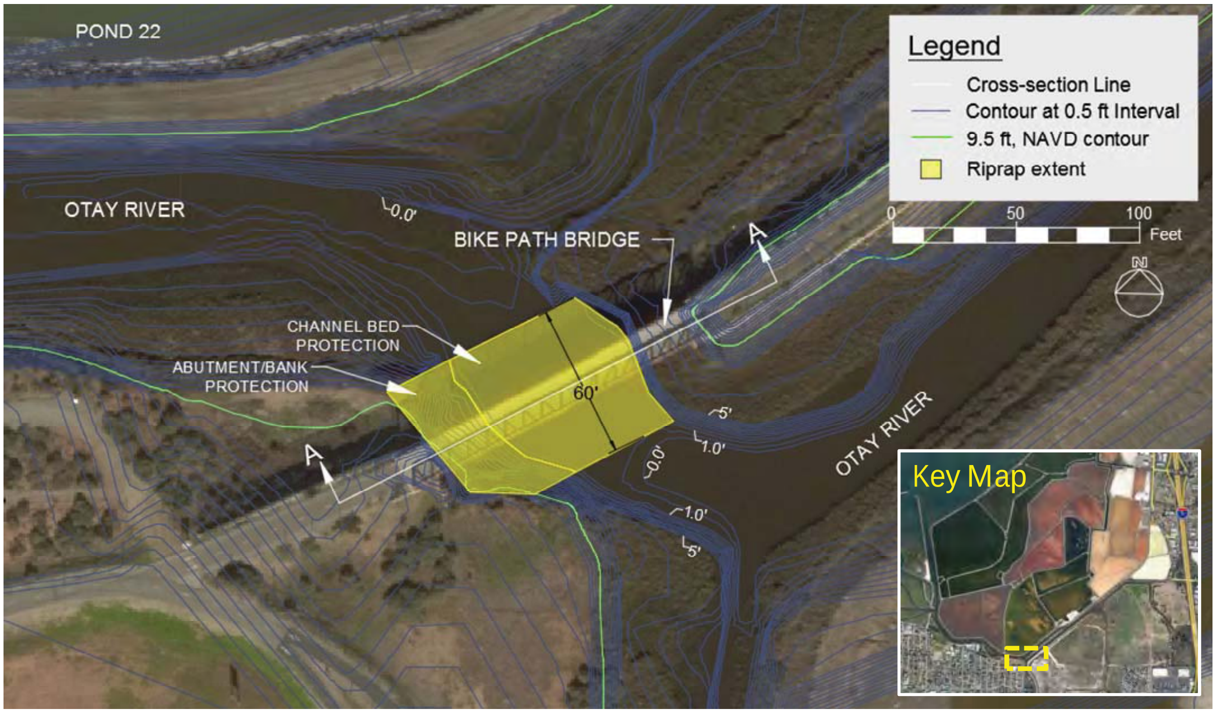
Table B.2 Channel Bed Protection Design Parameters

PARAMETER	SELECTED VALUE	SOURCE/ BASIS FOR SELECTED VALUE
S_s	2.65	Average riprap specific weight cited within various literature sources (165 lb/ft^3), and average freshwater density (62.4 lb/ft^3)
SF	1.7	Guidelines for the selection of stability factors, included as Table 1 in HEC-11
V_a	8.0 ft/s	TUFLOW model results under the bridge
d_{avg}	4.6 ft	TUFLOW model results under the bridge
θ	14.8°	Average bank slope at typical channel cross section
φ	40°	Average value cited within various literature sources

Since riprap size depends on velocity and water depth, the TUFLOW time series results were examined at multiple locations near the bridge to look for velocity and water depth sets that may result in larger rock size. The average maximum velocity under the bridge and corresponding average water depth values were selected. A conservative stability factor (SF) of 1.7 was selected to account for the effects of the sharp channel bend at the bridge. As such, the estimated rock size for 100-year flood conditions under the Subtidal Alternative is a D_{50} of 0.5 feet.

B.4. RECOMMENDED PROTECTION DESIGN

The estimated abutment riprap diameter (D_{50}) is 1 foot, which is twice that of the estimated riprap diameter of 0.5 feet for the channel bed. Since the abutment riprap needs to be extended 25 ft into the channel, it is easier for construction to extend it all across the channel bed instead of having part of the channel protection using the smaller 0.5 ft riprap size. Usage of a uniform riprap diameter and layer thickness for the overall abutment and channel bed protection is recommended for practical construction purposes. Since the underlying soils are fine-grained, a geotextile filter and granular filter should be placed in between the riprap and the soil surface. The recommended conceptual design for the overall revetment protection, including riprap extent, is presented in Figure B.1.



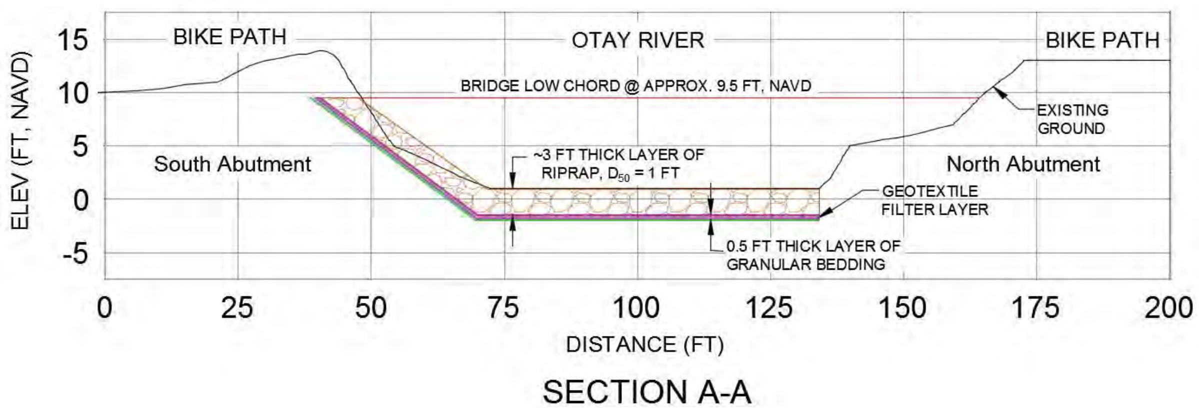


Figure B.1 Conceptual Design for Revetment Protection at the South Bayshore Bikeway Bridge (Do Not Use for Construction)

B.5. REFERENCES

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APPENDIX I

DDT Analysis

Sensitivity Analysis of Potential DDT Deposition in the Otay River Estuary Restoration Plan (ORERP) Post-100 Year and 50-Year Floods

by:

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First Draft: 2 April 2015; Final Draft 26 August 2015; Final 28 October 2015

ABSTRACT: This analysis focuses on an assessment of potential impacts on the ORERP from erosion of soils containing DDT by the 100 yr. flood, with additional analysis of the 50-year flood impacts. Scour potential associated with the 100-year flood on the ORERP have been evaluated in a companion study (Everest 2014). The present analysis evaluates the effects associated with erosion of soils containing DDT from the floodplain under the 100-year flood event that may release DDT to downstream portions of the project. Because the duration of the 100-yr flood is only 24 hours, it was assumed that tidal exchange will quickly re-establish flow dominance post-flood; and that the transport and settling dynamics of potentially contaminated silts and clays will be driven and limited by the tidal hydraulics and tidal residence times.

A sensitivity analysis was developed based on a parameter sweep of the amounts of soils containing DDT that might be eroded by the 100-year flood. Sediment coring data indicates that the depth of erosion in the area of soils containing DDT might vary between 1 ft. and 3 ft.; and the concentrations of DDT in the eroded soils could vary between 790 µg/kg and 310 µg/kg, depending on the depth of erosion. These eroded soils containing DDT could mix with as much as 438,000 cubic yards (cy) of "clean" (*i.e.*, assumed to be free of DDT) fine-grained sediments from the Otay River watershed below the Savage Dam; but that estimate was based on a surrogate watershed (Buena Vista Creek) for which more complete sediment yield data was available. Based on the uncertainties of applying that surrogate analysis to the Otay River watershed, it is sensible to consider the sensitivity of the final outcome to omitting consideration of that flux of what is believed to be "clean" sediments from upstream sources by eliminating the dilution effects that blending with clean fines exerts on DDT concentrations during the post-flood deposition. From this assessment of the possible sediment erosion input assumptions, a sensitivity analysis **is provided** for the post 100-year flood DDT deposition that is based on

1. Michael Baker International
2. Everest International
3. Environmental Contaminants Division, Carlsbad Fish and Wildlife Office

erosion fluxes from three erosion depths (1 ft., 2 ft. and 3 ft.) in the floodplain that are each combined with two possible fluxes of "clean" fines (0 cy and 438,000 cy) from the watershed below the Savage Dam. In addition, the biological risk assessment of these six possible deposition scenarios also considers bioturbation exposures occurring post-flood within the top 20 mm, 40 mm and top 80 mm of the muddy sediments in the tidal basins of the ORERP. This range of parameters yields a sensitivity analysis with 18 possible outcomes including worst-case scenarios.

It was found that the post 100-year flood will result in the deposition of less than 1 mm to as much as 8 mm of partially consolidated mud in the tidal basins of either restoration alternative that will have an average dry bulk DDT concentration of 42 μ g/kg to 790 μ g/kg, depending on the particular scenario. The DDT concentrations in the muds deposited in the ORERP can range as high as 310 μ g/kg to 790 μ g/kg, but the deposition thicknesses of these scenarios reduce to only fractions of a millimeter once these muds become consolidated. Using a depth-proportional exposure approach, and assuming all exposure occurs within the top 20 mm under worst-case, we calculated that the DDT concentration experienced by the benthic biota would range from approximately 13 μ g/kg to 29 μ g/kg initially, and would decrease with compaction and consolidation to a final 20 mm-based dry bulk concentration of 4.2 μ g/kg to 7.9 μ g/kg. The controlling variable in worst-case exposure determination is the total mass of DDT in the post-flood sediment deposition, which is maximized by the scenarios in which the largest volumes of DDT-contaminated sediments that were eroded, (*i.e.*, the 3ft. erosion depth scenarios) in the absence of mixing with additional sediments from upstream sources. Worst case exposures were found to be relatively insensitive to the dilution provided by sediments from upstream sources, while the mixing depth of bioturbation has a much stronger influence. DDT concentrations experienced by the benthic biota under worst-case are reduced 2 to 4 fold when bioturbation extends over the top 40 mm or top 80 mm of the muddy sediments in the tidal basins of the ORERP. The depth of bioturbation will be determined by the species that ultimately colonize the tidal basins, but we would not expect that to be less then approximately 20 mm.

Upon advice from the California Coastal Commission Science Advisory Panel, the above analysis was repeated for the 50-yr flood, to assure the most extreme potential DDT exposure outcomes have been modeled. The DDT deposition results for the 50-yr flood were found to be within the range of those for the 100-yr flood. The DDT concentrations in the muds deposited in the ORERP post 50-year flood can range as high as 111 μ g/kg to 790 μ g/kg, and again, deposition thicknesses of these scenarios reduce to only fractions of a millimeter once these muds become consolidated. Using a depth-proportional exposure approach within the top 20 mm under worst-case, we calculated that the DDT concentration experienced by the benthic biota would range from approximately 12 μ g/kg to 26 μ g/kg initially after the 50-year flood, and would decrease with compaction and consolidation to a final 20 mm-based dry bulk concentration of 4.0 μ g/kg to 7.1 μ g/kg.

Relative to impacts on the benthic organisms as the prey base, the maximum short-term DDT concentrations in the post-flood deposition fall between the ER-L and ER-M values. Thus, we would expect that impacts on benthic organisms could occur occasionally during the short-term. 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 these post-flood muddy deposits have compacted and consolidated, the DDT concentrations in the top 20 mm of muddy sediment are very close to the ER-L, and even lower for the top 40 mm and top 80 mm of sediment; so that 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.

In regards to the aquatic-dependent birds' exposures to DDT in prey , comparison of the 20 mm-based DDT concentrations to screening levels indicates that these concentrations fall within the range of highest and lowest NOAELs. Given the species known to be the most sensitive are pelicans and cormorants, (which are very closely related, and our target species are not members of groups believed to be particularly sensitive), impacts on aquatic-dependent birds are unlikely to result from the anticipated deposition of sediments in the ORERP following either a 100-year or 50-year flood event.

Upon advice from the California Coastal Commission Science Advisory Panel, the above analysis was repeated for the 100-yr flood in the absence of the ORERP (*i.e.,* No Project Alternative). Those results are given in APPENDIX-B. The DDT deposition results in Ponds 10 & 11 of the No Project Alternative were found to be within the range of those for the ORERP tidal basins post 100-yr flood, so that the above conclusions on potential flood-induced DDT impacts to the existing wetlands ecology are upheld; and it can be concluded that the ORERP does not increase the risk of exposure of wetland ecology to DDT, a risk that exists with or without the project.

Sensitivity Analysis of Potential DDT Deposition in the Otay River Estuary Restoration Plan (ORERP) Post-100 Year Flood

Scott A. Jenkins, Ph. D., Ying Poon, D.Sc., Catherine Zeeman, Ph.D., and Carol Roberts

1.0) Introduction:

In this study we estimate rates of fine-grained sediment deposition in the tidal basins of the ORERP *Intertidal and Subtidal Alternatives* for a model problem in which the wash load source is defined by the sediment yield of the Otay River during the 100 year flood. Because of the nearby Savage Dam, the sediment yield is assumed to be derived from scour and erosion of the Otay River floodplain, downstream from the dam. Scour impacts from the 100 year flood on the ORERP have been evaluated in a companion study Everest, (2014). The primary concern of the present analysis is that a portion of the floodplain that could be scoured and eroded by the 100 year flood has surficial layers of soil comprised of a high percentage of silts and clays that contain various concentrations of DDT; and that some of those fine-grained sediments might re-settle in the tidal basins of the ORERP post-flood. Because the duration of the 100-yr flood is only 24 hours, we assume that tidal exchange will quickly re-establish flow dominance post-flood; and that the transport and settling dynamics of potentially contaminated silts and clays will be driven and limited by the tidal hydraulics and tidal residence times detailed in Sections 4 and 5.

This study is a multi-disciplinary effort of four scientists. The study begins with a soil characterization and erosion analysis of the 100 year flood in Sections 2 and 3, respectively, which was conducted by Ying Poon, D.Sc. of Everest International. Section 2 provides the essential sediment flux initial conditions for a post-flood suspended sediment tidal transport and deposition analysis in Sections 4 and 5 that was performed by Scott Jenkins, Ph.D. of Michael Baker International. The post flood deposition thicknesses and DDT concentrations in the tidal basins that were calculated in Sections 5 were throughput to a biological impact assessment presented in Section 6 that was conducted by Catherine Zeeman, Ph.D. and Carol Roberts of the Environmental Contaminants Division, Carlsbad Fish and Wildlife Office. Deposition results for the 50-year flood appear in APPENDIX-B and were found to remain within the range of variability of scenarios for the 100-year flood.

2.0) Erosion Analysis for the 100-Year Flood in the Otay River Basin:

Everest International Consultants (Everest) conducted an analysis on the potential for the DDT containing soils in the Otay River Floodplain (ORF) to be eroded and transported to the proposed wetland during a 100-year flood event. The analysis was based on numerical simulations conducted with the two-dimensional hydrodynamic model – TUFLOW, which simulated the velocities over the ORF during a 100-year flood event. The analysis was also based on soil property data from the soil sampled in the ORF to evaluate the potential for soil erosion. Details of the TUFLOW model setup can be found in Everest (2014).

The 100-year flood hydrographs for the Otay River, Poggi Canyon Creek and Nestor Creek are shown in Figure 1. The total flow volume during a 100-year flood for the Otay River is 35,200,000 cubic yards (cy), or 26,911,315 cubic meters (m^3). The corresponding flow volumes for Poggi Canyon Creek and Nestor Creek are respectively 2,240,000 cy (1,712,254 m^3) and 1,748,800 cy (1,337,003 m^3), so that the combined flow through the floodplain is $\overline{Q}$ = 39,188,800 cy (29,960,856 m^3), or 24,290 acre ft. The flow for the Otay River is an order of magnitude higher than those for Poggi Canyon Creek and Nestor Creek. The percent of Nestor flow that would pass through the wetland was not analyzed, but since Nestor Creek directly flows into the proposed wetland area, it was assumed that all of the Nestor Creek flow would enter the wetland. Figures 2 & 3 give the distributions of maximum stream flow velocities for the 100-year flood velocity throughout the Otay River floodplain and adjacent pond complexes for the ORERP Intertidal and Subtidal Alternatives, respectively.

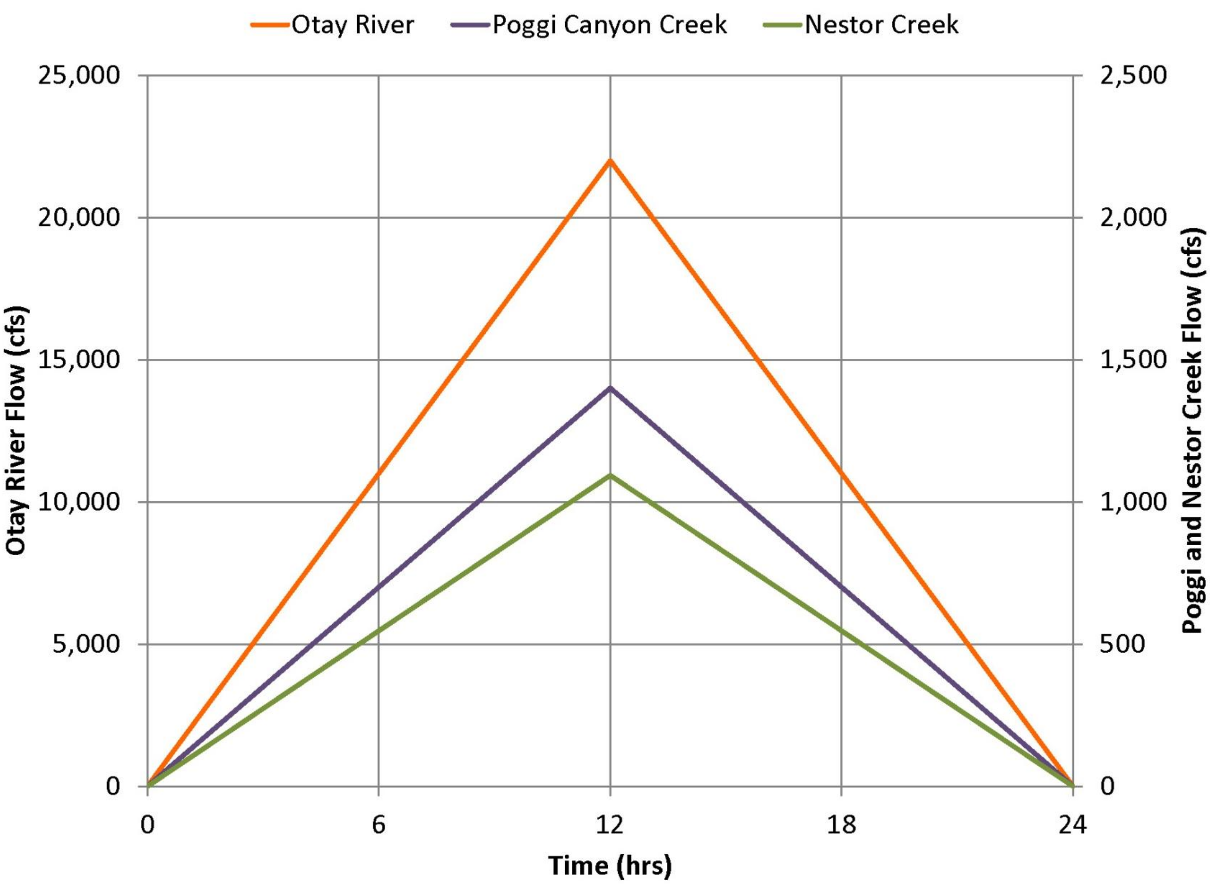

Figure 1. The 100-Year Return Period Flood Hydrographs**.**

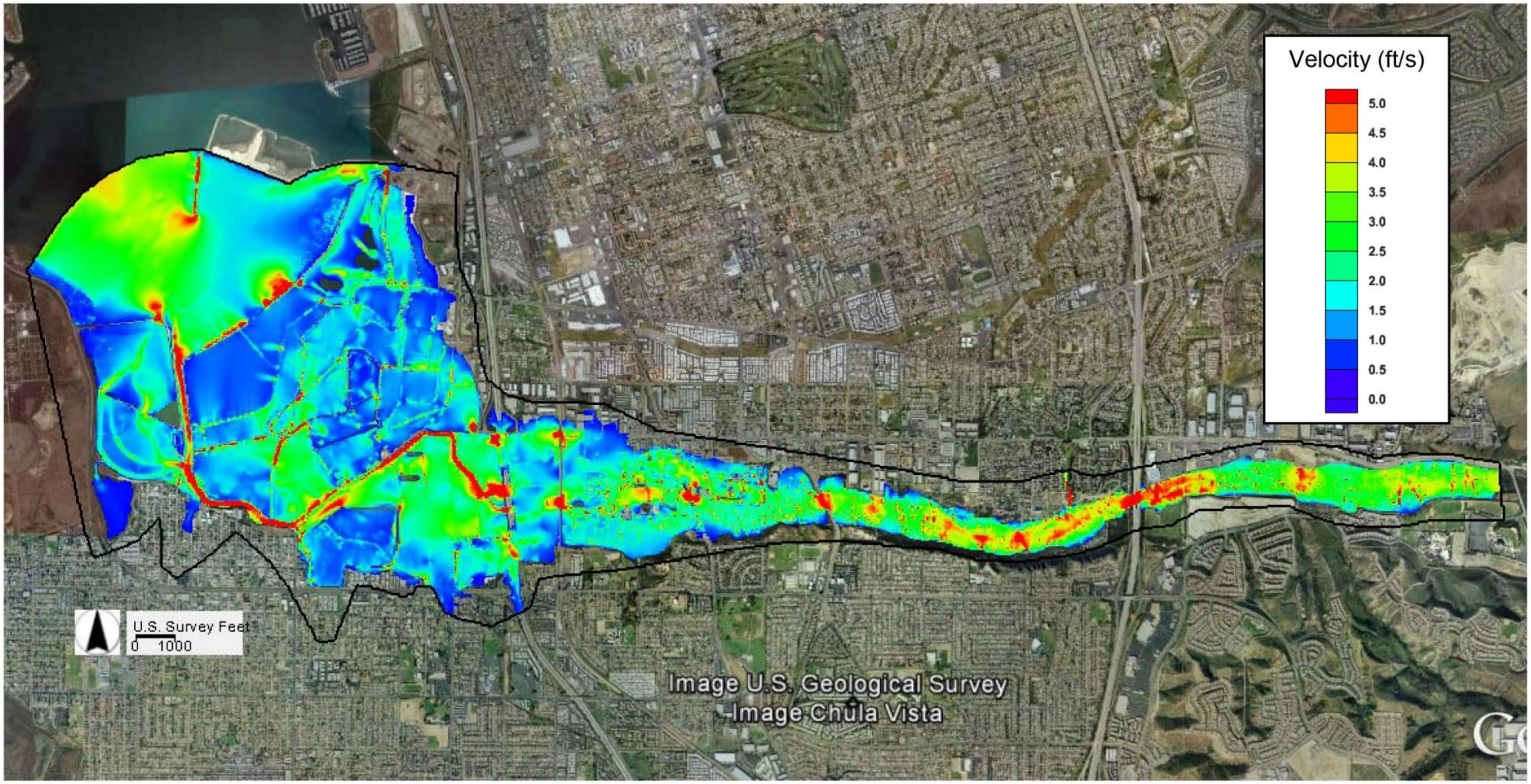

Figure 2: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain with the fully implemented Intertidal Alternative, (after Everest, 2014)

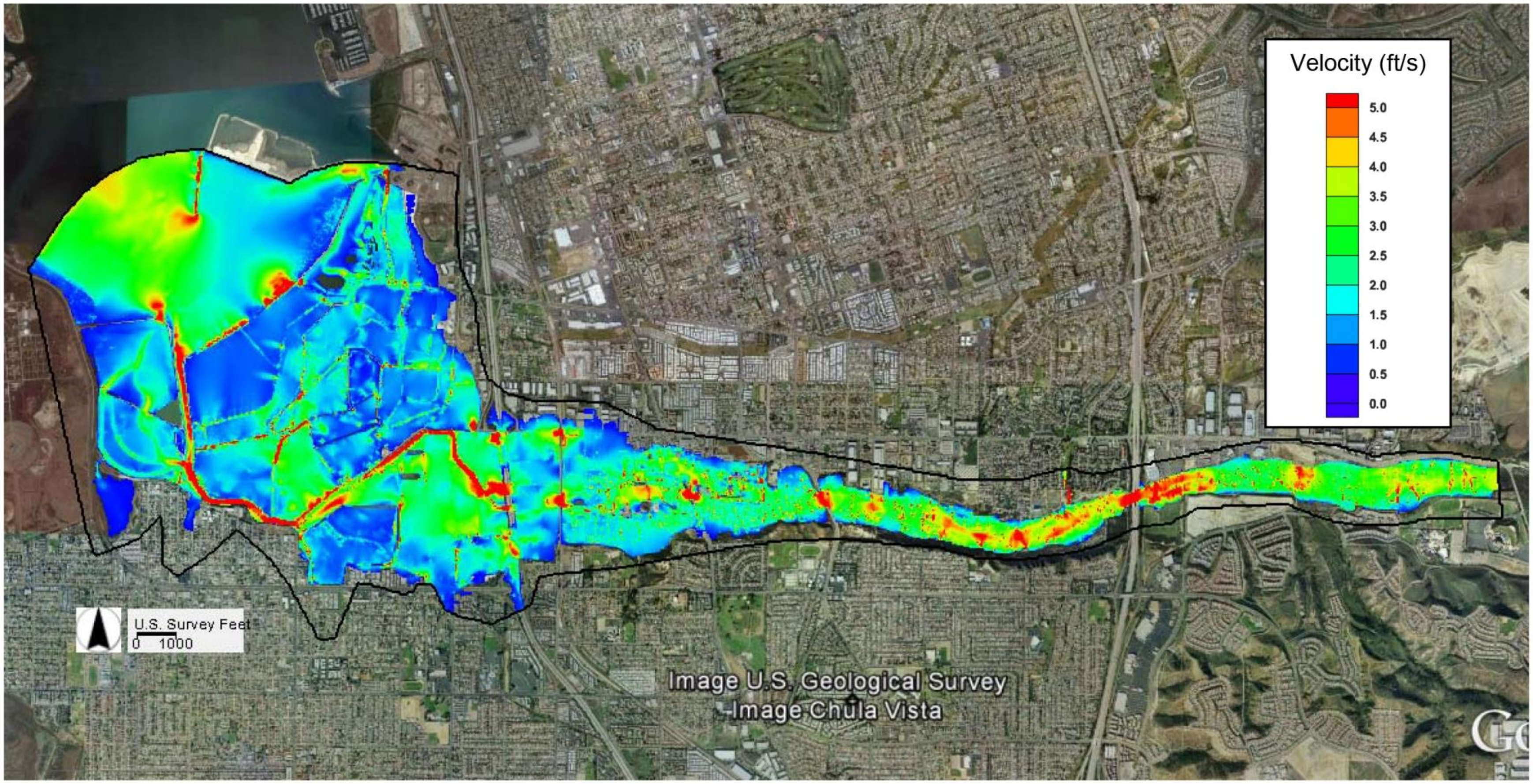

Figure 3: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain with the fully implemented Subtidal Alternative, (after Everest, 2014).

Data were not available for the sediment discharge from the Otay River Watershed during a 100-year flood event; hence, it was estimated based on sediment discharge from the Buena Vista Creek (BV) Watershed for which sediment discharge during a 100-year study was available. In an earlier fluvial hydraulic and sediment transport study, Everest (2008) estimated that the sediment discharge during a 100-year flood event for the BV Watershed would be about 603,000 cy. Characteristics of the Otay River Watershed and BV Watershed are compared in Table 1. The area for the BV Watershed is approximately 19 square miles, while the Otay River Watershed (portion below the dam) is about 46 square miles with the entire Otay Watershed covering 143 square miles. Compared with the BV Watershed, the Otay River Watershed (below dam) is less urbanized with more open space land use, potentially more susceptible to soil erosion during a flood event. Nevertheless, simply based on scaling by the watershed size, sediment discharge from the Otay River Watershed is about 1,460,000 cy during a 100-year event. Based on Taylor (1981), about 50% of the sediment delivered from the Otay River Watershed is fine grain size ($d < 0.065$ mm), and the other 50% is sand. Hence, the fine portion is about 730,000 cy. It is estimated that during a 100-year flood, approximately 60% of the fine grain sediment discharge, i.e. 438,000 cy (334,880 m^3) would pass through the proposed wetland.

Table 1: Comparison between Otay River and Buena Vista Creek Watersheds

COMPARISON	OTAY RIVER	BUENA VISTA CREEK
Watershed Area	46 mi^2 *	19 mi^2
Urban Land Uses	39.1%	75.2%
Agricultural Land Uses	0.6%	22.4%
Open Space Land Uses	60.3%	2.4%

**Watershed area below dam*

2.1) Soil Erosion from Otay River Floodplain: The potential for soil erosion from the ORF during a 100-year flood event is evaluated based on the flood velocities and soil properties. In general, silt and clay are less susceptible to erosion while sand is relatively easier to be eroded. Based on the sediment characterization study conducted by Anchor QEA (2013), the top three feet of sediment consists of fine to coarse sand (i.e., easy to be eroded), and below three feet, based on data for samples taken between 3 to 5 ft below ground, sediments are cohesive, consisting mainly of silt and clay (less susceptible to erosion). As illustrated by the Hjulstrom Curve shown in Figure 4, sediments consisting mainly of fine sand to coarse sand (the blue shaded area in Figure 4) are likely to be scoured (eroded) when the flood flow velocity is higher than approximately 0.6 ft/sec. The TUFLOW model simulated maximum flood velocities over the ORF area during a 100-year flood event is shown in Figure 5. The color scale of the figure is selected such that the lowest velocity shown is 0.6 ft/sec (threshold for scouring). As can be seen in the figure, the maximum flood velocities over the entire ORF are higher than 0.6 ft/sec; hence likely to be eroded based on the Hjulstrom curve. In addition, based on the TUFLOW model results, (Figures 2 & 3) the bed shear stress over the ORF ranges from about 0.2 N/m^2 to 0.9 N/m^2 during a 100-year flood event. Based on empirical data relating sediment erosion to bed shear stress, these bed shear stresses are high enough to result in sediment erosion (Roberts et al, 1998).

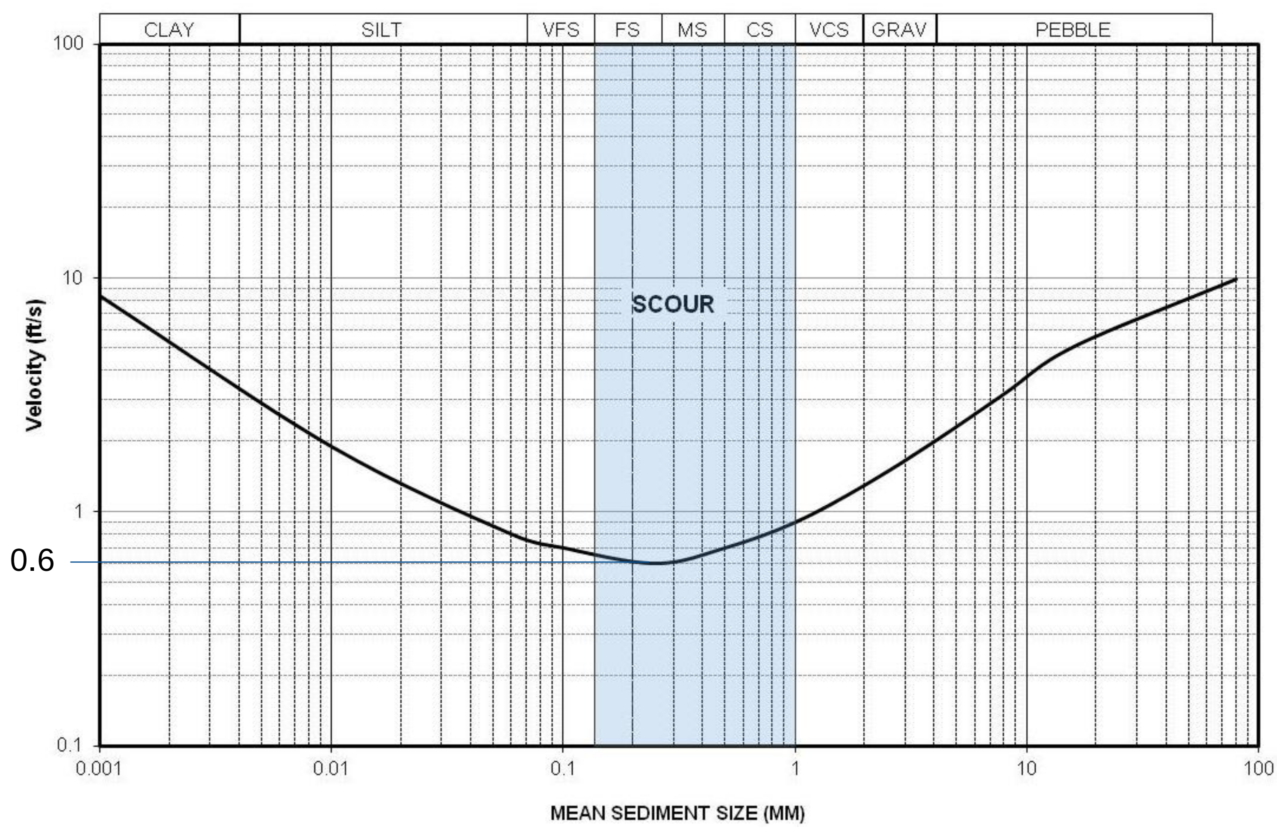

Figure 4. Hjulstrom Curve

Not all the sediment being eroded from the ORF would be transported and delivered to the proposed wetland. Sediment being eroded may simply move along the bed from one location to another, or remain suspended in the water column (portion that are likely to be transported). Some of the suspended sediment may be re-deposited in another area (not entering the wetland). In lieu of conducting a sediment transport modeling study, it is not easy to quantify the amount of eroded soil from the ORF that would be transported to the proposed wetland. Hence, for this study, three erosion scenarios for erosion depths of 1 ft, 2 ft, and 3 ft over the entire ORF were considered for the evaluation of potential transport and deposition of DDT contaminated soils from the ORF to the proposed wetland. The volume of eroded soil, percent fines (d < than 0.065 mm), and volume of fines for these three scenarios are summarized in Table 2.

Table 2: Volume and Properties of Eroded Soils of ORF

EROSION DEPTH (ft.)	**VOLUME OF ERODED SOIL (cy)**	**PERCENT FINES**	**VOLUME OF FINES (cy)**
1	114,890	21.1%	24,260
2	229,780	33.2%	76,350
3	344,700	37.2%	128,300

2.2) DDT Concentrations of the Eroded Soils: Two soil sampling and analysis datasets were utilized to evaluate the DDT concentrations of the ORF soils under the three erosion scenarios described above. The two datasets include data from an earlier Anchor QEA study (2013) along with newer data from a U.S. Fish and Wildlife Service study (Zeeman 2014). The two datasets consist of data for different sampling locations and boring depths. The Anchor data consist of 11 borings over the ORF, with DDT concentrations for depth layers of 0 to 1, 1 to 3, and 3 to 5 feet below ground. Soil data from the U.S. Fish and Wildlife Service consists of 14 sampling locations, and data were collected from the top 0.5 feet below ground.

Based on discussion with the project team, it was decided to assume that the DDT concentrations for the U.S. Fish and Wildlife samples would apply to the top one foot of soils; hence can be combined with the Anchor data for the top 1 ft to evaluate the DDT concentrations for the top 1 ft. of soil over the ORF. From these data, the DDT concentrations of the ORF were estimated using Voronoi diagrams, in which each cell area is partitioned based on the sampling locations. Figure 6 shows the resulting Voronoi diagram for the top 1 ft of the soil over the ORF

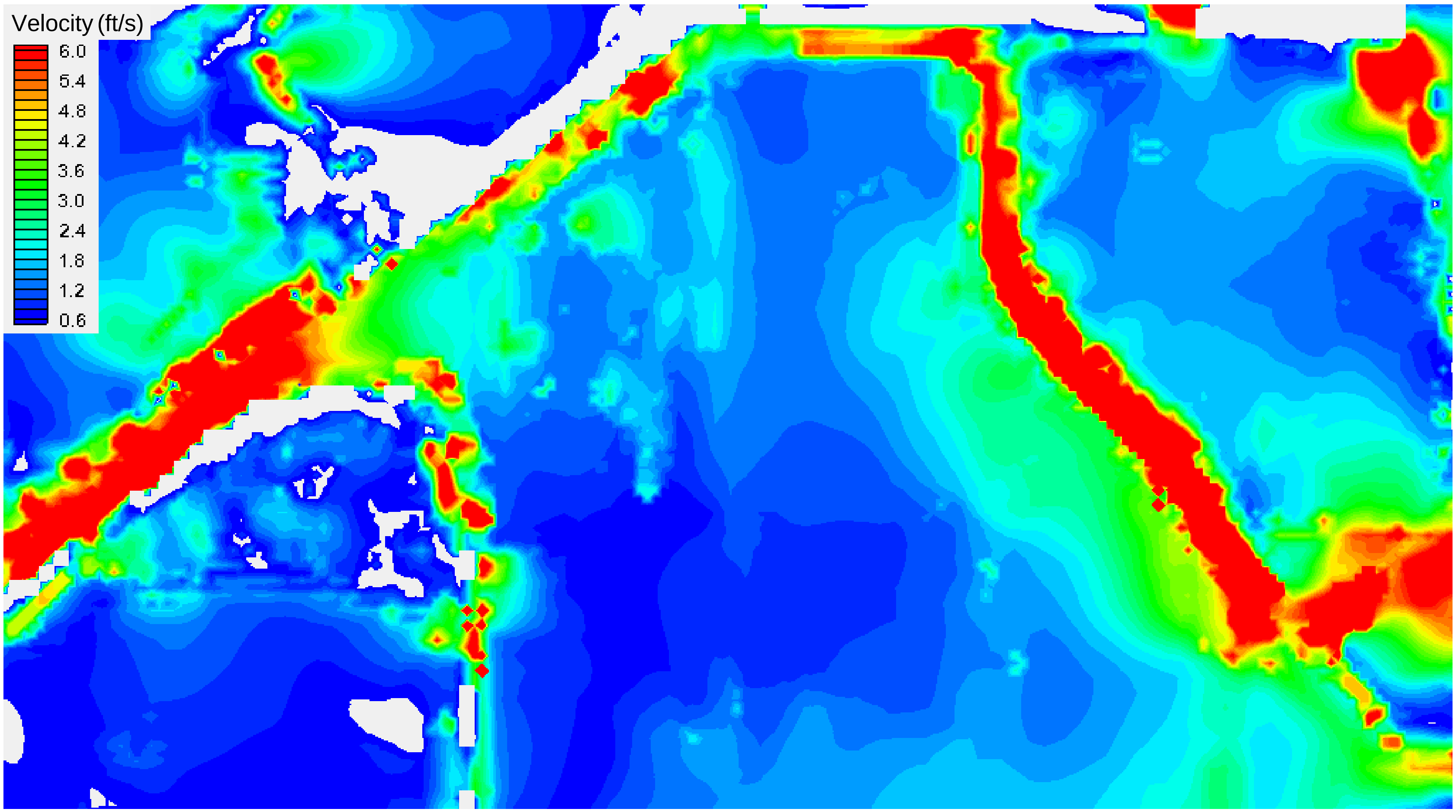

Figure 5. Maximum Velocity during a 100-year Flood under Existing Conditions. Note: white color indicates maximum velocity less than 0.6 ft/s

using both datasets (a total of 25 locations—11 from Anchor QEA and 14 from the U.S. Fish and Wildlife Service). The numbers shown in the figure are the Voronoi cell size in square feet and associated DDT concentrations in µg/kg. Similar Voronoi diagram for soil layer from 1 to 3 feet below ground is provided in Figure 7. This diagram is developed using only the Anchor QEA data. The number of cells in Figure 7 is fewer than those shown in Figure 6 since there are only 11 relevant boring locations for this layer. From these Voronoi diagrams, the average DDT concentration (weighted by soil volume) under the three erosion scenarios over the ORF were calculated and summarized in Table 3.

Table 3: Average DDT Concentrations for Three Erosion Scenarios

EROSION DEPTH (ft.)	AVERAGE DDT CONCENTRATION (µg/kg)
1	790
2	430
3	310

3.0) Specifying the Sensitivity Analysis for the Post 100-Year Flood DDT Deposition

The sensitivity analysis is based on a parameter sweep of the amounts of DDT containing sediments that might be eroded by the 100-year flood; and Section 2.2 has provided coring analysis that indicates the concentration of DDT in the eroded fine sediments could vary between 790 µg/kg to 310 µg/kg, depending on the depth of erosion. Section 2.0 indicates that these eroded contaminated sediments could mix with as much as 438,000 cy of fines (assumed to be uncontaminated) from the upper watershed below the Savage Dam. This estimate was based on a surrogate watershed (Buena Vista Creek) for which more complete sediment yield data was available. Based on the uncertainties of applying that surrogate analysis to the Otay River watershed, it is sensible to consider the sensitivity of the final outcome to omitting the flux of supposedly "clean" sediments from upstream sources altogether. In the absence of any new information revealing additional upstream sources of DDT, that omission will eliminate the dilution effects that blending with "clean" fines exerts on DDT concentrations during the post-flood deposition. From this assessment of the possible sediment erosion input assumptions, a sensitivity analysis **is posed** for the post 100-year flood DDT deposition that is based on erosion fluxes from three possible erosion depths (1 ft, 2 ft, and 3 ft) in the DDT contaminated area of the floodplain that are each combined with two possible fluxes of clean fines (0 cy and 438,000 cy) from the watershed below the Savage Dam; yielding a sensitivity analysis comprised of 6 separate deposition scenarios. The ensembles of input parameters for this sensitivity analysis are summarized in Table 4.

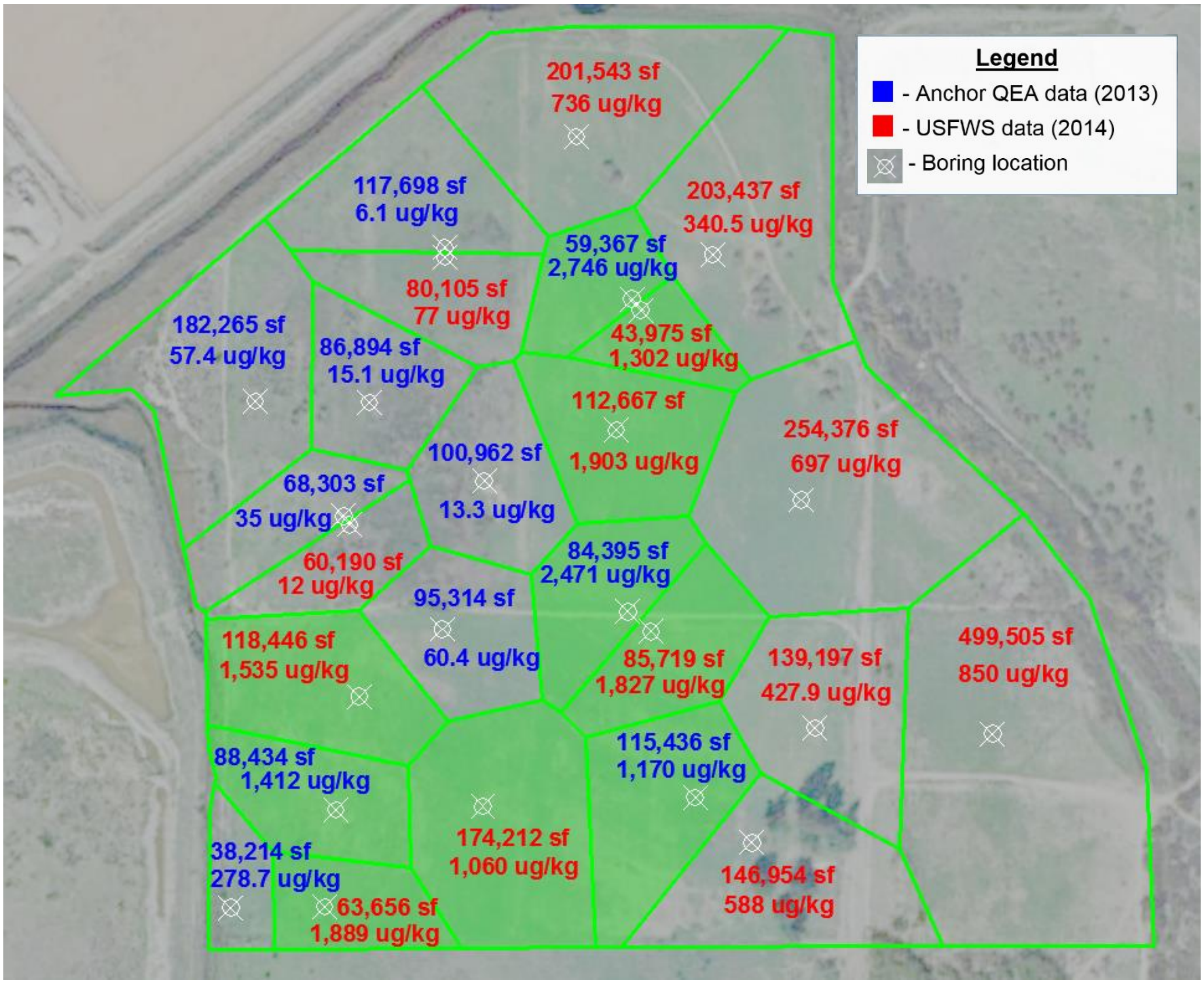

Figure 6. Voronoi Diagram for Soils 0 ft. to 1 ft. below ground surface - Cell Areas and DDT Concentrations

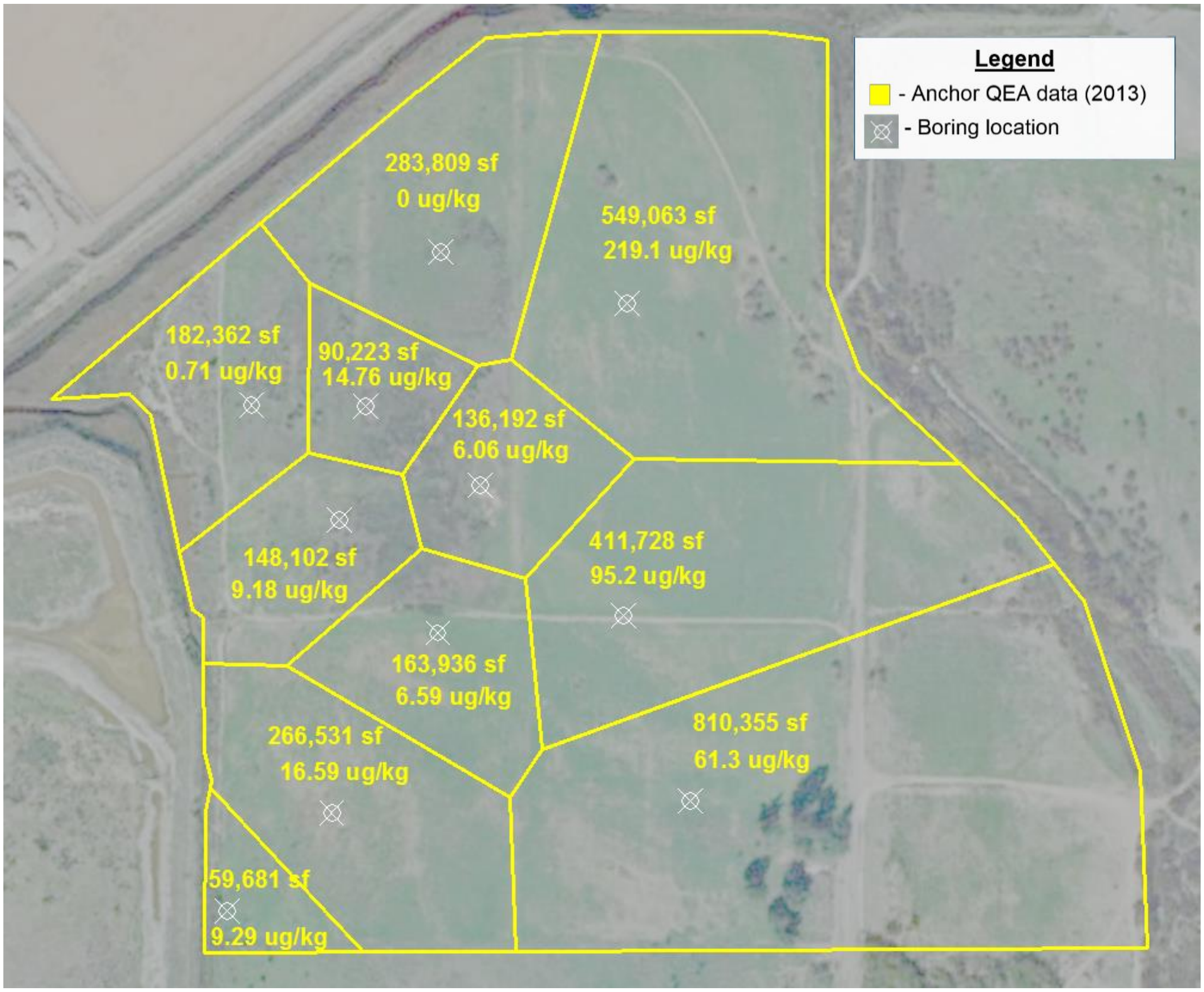

Figure 7. Voronoi Diagram for Soils 1 ft - 3 ft below ground surface - Cell Areas and DDT Concentrations

The suspended sediment concentrations in Table 4 are based on a dry bulk density for eroded soil of 2700 lb per cy, or 1.225 metric tons per cy; where a metric ton is 1000 kg. This conversion factor is applied to the sum of the volume of eroded DDT- bearing fines (column_2) and the volume of eroded fines from the upper Otay watershed (column_4) to obtain the total flux of suspended fine grained sediment in tons/day during the 24-hour flood period of the 100-year flood (cf. Figure 1). The sand and gravel sized fractions eroded from the floodplain by the 100-year flood are assumed to be transported as bed load. The suspended sediment flux component (column_2 + column_4) is divided by the flow volume of $\overline{Q}$ = 29,960,856 m^3 during the 24-hour flood period to give the average suspended sediment concentration in column_6 upon conversion of metric tons to grams and cubic meters to liters.

Table 4: Input Parameters for Sensitivity Analysis of Post 100-Year Flood DDT Deposition

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.
Erode top 3 ft. of Contaminated Area + Upper Watershed*	128,300 cubic yards	310 μ g/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.
Erode top 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 μ g/kg	438,000 cubic yards	24,290 acre ft	18.90 g/l
Erode top 2 ft. of Contaminated Area + Upper Watershed	76,350 cubic yards	430 μ g/kg	438,000 cubic yards	24,290 acre ft	21.03 g/l
Erode top 3 ft. of Contaminated Area Only*	128,300 cubic yards	310 μ g/kg	0 cubic yards	24,290 acre ft	5.25 g/l
Erode top 1 ft. of Contaminated Area Only*	24,260 cubic yards	790 μ g/kg	0 cubic yards	24,290 acre ft	0.99 g/l
Erode top 2 ft. of Contaminated Area Only*	76,350 cubic yards	430 μ g/kg	0 cubic yards	24,290 acre ft	3.12 g/l

4.0) Suspended Sediment Transport and Deposition:

Because DDT is hydrophobic, it can only be adsorbed and transported by the silt and clay fractions of floodplain soils eroded by the 100 year flood. These fine-grained fractions are transported as suspended load (commonly referred to as wash load), and capable of becoming re-distributed into the tidal basins of the restoration project; while the remaining coarser erodible fractions (primarily sands and gravels) are transported as bedload and remain confined to the streambeds of the Otay River, Poggi Canyon Creek and Nestor Creek, (Everest, 2014). For this reason, we focus on the tidally influenced suspended sediment transport dynamics of fine-grained silts and clays in the post-flood period.

While the duration of the 100 year flood is relatively brief (24 hr), the transport, redistribution and settling of the washload sediments can linger on for days, even weeks under the influence of tidal exchange. Typically in calm water, silt particles will require 4.3 hr. to settle to the bottom in 1 meter of water depth, while clay-sized particles can take as long as 18 days. The residence time of water in South San Diego Bay can be as long as 40 days (Largier, 1995); consequently, washload discharged into South San Diego Bay from the 100-year flood can potentially recirculate back into the tidal basins of the restoration project for many tide cycles before the fine-grained washload sediments completely settle out of the South Bay water mass.

From Anchor (2013), the average grain size of the silts and clays that make up the 37.2% of the sediments found in the top three feet of erodible sediments in the black outlined area of Figures 6 & 7 is only 25 microns ($\bar{d}_{fines} \cong 0.025$ mm). The settling velocity is only w_s = 0.030 cm/sec based upon 25 micron median aggregate size of silts and clays (Figure 8). Because of these very low settling rates, (*Stokes settling regime*), subsequent deposition of the silts and clays that contain DDT will be a slow process, which will extend for many tide cycles depending on the local water depth. In posing the problem of tidal flushing of these fine-grained sediments from the tidal basins of the restoration project, we shall neglect any hydrodynamic effect on the tidal hydraulics due to the river flow. This assumption is supported by the short duration of the flood hydrograph relative to the duration of settling and deposition processes. By this assumption, we are basically saying that the hydrodynamics are dominated by the fluvial processes during the first 24 hours, since the flow volume of the 100-year flood is 56 times larger than the combined tidal prisms of the restoration project tidal basins. Thereafter, tidal processes ensue; so that fluvial and tidal processes occur sequentially without interaction. In addition, we shall assume that the sediment yield of the 100-year flood is uniformly dispersed at the end of the flood period, with an initial suspended sediment concentration $\bar{C}_0$ given by column_6 in Table 4 that is uniform throughout the floodplain and adjacent South San Diego Bay as far north as the nodal points at the Chula Vista Wildlife Reserve (Figures 2 & 3). This initial uniform suspended concentration is subsequently modified by the action of tidal advection and diffusion and by gravity-induced settling that we shall represent by the following form of the sediment continuity equation:

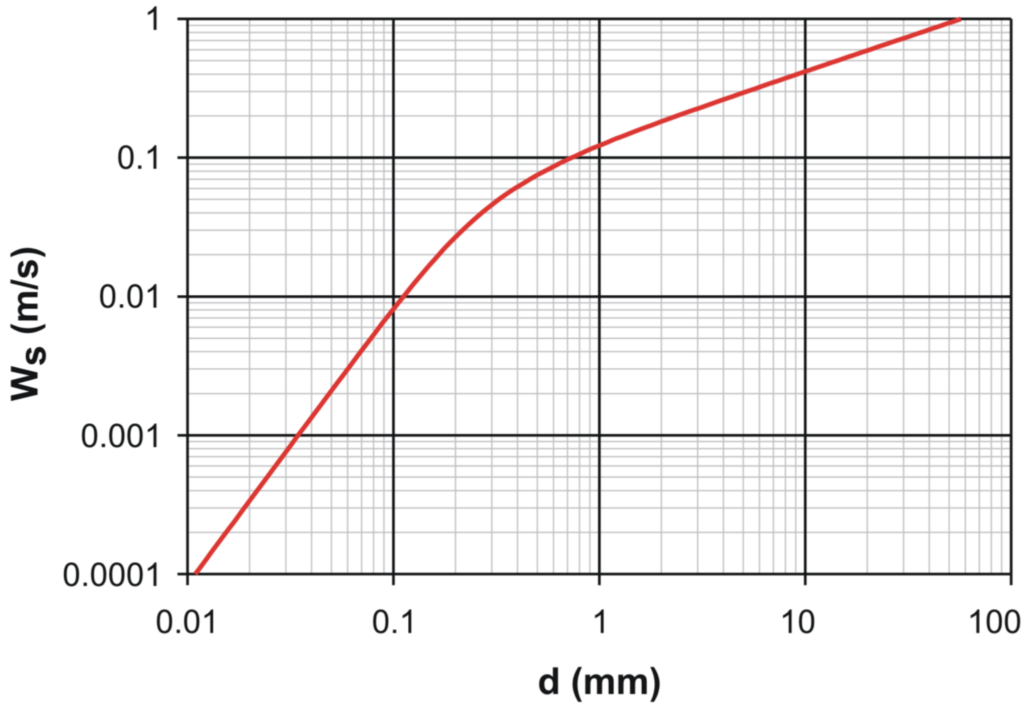

Figure 8: Settling velocity of quartz grains as a function of median grain size.

$$\frac{\partial}{\partial t} cH + \frac{\partial}{\partial x} J_x + \frac{\partial}{\partial y} J_y = \varepsilon_m \left(\frac{\partial^2 c}{\partial x^2} + \frac{\partial^2 c}{\partial y^2} \right) - Sc \qquad (1)$$

where $c = c(x, y, t)$ is the local suspended sediment concentration; S is the settling (sink) coefficient, $S \sim f(w_0)$; w_s is the settling velocity of the sediment that is independent of (*x, y, t*) and is a single valued function of grain size only according to Figure 8; the water depth at any finite element node is $H = \eta + h$; h is the local bottom elevation in NAVD 88; η is the tidal amplitude in NAVD 88; ε_m is the mass diffusivity, and J_x, J_y are local sediment flux components due to the local depth averaged tidal velocities, $(\bar{u}, \bar{v})$:

$$J_x = c \int_{-h}^{\eta} \bar{u} dz \qquad (2)$$

$$J_y = c \int_{-h}^{\eta} \bar{v} dz$$

Equation (1) is forced by the solutions for the water surface elevations, η , and tidal velocities, $(\bar{u}, \bar{v})$ generated by the TIDE_FEM finite element tidal hydraulics model applied to the grading designs of the Intertidal and Subtidal Alternatives for the ORERP. These TIDE_FEM tidal hydraulics solutions are documented in Jenkins and Wasyl (2014).

The term Sc in Equation (1) represents a sink for suspended sediment, often referred to as the deposition flux, $D(x, y, t)$, that is the net of settling and re-suspension:

$$Sc = D(x,y,t) = c(x,y,t)\,w_s - \frac{\alpha\left[\tau(x,y,t) - \tau_c\right]}{\tau_c} \tag{3}$$

Where the term $c\,w_s$ is the downward-directed settling flux, while the upward flux of sediment re-suspended by bottom shear stress is $E(x,y,t) = \alpha(\tau - \tau_c)/\tau_c$. Here, α is an empirical coefficient, α = 2.356 X 10^{-4} g/cm^2/sec after Mehta (1981); τ_c = 0.5 dynes/cm^2 is the cohesive yield stress for unconsolidated mud after Mehta, et al. (1982); and $\tau = (\tau_x^2 + \tau_y^2)^{1/2}$ is the tidally induced bottom shear stress from the that is quasi-linearized by Chezy-based friction using Manning's roughness factor, *n_o:*

$$\begin{aligned} \tau_x &= -\frac{g}{\rho H^2 C_z^{\,2}}\, q_x \left(q_x^{\,2} + q_y^{\,2}\right)^{1/2} \\ \tau_y &= -\frac{g}{\rho H^2 C_z^{\,2}}\, q_y \left(q_x^{\,2} + q_y^{\,2}\right)^{1/2} \end{aligned} \tag{4}$$

$$q_x = \rho \int_{-h}^{\eta} \bar{u}\, dz \quad ; \quad q_y = \rho \int_{-h}^{\eta} \bar{v}\, dz$$

Here, C_z is the Chezy coefficient calculated as:

$$C_z = \frac{1.49}{n_0} H^{1/6} \tag{5}$$

By Equations (1) – (5), the post flood deposition processes of settling and re-suspension are posed as a time-dependent, two-dimensional boundary value problem in which the forcing is provided by the depth averaged tidal velocities, $(\bar{u}, \bar{v})$ resolved by the TIDE_FEM tidal hydraulics model detailed in Sections 2 and 3 of Jenkins and Wasyl, (2014). Boundary conditions and initial conditions on Equation (1) are imposed at the land-water and open water boundaries and open-water boundaries and nodes. Flux quantities normal to these boundary contours are denoted with "n" subscripts and tangential fluxes are given "s" subscripts. At any point along a boundary contour, the normal and tangential suspended sediment fluxes are:

$$J_n = \int_{-h}^{\eta} c u_n dz = \alpha_{nx} J_x + \alpha_{ny} J_y$$
$$J_s = \int_{-h}^{\eta} c u_s dz = -\alpha_{nx} J_x + \alpha_{ny} J_y \qquad (6)$$
$$\alpha_{nx} = \cos(n, x)$$
$$\alpha_{ny} = \cos(n, y)$$

On land-boundary contours, the suspended sediment flux components are prescribed as:

$$J_n = J_s = 0 \qquad \text{on land-water boundaries} \qquad (7)$$

On the open-water boundaries and nodes of the computational mesh, an initial post-flood condition is imposed requiring that the suspended sediment concentration is a constant, $\overline{C}_0$, given by the eroded area values from column_6 in Table 4, or $c = \overline{C}_0$ in Equation (6) at $t = 24$ hr.

Equation (1) is solved over the same finite element mesh as the ORERP tidal hydraulics simulations using the Galerkin weighted residual method detailed in Gallagher,(1981), Weiyan (1992). By this approach, the sediment continuity equation (1) reduces to a simple oscillator equation forced by the collection of algebraic terms which is easily integrated over time. The time integration scheme used over each time step of the post-flood tidal forcing period is based upon the *trapezoidal rule*. This scheme was chosen because it is known to be unconditionally stable, and in tidal propagation problems has not been known to introduce spurious phase differences or damping. It replaces time derivatives between two successive times, $\Delta t = t_{n+1} - t_n$, with a truncated Taylor series.

Solutions to Equation (1) for the post-flood suspended sediment concentration $c = c(x, y, t)$ are combined with solutions for the tidally induced bottom shear stress, $\tau(x, y, t)$, from the TIDE_FEM model to compute the deposition flux, $D(x, y, t)$ using Equation (3). As these solutions continue forward in time post-flood, $D(x, y, t) \rightarrow 0$ as the suspended sediments progressively fall out of suspension and $c(x, y, t) \rightarrow 0$. The deposition flux is integrated over this post-flood deposition period to compute the deposition thickness, but initially this deposition represents unconsolidated of fluid mud. With this initial deposition to consolidate and compact from an initial fluid-mud layer whose bulk concentration is C_f; to some partially consolidated mud layer whose bulk density is C_s, after Krone (1978), Mehta (1989). The deposition thickness at time $t = j\,\Delta t$ for any given nodal point is calculated [Krone, 1962]:

$$\Delta Z(x,y,t) = \int_0^{j\Delta t} \frac{D(x,y,t) - K_s C_s\, g}{1 - C_f\,/C_s}\,dt \qquad (8)$$

where K_s = 4 x 10^{-13} sec is the sedimentation coefficient after the work of Fujita (1962). The fluid mud layer bulk concentration shall be set at C_f = 100g/l and the partially consolidated mud concentration shall be set at a rather low value of C_s = 200 g/l to allow for the effects of bioturbation. These are conservative values which will tend to overestimate deposition thickness. The mass diffusivity shall be set at ε_m = 4.9 cm^2/sec based upon work conducted in tidal basins in the San Francisco Bay Estuary, Jenkins and Wasyl (1980, 1983, and 1990).

5.0) Post-Flood Tidal Deposition Simulations for the 100-Year Flood:

The TIDE_FEM model was run for 276 hours immediately following the 100-year flood using tidal forcing with Δt = 2 sec time step intervals at the mouth of the Otay River, derived from a spectral correction applied to the NOAA tide gage #941-0170 located at the Navy Pier, as detailed in Section 3.4 of Jenkins and Wasyl (2014). The post-flood tidal deposition simulations were run on the same finite element grid using the TIDE_FEM outputs for depth averaged tidal velocities, $(\bar{u},\bar{v})$, tidally induced bottom shear stress $\tau(x,y,t)$, and local water surface elevations, η as forcing functions to Equation (1).

Initial conditions post flood were a uniform dispersion throughout the model grid of a suspension of silt and clay sized sediment characterized by a 20 micron median grain size with a settling rate of w_s = 0.030 cm/sec to account for some degree of flocculation. The initial conditions were specified as a uniform suspended sediment concentration, $\overline{C}_0$, and companion DDT concentration for each scenario of the sensitivity analysis according column_6 and column_3 respectively in Table 4. The finite element model grid included the lower Otay River channel beginning at the presently contaminated area shown in Figures 6 & 7; the tidal basins of the restoration with all of the salt pond complexes; and extended out into south San Diego Bay as far as the Chula Vista Wildlife Reserve as shown in Figures 2 & 3. Boundary conditions on this grid consisted of no normal fluxes of suspended sediment through the land-water boundaries, and continuity of normal and tangential fluxes of suspended sediment across the open water boundaries where a constant suspended sediment concentration $c = \overline{C}_0$ from column_6 in Table 4 prevailed at time $t = 24$ hr at the start of the deposition simulation. For each time step, the TIDE_FEM model solves equations (3) and (8) for deposition flux and deposition thickness at each finite element node in the grid mesh. The deposition of partially consolidated mud in the tidal basins of the restoration was characterized by averaging deposition flux and deposition thickness at 6 (ea.) nodes distributed across the Floodplain Tidal Basin and 9 (ea.) nodes distributed across the Pond 15 Tidal Basin of the Intertidal and Subtidal Alternatives.

Figure 9 gives the time evolution of the post-flood deposition flux and deposition thickness for the first scenario (row_2 of Table 4) in the Floodplain Tidal Basin of the Intertidal and Subtidal Alternatives; and Figure 10 gives results for those same quantities in the Pond 15 Tidal Basin of the Intertidal and Subtidal Alternatives. This scenario is based on maximum flood-induced erosion depths of 3 ft. in the contaminated area adjacent the Floodplain Tidal Basin mixed with 438,000 cubic yards of fine-grained sediments from upstream erosion of the portion of the watershed below the Savage Dam. Results are similar for both tidal basins and restoration alternatives with dry bulk DDT concentrations of 70.2 μg/kg everywhere in the post-flood deposition, because the initial post-flood suspended sediment concentration is the same in all areas in and around the restoration as a consequence of the 100 year flood over topping and flowing through these areas with its washload (cf. Figures 2 & 3). The general depositional features are that deposition flux peaks within one diurnal tide cycle after cessation of the flood in both basins of both restoration alternatives, with an initial deceleration in flux during the first semidiurnal ebb tide. After the first post-flood diurnal tidal cycle, the deposition flux declines as progressive settling depletes the suspended sediment concentration, and tidal residence times in the tidal basins limits the amount of time for settling and deposition to occur. Meanwhile, deposition thickness, which results from the cumulative sum of deposition flux over time, rapidly builds during the peak deposition flux period, and then gradually approaches a constant limit for partially consolidated mud at 200 g/l bulk density as the deposition flux vanishes after 120 to 150 hours post-flood. The minor differences in deposition flux and deposition thickness among tidal basins and restoration alternatives in Figures 9 & 10 is due to differences in residence times and grading elevations (i.e. water depth).

The Floodplain Tidal Basin, which has the shortest residence time (2 days for the Intertidal Alternative and 2.5 days for the Subtidal Alternative), has the lowest peak deposition flux (16.5 – 18.3 ton/acre/day) and the shortest deposition period (~120 hours); and accumulates only 3.3 to 3.4 mm of partially consolidated mud after 276 hours post-flood (Figure 9). Because of the sub-tidal channel graded into the Floodplain Tidal Basin design for the Subtidal Alternative, the residence time and consequently the deposition fluxes and thickness are slightly greater than for the Intertidal Alternative.

On the other hand, tidal residence times are nearly a day longer for the Pond 15 Tidal Basin of both alternatives (where residence times are 3.0-3.2 days), and consequently deposition fluxes and thickness are notably greater in Figure 10 than for the Floodplain Tidal Basin in Figure 9. In Pond 15, the deposition flux peaks at 18.9-19.9 ton/acre/day, and the deposition period is longer, about 150 hours post-flood. Consequently the deposition thickness is nearly double in Pond 15, with 7.6 to 8.0 mm of partially consolidated mud laid down after 276 hours post-flood. Because more dredge fill from the Floodplain Tidal Basin construction is deposited in Pond 15 of the Subtidal Alternative, its storage volume and residence times are less than for the Intertidal Alternative, whence the deposition fluxes and thickness are slightly less for the Subtidal Alternative in Figure 10 than for the Intertidal Alternative.

The initial post 100-year flood accumulations of partially consolidated mud computed in Figures 9 & 10 will, over time, dewater and compact under its own immersed weight. If

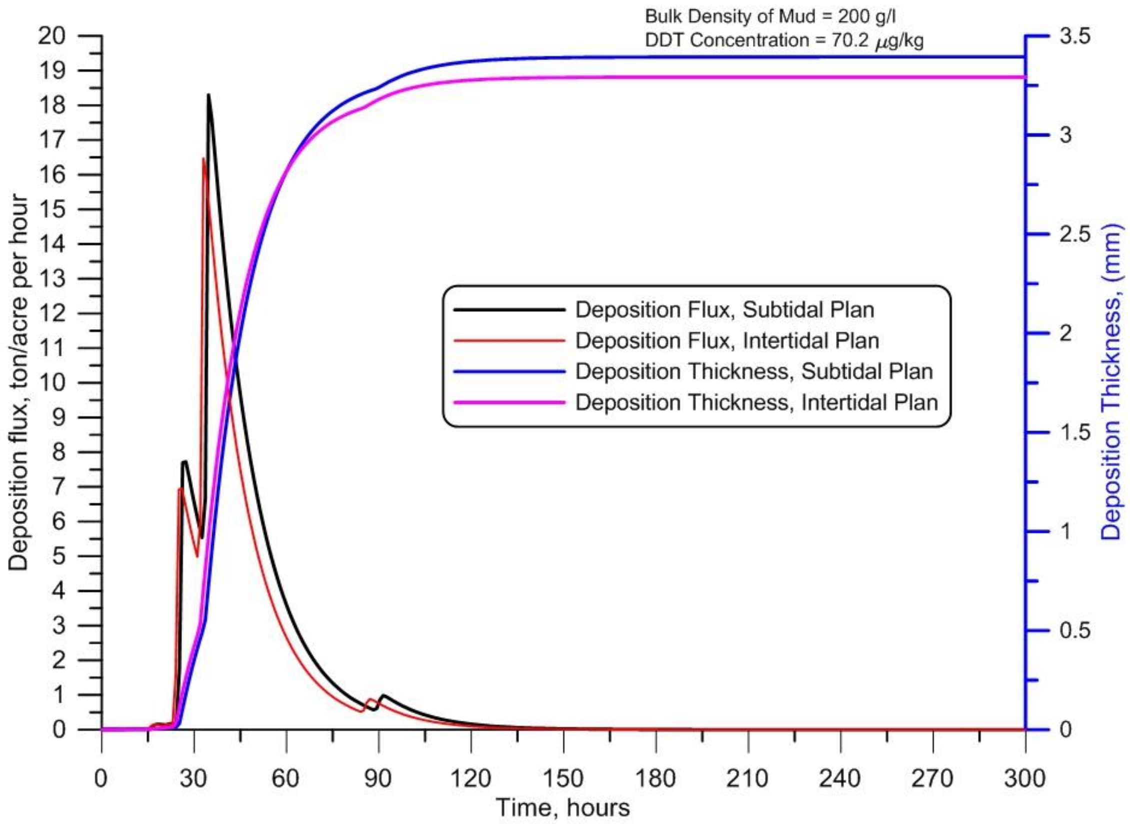

Figure 9. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

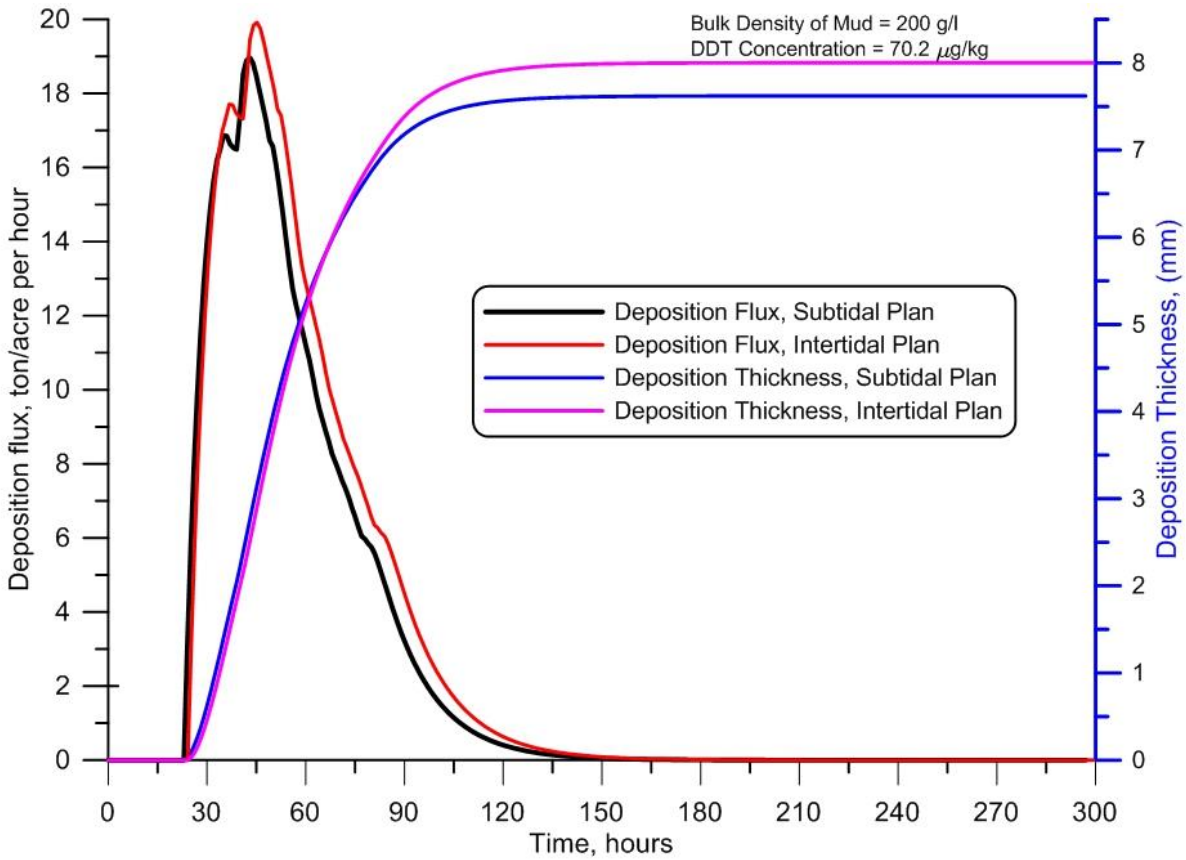

Figure 10. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

we assume that the 3mm to 7mm of initial deposition would consolidate and compact to a maximum saturated density for fully consolidated mud, 1200 g/l, then the 100-year flood deposition for the first scenario in Table 4 (row_2) would eventually become a layer of consolidated mud only 0.5 mm to 1.2 mm thick; or:

Floodplain Basin: $3.3\,mm\ @\ 200 g/l \ \Rightarrow\ \left\{\frac{dewatering}{consolidation}\right\}\ \Rightarrow\ 0.55\,mm\,@\,1{,}200 g/l$

Pond 15 Basin: $8\,mm\ @\ 200 g/l \ \Rightarrow\ \left\{\frac{dewatering}{consolidation}\right\}\ \Rightarrow\ 1.4\,mm\,@\,1{,}200 g/l$

Consolidation only involves a reduction in the water content of the post-flood deposition, and therefore does not alter the DDT dry bulk concentration, which remains 70.2 μ g/kg once the muds have consolidated to a density of 1,200 g/l. The amount of time required for this degree of consolidation is uncertain, but experience with dredge material disposal ponds at Mare Island, CA and Charleston, SC [Jenkins, 1980; Jenkins et al., 1981; Jenkins and Skelly, 1983] suggests that consolidation to 600 g/l could occur within three months while full consolidation to saturation could take several years.

Next, consider how such results may be affected if we assume no erosion of soils occurs in the portion of the watershed upstream of the floodplain and below the Savage Dam. This scenario is specified by the fifth row in Table 4 and is based on maximum erosion depths of 3 ft. in the contaminated area only; and is considered *worst-case.* Here, runoff from the 100 year flood consists of a uniform suspended load of silts and clays with concentration of $\overline{C}$ = 5.25 g/l. Figure 11 gives the time evolution post-flood for deposition flux and deposition thickness in the Floodplain Tidal Basin of the Intertidal and Subtidal Alternatives; and Figure 12 gives results for those same quantities in the Pond 15 Tidal Basin of the Intertidal and Subtidal Alternatives. Again, results are similar for both tidal basins and restoration, but the dry bulk concentration of DDT in the post-flood deposition has increased to 310 μ g/kg, while the deposition thicknesses are greatly diminished. Again, the Floodplain Tidal Basin, with the shortest residence time (Figure 11), has the lowest peak deposition flux (3.7 – 4.1 ton/acre/day) and the shortest deposition period (~120 hours); and accumulates only 0.75 to 0.77 mm of partially consolidated mud after 276 hours post-flood. Deposition fluxes and thickness are slightly greater for the Floodplain Subtidal Alternative than for the Intertidal Alternative, due to its deeper sub-tidal channel and longer residence time. With tidal residence times being nearly a day longer for the Pond 15 Tidal Basin of both alternatives, deposition fluxes and thickness are notably greater in Figure 12 than for the Floodplain Tidal Basin in Figure 11. In Pond 15, the deposition flux peaks at 4.3 - 4.5 ton/acre/day, and the deposition period is longer, about 150 hours post-flood. Consequently the deposition thickness is nearly double in Pond 15, with 1.7 to 1.8 mm of partially consolidated mud laid down after 276 hours post-flood. Because more dredge fill is deposited in Pond 15 under the Subtidal Alternative, its storage volume and residence times are less than for the Intertidal Alternative, whence the deposition fluxes and thickness are slightly less in Figure 12 for the Subtidal Alternative. After dewatering and compaction to a density of 1200 g/l, the post-flood deposition for this worst case eventually become a layer of consolidated mud on the order of

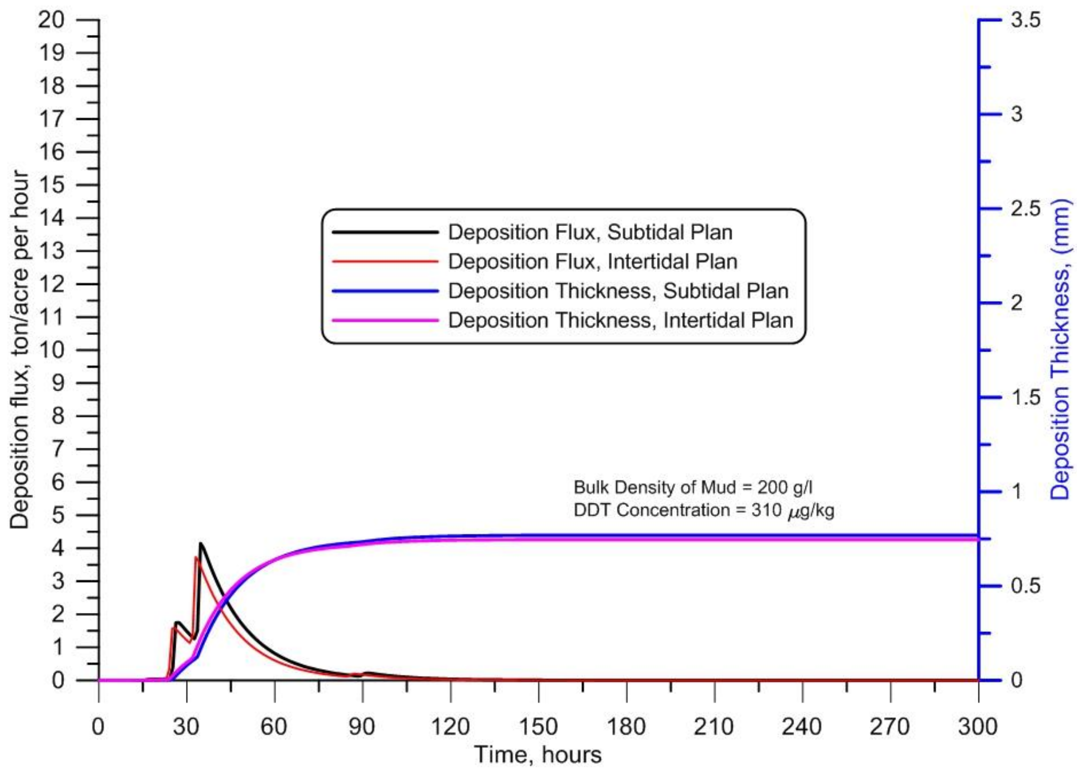

Figure 11. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration

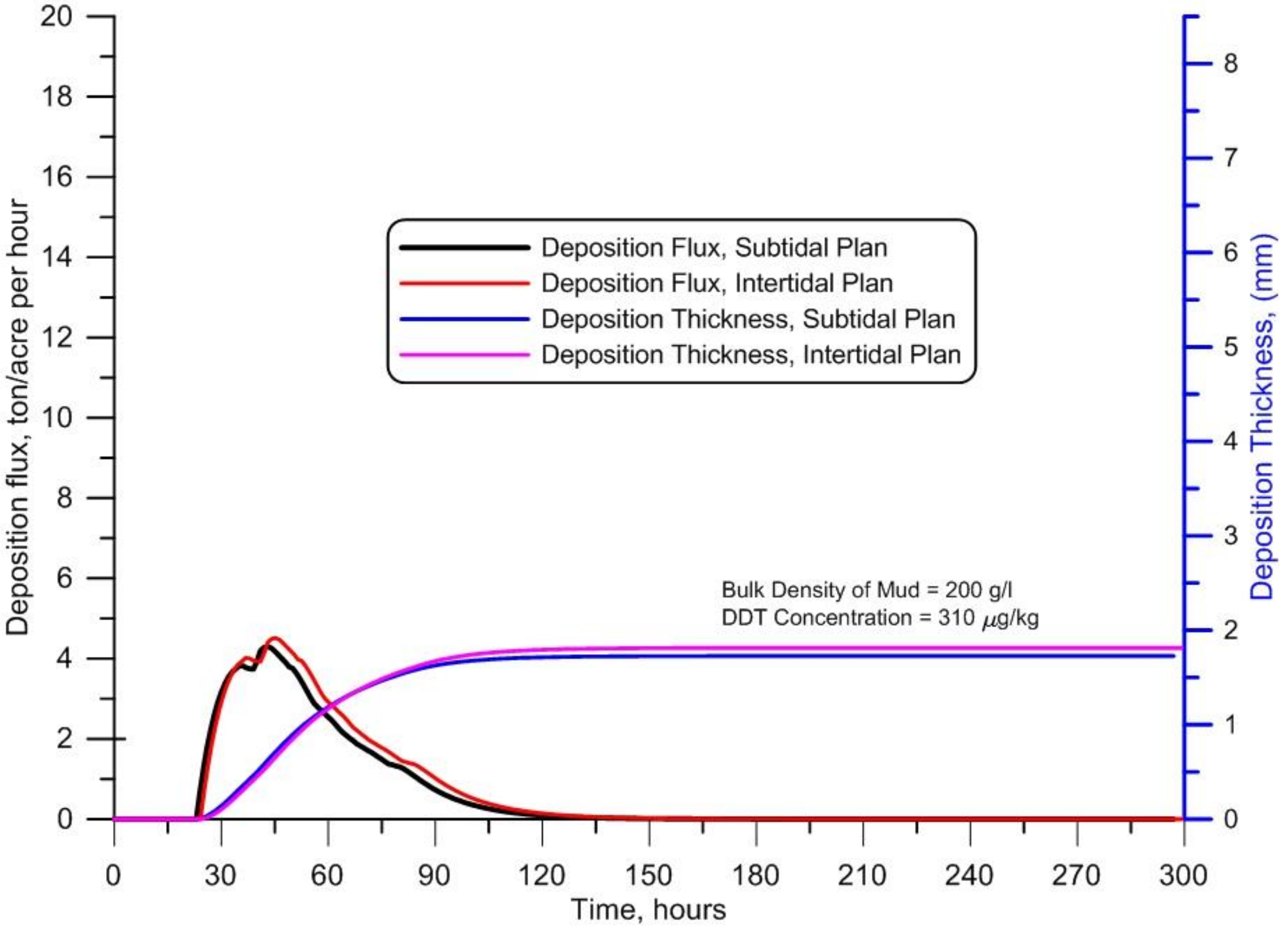

Figure 12. Sensitivity analysis of deposition of fine-grained sediment (mud) in Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration

only 0.2 mm to 0.4 mm thick; or:

$$\text{Floodplain Basin: } 0.75\,mm\ @\ 200 g/l \;\Rightarrow\; \left\{\frac{dewatering}{consolidation}\right\} \;\Rightarrow\; 0.17\,mm\ @\ 1{,}200 g/l$$

$$\text{Pond 15 Basin: } 1.8\,mm\ @\ 200 g/l \;\Rightarrow\; \left\{\frac{dewatering}{consolidation}\right\} \;\Rightarrow\; 0.41\,mm\ @\ 1{,}200 g/l$$

Again, dewatering and consolidation does not alter the dry bulk DDT concentrations in the post-flood muddy deposits, which will remain at 310 μ g/kg even if these muds consolidate to full saturation.

Plots of the deposition flux and deposition thickness time series for the other scenarios of the sensitivity analysis are found in APPENDIX-A. The complete ensemble of deposition scenarios from this sensitivity analysis are summarized in Table 5 below. Entries in the last three rows are based on the assumption of no erodible fine-grained sediments anywhere else in the Otay River watershed outside of the contaminated area adjacent the ORERP Floodplain Tidal Basin. While the DDT concentrations in the muds deposited under these scenarios of no upstream sources can range as high as 310 μ g/kg to 790 μ g/kg, the deposition thicknesses reduce to only fractions of a millimeter once these muds become consolidated (cf. column_8, Table 5). To assess the potential biological impacts of these simulation results, a risk assessment analysis based on screening levels of keystone wetland species is presented in Section 6 below.

6) Post-Flood Tidal Deposition Simulations for the 50-Year Flood:

6.1 Input Assumptions: The 50-year flood hydrographs for the Otay River, Poggi Canyon Creek and Nestor Creek are triangular with 24-hour durations, similar to those shown in Figure 1 for the 100-year flood, but involving significantly less flow volumes. The total flow volume during a 50-year flood for the Otay River is 19,200,000 cubic yards (cy), or 14,679,545 cubic meters (m^3). The corresponding flow volumes for Poggi Canyon Creek and Nestor Creek are respectively 1,488,000 cy (1,137,664 m^3) and 1,584,000 cy (1,211,062 m^3), so that the combined flow through the floodplain is $\overline{Q}$ = 22,272,000 cy (17,028,272 m^3), or 13,805 acre ft. The flow for the Otay River is an order of magnitude higher than those for Poggi Canyon Creek and Nestor Creek. It was estimated that during the 50-year flood, only about 60% of the Otay and Poggi flow would pass through the proposed wetland restoration areas, while the remainder would flow through the adjacent salt ponds and into South San Diego Bay. The percent of Nestor flow that would pass through the wetland was not analyzed, but since Nestor Creek directly flows into the proposed wetland area, it was assumed that all of the Nestor Creek flow would enter the wetland. Based on these flow volumes and the sediment stratigraphy revealed by the borings taken by Anchor 201, it was estimated that the 50-year flood would erode the top 1 ft of soil over the entire ORF. The eroded volume of soil in the ORF due to the 50-year flood was estimated to be 114,900 cy (87,848 m^3), of which 21.1% (24,260 cy or 18,545 m^3) are DDT bearing fin grained sediments. The average dry bulk DDT concentration in these fine grained sediments is 790 µg/kg.

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.	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. of Contaminated Area + Upper Watershed*	128,300 cubic yards	310 μ g/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.	3.3 mm to 8.0 mm	0.5 mm to 1.4 mm	70.2 μ g/kg
Erode top 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 μ g/kg	438,000 cubic yards	24,290 acre ft	18.90 g/l	2.7 mm to 6.5 mm	0.4 mm to 1.1 mm	41.5 μ g/kg
Erode top 2 ft. of Contaminated Area + Upper Watershed	76,350 cubic yards	430 μ g/kg	438,000 cubic yards	24,290 acre ft	21.03 g/l	3.0 mm to 7.3 mm	0.45 mm to 1.3 mm	63.8 μ g/kg
Erode top 3 ft. of Contaminated Area Only**	128,300 cubic yards	310 μ g/kg	0 cubic yards	24,290 acre ft	5.25 g/l	0.75 mm to 1.8 mm	0.17 mm to 0.41 mm	310 μ g/kg
Erode top 1 ft. of Contaminated Area Only	24,260 cubic yards	790 μ g/kg	0 cubic yards	24,290 acre ft	0.99 g/l	0.14 mm to 0.34 mm	0.02 mm to 0.06 mm	790 μ g/kg
Erode top 2 ft. of Contaminated Area Only	76,350 cubic yards	430 μ g/kg	0 cubic yards	24,290 acre ft	3.12 g/l	0.44 mm to 1.1 mm	0.07 mm to 0.12 mm	430 μ g/kg

Table 5: Matrix of Sensitivity Analysis of Potential DDT Deposition in the ORERP post-100 year flood.

The 50-year flood will cause additional soil erosion from the watershed below the Savage Dam. Based on scaling by the watershed size relative to the Buena Vista watershed, it was estimated that sediment discharge from the Otay River watershed below Savage Dam during the 50-yr flood is about 501,000 cy of which 50% is fine, or 250,500 cy. Because only 60% of flow from the upper Otay River watershed would pass through ORF, the eroded contaminated sediments from the ORF could mix with as much as 150,300 cy (114,913 m^3) of fines not known to contain DDT from the upper watershed below the Savage Dam.

From this assessment of possible sediment erosion input assumptions, we pose a sensitivity analysis for the post 50-Year flood DDT deposition that is based on erosion fluxes from one possible erosion depth (1 ft.) in the DDT contaminated area of the floodplain that is each combined with two possible fluxes of clean fines (0 cy and 150,300 cy) from the upper watershed below the Savage Dam; yielding a sensitivity analysis comprised of two separate deposition scenarios. The ensembles of input parameters for this sensitivity analysis are summarized in Table 6.

Table 6: Input Parameters for Sensitivity Analysis of Post 50-Year Flood DDT Deposition

Scenario	Volume of Eroded DDT-Bearing Fines	DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.
Erode top 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 μg/kg	150,300 cubic yards	13,805 acre ft	12.60 g/l
Erode top 1 ft. of Contaminated Area Only*	24,260 cubic yards	790 μg/kg	0 cubic yards	13,805 acre ft	1.8 g/l

The suspended sediment concentrations in Table 6 are based on a dry bulk density for eroded soil of 2700 lb per cy, or 1.225 metric tons per cy; where a metric ton is 1000 kg. This conversion factor is applied to the sum of the volume of eroded DDT- bearing fines (column_2) and the volume of eroded fines from the upper Otay watershed (column_4) to obtain the total flux of suspended fine grained sediment in tons/day during the 24 hour flood period of the 50-year flood. The sand and gravel sized fractions eroded from the floodplain by the 50 year flood are assumed to be transported as bed load. The suspended sediment flux component (column_2 + column_4) is divided by the flow volume of $\overline{Q}$ = 17,028,272 m^3 during the 24 hour flood period to give the average suspended sediment concentration in column_6 upon conversion of metric tons to grams and cubic meters to liters.

6.2 Deposition Results: Plots of the deposition flux and deposition thicknesses in the ORERP tidal basins for the 50-year flood scenarios are found in Figures 13 through Figure 16. The complete ensemble of 50-year flood deposition scenarios from this sensitivity analysis are summarized in Table 7 below. With initial dilution from mixing with the clean sediments from upstream sources, DDT concentrations post-50 year flood in the tidal basins of the ORERP are on the order of 110 μ g/kg. This concentration is higher than the companion result for the 100-year flood in row_1, column_9, Table 5. This is due to the fact that the 50-year flood causes proportional less erosion in the upper water shed of the Otay River than the 100 year flood. Entries in the last row of Table 7 are based on the assumption of no erodible fine-grained sediments anywhere else in the Otay River watershed outside of the contaminated area adjacent the ORERP Floodplain Tidal Basin and represent *worst case* for the 50-year flood. While the DDT concentrations in the muds deposited under worst case scenarios of no upstream sources can range as high as 790 μ g/kg, the deposition thicknesses are initially only 0.62 mm to 0.26 mm reduce to only fractions of a millimeter (0.06 mm to 0.14 mm) once these muds become consolidated (cf. column_8, Table 7). However, the DDT deposition results for 50-yr were found to be within the range of those for the 100-yr flood, so that the conclusions put forth previously in Section 6 on potential flood-induced DDT impacts to the ORERP wetlands ecology are upheld.

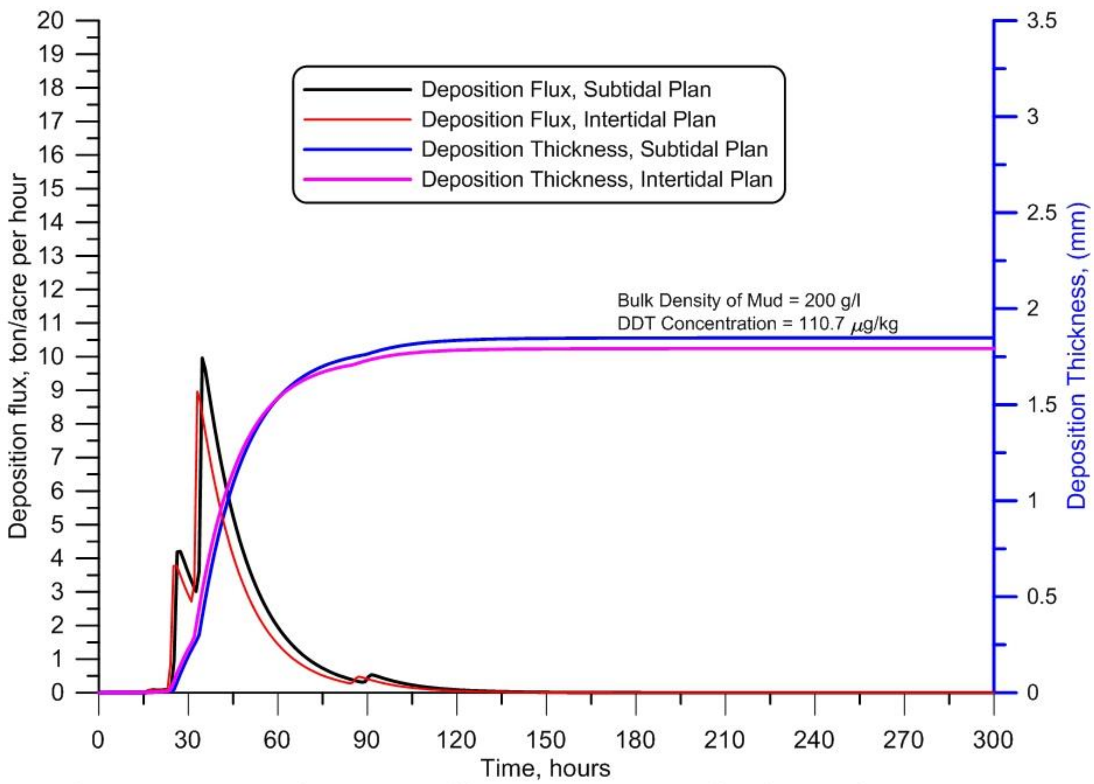

Figure 13. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 50-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,500 cubic yards of contaminated fines from erosion of the top 1 ft. and 150,300 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

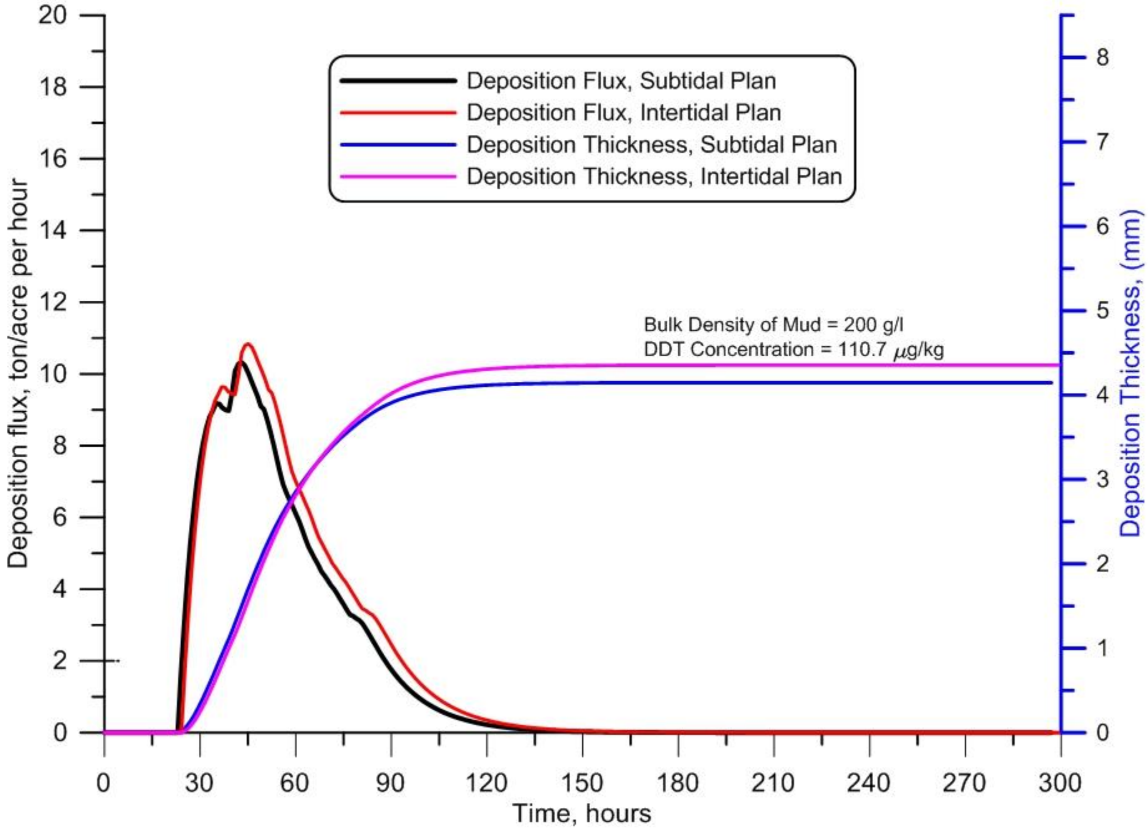

Figure 14. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 50-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,500 cubic yards of contaminated fines from erosion of the top 1 ft. and 150,300 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

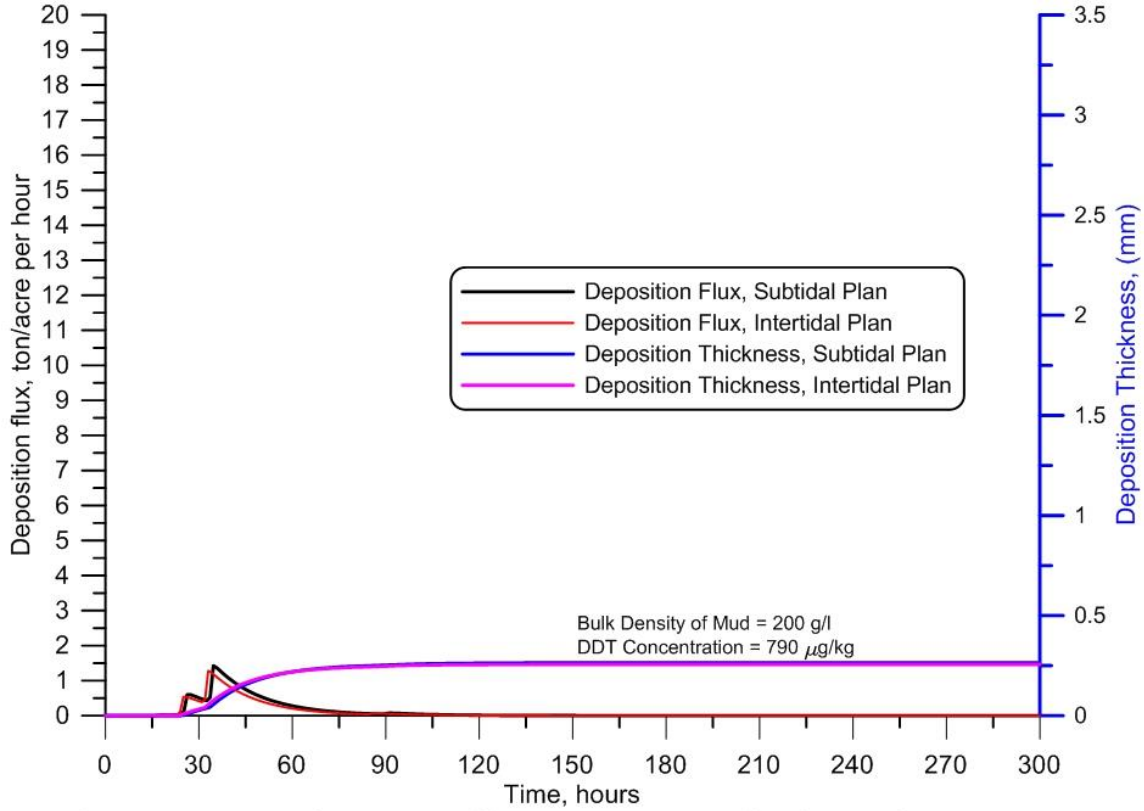

Figure 15. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 50-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

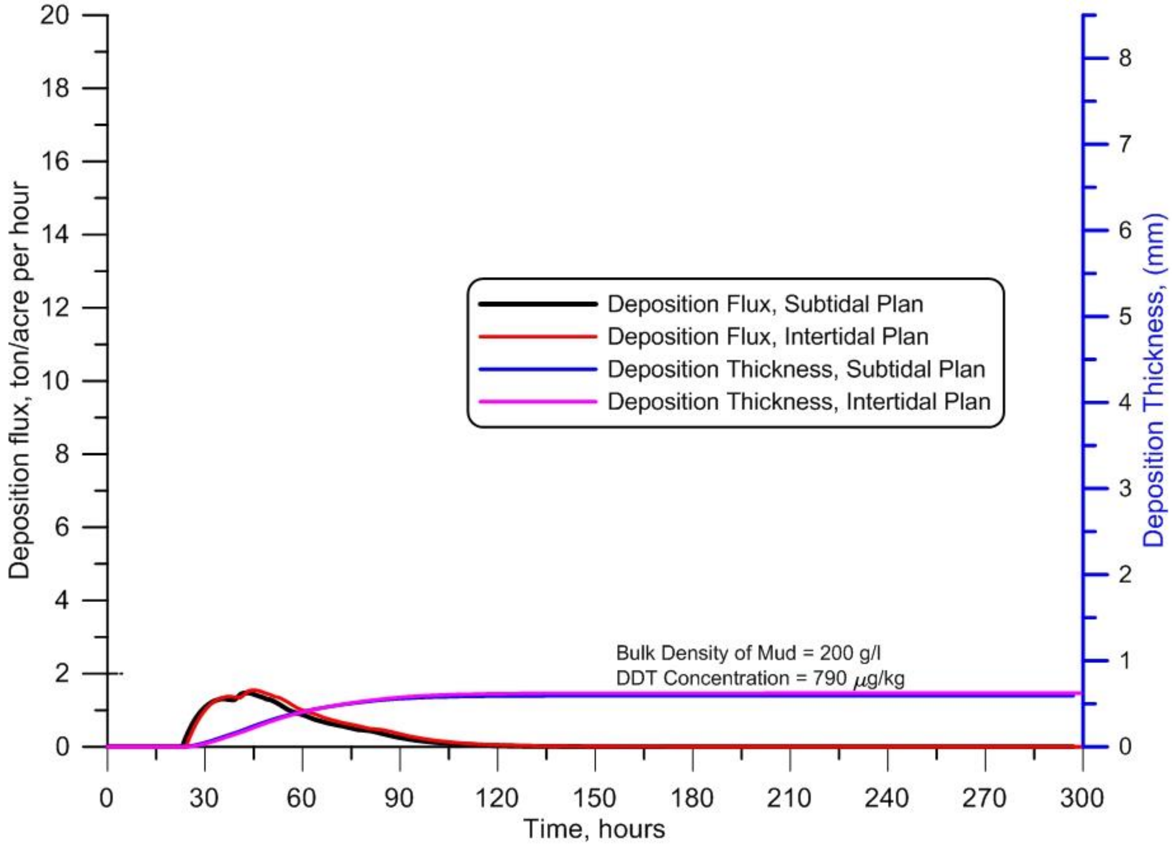

Figure 16. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 50-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,500 cubic yards of contaminated fines from erosion of the top 1 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.	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 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 μ g/kg	150,300 cubic yards	13,805 acre ft	12.60 g/l	1.8 mm to 4.3 mm	0.30 mm to 0.72 mm	110.7 μ g/kg
Erode top 1 ft. of Contaminated Area Only	24,260 cubic yards	790 μ g/kg	0 cubic yards	13,805 acre ft	1.8 g/l	0.26 mm to 0.62 mm	0.06 mm to 0.14 mm	790 μ g/kg

Table 7: Matrix of Sensitivity Analysis of Potential DDT Deposition in the ORERP post-50 year flood.

*Entries in RED are based on the assumption of NO erodible fine-grained sediments anywhere else in the Otay River watershed below Savage Dam outside of the contaminated area adjacent the ORERP Floodplain Tidal Basin.**,** and represent *Worst-Case* for the 50-year flood

7.0) Biological Implications of the Post-Flood Deposition Simulations

The approach used for this analysis was to focus on critical and applicable information. The focus was on sensitive and potentially most exposed species, and data that would be applicable to the specific area (i.e., salt marshes in San Diego Bay). A risk assessment approach was used to identify wildlife risk-based screening levels for DDT in salt marsh sediment. A screening level approach was used, in that estimates were based on most exposed and/or sensitive species, and conservative assumptions used when there was uncertainty. This analysis entails the identification of no-effects based screening levels (doses and dietary concentrations) for birds, and factors that can be used to relate DDT concentrations in the bird's diet (specifically marsh invertebrates and forage fish) to concentrations in sediment. The availability of applicable data is greatest for effect levels in birds, while data on biota/sediment relationships are limited, especially for forage fish. Consequently, while it is possible to identify conservative dietary screening levels for avian receptors, whether factors used to relate DDT concentrations in biota to DDT concentrations in sediment are particularly conservative is not possible to tell at this time. In other words, this is not necessarily a worst case relative to this element of the analysis.

7.1 Screening Levels For DDT and Metabolites In Salt Marsh Sediment Relative to Proposed ORERP Activities: DDT in environmental media usually occurs as a mixture of parent compound (p,p'-DDT), and impurities and metabolites (i.e., o,p'-DDT, o,p'-DDD, o,p'-DDE, p,p'-DDD and p,p'-DDE). The metabolite, p,p'-DDE is the most persistent and the dominant of the six isomers (forms) in biological samples and in environmental media where there have been no recent DDT applications. The p,p'-DDE isomer is also the one associated with the most sensitive adverse effects in avian species. Consequently, some studies focus on p,p'-DDE only, while others consider the sum of the six isomers (total DDT). Data from studies on p,p'-DDE were considered in the development of the sediment screening levels. However, because of concerns about ongoing conversion of DDT to DDE, and because isomers other than p,p'-DDE are associated with adverse effects, sediment screening levels are used for comparison with total DDTs even though they are derived based on data for the most sensitive effects that are associated with p,p'-DDE.

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. Sediment screening levels for DDT and metabolites must consider; 1) potential for toxicity to benthic invertebrates, and 2) potential for uptake and food chain transfer and therefore adverse effects via dietary exposure among aquatic-dependent wildlife.

The focus of this exercise is on avian species because marsh habitats on San Diego Bay NWR: 1) are specifically managed for federally listed species (birds and one plant) and migratory birds[1], and 2) do not support mammalian or reptile species of concern nor other species that (based on feeding habits) are likely to experience significant exposure to sediment-borne DDT. Avian species that are present during the nesting season are of particular concern because DDT (specifically p,p'-DDE) impairs eggshell production by adult females (thin shells) and, because it is readily transferred to eggs, may adversely affect developing embryos. Eggshell thinning is a well-documented effect in many species of birds, and it may be one of the most sensitive of sub-lethal effects leading to population-level impairments. Sensitivity to the thinning effects of p.p'-DDE varies among species. Species that are less sensitive to eggshell thinning may be at risk of endocrine disrupting effects of o,p'-DDT on developing embryos (e.g., developmental feminization) (Fry and Toone 1981). It is assumed that screening levels based on the toxicity of p,p-DDE but applied to total DDTs will protect against adverse effects associated with any of the isomers.

7.2: Wildlife Receptors: Two species of birds were considered as representatives of potentially most exposed aquatic-dependent wildlife to DDT in marsh sediments: One is the light-footed Ridgeway's rail (*Rallus obsoletus longirostrus* or LFRR; formerly light-footed clapper rail), and the other is the snowy egret (*Egretta thula*).

1. The LFRR is a federally endangered bird that is a year-round resident of salt marshes of coastal southern California, including at the San Diego Bay NWR. LFRR forage for food in vegetated marsh and tidal creek channels by gleaning and probing for benthic organisms. Their primary foods are snails and crabs, but they are opportunistic and will eat bivalves, shrimps, worms and fish (Zembal and Fancher 1988). LFRR exposure to sediment-borne DDT is almost completely via diet, but there may be some exposure via incidental ingestion of sediment while foraging as well. The LFRR is larger than two other rallid species with similar feeding habitats that might occur in the restored salt marsh (i.e. the Sora and the Virginia rail), but only infrequently and generally not during the nesting season (SDSU San Diego Bird Atlas). However, it is the same size or smaller, therefore has equal or greater nutritional needs, than most species with similar feeding habits that commonly forage in San Diego Bay salt marshes (e.g., willet, long-billed curlew and whimbrel). Given the estimated nutritional needs, and year-round residency, the LFRR is considered a reasonably conservative representative of marsh birds that rely on resident mid-trophic level invertebrates for food, and will be exposed to site-specific DDT during the nesting season.

2. The snowy egret is a wading bird that can be found foraging for fish in San Diego Bay marshes while nesting in colonies at nearby locations. The snowy egret mainly eats fish, but may opportunistically consume invertebrates and small terrestrial vertebrates. Because most of their diet is fish, snowy egrets are considered upper trophic level aquatic-dependent predators that may encounter even higher DDT concentrations in their diet than will species such as the LFRR. The snowy egret is one of the smaller wading bird species, which include egrets, herons and bitterns, and as such has proportionally

[1] Note: the highlights are provided to bring the reader's attention to the specific steps in this analysis.

greater nutritional needs than other larger species. Because of its diet, food requirements and foraging habits, snowy egrets are considered a conservative representative of piscivorous birds given they rely on upper trophic level salt marsh biota (fish) for food and are relatively small among wading birds.

7.3 General Approach: A couple approaches were used to derive wildlife risk-based sediment screening levels, determined largely by the kinds of data available for assessing effects thresholds in birds and relating thresholds for eggs and diet to concentrations in sediment. This is provided because each approach will give somewhat different but valid results relative to the question of risk posed by the sediments.

1. Tissue targets for p,p'-DDE and/or total DDTs in avian eggs: recommend 1.5 mg $_{DDT}$/kg wet weight (ww).

Total DDT and p,p'-DDE concentrations in eggs have been related to eggshell thinning and reduced nesting success of numerous avian species. Eggshell thinning appears to be one of the most sensitive of the adverse effects in birds (i.e., occurs at lower dose levels than other adverse effects such as neurotoxicity).

1a) There are species differences in sensitivity, reflected by DDE concentrations associated with eggshells that are 20% thinner than shells collected before DDT was in heavy use (e.g., pre 1940s). This is a convenient benchmark for comparison, but this extent of thinning (15–20%), when it is persistent over several years, is associated with population level impacts in many species. DDE concentrations in eggs associated with 20% shell thinning (as mg /kg ww; from Blus 2011) include:

- 5 - 10 mg $_{DDT}$/kg ww (pelican, condor, prairie falcon, osprey, sparrowhawk, ibis)
- 10 - 20 mg $_{DDT}$/kg ww (loon, great blue heron, peregrine falcon, and merlin)
- >50 mg $_{DDT}$/kg ww (black crowned night heron and bald eagle)

1b) DDE concentrations associated with adverse effects at <20% shell thinning – pelicans (Blus 1984)

- 3.0 mg $_{DDT}$/kg ww is associated with colony collapse (= effect concentration for productivity)
- 2.0 mg $_{DDT}$/kg ww is associated with productivity that is indistinguishable from productivity observed with non-detectable DDE levels in eggs (= potential no effect concentration for productivity). This concentration may affect eggshell thickness, but not to the extent that productivity is affected.

1c) Estimated no effect threshold for eggshell thinning in sensitive species - Using regression equations from Fry (1994) relating p,p'-DDE concentration to percent of pre-DDT eggshell thickness, one can estimate DDE concentration for an eggshell with no thinning (equal to 100% of pre-DDT eggshell thickness). This would be a true no-effect level for pp’-DDE relative to all endpoints, given it applies to the most sensitive endpoint.

- 1.5 mg $_{DDT}$/kg ww for brown pelican, and 1.2 mg/kg ww for double-crested cormorant.

1d) Data specific to rails and/or snowy egrets.

- 1.0 – 2.0 mg $_{DDT}$/kg ww in CA clapper rail eggs; no effect for shell thinning (Lonzarich et al. 1992)
- 0.45 & 1.02 mg $_{DDT}$/kg ww (means; range 0.197 – 1.78) in light footed clapper rail from Tijuana Slough and Seal Beach NWRs; no effect on shell thinning (Goodbred et al 1996).
- 2.13 mg $_{DDT}$/kg ww (mean; range 0.63-5.60) in light footed clapper rail eggs from Mugu Lagoon; no effect on shell thickness relative to pre-DDT, but shells thinner than for eggs from Seal Beach and Tijuana Slough NWRs (Goodbred et al 1996). Although we have a difference between sites in terms of measured eggshell thickness, this is not likely to have been manifested in adverse effects in productivity given the eggshell measurements were, for the most part, similar to pre-DDT era eggshells.
- 0.41, 0.97 and 1.3 mg $_{DDT}$/kg ww (means; overall range 0.1 – 6.4 mg/kg ww) in clapper rail eggs collected in 1972-73 from 3 Atlantic coast locations. No effect levels for eggshell thickness compared with pre-1947, but there were location-specific variations for both pre- and post- 1947 eggs (Klaas et al 1980).
- 1.05 mg $_{DDT}$/kg ww in single light-footed clapper rail egg; eggshell thickness within range for pre-DDT use, but thinner than eggs collected at the same time and location, but with lower concentrations (~0.45 – 0.70 mg/kg ww; Sutula et al 2005).
- 1.0 – 5.0 mg $_{DDT}$/kg ww in snowy egret egret eggs; no effect on productivity (Henny et al 1985)
- 5.0 – 10 mg $_{DDT}$/kg ww in snowy egret eggs; effect level for productivity (Henny et al 1985)

These species-specific concentrations give us confidence that our proposed target in avian eggs of 1.5 mg DDT/kg ww is appropriately protective for the rail and the egret.

Based on concentrations of DDE/total DDT in eggs, pelicans are among, if not the most sensitive species for eggshell thinning (compared with pre-DDT use) and productivity effects of DDT (primarily DDE). For pelicans, productivity in the field is impacted @ 3.0 mg/kg ww, but DDE-related impacts are not detectable @ 2.0 mg/kg ww, and an estimated no effect level for eggshell thinning is 1.5 mg/kg ww.

For rails, no shell thinning (compared with pre-DDT eggs) has been detected with mean concentrations of 1.02 mg/kg ww (Goodbred et al. 1996), and 1.3 mg/kg ww (Klaas et al. 1980). There is limited information to suggest that subtle thinning (but not different from pre-DDT eggs) may occur with concentrations as low as ~1.0 mg/kg ww. But the effect may be due to population-related variation in shell thickness or statistical artifact. The available data suggest that light-footed Ridgeway's rails are no more sensitive than pelicans to the eggshell thinning and productivity effects of DDT. Data are insufficient to determine if rails are less sensitive than pelicans. In comparison, data on snowy egrets indicate that they are less sensitive to DDT than pelicans. The recommended screening level is based on no effects in pelicans and as such will be protective of other species as well.

A screening level of 1.5 mg $_{DDT}$/kg egg ww is recommended for total DDT concentration in eggs. This value is based on data for pelicans. It is considered protective of rails and is within the range of no effect levels for snowy egrets.

2. Tissue targets for p,p'-DDE and/or total DDTs in avian diets (mg $_{DDT}$/kg fish or invertebrate ww).

2a) Combining the screening level for eggs (1.5 mg $_{DDT}$/kg egg ww), with egg-to-diet concentration ratios. Wet weight-based ratios were used, consistent with concentrations and ratios reported in the literature.

- Egg/invertebrate ratios in clapper rail studies - rail egg/crab ratios ~25 (Goodbred et al. 1996 & Foehrenrich et al. 1972), and rail egg/snail ratio ~73 (Foehrenrich et al. 1972). Given the target concentration of 1.5 mg/kg in rail eggs, corresponding target concentrations in crabs is 0.06 mg/kg ww and in snails, it would be 0.021 mg/kg ww, or an overall average of 0.03 mg/kg ww, assuming a 50:50 mix.
- Egg/forage fish ratios in studies of piscivorous birds - egg/fish ratios are generally between 20 and 60 (Davis et al 2007). Values of 32 to 45 have been reported for herring gulls on Lake Ontario (Braune and Norstrom 1989), and values between 15 and 32 are indicated by data for California brown pelican (Anderson et al. 1975). In one study by Zeeman et al (2008), the average concentration of total DDT in forage fish from South San Diego Bay was 0.042 mg/kg ww. Corresponding bird egg/fish concentration ratios were 43 using black skimmer and Caspian tern eggs and approximately 10 using elegant and California least tern eggs. If using the geometric mean concentration for all seabird egg samples (1.08 mg $_{DDT}$/kg egg ww), the average ratio is 25. With a target DDT concentration of 1.5 mg $_{DDE}$/kg egg ww, the target DDT concentration in forage fish consumed by egrets (or other piscivorous birds) based on the ratios of 10-43 identified above would be between 0.150 mg/kg ww and 0.034 mg/kg ww, or an overall average (based on the mean of 25) of 0.060 mg $_{DDT}$/kg fish ww.

Ratios used to estimate dietary screening levels from the avian egg screening level, are averages. For rails, geometric mean concentrations for snails and crabs were used. Similarly, for piscivorous birds, geometric mean concentrations of multiple species of forage fish were used. This was done because (1) data are limited, and (2) birds generally consume a variety of species. Also, data from four species of piscivorous birds were combined to produce a geometric mean concentration of DDT in bird eggs. This was done to simplify the analysis (using an average rather than a range), and we deemed it appropriate given we know that the snowy egret is not among the most sensitive species.. The outcome (estimated dietary concentration) is less conservative than what the worst case value would be, but the difference is less than 2-fold. If you assume the worst case at every step, it is possible to end up with a totally protective, yet totally unrealistic, result. We were trying to strike a balance between these two. Overall, the egg/diet ratios used for estimates in this analysis are: Rail eggs/invertebrates = 50 and piscivorous bird egg/fish = 25.

2b) Reference dose (TRV)-based (combined with food ingestion rates estimated from Nagy 2001)

- TRV @ 0.014 mg/kg-d (a hybrid approach using field data, and therefore some uncertainty about actual concentrations in diet): This TRV is a chronic value for California brown pelican, a species known to be sensitive to these effects (USEPA 1995), adjusted downward by a Lowest Observed Adverse Effect Level (LOAEL) to No Observed Adverse Effect Level (NOAEL) uncertainty factor of 2.0 (based on observed low effect- and estimated no effect concentration in egg for eggshell thinning), combined with an egg/diet concentrations ratio of 32X (from Anderson et al. 1975). Using ingestion rates from Nagy (2001), combined with a TRV of 0.014 mg/kg-d, the estimated dietary screening level for LFRR (concentrations in invertebrates) is 0.027 mg $_{DDT}$/kg ww and the screening level for snowy egret (concentrations in fish) is 0.029 mg $_{DDT}$/kg ww.

- TRV @ 0.227 mg/kg-d (from lab studies with known concentrations in diet): Highest bounded NOAEL lower than the lowest bounded LOAEL for effects on growth, reproduction and survival in multiple avian species including waterfowl and double-crested cormorants (a sensitive species; EPA ECO-SSL). It is equal to or less than bounded and unbounded NOAELs for biochemical effects, pathology, survival and growth in sub-chronically (9 week) exposed double-crested cormorants. Other than cormorants and kestrels, most of the species represented by the TRV are not among the most sensitive (Item 1a above). Consequently, this TRV is considered an upper bound of no effects-based TRVs. This approach is a reasonable one to use in assessing risk more broadly among species, as it is not based on the most sensitive endpoints nor on the most sensitive species. Using ingestion rates from Nagy (2001), combined with a TRV of 0.227 mg/kg-d, the estimated upper bound dietary screening level for LFRR (concentrations in invertebrates) is 0.432 mg $_{DDT}$/kg ww and the screening level for snowy egret (concentrations in fish) is 0.465 mg $_{DDT}$/kg ww.

2c) Literature values: 3.0 mg/kg ww: Concentration in avian diet which could cause adverse impacts (Goodbred et al. 1996)

Table 8: Screening levels for total DDT in marsh bird diets (mg $_{total\ DDT}$/kg diet ww)

Approach	Rails – Concentration in invertebrates
Egg SL/invertebrate ratio+*	0.030
Dose rate (hybrid)*	0.027
Dose rate (lab based)**	0.432

Approach	Egrets – Concentration in forage fish
Egg SL/fish ratio+*	0.060
Dose rate (hybrid)*	0.029
Dose rate (lab based)**	0.465

+ Based on field collections from southern California
* Based on No Observed Adverse Effects Levels in most sensitive species
** Based on No Observed Adverse Effects Levels in a few studies on most sensitive, but primarily in studies on less sensitive species; considered here as an upper bound no observed adverse effect level for avian species that forage in salt marsh habitats.

3. Sediment targets for total DDTs

3a) Benthic community:

ER-L = 0.00158 mg/kg dry weight (dw) and ER-M = 0.0461 mg/kg dw, (Long et al 1995). These two guidelines delineate three concentration ranges: concentrations below the ER-L represent "minimal-effects range" (adverse effects rarely observed), concentrations between the ER-L and ER-M represent a "possible effects range" (adverse effects may occur occasionally), and concentrations equal to or greater than the ER-M represent the "probable effects range" and at which effects to benthic invertebrates would frequently occur. (Note: the effect levels are considered to apply to an “active zone” that is 20 mm deep. These benchmarks would not be applicable to a thin layer such as that associated with our modeled sediment deposition as that thin layer is not biologically meaningful to the species and circumstances evaluated in this compellation.)

3b) Reference concentrations for San Diego Bay, with the term "reference" representing DDT concentrations measured in sediments from San Diego Bay, and not in the immediate vicinity of known contaminated sites

0.001 mg/kg ww, or between 0.0013 and 0.0016 mg/kg dw. These are geometric mean concentrations from the USFWS south San Diego Bay mudflats study (unpublished) and the F&G Street Marsh study (Zeeman et al. 2008a)

3c) Wildlife risk-based sediment screening levels using target concentrations in invertebrates and forage fish, combined with biota/sediment ratios (data are very limited)

Ratios are wet weight-based using geometric mean concentrations. USFWS south San Diego Bay mudflats study (unpublished) California horn snail/sediment = 2.5, fiddler crab/sediment = 6.8, and forage fish/sediment = 27. The ratio for invertebrates in general (fiddler crabs and snails combined) = 4.1. Goodbred et al. (1996) report shore crab/sediment ratios of 1.3 and 2.2, for two southern California salt marshes. (dry weight-based ratios available in Sutula et al. 2005; wet weight-based ratios would be lower than reported). These are the actual relationships derived from the field data collected by the Carlsbad Fish and Wildlife Office.

Overall, the biota/sediment ratios used for estimates in this analysis are: 3.0 for invertebrates /sediment and 27 for forage fish/sediment (all wet weight). The former ratio is another case where we avoided pursuing the worst case scenario into what would be an unrealistic result. We know that rails do eat more than one prey type.

Table 9: Inputs and estimates of wildlife risk-based screening levels for DDT in marsh sediment

Dietary screening levels (mg DDT/kg diet ww)	diet/sediment ratio (ww / ww)	Sediment screening level (mg $_{DDT}$/kg sediment ww)	Sediment screening level (mg $_{DDT}$/kg sediment dw)*
Rails (invertebrates)			
0.030	3	0.010	0.017
0.027	3	0.009	0.015
0.432	3	0.144	0.240
Snowy egrets (fish)			
0.060	27	0.002	0.003
0.029	27	0.001	0.002
0.465	27	0.017	0.028

* wet weight-dry weight conversion based on geometric mean moisture contents for sediment samples from the south San Diego Bay mudflats study (=35) and in F&G street marsh study (=43%);

Table 10: Summary of estimated wildlife risk-based screening levels for DDT in salt marsh sediments, San Diego Bay NWR

Dietary screening levels (mg/kg ww)		Sediment screening levels (ug/kg dw)[#]
Rails - Concentration	Approach	Concentration
0.030	Egg SL/invertebrates ratio*	17
0.027	Dose rate (hybrid)*	15
0.432	Dose rate (lab based)**	240
Egrets - Concentration	Approach	Concentration
0.060	Egg SL/fish ratio*	3
0.029	Dose rate (hybrid)*	2
0.465	Dose rate (lab based)**	28

For comparison: more broadly, surficial sediments in San Diego Bay have concentrations of 1.3-1.6 ug/kg dw, ER-L = 1.58 ug/kg dw, and ER-M = 46.1 ug/kg dw .
* Based on No Observed Adverse Effects Levels in most sensitive species
** Based on No Observed Adverse Effects Levels in a few studies on most sensitive, but primarily in studies on less sensitive species; considered here as an upper bound no observed adverse effect level for avian species that forage in salt marsh habitats.

7.4) Risk Assessment of DDT Deposition in the ORERP for the 100-Year Flood: The results of the first deposition scenario, (cf. row_2 of Table 5; Figures 9 & 10) were used as the starting point for the risk evaluation. This evaluation considers the potential for sediment concentrations of DDTs to impact the benthic organisms and thus 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 use the restored areas. In evaluating these concerns, we needed to take into consideration not only the concentration of DDTs in the deposited materials, but how those deposited materials would result in exposure by the benthic organisms. For this element of the evaluation, we calculated exposure concentrations in the context of a vertical sediment layer. We assumed that sediments exposed by the restoration, but before deposition of flood-associated particles, have low levels of DDT equal to what has been observed in sediments from mudflats and marshes of south San Diego Bay (see notes in Table 8 above).

The vertical layer that was used was 20 mm (2 cm), as that thickness is used as the “active layer” for a variety of studies related to evaluation of sediment toxicity, including laboratory bioassays and in-situ mussel data (Long et al. 1995), and was deemed reasonable to represent the potential trophic relationships for the species evaluated here. The model outputs included the estimated depths of deposition of the contaminated materials in addition to the estimated concentration (70.2 ug/kg dw). In consideration of the range of particle sizes and the locations in which deposition would occur, the model results in Figures 9 & 10 indicated that a 3.3 to 8.0 mm layer of contaminated material would be deposited in restored areas over clean sediments (as based on soil and sediment sampling at depth). Over time, this would become fully consolidated into a layer 0.55 to 1.4 mm thick (Table 5, row-2, column_8). Using a depth-proportional exposure approach, assuming all exposure occurs within the top 20 mm, we calculated that the contamination experience by the benthic biota would range from approximately 13 to 29 ug/kg (dw) initially and would decrease with settlement to a final 20 mm-based concentration of 3.5 to 6.4 ug/kg (dw), see Table 9, row_2, column_10. While this approach does not take into consideration the potential effects of sediment density on the foraging behaviors of benthic organisms (and any resultant changes in exposure), we see this as a reasonable way to incorporate the thickness of the deposited material into our consideration of near-term and long-term potential effects in the restored areas (note that colonizing benthic organisms are not likely to be present in the early stages of settling). Given many benthic species burrow and forage to considerably deeper depths within the sediments, thus averaging the exposure over much thicker layers of clean sediment, we considered this to be a conservative approach.

Results for the 20 mm-based concentrations of the worst-case sediment deposition scenario appear in red font in column_10 of Table 9. The estimated post-flood DDT concentration for this worst case scenario is based on the assumption that DDT- contaminated soils from the former agricultural fields are the only source of sediment settled in restored marsh following a 100-year flood (column_10, row_5 through row_7 in Table 9). These results are considered worst case because higher concentrations could only occur if sediment from other (upstream) sources, and with higher DDT concentrations than those from the former agricultural fields, were added to the mix entering the restored marshes of the ORERP. Given the mixed but predominantly urban land uses in the Lower Otay River watershed (Aspen Environmental Group 2005), suspended fine-grained sediment entering the Otay River floodplain from upstream sources are expected to have lower DDT concentrations than fines from the former agricultural fields (e.g., Mahler et al. 2006). Consequently, the estimated DDT concentration in post-flood sediments under worst the case scenario (i.e., all from the former agricultural fields) forms the upper limit on what may occur in the marsh, and actual concentrations, which include contributions from less contaminated upstream sources, will be lower. Other, lower impact cases for the worst case scenario have also been considered in column_11 and in column_12 of Table 9 where depth-proportional exposure approach of the sensitivity analysis includes bioturbation exposures occurring within the top 40 mm and top 80 mm of the muddy sediments in the tidal basins of the ORERP for comparison. The depth of bioturbation will be determined by the species that ultimately colonize the tidal basins, but we would not expect that to be less then approximately 20 mm, and it could be more than 80 mm.

The final step in this evaluation was comparing our 20 mm, 40 mm and 80 mm-based DDT concentrations to our screening values. Relative to impacts on the benthic organisms as the prey base, the maximum short-term concentrations in Table 11 (initial concentrations) of 13-29 ug_{DDT}/kg dw fall between the ER-L and ER-M values (1.58 ug/kg dw and 46.1 ug/kg dw, respectively). Thus, we would expect that impacts on benthic organisms could occur occasionally during the short-term. 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 in the ORERP have compacted and consolidated, the DDT concentrations in the top 20 mm of muddy sediment, at 4.2-7.9 ug_{DDT}/kg dw are very close to the ER-L, and even lower for the top 40 mm and top 80mm of sediment; so that 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.

In regards to the aquatic-dependent birds' exposures to contaminated prey resulting in impacts, comparison of the 20 mm-based concentrations to our screening levels indicates that these concentrations fall within the range of our highest and lowest NOAELs. Given the species known to be the most sensitive are pelicans and cormorants, which are very closely related, and our target species are not members of groups believed to be particularly sensitive, impacts on aquatic-dependent birds are unlikely to result from the anticipated deposition of DDT-contaminated sediments following a 100-year flood event.

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Clean Fines	Flood Flow Volume	Suspended Sediment Conc.	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)	Average DDT Concentration in top 20 mm of Sediment Post-Flood		Average DDT Concentration in top 40 mm of Sediment Post-Flood *		Average Concentration in top 80 mm of Sediment Post-Flood*	
									Initial /	Final	Initial /	Final	Initial /	Final
Erode top 3 ft. of Contaminated Area + Upper Watershed	128,300 cubic yards	310 µg/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.	3.3 mm to 8.0 mm	0.5 mm to 1.4 mm	70.2 µg/kg	13 – 29 µg/kg	3.5 – 6.4 µg/kg	7.3 – 15 µg/kg	2.5 – 4.0 µg/kg	4.4 – 8.5µg/kg	2.1 – 2.8 µg/kg
Erode top 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 µg/kg	438,000 cubic yards	24,290 acre ft	18.90 g/l	2.7 mm to 6.5 mm	0.4 mm to 1.1 mm	41.5 µg/kg	7.0 – 15 µg/kg	2.4 – 3.8 µg/kg	4.3 – 8.1µg/kg	2.0 – 2.7 µg/kg	2.9 – 4.8 µg/kg	1.8 – 2.1 µg/kg
Erode top 2 ft. of Contaminated Area + Upper Watershed	76,350 cubic yards	430 µg/kg	438,000 cubic yards	24,290 acre ft	21.03 g/l	3.0 mm to 7.3 mm	0.45 mm to 1.3 mm	63.8 µg/kg	11 – 24 µg/kg	3.0 – 5.6 µg/kg	6.3 - 13µg/kg	2.3 – 3.6µg/kg	3.9 – 7.3µg/kg	1.9 – 2.6 µg/kg
Erode top 3 ft. of Contaminated Area Only**	128,300 cubic yards	310 µg/kg	0 cubic yards	24,290 acre ft	5.25 g/l	0.75 mm to 1.8 mm	0.17 mm to 0.41 mm	310 µg/kg	13 – 29 µg/kg	4.2 – 7.9 µg/kg	7.4 – 15 µg/kg	2.9 – 4.8 µg/kg	4.5 – 8.5 µg/kg	2.3 – 3.2 µg/kg
Erode top 1 ft. of Contaminated Area Only	24,260 cubic yards	790 µg/kg	0 cubic yards	24,290 acre ft	0.99 g/l	0.14 mm to 0.34 mm	0.02 mm to 0.06 mm	790 µg/kg	7.1 – 15µg/kg	2.4 – 4.0 µg/kg	4.4 – 8.3 µg/kg	2.0 – 2.8 µg/kg	3.0 – 5.0 µg/kg	1.8 – 2.2 µg/kg
Erode top 2 ft. of Contaminated Area Only	76,350 cubic yards	430 µg/kg	0 cubic yards	24,290 acre ft	3.12 g/l	0.44 mm to 1.1 mm	0.07 mm to 0.12 mm	430 µg/kg	11 – 25 µg/kg	3.1 – 4.2 µg/kg	6.3 – 13 µg/kg	2.3 – 2.9 µg/kg	4.0 – 7.5 µg/kg	2.0 – 2.2 µg/kg
Erode top 1 ft. of Contaminated Area + Upper Watershed: 50-year event	24,260 cubic yards	790 µg/kg	150,300 cubic yards	13,805 acre ft.	12.60 g/l	1.8 mm to 4.3 mm	0.30 mm to 0.72 mm	110.7 µg/kg	11 - 25µg/kg	3.3 – 5.5µg/kg	6.5 - 13 µg/kg	2.4 – 3.6µg/kg	4.1 – 7.5 µg/kg	2.0 – 2.6 µg/kg
Erode top 1 ft. of Contaminated Area Only: 50-year event**	24,260 cubic yards	790 µg/kg	0 cubic yards	13,805 acre ft.	1.8 g/l	0.26 mm to 0.62 mm	0.06 mm to 0.14 mm	790 µg/kg	12 – 26 µg/kg	4.0 – 7.1 µg/kg	6.7 - 14µg/kg	2.8 – 4.4µg/kg	4.2 – 7.7µg/kg	2.2 – 3.0µg/kg

Table 11: Matrix of Sensitivity Analysis of Potential DDT Deposition in the ORERP post-100 and post-50 year flood events.

***** Values initially calculated for these columns were calculated incorrectly; these are the revised values (please see comparison below).

**Entries in blue are based on 50-year floods.

8.0) References:

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APPENDIX-A: Additional Deposition Flux and Deposition Thickness Simulations Supporting Tables 5 and 11

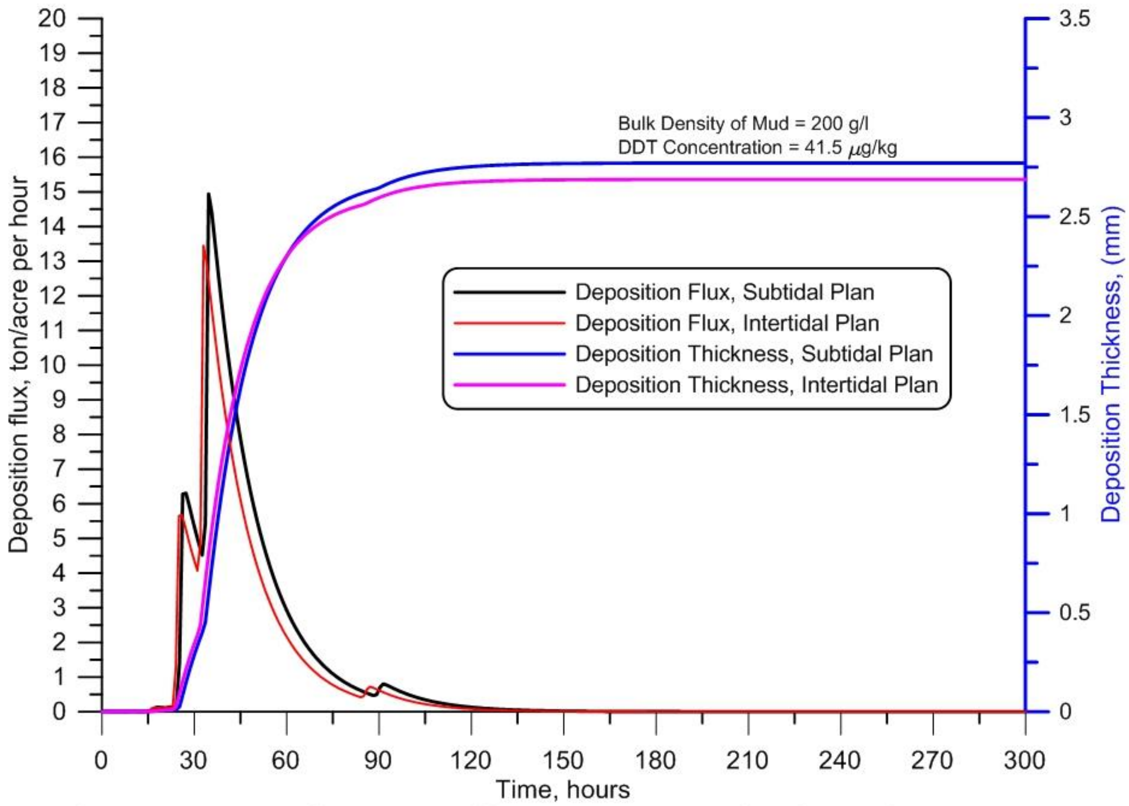

Figure A1. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

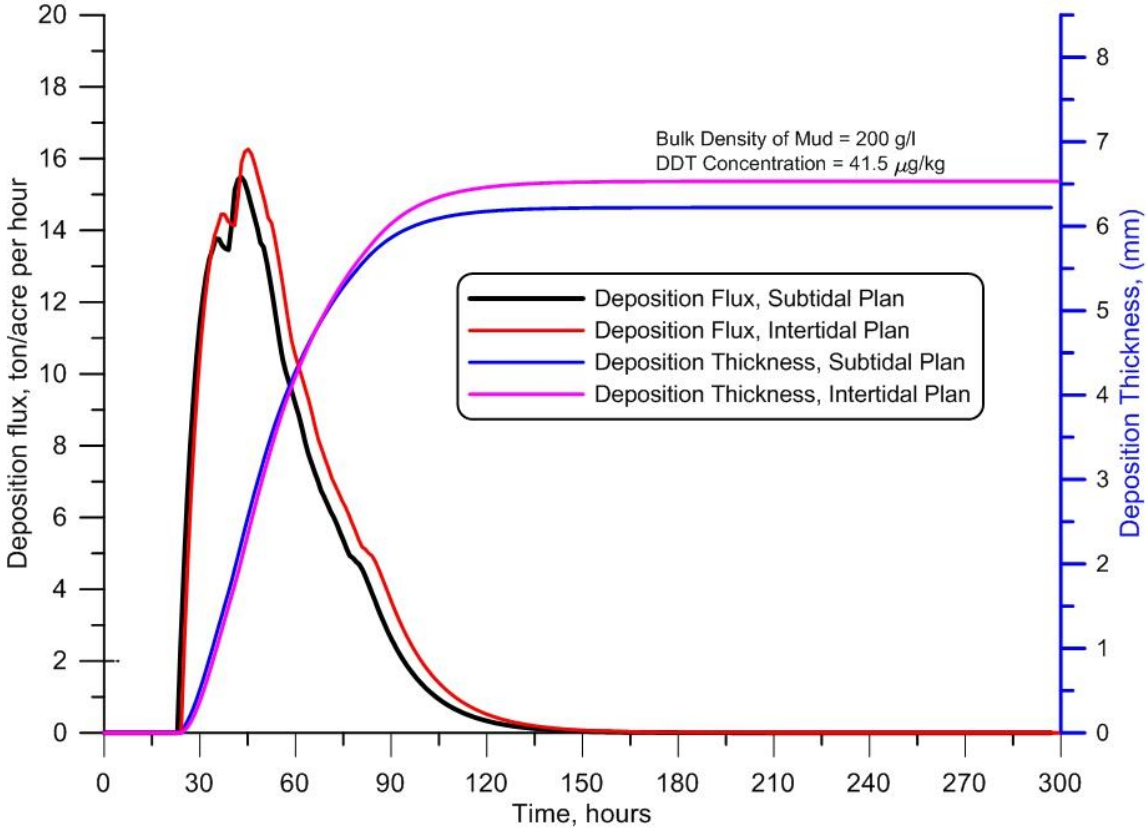

Figure A2. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

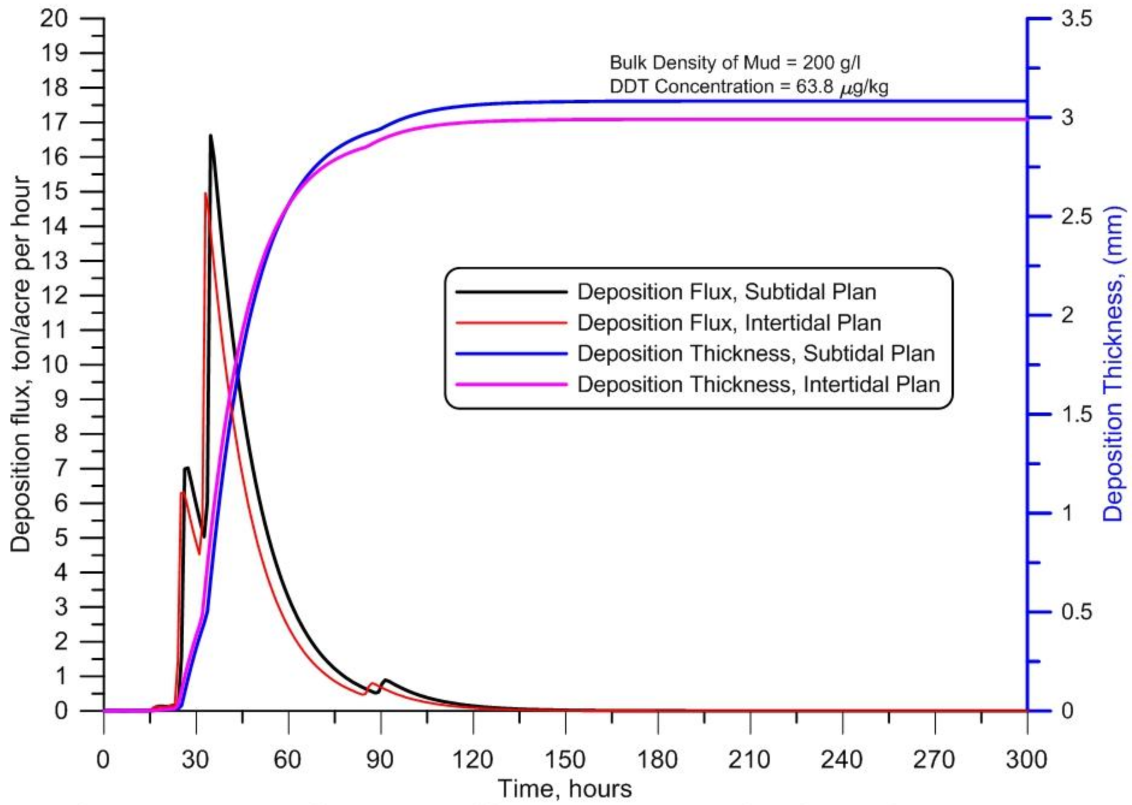

Figure A3. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 76,350 cubic yards of contaminated fines from erosion of the top 2 ft. and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

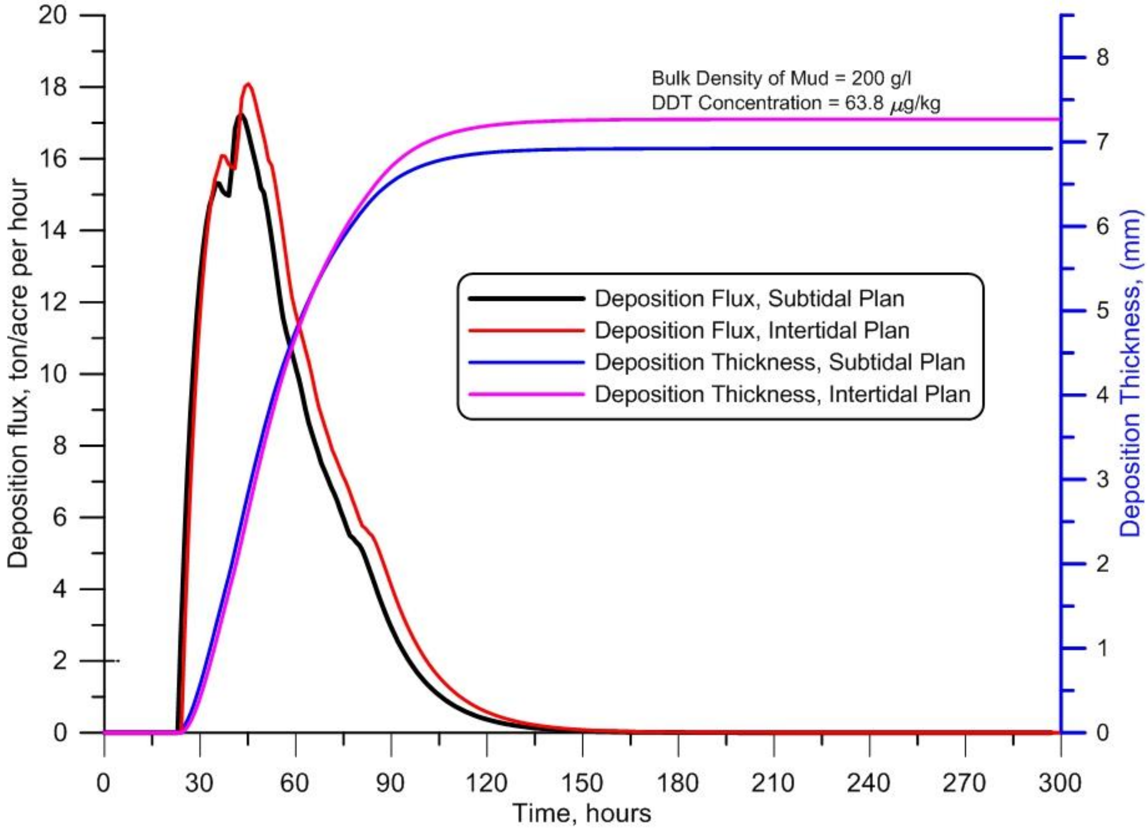

Figure A4. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 76,350 cubic yards of contaminated fines from erosion of the top 2 ft. and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

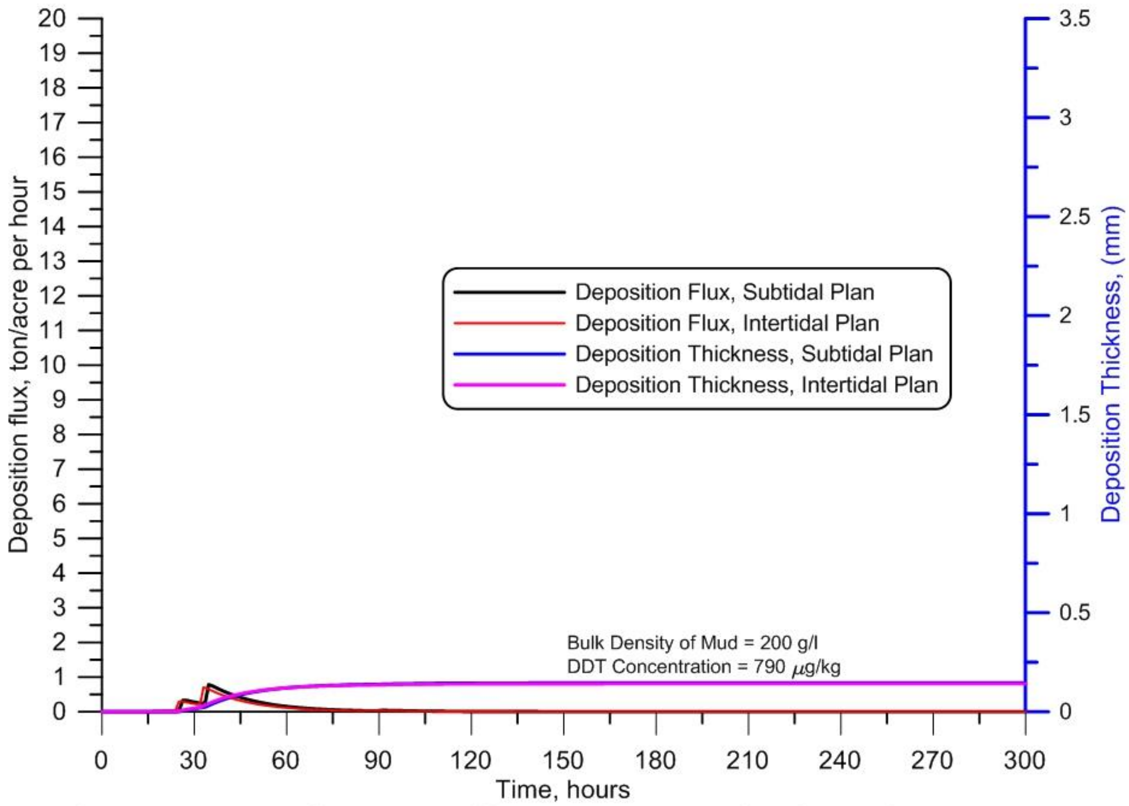

Figure A5. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

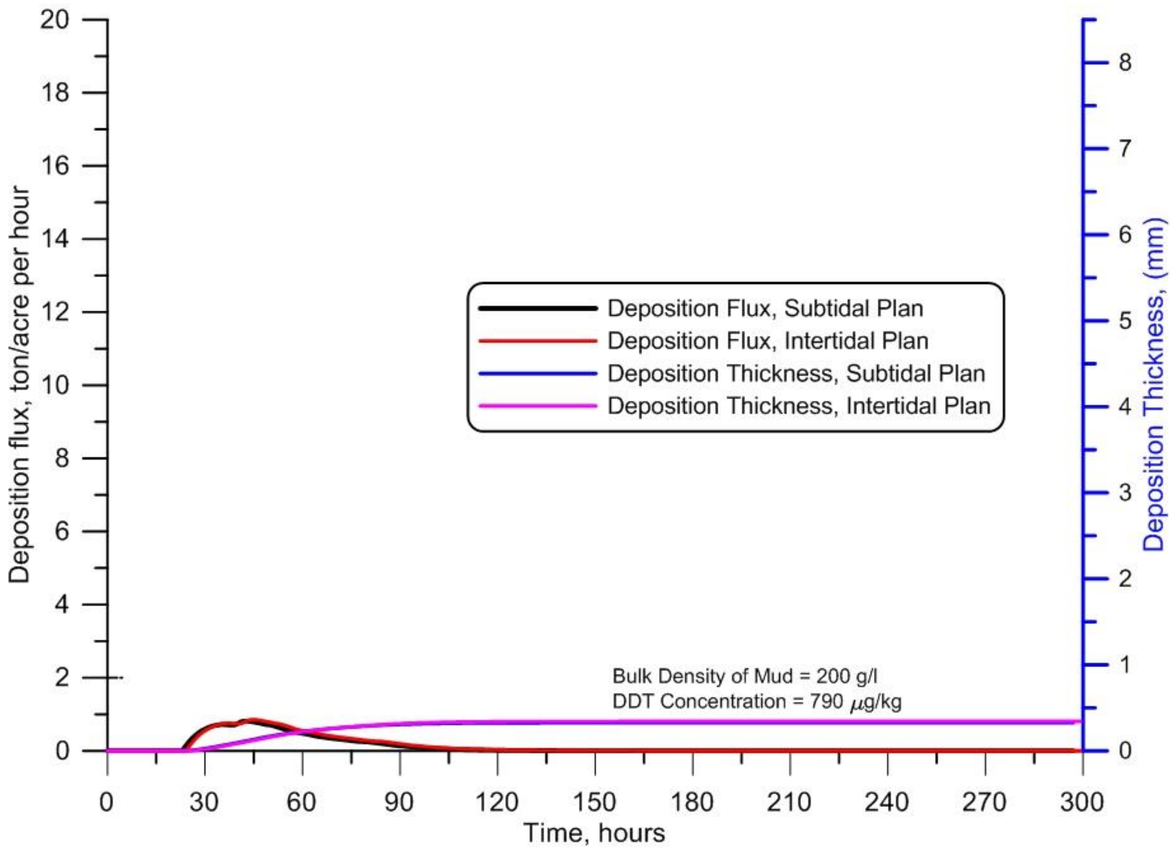

Figure A6. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

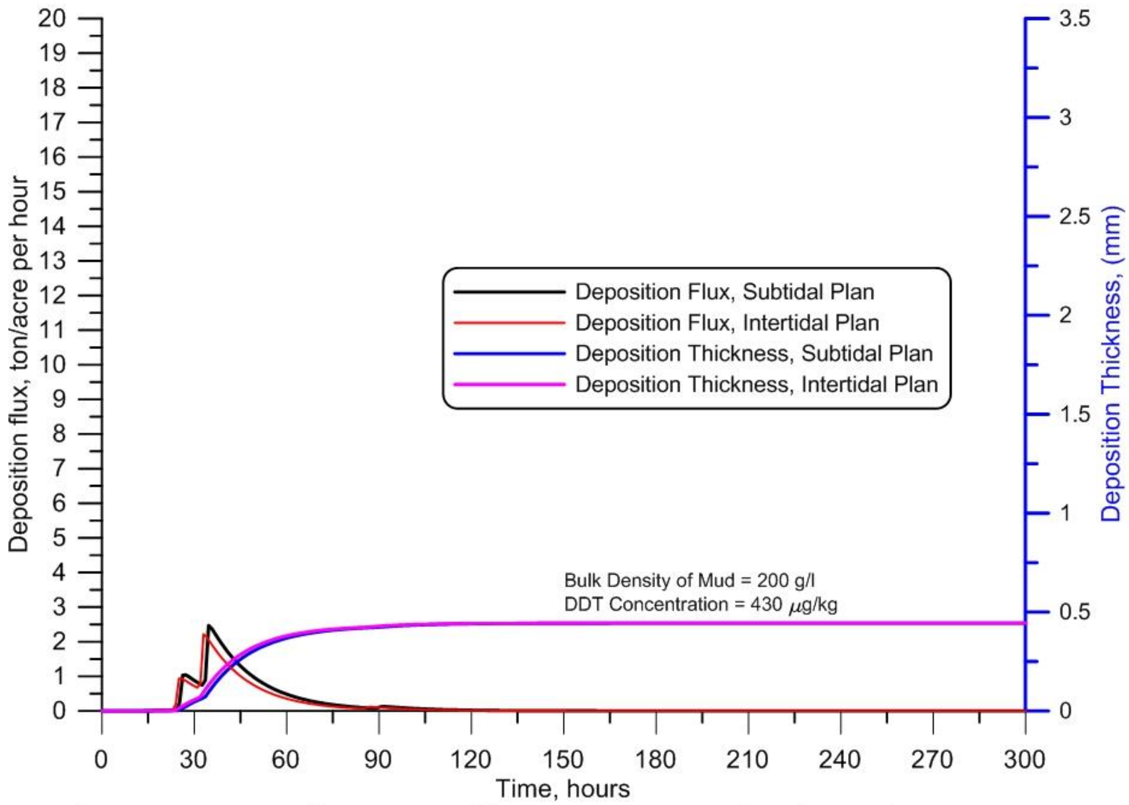

Figure A7. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 76,350 cubic yards of contaminated fines from erosion of the top 2 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

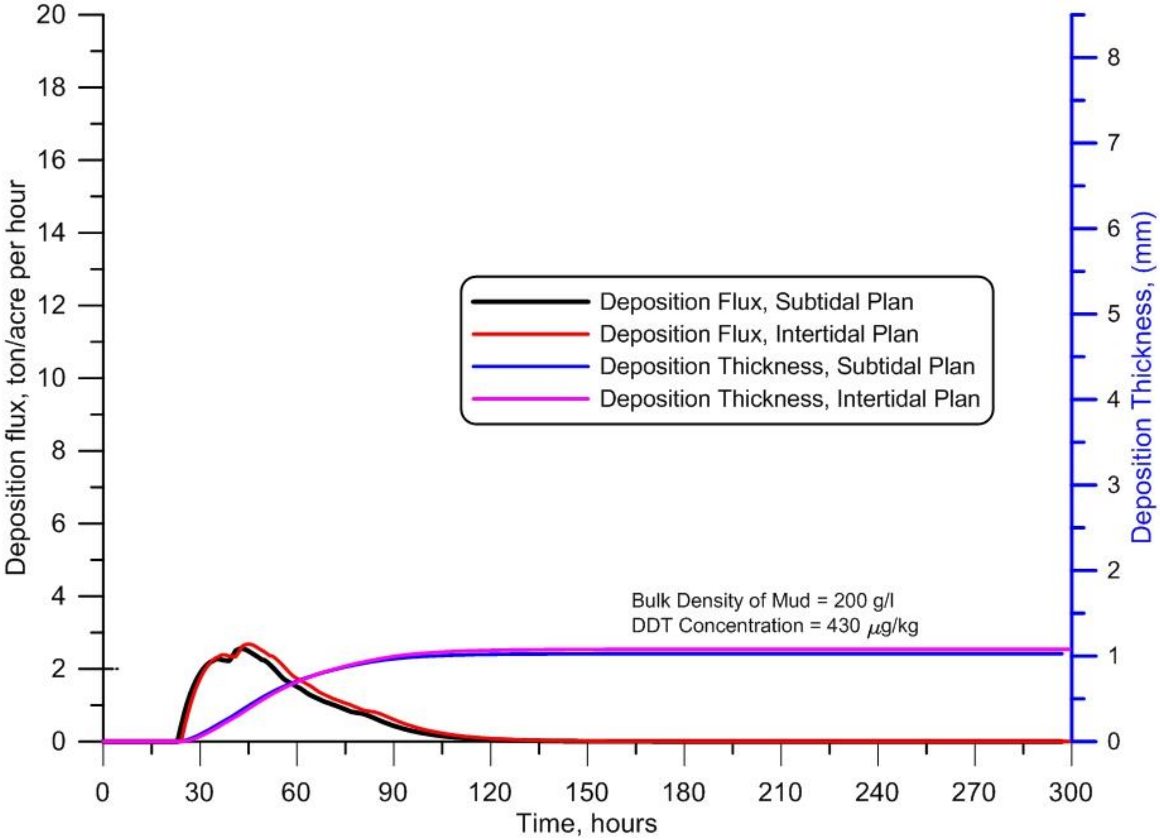

Figure A8. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 76,350 cubic yards of contaminated fines from erosion of the top 2 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

APPENDIX-B: Additional Deposition Flux and Deposition Thickness Simulations for the *No-Project Alternative* Post 100-Year Flood.

Input Assumptions: The 100-year flood hydrographs for the Otay River, Poggi Canyon Creek and Nestor Creek are unchanged by the presence of the ORERP. The total flow volume during a 100-year flood for the no-project alternative is 35,200,000 cubic yards (cy), or 26,911,315 cubic meters (m^3) for the Otay River. The corresponding flow volumes for Poggi Canyon Creek and Nestor Creek are respectively 2,240,000 cy (1,712,254 m^3) and 1,748,800 cy (1,337,003 m^3), so that the combined flow through the floodplain is $\overline{Q}$ = 39,188,800 cy (29,960,856 m^3), or 24,290 acre ft. Figure B1 give the distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain and salt pond complex for the no-project alternative, (after Everest, 2014); while Figure B2 gives the velocity distribution for the ORERP Intertidal Alternative and Figure B3 gives the Subtidal Alternative. In each of these figures, the DDT contaminated area is bounded by a yellow polygon in the lower left hand corner.

Comparing the velocities in the DDT contaminated area among Figures B1 – B3, we find the maximum flood velocities for the 100-yr flood are about 0.5 ft/s to 1.0 ft./s greater for the Intertidal and Subtidal Alternatives relative to the no-project alternative. At first impression, this would suggest that the ORERP might cause more soil erosion in the DDT contaminated area than the no-project alternative. However, the sediment stratigraphy in this area indicates this is not the case, as revealed by sediment coring conducted by Anchor QEA (2013). In the DDT contaminated area of the floodplain, the top 3 ft of soils are comprised of 27 % silt and clay ($d < 0.0625$ mm) and 63 % fine sands to coarse sand ($d > 0.0625$ mm). However, from 3 ft to 5 ft below existing grade, 74.1 % of the soils are comprised of silt and clay, and 25.9 % are fine sand to coarse sand. Hence, there is an abrupt transition from more sandy, erodible, material in the top 3 ft, to more cohesive erosion-resistant soil below 3 ft. It was this difference in grain sizes that the original assumption set forth in Section 2.1 was based, whereby the top 3-ft of soil could be completely eroded during a 100-year flood. It is also this abrupt transition in grain sizes at 3 ft below existing grade in the DDT contaminated area that creates a hard enough basement on the depth of erodible soil so that erosion below 3 ft will not occur, with or without the project during a 100-year flood, (given the maximum flood velocities shown in Figures B1 – B3). Therefore we can assume the same amounts of DDT contaminated soils will be eroded from the floodplain for the no-project alternative as for the ORERP alternatives. From that assumption we formulate the model inputs for the post 100-yr floor flood analysis of the no-project alternative as listed in Table B1. The inputs for the no-project alternative are based on erosion fluxes from one possible erosion depth (3 ft.) in the DDT contaminated area of the floodplain, and is combined with two possible fluxes of clean fines (0 cy and 438,000 cy) from the upper watershed below the Savage Dam; yielding a sensitivity analysis comprised of 2 separate deposition scenarios. Thus, the ensemble of input parameters for the no-project sensitivity analysis are comparable to inputs used for the ORERP in Table 4, rows 2 & 5.

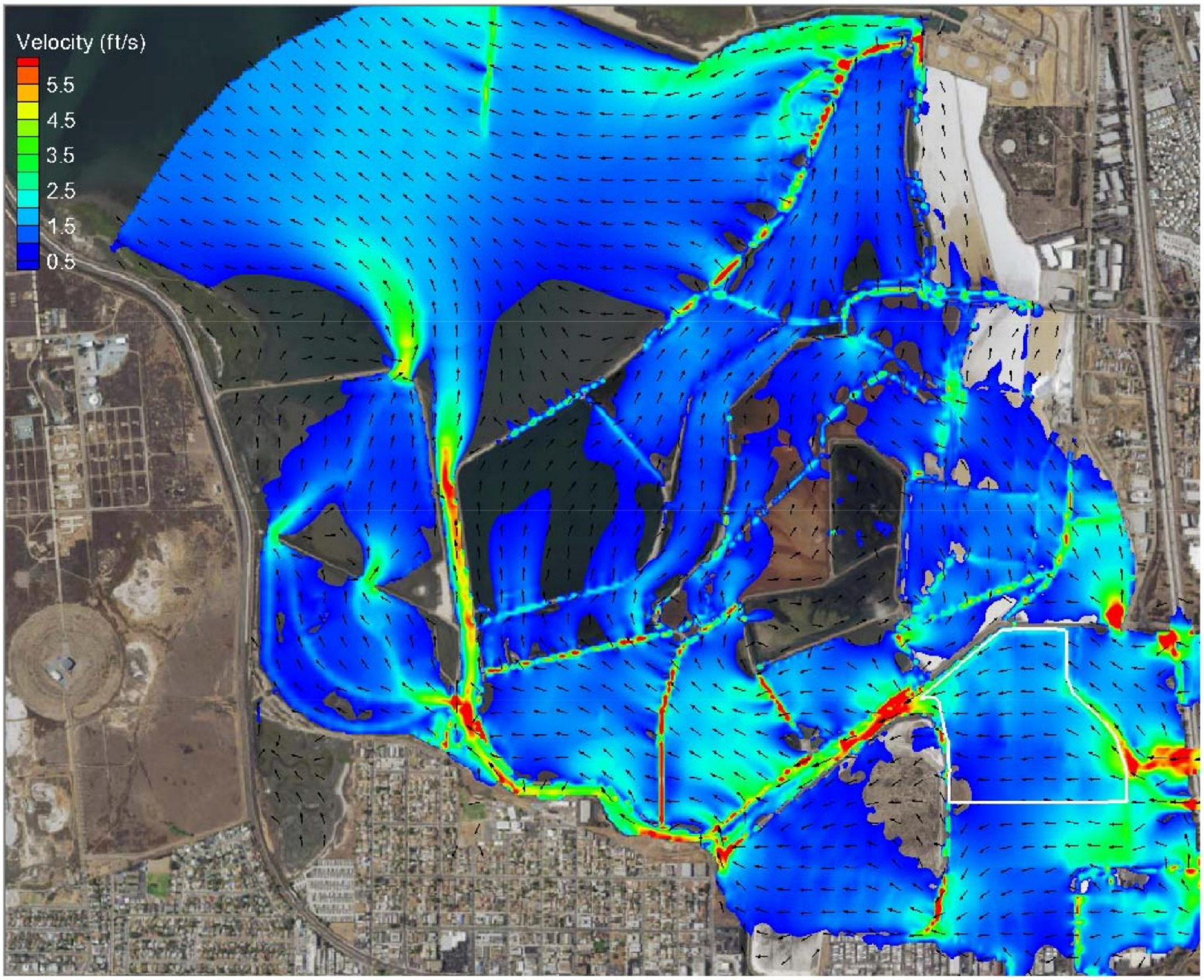

Figure B1: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain and salt pond complex for the no-project alternative, (after Everest, 2014). DDT contaminated area bounded by yellow polygon in the lower right hand corner. Ponds 10 & 11 shown in the lower left corner.

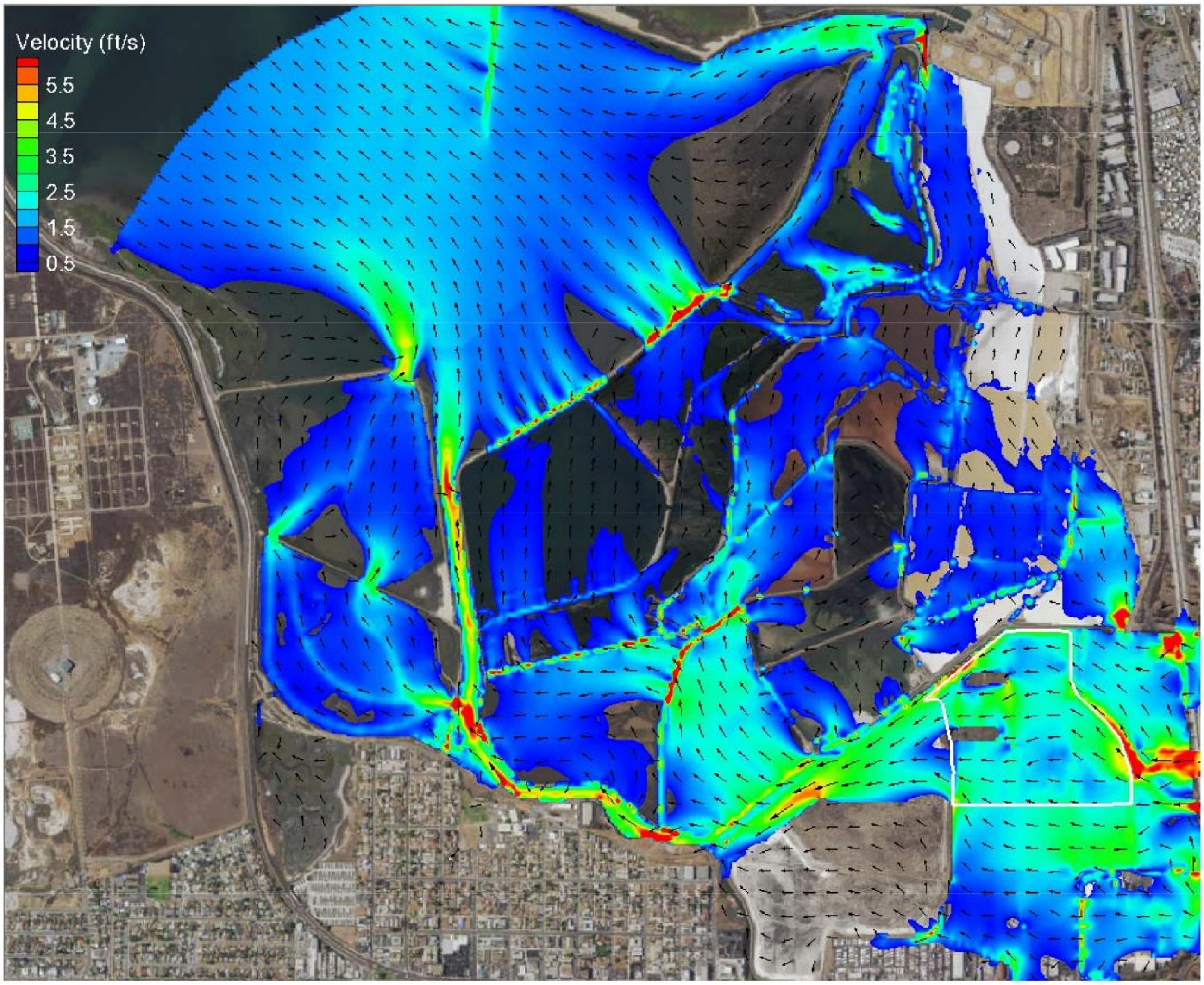

Figure B2: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain and salt pond complex for the fully implemented Intertidal Alternative, (after Everest, 2014). DDT contaminated area bounded by yellow polygon in the lower right hand corner. Ponds 10 & 11 shown in the lower left corner.

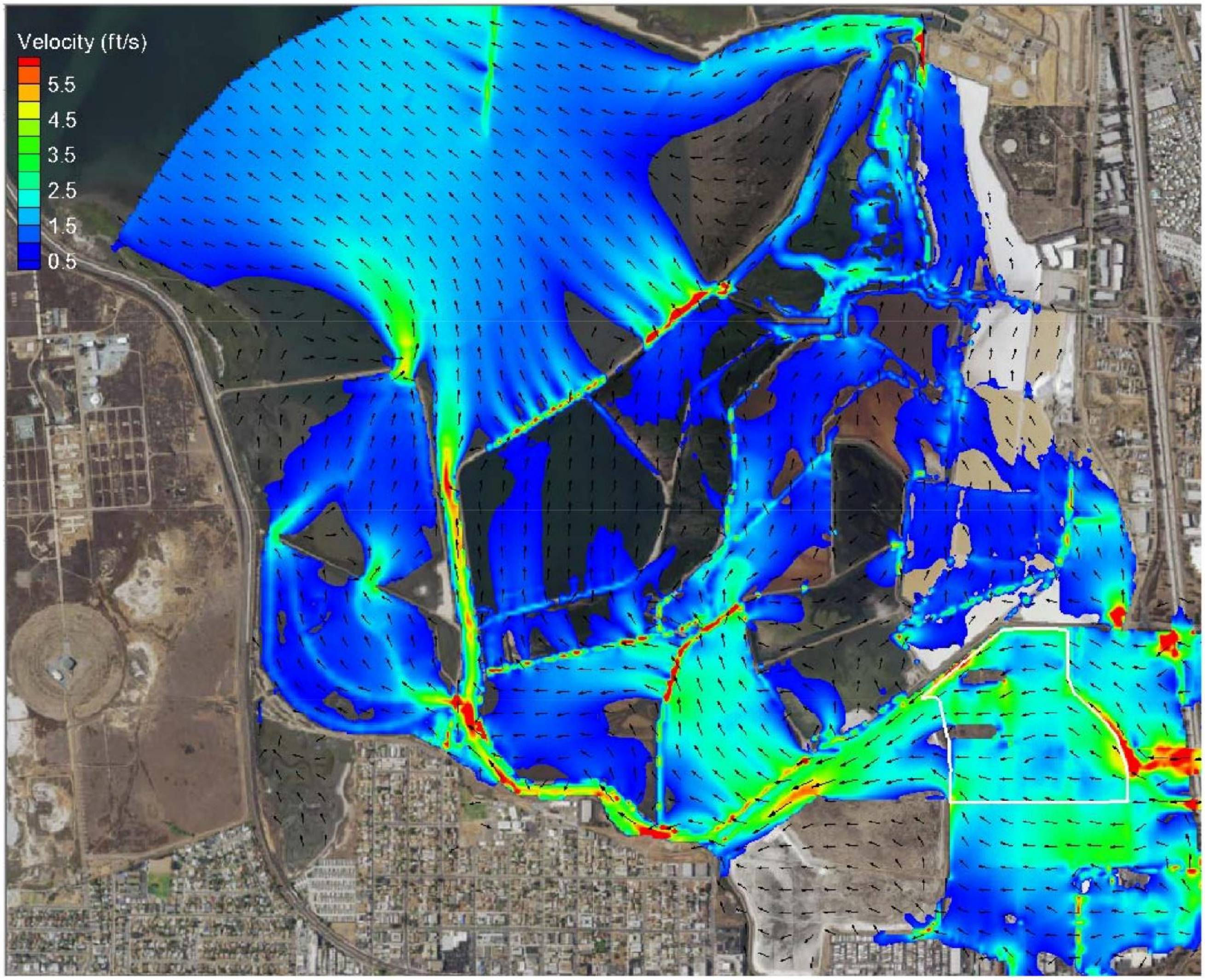

Figure B3: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain and salt pond complex for the fully implemented Subtidal Alternative, (after Everest, 2014). DDT contaminated area bounded by yellow polygon in the lower right hand corner. Ponds 10 & 11 shown in the lower left corner.

Table B1: Input Parameters for Sensitivity Analysis of Post 100-Year Flood DDT Deposition for the No-Project Alternative

Scenario	Volume of Eroded DDT-Bearing Fines	DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.
Erode top 3 ft. of Contaminated Area + Upper Watershed*	128,300 cubic yards	310 μ g/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.
Erode top 3 ft. of Contaminated Area Only*	128,300 cubic yards	310 μ g/kg	0 cubic yards	24,290 acre ft	5.25 g/l

The suspended sediment concentrations in Table B-1 are based on a dry bulk density for eroded soil of 2700 lb per cy, or 1.225 metric tons per cy; where a metric ton is 1000 kg. This conversion factor is applied to the sum of the volume of eroded DDT- bearing fines (column_2) and the volume of eroded fines from the upper Otay watershed (column_4) to obtain the total flux of suspended fine grained sediment in tons/day during the 24 hour flood period of the 100-year flood for the no-project alternative. The sand and gravel sized fractions eroded from the floodplain by the 100 year flood (292,000 cy) are assumed to be transported as bed load and remain in the Otay River channel. The suspended sediment flux component (column_2 + column_4) is divided by the flow volume of $\overline{Q}$ = 29,960,856 m^3 during the 24 hour flood period to give the average suspended sediment concentration in column_6 upon conversion of metric tons to grams and cubic meters to liters.

Deposition Results: We use the 2011 bathymetric survey conducted by WRA for modeling post-flood deposition in no-project alternative (Figure B4), and use the deposition results from Ponds 10 and 11 as a proxy for evaluating potential wetlands impacts from the 100-yr flood. In Section 5, it was shown that the deposition thickness in the tidal basins is proportional to the water depths and tidal residence times in those basins, where greater deposition thickness was observed in Pond 15 where water depths are greater and residence times longer than in the Otay River Floodplain Basin of the ORERP, (cf. Figures 9 vs. 10). Figures B4 reveals that water depths in Ponds 10 and 11 are comparable to water depths in the Subtidal Alternative of the ORERP, and the TIDE_FEM solutions indicate that the residence times are also comparable (on the order of 2.5 days). Thus it is not surprising to find that the plots of the deposition flux and deposition thicknesses in the Ponds 10 and 11 in Figures B5 and B6 for the 100-year flood are very similar to those in Figures 9 and 11 for the Subtidal Alternative; although the exact time response (shape) of the two sets of curves are different than for the ORERP simulations.

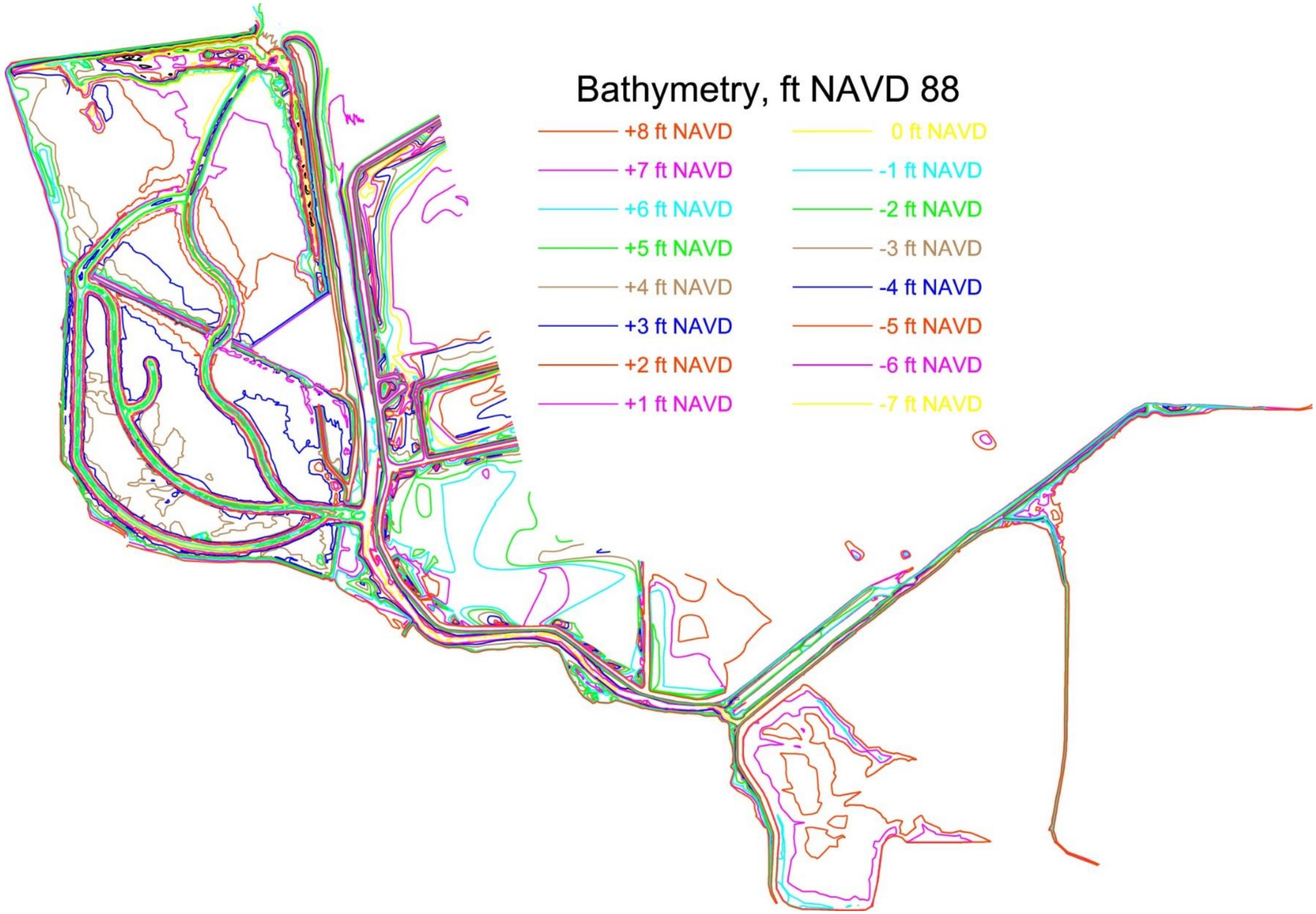

Figure B4: Bathymetry for the *No-Project Alternative* with Ponds 10 & 11 shown on the left hand side (west bank) of the Otay River at the river mouth. Bathymetry shown in ft. NAVD based on bathymetric survey by WRA (2011).

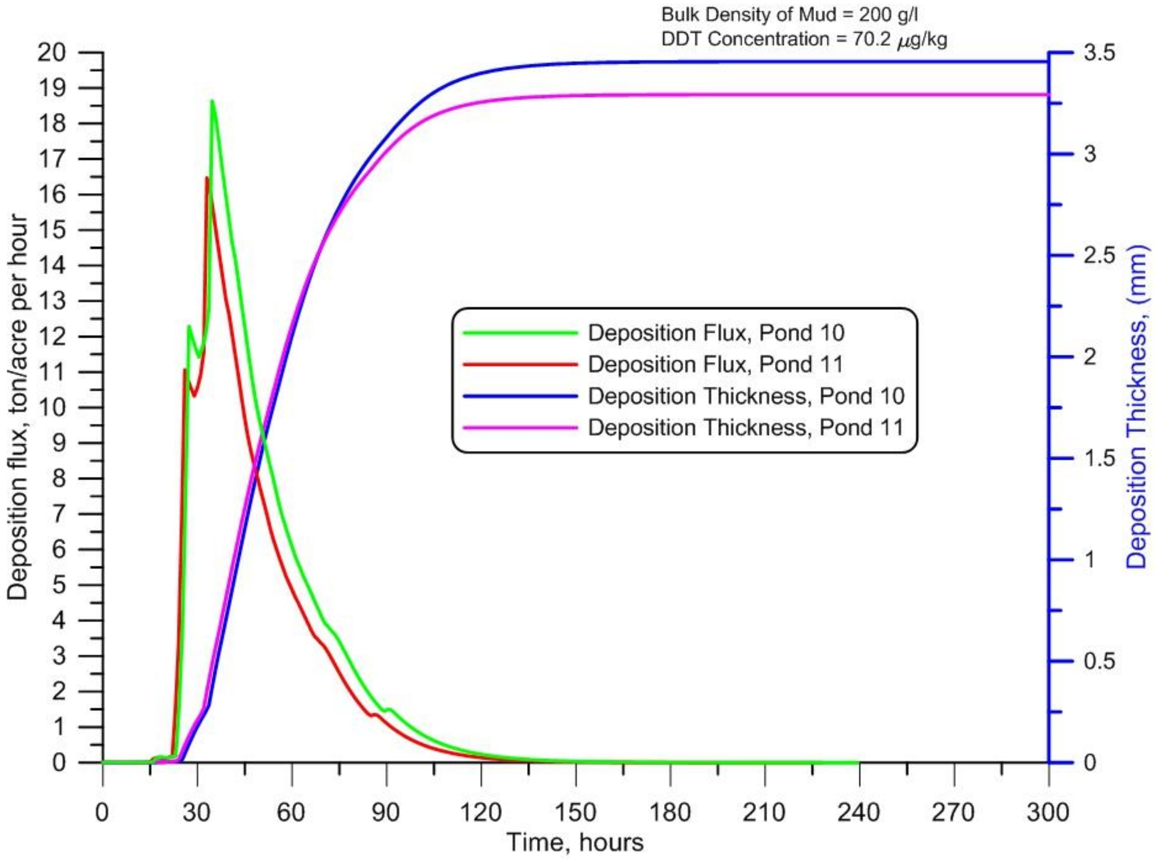

Figure B5. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Ponds 10 and 11 in the Otay River Floodplain (*No-Project Alternative*) following the 100-year flood. Deposition flux (green & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

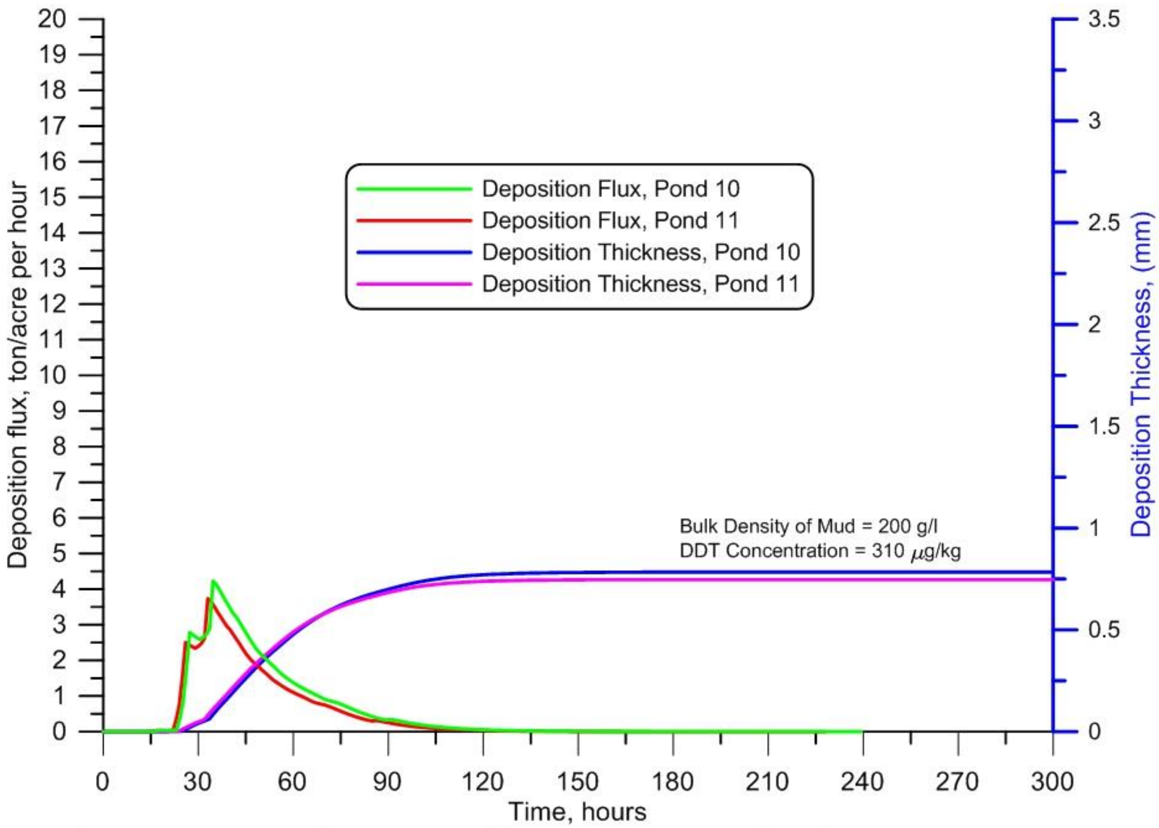

Figure B6. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Ponds 10 and 11 in the Otay River Floodplain (*No-Project Alternative*) following the 100-year flood. Deposition flux (green & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

Figure B5 gives the time evolution of the post-flood deposition flux and deposition thickness for the first scenario (row_2 of Table B1) in Ponds 10 and 11 of the no-project alternative. This scenario is based on maximum flood-induced erosion depths of 3 ft. in the contaminated area adjacent the Floodplain Tidal Basin mixed with 438,000 cubic yards of fine-grained sediments from upstream erosion of the portion of the watershed below the Savage Dam. Results are similar for both Ponds 10 and 11 showing that accumulations range from 3.4 to 3.7 mm of partially consolidated mud after 276 hours post-flood, with dry bulk DDT concentrations of 70.2 μ g/kg everywhere in the post-flood deposition. 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 washload, (cf. Figure B1). The general depositional features are that deposition flux peaks within one diurnal tide cycle after cessation of the flood in both basins of both restoration alternatives, with an initial deceleration in flux during the first semidiurnal ebb tide. After the first post-flood diurnal tidal cycle, the deposition flux declines as progressive settling depletes the suspended sediment concentration, and tidal residence times in the ponds limits the amount of time for settling and deposition to occur. Meanwhile, deposition thickness, which results from the cumulative sum of deposition flux over time, rapidly builds during the peak deposition flux period, and then gradually approaches a constant limit for partially consolidated mud at 200 g/l bulk density as the deposition flux vanishes after 120 to 150 hours post-flood. The minor differences in deposition flux and deposition thickness among the ponds and restoration alternatives are due to differences in residence times as a consequence of proximity of outlets to The Bay and river.

Next, consider in Figure B6 how such results may be affected if we assume no erosion of soils occurs in the portion of the watershed upstream of the floodplain and below the Savage Dam. This scenario is specified by the third row in Table B1 and is based on maximum erosion depths of 3 ft. in the contaminated area only. Here, runoff from the 100 year flood consists of a uniform suspended load of silts and clays with concentration of $\overline{C}$ = 5.25 g/l. Figure B6 gives the time evolution post-flood for deposition flux and deposition thickness in Ponds 10 and 11 of the no-project alternative. Again, results are similar for both ponds, but the dry bulk concentration of DDT in the post-flood deposition has increased to 310 μ g/kg, while the deposition thicknesses are greatly diminished. Ponds 10 & 11 accumulate only 0.74 to 0.78 mm of partially consolidated mud after 276 hours post-flood.

The initial post 100-year flood accumulations of partially consolidated mud computed in Figures B5 & B6 will, over time, dewater and compact under its own immersed weight. The initial deposition will consolidate and compact to a maximum saturated density for fully consolidated mud, 1200 g/l, so that the 100-year flood deposition for the two scenarios in Table B1 would eventually become a very thin layer of consolidated mud on the order of a fraction of a millimeter thick; or:

Deposition with upper watershed sediments:

$$3.4 - 3.7\ mm\ @\ 200 g/l \quad \Rightarrow \quad \left\{ \frac{dewatering}{consolidation} \right\} \quad \Rightarrow \quad 0.5 - 0.6\ mm\ @\ 1{,}200 g/l$$

Deposition without upper watershed sediments:

$$0.74 - 0.78\, mm\ @\ 200 g/l \quad \Rightarrow \quad \left\{ \frac{dewatering}{consolidation} \right\} \quad \Rightarrow \quad 0.17 - 0.18\, mm\, @\, 1{,}200 g/l$$

Consolidation only involves a reduction in the water content of the post-flood deposition, and therefore does not alter the DDT dry bulk concentration, which remains 70.2 μ g/kg when there is dilution from upper watershed sediments and 310 μ g/kg when there is no deposition of upper watershed sediments. The amount of time required for this degree of consolidation is uncertain, but experience with dredge material disposal ponds at Mare Island, CA and Charleston, SC [Jenkins, 1980; Jenkins et al., 1981; Jenkins and Skelly, 1983] suggests that consolidation to 600 g/l could occur within three months while full consolidation to saturation (1,200 g/l) could take several years.

The DDT deposition results in Ponds 10 and 11 for the 100-yr flood under the no-project alternative are summarized in Table B2 below. These results are found to be within the range of those for the ORERP post 100-yr flood as detailed in Section 5. From that finding, we submit that the conclusions on potential flood-induced DDT impacts to the existing wetlands ecology, as detailed in Section 7 are upheld; and it can be concluded that the ORERP does not increase the risk of exposure of wetland ecology to DDT, (a risk that exists with or without the project).

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.	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. of Contaminated Area + Upper Watershed*	128,300 cubic yards	310 μ g/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.	3.4 mm to 3.7 mm	0.5 mm to 0.6 mm	70.2 μ g/kg
Erode top 3 ft. of Contaminated Area Only**	128,300 cubic yards	310 μ g/kg	0 cubic yards	24,290 acre ft	5.25 g/l	0.74 mm to 0.78 mm	0.17 mm to 0.18 mm	310 μ g/kg

Table B2: Matrix of Sensitivity Analysis of Potential DDT Deposition in Ponds 10 and 11 for the *No-Project Alternative* post-100 year flood.

APPENDIX J

Biological Technical Report

BIOLOGICAL RESOURCES EXISTING CONDITIONS TECHNICAL REPORT
for the
OTAY RIVER ESTUARY RESTORATION PROJECT SOUTH BAY UNIT OF THE SAN DIEGO BAY NATIONAL WILDLIFE REFUGE
CITY OF SAN DIEGO, CALIFORNIA

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AA	Assessment Area
CDFW	California Department of Fish and Wildlife
CNPS	California Native Plant Society
Commission	California Coastal Commission
Corps	U.S. Army Corps of Engineers
CRAM	California Rapid Assessment Method
CRPR	California Rare Plant Rank
MHPA	Multi-Habitat Planning Area
MSCP	Multiple Species Conservation Program
NWR	National Wildlife Refuge
ppt	parts per thousand
Regional Board	Regional Water Quality Control Board
Service	U.S. Fish and Wildlife Service

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SUMMARY OF FINDINGS

The proposed Otay River Estuary Restoration Project (project) site occupies approximately 165.3 acres of the South Bay Unit of the San Diego Bay National Wildlife Refuge (NWR) in the City of San Diego. The site is located north of Palm Avenue, is part of the South Bay Salt Works and also south of the South Bay Salt Works, is west of Interstate 5, and is east of the developed area of Imperial Beach.

Biological surveys of the project site were conducted by Dudek biologists in 2011, 2013, and 2014, with focused surveys conducted in spring and summer 2011. The surveys consisted of vegetation mapping, jurisdictional delineation, and focused surveys for 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. The purpose of this biological resources technical report is to identify existing vegetation and jurisdictional resources, and survey for plant and animal species recognized as sensitive by local, State, and/or Federal wildlife agencies and/or environmental organizations.

Based on species composition and general physiognomy, 15 vegetation communities (or habitat types) and land covers were identified within the project site, inclusive of the Otay River Floodplain Site, the Pond 15 Site, and the project features required for the restoration: bay, beach, disturbed habitat, open water, salt pond levee, southern coastal salt marsh, southern coastal salt marsh–disturbed, brackishwater, former salt pond bottom and borrow area, *Isocoma* scrub, developed land, salt flat, Otay River floodplain restoration, freshwater marsh, and mule fat scrub.

Three special-status plants were observed during the 2011 surveys: California desert-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).

Nine special-status wildlife species were detected on site during the 2011 surveys: northern harrier, white-tailed kite (*Elanus leucurus*), elegant tern (*Thalasseus elegans*), western gull-billed tern (*Gelochelidon nilotica vanrossemi*), light-footed Ridgway's rail, burrowing owl, short-eared owl (*Asio flammeus*), Belding's Savannah sparrow, and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*). Nesting of a number of special-status wildlife species was recorded by the San Diego Bay NWR, including Belding's Savannah sparrow, western snowy plover (*Charadrius alexandrinus nivosus*), black skimmer (*Rynchops niger*), Forster's tern (*Sterna forsteri*), California least tern (*Sternula [=Sterna] antillarum browni*), double-crested cormorant (*Phalacrocorax auritus*), Caspian tern (*Hydroprogne caspia*), elegant tern, and western gull-billed tern. Six special-status wildlife species were detected off site to the west or in the Otay

River drainage immediately off site during the 2011 surveys: merlin (*Falco columbarius*), northern harrier, white-tailed kite, Clark's marsh wren (*Cistothorus palustris clarkae*), yellow warbler (*Dendroica petechia brewsteri*), and yellow-breasted chat (*Icteria virens*).

The results of the delineation concluded that there are areas on site that are under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and California Coastal Commission. Although the non-tidal portion of the Otay River channel would have qualified for California Department of Fish and Wildlife jurisdiction, the portion is on Federal land and thus is not subject to Section 1600 et seq. of the California Fish and Game Code. Within the two sites, 97.73 acres of wetlands and waters are under the joint jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and California Coastal Commission.

1 INTRODUCTION

The Otay River Estuary Restoration Project (project) is a partnership between the U.S. Fish and Wildlife Service (USFWS or Service) and Poseidon Resources (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 project area (inclusive of the 40.8 acres of project features) is on approximately 165.3 acres located on two non-contiguous sites within the South San Diego Bay Unit of the San Diego Bay NWR (Figures 1 and 2). The first site is an approximately 33.5-acre area of predominantly disturbed uplands within the Otay River floodplain (hereafter referred to as the Otay River Floodplain Site). The second site is an approximately 90.9-acre active solar salt pond (hereafter referred to as the Pond 15 Site). The project also includes all project components required to implement the project.

The project site is located at the south end of San Diego Bay in San Diego County, California. 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 a 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 corporate limits of the City of San Diego, and the Pond 15 Site is within the corporate limits of the City of National City. 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. Specifically, the approximately 33.5-acre Otay River Floodplain Site is located west of Interstate 5 between Main Street to the north and Palm Avenue to the south (Figures 1 and 2). The 90.9-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. The project also includes all project components that are required for implementation of the project. The Otay River Floodplain Site is located within Sections 20 and 21, Township 18 South, Range 2 West on the U.S. Geological Survey 7.5-minute Imperial Beach quadrangle map (1966); longitude 117°5'46.02" W and latitude 32°35'29.95" N (Figure 2). The Pond 15 Site is located within Sections 16, 17, 20, and 21, Township 18 South, Range 2 West on the U.S. Geological Survey 7.5-minute Imperial Beach quadrangle map (1966); longitude 117°6'24"W and latitude 32°36'05"N (Figure 2).

Biological surveys of the project site were conducted by Dudek biologists from February through July 2011 for the Otay River Floodplain Site and in March 2013 for the Pond 15 Site, with focused surveys conducted for the Otay River Floodplain Site in spring and summer 2011. An additional visit was conducted in May 2014 to review existing conditions within the project features.

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

This report describes the existing biological character of the project site in terms of vegetation, flora, wildlife, wetlands, and wildlife habitats, and analyzes the biological significance of the site with respect to regional biological resources planning and Federal, State, and local laws.

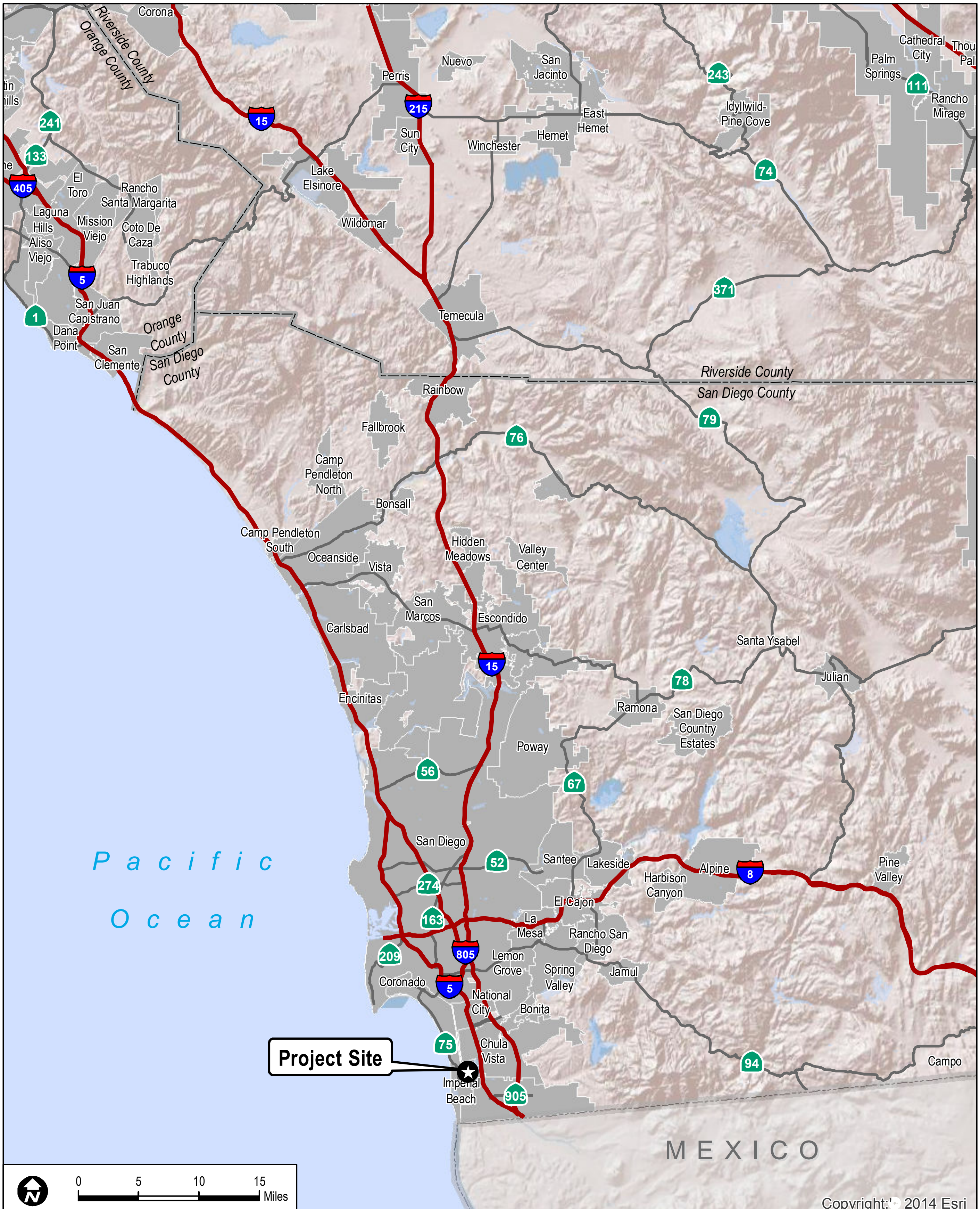

FIGURE 1

Regional Map

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Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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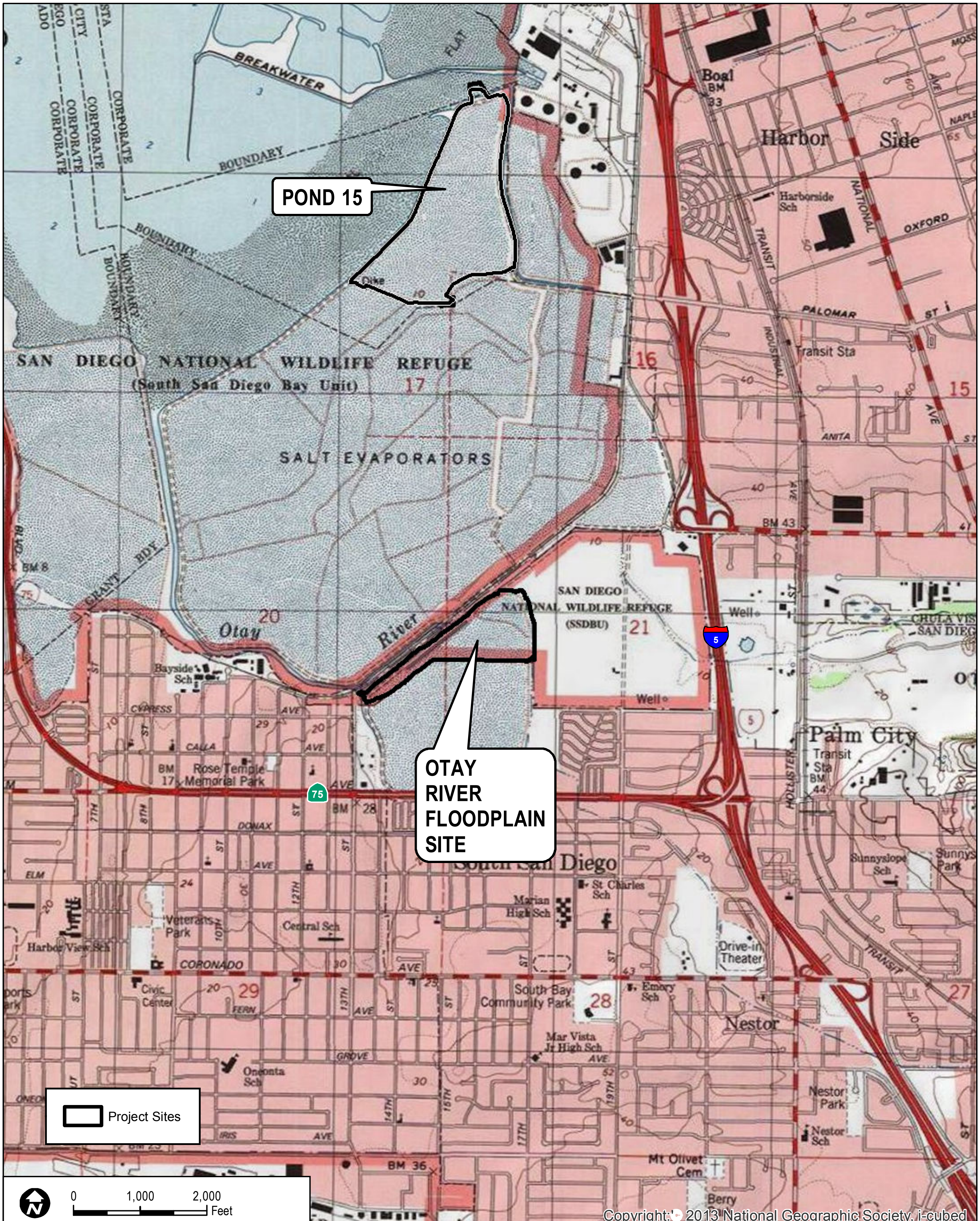

SOURCE: USGS 7.5-Minute Series Quadrangle, USA Topographic Maps Service, Imperial Beach Quadrangle.

FIGURE 2

Vicinity Map

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Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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2 METHODS AND SURVEY LIMITATIONS

Data regarding biological resources present on the project site were obtained through a review of pertinent literature and through field reconnaissance; both are described in detail below.

2.1 Literature Review

Sensitive biological resources present or potentially present on site were identified through a literature search using the following sources: USFWS (2010), California Department of Fish and Game (CDFG) (2009 and 2011a–c), and the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants (2015). General information regarding wildlife species present in the region was obtained from Unitt (1984, 2004) for birds, Hall (1981) and Ingles (1965) for mammals, Stebbins (2003) for reptiles and amphibians, and Emmel and Emmel (1973) for butterflies.

2.2 Field Reconnaissance

Dudek biologists conducted a number of surveys in 2011, 2013, and 2014. These included vegetation mapping, jurisdictional delineation, and focused surveys for 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. Table 1 lists the dates, conditions, and survey focus for each of the survey visits.

Table 1
Schedule for Special-Status Species Surveys

Date	Hours	Personnel	Focus	Conditions
2/22/2011	0800–1730	A. Thomson, K. Dayton	Wetland delineation and vegetation mapping	Not recorded
2/25/2011	0615–0955	A. Hayworth	Belding's Savannah sparrow	58–63°F; overcast; 3–8 mph wind
3/10/2011	0710–1135	A. Hayworth	Belding's Savannah sparrow	61–69°F; clear; 1–5 mph wind
3/16/2011	0800–1000	A. Hayworth	California gnatcatcher	58°F, clear, 0–1 mph wind
3/24/2011	1015–1520	S. Fraser, K. Shaw	Burrowing owl habitat assessment	62°F, 0–40% cloud cover, 3–4 mph wind
4/4/2011	00730–1230	A. Hayworth	California gnatcatcher; Belding's Savannah sparrow	58–63°F, overcast, 0–1 mph wind

Table 1
Schedule for Special-Status Species Surveys

Date	Hours	Personnel	Focus	Conditions
4/11/2011	0600–1205	A. Hayworth	Least Bell's vireo; Belding's Savannah sparrow; northern harrier	56–60°F; overcast; 0–1 mph wind
4/14/2011	0530–1000	S. Fraser	Burrowing owl	56–62°F; clear; 2–4 mph wind
4/25/2011	0600–1230	A. Hayworth	California gnatcatcher; Belding's Savannah sparrow; least Bell's vireo	58–66°F; overcast to clear; 0–8 mph wind
4/27/2011	0500–1000	S. Fraser	Burrowing owl	58–64°F; clear; 0–1 mph wind
3/27/2011	1650–1815	J. Konecny	light-footed Ridgway's rail	65–61°F; overcast; 7–10 mph wind
4/3/2011	1645–1815	J. Konecny	Light-footed Ridgway's rail	62–59°F; overcast; 5–12 mph wind
4/10/2011	0645–0815	J. Konecny	Light-footed Ridgway's rail	60–63°F; overcast; 5–7 mph wind
4/17/2011	0625–0800	J. Konecny	Light-footed Ridgway's rail	61–63°F; overcast; 5–7 mph wind
4/24/2011	0630–0800	J. Konecny	Light-footed Ridgway's rail	64–65°F; overcast; 7–10 mph wind
5/1/2011	1840–1910	J. Konecny	Light-footed Ridgway's rail	63–60°F; overcast; 9–14 mph wind
5/6/2011	0620–1045	A. Hayworth	Least Bell's vireo; northern harrier	58–59°F; overcast; 1–3 mph wind
5/11/2011	0515–1000	S. Fraser, T. Liddicoat	Burrowing owl	58–68°F; clear; 3–5 mph wind
5/19/2011	0630–0835	A. Hayworth	Least Bell's vireo	61–63°F; overcast; 3–5 mph wind
5/19/2011	0900–1630	A. Thomson, K. Dayton	Rare plant survey	65–70°F; 50% cloud cover; 2–4 mph wind
6/3/2011	0600–1030	A. Hayworth	Least Bell's vireo; northern harrier	68–69°F; clear; 0–5 mph wind
6/22/2011	0900–1045	A. Hayworth	Least Bell's vireo	61–65°F; overcast; 3–5 mph wind
7/18/2011	0700–0910	A. Hayworth, K. Shaw	Least Bell's vireo	58–60°F; overcast; 1–6 mph wind
7/20/2011	0800–1200	S. Fraser	Wetland delineation	Not recorded
7/29/2011	0640–0835	A. Hayworth, K. Shaw	Least Bell's vireo	65–68°F; overcast; 0–1 mph wind
3/13/2013	0800–1700	A. Thomson, K. Dayton	Wetland delineation and vegetation mapping	Not recorded
3/13/2013	830–1200	A.Hayworth	Wildlife survey	60–65°F; clear; 1–5 mph wind
5/29/2014	0800–1500	A. Thomson	Wetland delineation	Not recorded

mph = miles per hour.

2.2.1 Resource Mapping

Vegetation communities were mapped in February 2011 and March 2013 by Andy Thomson and Kathleen Dayton (Table 1). Vegetation communities were mapped in the field directly onto a 100-scale (1 inch = 200 feet) digital orthographic map of the site. These boundaries and locations were digitized by Dudek Geographic Information Systems (GIS) technician Mark McGinnis using ArcGIS software. GIS coverage was created using ArcCAD to calculate acreages of each vegetation type and impacts of the proposed action.

Vegetation communities and land covers used in this report follow the Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986), with modifications to accommodate the lack of conformity of the observed communities to those of Holland (1986). Community classifications were selected based on site factors, descriptions, distribution, and characteristic species present within an area. Information such as dominant species and their associated cover classes, aspect, canopy height, and visible disturbance factors were recorded. For locations of rare or sensitive plant species mapped during the focused surveys, the numbers present were counted or visually estimated.

2.2.2 Flora

All plant species encountered during the field surveys were identified and recorded. Those species that could not be identified immediately were brought into the laboratory for further investigation. A list of plant species observed on site is presented in Appendix A.

Latin and common names for plant species with a California Rare Plant Rank (CRPR) (formerly CNPS List) follow the *California Native Plant Society On-Line Inventory of Rare, Threatened, and Endangered Plants of California* (CNPS 2015). For plant species without a California Rare Plant Rank, Latin names follow the *Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California* (Jepson Flora Project 2015) and common names follow the United States Department of Agriculture (USDA) Natural Resources Conservation Service Plants Database (USDA 2015). Other references used include Rebman and Simpson 2006 and Roberts 1998.

2.2.3 Fauna

Wildlife species detected during the field surveys by sight, calls, tracks, scat, or other signs were recorded. Binoculars (10 x 50 power) were used to aid in the identification of observed wildlife. In addition to species actually detected, expected wildlife use of the site was determined by known habitat preferences of local species and knowledge of their relative distributions in the area. A list of wildlife species observed on the property is presented in Appendix A.

Latin and common names of animals follow Crother (2008) for reptiles and amphibians, American Ornithologists' Union (AOU 2015) for birds, Wilson and Reeder (2005) for mammals, and the North American Butterfly Association (NABA 2001) for butterflies.

2.2.4 Special-Status/Regulated Biological Resources

Special-status biological resources are those defined as follows: (1) species that have been given special recognition by Federal, State, or local conservation agencies and organizations due to limited, declining, or threatened population sizes; (2) species and habitat types recognized by local and regional resource agencies as sensitive; (3) habitat areas or vegetation communities that are unique, are of relatively limited distribution, or are of particular value to wildlife; and (4) wildlife corridors and habitat linkages. Regulated biological resources may or may not be considered special status, but are regulated under Federal, State, and/or local laws.

Surveys for special-status biological resources included rare plant surveys, special-status wildlife species surveys, and wetland delineations, as described below.

Focused Plant Surveys

Dudek performed literature research to determine which special-status plant species have the potential to occur on site. This included a review of CNPS 2015, the California Natural Diversity Database (CDFG 2011c), and USFWS 2010.

Dudek conducted a survey for rare plants that have a moderate to high potential to occur within the project site based on suitable habitat present; all rare plants were recorded if they were observed, regardless of whether they were expected or not. Survey emphasis was placed on determining the presence, or potential for occurrence, of State- and Federally listed and CNPS List 1B and 2 species. CNPS List 3 and 4 species were recorded if observed. Based on the distribution and results from preliminary research, as well as the blooming period and detectability of the plant species potentially present, it was assumed that one full survey pass would provide the results to support presence or absence of the potential for plant species to occur within the site. Field survey methods conformed to *California Native Plant Society* (*CNPS) Botanical Survey Guidelines* (CNPS 2001); *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFG 2000); and *Guidelines for Conducting and Reporting Botanical Inventories For Federally Listed, Proposed, and Candidate Plants* (USFWS 1996). If special-status species were encountered during the field study, the biologist recorded the center of the polygon in which the special-status plant was observed as a point using a GPS unit, and estimated the number of individuals present within the polygon. Depending on the species encountered or the number of individuals observed, percent cover was estimated in lieu of the number of individuals.

Focused Wildlife Surveys

Focused wildlife surveys were conducted to address the following special-status species: California gnatcatcher, Belding's Savannah sparrow, least Bell's vireo, light-footed Ridway's rail, northern harrier, and western burrowing owl.

California Gnatcatcher. Surveys were conducted under the authorization of permit TE-781084 (Anita M. Hayworth) according to the schedule provided in Table 1. The survey followed the most current protocol established by the Service, *Coastal California Gnatcatcher* (*Polioptila californica californica*) *Presence/Absence Survey Protocol*, *July 28*, *1997* (USFWS 1997).

Suitable habitat within the project site was surveyed three times for California gnatcatcher, and included the *Isocoma* scrub and mulefat scrub habitats. Although these habitat types are not typically occupied by California gnatcatcher, the structure of the habitat is potentially suitable and the species is known to periodically forage in mulefat scrub (and *Isocoma* scrub is a subtype of coastal sage scrub). The route selected ensured complete coverage of all suitable habitat within the study area. A topographic map of the site (scale 1 inch = 100 feet) overlain with vegetation polygons was used for the survey. Weather conditions during surveys are provided in Table 1. Binoculars (10×50) were used to aid in detecting and identifying bird species. Taped gnatcatcher vocalizations were played frequently to elicit a response from the species. The tape was played approximately every 50 to 100 feet within suitable habitat. If a California gnatcatcher was detected, playing of the tape ceased to avoid harassment, and the California gnatcatcher location was recorded on the site map.

Burrowing Owl. Dudek biologists conducted a habitat assessment and focused survey for burrowing owl within the project site during the breeding season for burrowing owl. Surveys for burrowing owl followed the California Department of Fish and Wildlife (CDFW) protocol provided in the *Staff Report on Burrowing Owl Mitigation* (CDFG 1995). The surveys were conducted between April 15 and July 15. Survey visits were conducted from 2 hours before sunset to 1 hour after, or from 1 hour before to 4 hours after sunrise. The surveys extended approximately 2 hours beyond the recommended time period because a clear view of the soil surface was available to determine if burrows were present and because temperatures remained low. Four surveys were conducted at no closer than weekly intervals by walking suitable habitat within the survey area. Locations of potential burrows were recorded on a map and notes were recorded of any appropriate evidence indicating that a burrow was occupied (e.g., feathers, pellets, tracks, and prey remains). Any burrowing owls observed also were recorded and mapped and digitized using ArcGIS.

Light-Footed Ridgway's Rail. Dudek subconsultant John Konecny conducted a focused survey for light-footed Ridgway's rail within the survey area. Light-footed Ridgway's rails have been documented in the vicinity. Six focused survey visits for light-footed Ridgway's rail were conducted 1 week apart following the survey protocol approved by the Service (USFWS 2006a) and the Light-Footed Ridgway's Rail Study Team (CRST 2009). Each survey had a dawn and dusk component. The surveys were conducted between March 27 and May 1. Survey stations were established at approximately 300-foot intervals along the survey area, including all side channels. The surveys were conducted by stopping at all stations and passively listening for light-footed Ridgway's rails during the first 5 minutes. If Ridgway's rails were not detected, a digital vocalization consisting of 30 seconds of light-footed Ridgway's rail calls followed by 30 seconds of silence was played from an iPod with amplified speakers. A response was listened for during a 1-minute period following the recorded vocalizations before proceeding to the next station. Any light-footed Ridgway's rails or other special-status species observed were recorded and mapped. If observed, the data on the light-footed Ridgway's rail's location was digitized using ArcGIS.

Least Bell's Vireo. Dudek conducted a habitat assessment and focused survey for least Bell's vireo within the study area. A recovery permit pursuant to Section 10(a)(1)(A) of the Endangered Species Act of 1973 was not required to conduct presence/absence surveys, provided that the January 19, 2001, survey protocol was followed and vocalization tapes were not used. Eight site visits to areas of suitable habitat were conducted, with 10-day intervals between each visit. Surveys were conducted between April 10 and July 31. Additional visits were conducted up to August 31 and provided information on juvenile use of the habitat and habitat use outside of the typical suitable habitat. Such additional visits were not required. Surveys were conducted between dawn and 11 a.m. by a qualified biologist familiar with least Bell's vireo songs, calls, and plumage. Any least Bell's vireos that were observed were recorded and mapped. If observed, data was digitized using ArcGIS.

Belding's Savannah Sparrow. Dudek conducted focused surveys for Belding's Savannah sparrow within the study area. Surveys for Belding's Savannah sparrow followed the CDFW protocol (CDFG 2001).

The surveys were conducted between February 15 and April 30. Survey visits were conducted from 6 a.m. to 10 a.m., and temperatures were acceptable and sunshine optimal. Five surveys were conducted. Any Belding's Savannah sparrows observed were recorded and mapped. If observed, data was digitized using ArcGIS.

Northern Harrier. Dudek conducted focused surveys for northern harrier within the study area. There is currently no survey protocol for northern harrier. Surveys for northern harrier focused on the detection of breeding of the species, since their numbers increase during the fall and winter due to migration. Surveys were conducted in conjunction with other surveys to be efficient with the surveys required. To detect breeding of the species, surveys were conducted during the peak breeding season, which is generally between April 1 and late July. Although there is no guidance for number of visits required, conducting three visits is prudent, and the visits were made once each in April, May, and June. Surveys were performed in suitable grassland and marshland habitat. Survey methods included walking the suitable areas and observing the behavior of harriers. Nesting is often indicated by observation of a food pass from the male to the female; observation of territorial behavior, since the hunting females often search near the nest locations; and observations of young birds, which would indicate a nest site is near. The biologist conducting the surveys is experienced in the behavior of nesting northern harriers. Any harriers observed were recorded and mapped. If observed, data was digitized using ArcGIS.

2.2.5 Jurisdictional Wetlands Delineation

A formal jurisdictional wetlands delineation was conducted in accordance with the following agencies and regulations: (1) the U.S. Army Corps of Engineers (Corps), pursuant to Section 404 of the Federal Clean Water Act; (2) the Regional Water Quality Control Board (Regional Board), pursuant to Section 401 of the Federal Clean Water Act and the Porter-Cologne Act; (3) CDFW, pursuant to Section 1600 of the California Fish and Game Code; and (4) the California Coastal Commission (Commission). Details of the jurisdictional wetlands delineation are provided in the *Results of a 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* (Dudek March 10, 2015; Appendix B).

The following data sources were reviewed to assist in the delineation effort:

- National Wetlands Inventory Maps (USFWS 2009)
- National Hydric Soils List
- Natural Resource Conservation Service Web Soil Survey (USDA 2009)
- Historical aerial photographs

The wetlands delineation was performed in accordance with the methods prescribed in the Corps's 1987 Wetland Delineation Manual (ACOE 1987), Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (ACOE 2008), and the Corps/Environmental Protection Agency's Rapanos Guidance (ACOE 1987, 2008; ACOE and

EPA 2007). Other references used for the delineation included Reed 1988, SWANCC 2001, USDA 1994, USGS 2007, and USFWS 2008.

Areas under the jurisdiction of the Regional Board generally coincided with waters of the United States; however, isolated waters may have been under the jurisdiction of the Regional Board as waters of the State as provided by the State Porter-Cologne Act. The Corps/Regional Board wetland delineation consists of the field identification of jurisdictional wetlands using the three parameters described in the Corps Manual: hydric soils, hydrology, and hydrophytic vegetation. A predominance of hydrophytic vegetation, where associated with a stream channel, was used to determine CDFW-regulated riparian areas. Wetlands under the jurisdiction of the Commission were delineated using the Cowardin method of wetlands classification (Cowardin et al. 1979), which defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology). In some instances where isolated surface waters are present, the Regional Board may choose to take jurisdiction over these resources under the State's Porter-Cologne Act.

Otay River Floodplain Site

Dudek biologists Andrew Thomson and Kathleen Dayton performed a formal (routine) wetlands delineation within the Otay River Floodplain Site on February 22, 2011. An additional analysis of the site was conducted by Dudek's Stuart Fraser on July 20, 2011, to confirm lack of ponding in the former salt pond areas in the western portion of the site. The Corps conducted fieldwork in August 2012 to refine Corps jurisdictional areas. All areas identified as being potentially subject to the jurisdiction of the Corps, Regional Board, CDFW, and/or the Commission were field verified and mapped.

Hydrology, vegetation, and soils were assessed at 21 geographically distinct sampling locations (Sampling Points 5–25) (Appendix B) throughout the site to determine the presence or absence of wetland field indicators. The overall area was assessed for evidence of an ordinary high water mark, saturation, permanence of surface water, wetland vegetation, and a nexus to traditional navigable waters. A more detailed description of the methods is described below.

The location of sampling points and the limits of wetlands were collected in the field using a 100-scale (1 inch = 100 feet) aerial photograph, topographic base, and GPS equipment with sub-meter accuracy. ArcGIS software was used to compile the information into a geospatial database.

Pond 15 Site

Dudek biologists Andrew Thomson and Kathleen Dayton performed a formal wetlands delineation within the Pond 15 Site on March 13, 2013. All areas identified as being potentially subject to the jurisdiction of the Corps, Regional Board, CDFW, and/or the Commission were field verified and mapped.

Hydrology, vegetation, and soils were assessed at 15 geographically distinct sampling locations (Sampling Points 1–15) (Appendix B) throughout the site to determine the presence or absence of wetland field indicators. The overall site was assessed for evidence of an ordinary high water mark, saturation, permanence of surface water, wetland vegetation, and a nexus to traditional navigable waters.

The location of sampling points and the limits of wetlands were collected in the field using a 100-scale (1 inch = 100 feet) aerial photograph, topographic base, and GPS equipment with sub-meter accuracy. ArcGIS software was used to compile the information into a geospatial database.

Project Features

Dudek biologist Andrew Thomson performed a formal wetlands delineation within the project features on May 29, 2014. All areas identified as being potentially subject to the jurisdiction of the Corps, Regional Board, CDFW, and/or the Commission were field verified and mapped.

Hydrology, vegetation, and soils were assessed at seven geographically distinct sampling locations (Sampling Points 1–7) (Appendix B) throughout the access route area to determine the presence or absence of wetland field indicators. The overall area was assessed for evidence of an ordinary high water mark, saturation, permanence of surface water, wetland vegetation, and nexus to a traditional navigable water.

The location of sampling points and the limits of wetlands were collected in the field using a 100-scale (1 inch = 100 feet) aerial photograph, topographic base, and GPS equipment with sub-meter accuracy. Dudek GIS technician Lesley Terry digitized the jurisdictional extents based on the GPS data and data collected directly onto field maps using ArcGIS software.

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3 PHYSICAL CHARACTERISTICS

3.1 Site Description

The project site is separated into two non-contiguous areas: the Otay River Floodplain Site and the Pond 15 Site. Both sites will provide wildlife habitat and proximity to the coastline upon completion of the project. The project also includes a number of project features. The lack of significant topographic relief on the 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, and Imperial Beach, and the Silver Strand (State Route 75). The project site is surrounded by scenic resources, including San Diego Bay, the Pacific Ocean, and low coastal bluffs and marshlands.

3.1.1 Topography

The approximately 33.5-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 2. The relatively flat floodplain gently slopes from southeast to northwest, ranging in elevation from approximately 9.5 to 18.5 feet. The flat elevation of the site and surrounding areas allows for direct views of the adjacent salt ponds and the 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 San Diego Bay and much of the developed upland areas that border the San Diego Bay to the south (USFWS 2006b). The San Ysidro Mountain Range and 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.

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 ponds 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 2006b).

The approximately 90.9-acre Pond 15 Site is relatively flat, located directly along the southeastern edge of the San Diego Bay, approximately 1.5 miles west of the Pacific Ocean. The water-filled pond has little to no vegetation due to its high salinity, and often includes periods of very low water levels. The levees and salt ponds, including the Pond 15 Site, are visible throughout the San Diego Bay and much of the developed upland area that borders the south of the San Diego Bay, including the industrially developed sites located east and northeast of the salt ponds.

The prominent visual feature from the Pond 15 Site as viewed from outside the San Diego Bay NWR is the levee barrier system that separates the pond from tidal circulation of the surrounding Bay. Chula Vista Bayfront Park is located approximately 0.5 mile north of the Pond 15 Site. This area also has an uninterrupted 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 between 1 to 2 miles across the San Diego Bay from the Bayshore Bikeway and Silver Strand (State Route 75).

3.1.2 Soils

The Otay River Floodplain Site is located at the western terminus of the Otay River within the Otay River floodplain. The floodplain is characterized by soft alluvial/bay deposits under 3 to 5 feet of uncompacted fill soils. The Otay River Floodplain Site is almost entirely composed of Grangeville fine sandy loam at 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% slope. Visalia gravelly sandy loam is also commonly found in alluvial fans and has a high capacity for transmitting water. However, this soil only contains a moderate available water capacity compared to the soil on the majority of the site. 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 capacity (USDA 2009).

The Pond 15 Site is composed of 140 million gallons of water underlain by Quaternary alluvium. This is silt, sand, clay, and gravel with minor cobbles and boulders generally found in river and stream bottoms, valley fill, floodplains, fans, beach sand, swamps, and sand dune deposits. The Pond 15 Site is within a liquefaction hazard area, or 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 Environmental Impact Report Geologic Maps (Figures 5.5-1 and 5.5-2 in the General Plan Environmental Impact Report) (City of Chula Vista 2005).

4 RESULTS OF SURVEY

4.1 Botany – Plant Communities and Floral Diversity

4.1.1 Otay River Floodplain Site

The Otay River Floodplain Site is approximately 33.5 acres, consisting mostly of disturbed and native upland habitat and approximately 6.43 acres of wetland habitat or waters of the United States. Historically, some of the upland areas within the Otay River Floodplain Site supported either freshwater or riparian habitat, but appear to have predominantly been composed of coastal salt marsh habitat (USFWS 2006b). Over time these wetland areas were converted to upland due to channelization of the Otay River, construction of solar salt ponds, and past agricultural activity.

The Otay River Floodplain Site contains five vegetation communities or land covers, as listed in Table 2 and shown in Figure 3, Otay River Floodplain Restoration Site and Project Features Vegetation. Each vegetation community within the project site is described in greater detail below.

Table 2
Vegetation Communities and Land Cover Types for the Otay River Floodplain Site

Vegetation Community/Land Cover Type	Acreage
Isocoma Scrub	11.97
Brackish Water	0.77
Southern Coastal Salt Marsh	1.26
Disturbed Land	8.68
Former Salt Pond Bottom and Borrow Area	10.83
Total	**33.51**

4.1.1.1 Isocoma Scrub; Tier II

Isocoma scrub is dominated by Menzies' goldenbush (*Isocoma menziesii*). The stands of *Isocoma* scrub vegetation on the site, which occur 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 (*Opuntia prolifera*) within the community, but the community lacks diversity and is predominantly 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*), bromes (*Bromus* spp.), and slender oat (*Avena barbata*).

4.1.1.2 Southern Coastal Salt Marsh; Wetlands

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

On site, southern coastal salt marsh generally occurs along the channel of the Otay River that extends along the northern edge of the site, within Nestor Creek, and at the convergence of the Otay River and Nestor Creek. The southern coastal salt marsh on site includes seablite, Pacific swampfire, Parish's glasswort, and California cordgrass.

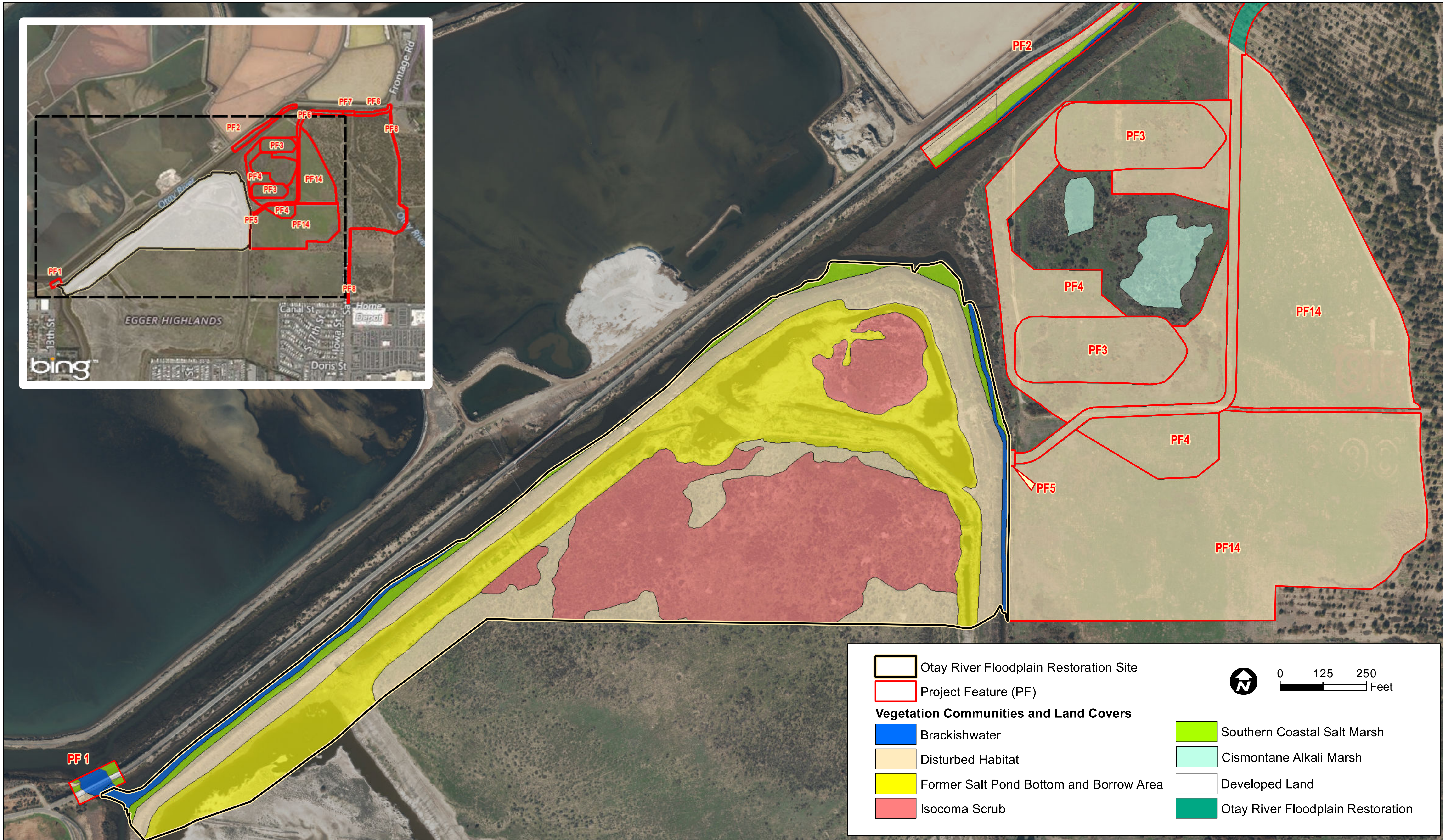

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FIGURE 3

Otay River Floodplain Restoration Site and Project Features Vegetation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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4.1.1.3 Brackish Water; Wetlands

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 effects 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 ocean with regular tidal inundation, and from 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 through the center of the site (Nestor Creek). Within the project site, both channels are subject to regular tidal inundation.

4.1.1.4 Former Salt Pond Bottom and Borrow Area; Tier IV

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 tall 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 south and west of the Otay River and Nestor Creek channels.

4.1.1.5 Disturbed Land; Tier IV

Disturbed land refers to areas that are not developed but lack vegetation, and generally are the result of severe or repeated mechanical perturbation. The disturbed habitat on site includes an area that was farmed in the past and is periodically mowed by the San Diego Bay NWR to control non-native weeds (specifically crowndaisy [*Glebionis coronaria*]) and for fire management purposes.

4.1.2 Pond 15 Site

The Pond 15 Site consists of approximately 91 acres of disturbed and native upland habitat and approximately 86.27 acres of non-vegetated habitat, including the brines contained in the salt ponds and areas mapped as bay, beach, and disturbed habitat (Figure 4, Pond 15 Restoration Site and Project Features Vegetation). 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 the South Bay Salt Works operation that currently produces salt for commercial purposes using solar radiation to evaporate water from seawater and concentrate 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 [NAVD 88]). The Pond 15 Site includes the vegetation communities or land covers listed in Table 3 and shown in Figure 4. Each vegetation community within the project site is described in greater detail below.

Table 3
Vegetation Communities and Land Cover Types for the Pond 15 Site

Vegetation Community/Land Cover Type	Acreage
Bay	1.15
Beach	0.01
Disturbed Land	2.77
Open Water	82.34
Salt Pond Levee	3.67
Southern Coastal Salt Marsh	0.87
Disturbed Southern Coastal Salt Marsh	0.10
Total	**90.90**

4.1.2.1 Bay

Areas mapped as bay refer to the open water located within the San Diego Bay. An area mapped as bay is located at the north of the Pond 15 Site.

4.1.2.2 Beach

Beach refers to areas that are on the Bay side of the levees and that are subject to tidal inundation but are generally 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.

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FIGURE 4

Pond 15 Restoration Site and Project Features Vegetation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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4.1.2.3 Disturbed Land

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

4.1.2.4 Open Water

Open water consists of concentrated brines and areas that are perennially inundated by brines within the Pond 15 Site. The salt pond brines are hypersaline and vary in salinity from pond to pond, depending on its position in the sequential evaporative water process. Overall salinity within the South Bay Salt Works varies from the salinity of south San Diego Bay (32 parts per thousand (ppt)) to 356 ppt, with the Pond 15 Site varying from 71.3 to 128.5 ppt (USFWS 2006b). As a matter of reference, ocean water salinity varies from 32 to 37 ppt (Office of Naval Research 2014).

4.1.2.5 Salt Pond Levee

The salt pond levees separate the salt ponds for controlling the salinity as part of the salts works operation. The levees vary in the degree to which they are compacted, with the lower and outer edges being less compacted, and the surfaces intended for vehicle access being more compacted. Areas with less compaction occasionally support disjunct patches of vegetation, but the compacted areas are devoid of vegetation. Areas intended for driving access that are devoid of vegetation were classified as disturbed habitat 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 saltgrass, Parish’s glasswort, and seablite. Non-native species occurring on the levees consists of iceplant (*Mesembryanthemum* spp.), bromes, and patches of Australian saltbrush (*Atriplex semibaccata*).

4.1.2.6 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 alkali seaheath, seablite, and Parish’s glasswort along the drier upper edges of the marshes; Pacific swampfire and turtleweed at middle elevations; and cordgrass closest to the water.

On site, southern coastal salt marsh occurs as small patches of vegetation along the levee that surrounds the salt pond. It is classified as a disturbed form of the habitat in areas where there is overall low vegetative cover of the community. Salt marsh vegetation is also present off site along some of the internal levees of the South Bay Salt Works, on the Otay River and Bay side of the levee system, and along the Palomar Street channel and the channel east of Pond 15. On the Pond 15 Site, the internal levees are lacking in vegetation. The southern coastal salt marsh on site includes seablite, Parish's glasswort, and California cordgrass.

4.1.3 Project Features

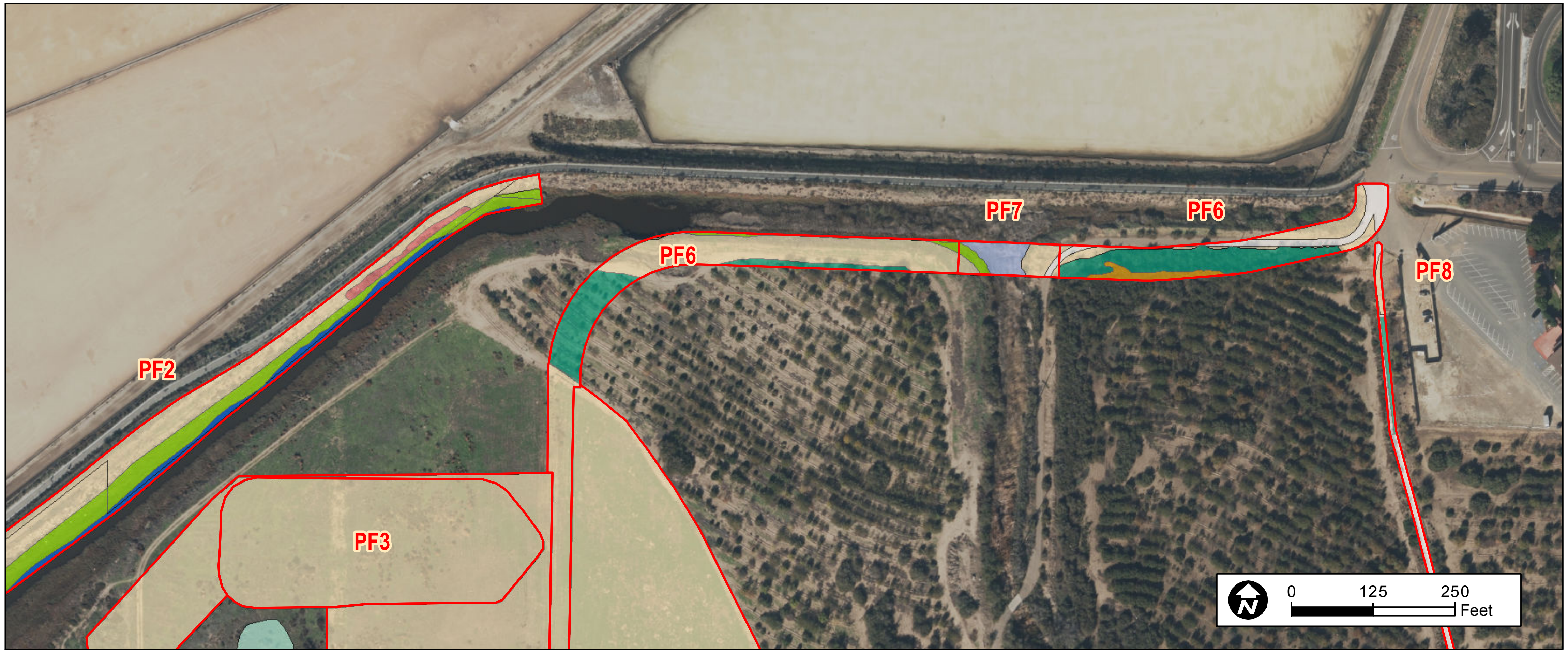
Implementation of the project features in support of the overall habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site would involve approximately 1.61 acres of native vegetation communities and 39.14 acres of non-native vegetation communities and land covers (Figures 5 and 6, Project Features Vegetation). Table 4 provides a summary of the acreage of existing vegetation communities and land cover types associated with the project features.

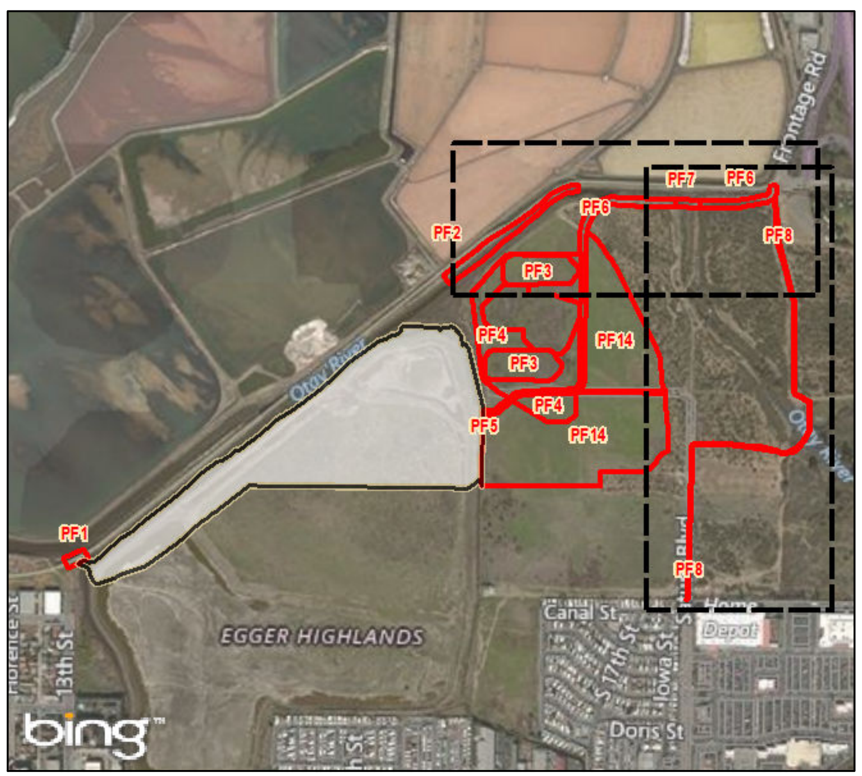
Table 4
Vegetation Communities and Land Covers within the Project Features

Vegetation Community/ Land Cover Type	Project Features (Acres)														
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Non-Native Communities and Land Covers															
Brackish Water	0.13	0.08	—	—	—	—	—	—	0.01	—	—	—	—	—	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	6.06	0.02	1.87	0.07	0.02	0.04	0.30	0.02	0.02	0.41	21.50	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
Non-Native Communities Subtotal	0.18	0.76	4.07	6.06	0.02	1.99	0.08	0.76	0.10	1.70	1.00	1.08	0.75	21.50	39.26
Native Communities															
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
Native Communities Subtotal	*0.06*	*0.53*	*0.00*	*0.00*	*0.00*	*0.64*	*0.10*	*0.03*	*0.06*	*0.19*	*0.00*	*0.00*	*0.00*	*0.00*	*1.61*
Total	**0.24**	**1.29**	**4.07**	**6.06**	**0.02**	**2.63**	**0.18**	**0.79**	**0.16**	**1.90**	**1.00**	**0.18**	**0.76**	**21.50**	**40.76**

Project Features:
1 Otay Channel Protection under Bikeway Bridge (Temporary and Permanent)
2 Otay Channel Protection (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 Restoration Area East of Nestor Creek (Permanent)





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

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FIGURE 5

Project Features Vegetation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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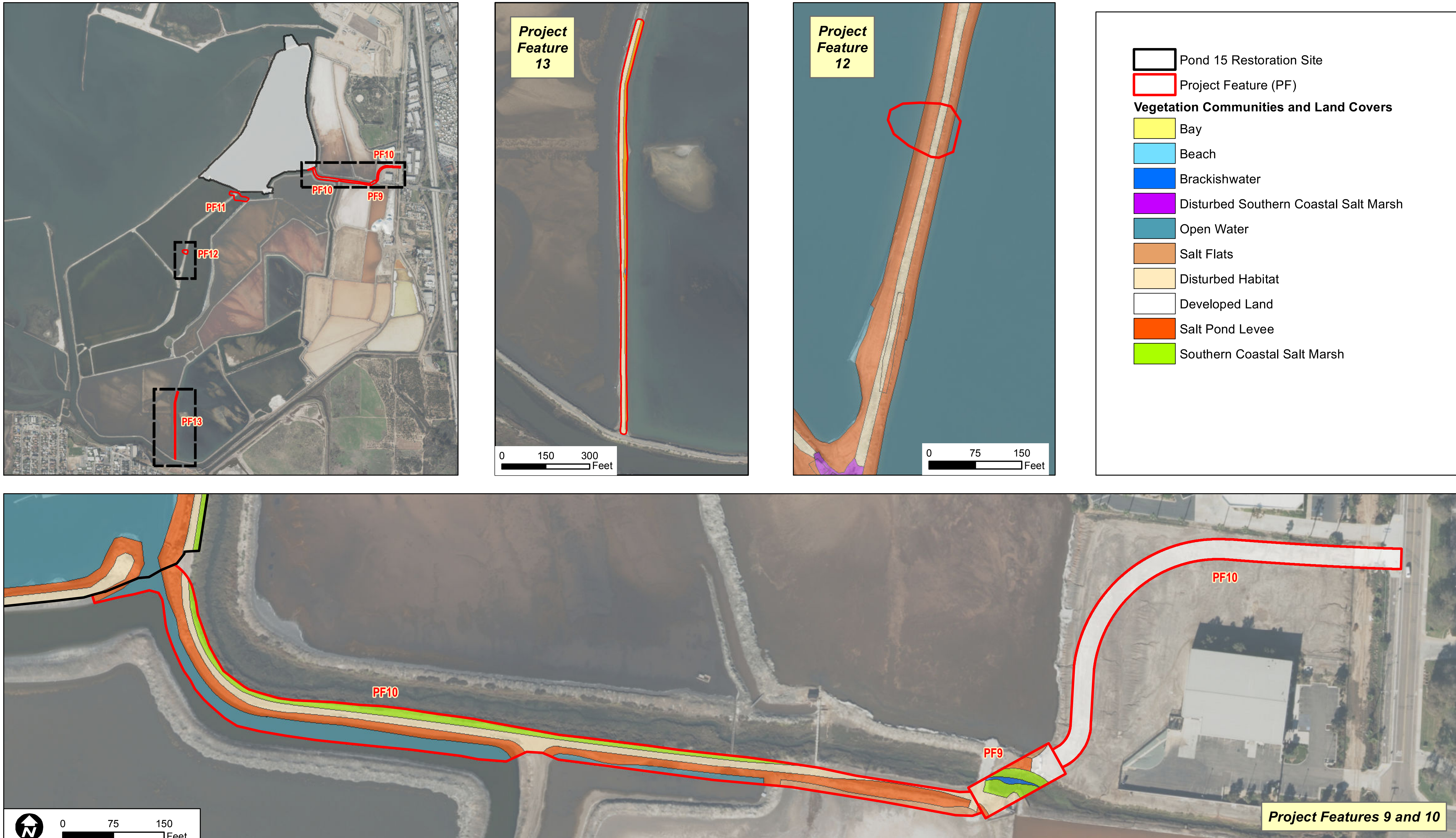

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FIGURE 6

Project Features Vegetation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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The proposed action would consist of the following:

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 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 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 truck construction access route would be used under any one 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 temporary crossing at the Otay River channel.
8. ***Bike Path Reroute.*** The existing bike path 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.

14. ***Restoration Area East of Nestor Creek.*** The 21.5-acre area east of Nestor Creek would be restored to native vegetation following completion of the proposed action. Stockpiled material on the staging area would partially be used for this restoration effort.

4.1.4 Floral Diversity

A total of 61 species of vascular plants, 36 native (59%) and 25 non-native (4%), were identified on the site in 2011. The complete list of plant species identified on site during surveys conducted in 2011 is provided as Appendix A.

4.2 Zoology – Wildlife Diversity

4.2.1 Otay River Floodplain Site

The Otay River Floodplain Site offers moderate 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 habitat supports a number of upland species prevalent within disturbed and urbanized areas. The habitat within the project site lacks cover and structural diversity and, except for the patches of *Isocoma* scrub, is dominated by non-native species, providing relatively few resources for wildlife. A total of 83 species of wildlife (79 birds and four mammals) were observed on the project site. Typical species commonly observed on site were house finch (*Carpodacus mexicanus*) and lesser goldfinch (*Spinus tristis*). Several swallow species were observed over the survey period, and many individuals were observed foraging in flight over the site. A number of raptor species were observed foraging on small mammals within 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*), side-blotched lizard (*Uta stansburiana*), and gopher snake (*Pituophis melanoleucus*). Common species of mammals recorded in upland parts of the site included brush rabbit (*Sylvilagus bachmani*), coyote (*Canis latrans*), and California ground squirrel (*Spermophilus beecheyi*). Other mammals adapted to living in areas near human disturbance, such as striped skunk (*Mephitis mephitis*) and Virginia opossum (*Didelphis virginica*), may also occur on the site.

4.2.2 Pond 15 Site

The Pond 15 Site offers moderate habitat value for wildlife species, primarily for migratory and water birds, with some support for common upland species that typically inhabit a wide range of sites. During a visit to the site, it was noted that although numbers of birds within the Pond 15 Site were high, species richness was low. In comparison, immediately adjacent to the Pond 15 Site within the San Diego Bay, species richness was very high, as species responded to the tidal influence cycles and the foraging opportunities within the periodically exposed mudflat. Habitat within the project site consists mostly of saline brines, with a narrow upland perimeter formed by the levee system. There are a few dominant species that use the Pond 15 Site. Within the shorebird group, the most common species included red-necked phalarope (*Phalaropus lobatus*), Wilson's phalarope (*P. tricolor*), western sandpiper (*Calidris mauri*), marbled godwit (*Limosa fedoa*), willet (*Tringa semipalmatus*), and black-necked stilt (*Himantopus mexicanus*). Eared grebes (*Podiceps nigricollis*) represent the largest population of any species occurring within the Pond 15 Site. California brown pelican (*Pelecanus occidentalis californicus*), California gull (*Larus californicus*), double-crested cormorant (*Phalacrocorax auritus*), and elegant terns (*Thalasseus elegans*) also show a large population size at the salt ponds in general. Various levees within the South Bay Salt Works provide nesting habitat for a number of colonial nesting seabirds, including the Federally endangered California least tern (*Sternula antillarum browni*), Caspian tern (*Hydroprogne caspia*), elegant tern, royal tern (*Thalasseus maximus*), gull-billed tern (*Gelochelidon nilotica vanrossemi*), Forster's tern (*Sterna forsteri*), and black skimmer (*Rynchops niger*).

4.3 Sensitive Biological Resources

The following resources are discussed in this section: (1) plant and animal species present in the project vicinity that are given special recognition by Federal, State, or local conservation agencies and organizations owing to declining, limited, or threatened populations that are the result, in most cases, of habitat reduction, and (2) habitat areas that are unique, are of relatively limited distribution, or are of particular value to wildlife. Sources used for determining sensitive biological resources are as follows: the Service (USFWS 2010) and CDFW (CDFG 2009, 2011c) for wildlife; CDFW (CDFG 2011a, 2011b, 2011c) and CNPS (2015) for plants; and Holland (1986) and the City of San Diego (2004) for habitats.

4.3.1 Special-Status Plant Species

4.3.1.1 Otay River Floodplain Site

Three special-status plants were observed during the 2011 surveys of the Otay River Floodplain Site: California desert-thorn (*Lycium californicum*) (CRPR 4.2), estuary seablite (*Suaeda esteroa*) (CRPR 1B.2), and woolly seablite (*Suaeda taxifolia*) (CRPR 4.2) (Table 5 and Figure 7, Otay River Floodplain Restoration Site Special-Status Plant Species).

California desert-thorn is a perennial shrub that is located within coastal bluff scrub or coastal scrub habitats at an elevation ranging from 5 to 150 meters. Within the Otay River Floodplain

Site, approximately 16 individuals were mapped within southern coastal salt marsh and disturbed habitat (Figure 7).

Estuary seablite is a perennial herb that is found within coastal salt marshes and swamps at an elevation ranging from 0 to 5 meters (CNPS 2015). Within the Otay River Floodplain Site, several populations totaling approximately 230 individuals were found within areas mapped as southern coastal salt marsh and estuarine brackish water (Figure 7).

Woolly seablite is a perennial evergreen shrub that occurs between 0 and 50 meters within coastal bluff scrub and dune habitats, as well as along the margins of coastal salt marshes and swamps (CNPS 2015). Small occurrences consisting of 94 individuals are located throughout the Otay River Floodplain Site and within areas designated as project features in areas mapped as southern coastal salt marsh and disturbed habitat.

4.3.1.2 Pond 15 Site

One special-status plant was observed during the 2013 surveys of the Pond 15 Site: estuary seablite, a CRPR 1B.2 species (Table 5 and Figure 8, Pond 15 Restoration Site Special-Status Plant Species). Approximately 129 individuals were mapped within areas of southern coastal salt marsh.

Table 5 lists several sensitive plant species that have a moderate to high potential to occur within the project site based on the location of the site and general soils mapping, or that were observed (see also Figure 9, Ponds 22 and 23 Site Special-Status Plant Species). For each species listed in Table 5, a determination is made regarding the potential for the species to occur, based on the location of the site, habitats present, and degree of disturbance to the vegetation. Table 6 provides the list of those species with no or low potential to occur on site.

Table 5
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 6
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.

Table 6
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
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.
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.

Table 6
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
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.
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.

Table 6
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
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.
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.

Table 6
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
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.
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.

Table 6
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
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 6
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.

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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
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.
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.

Table 6
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
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.
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.

Table 6
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
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.
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.

Table 6
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
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

Multiple Species Conservation Program (MSCP):
MSCP: Covered by the MSCP
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)

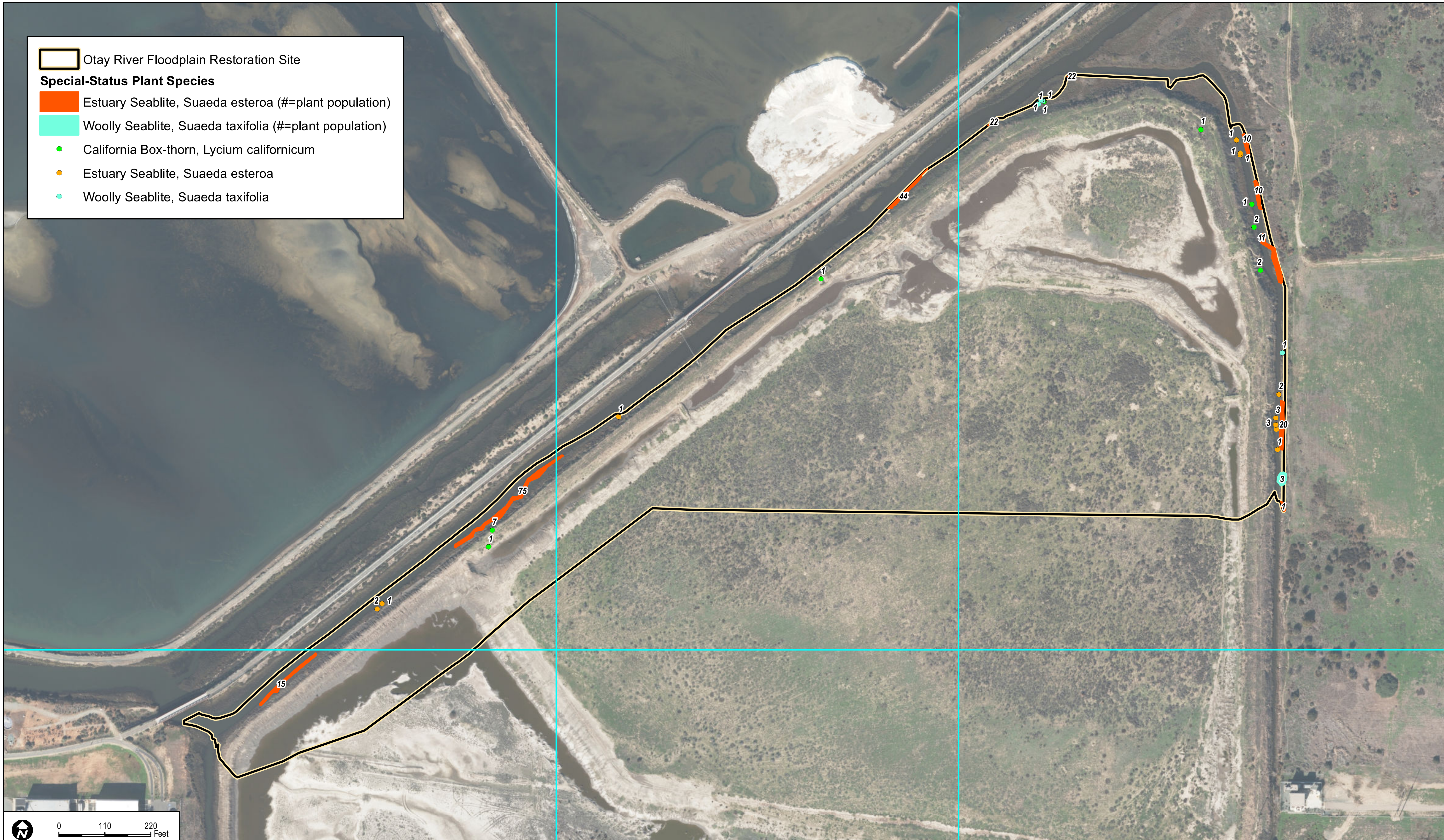

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Figure 7

Otay River Floodplain Restoration Site Special-Status Plant Species

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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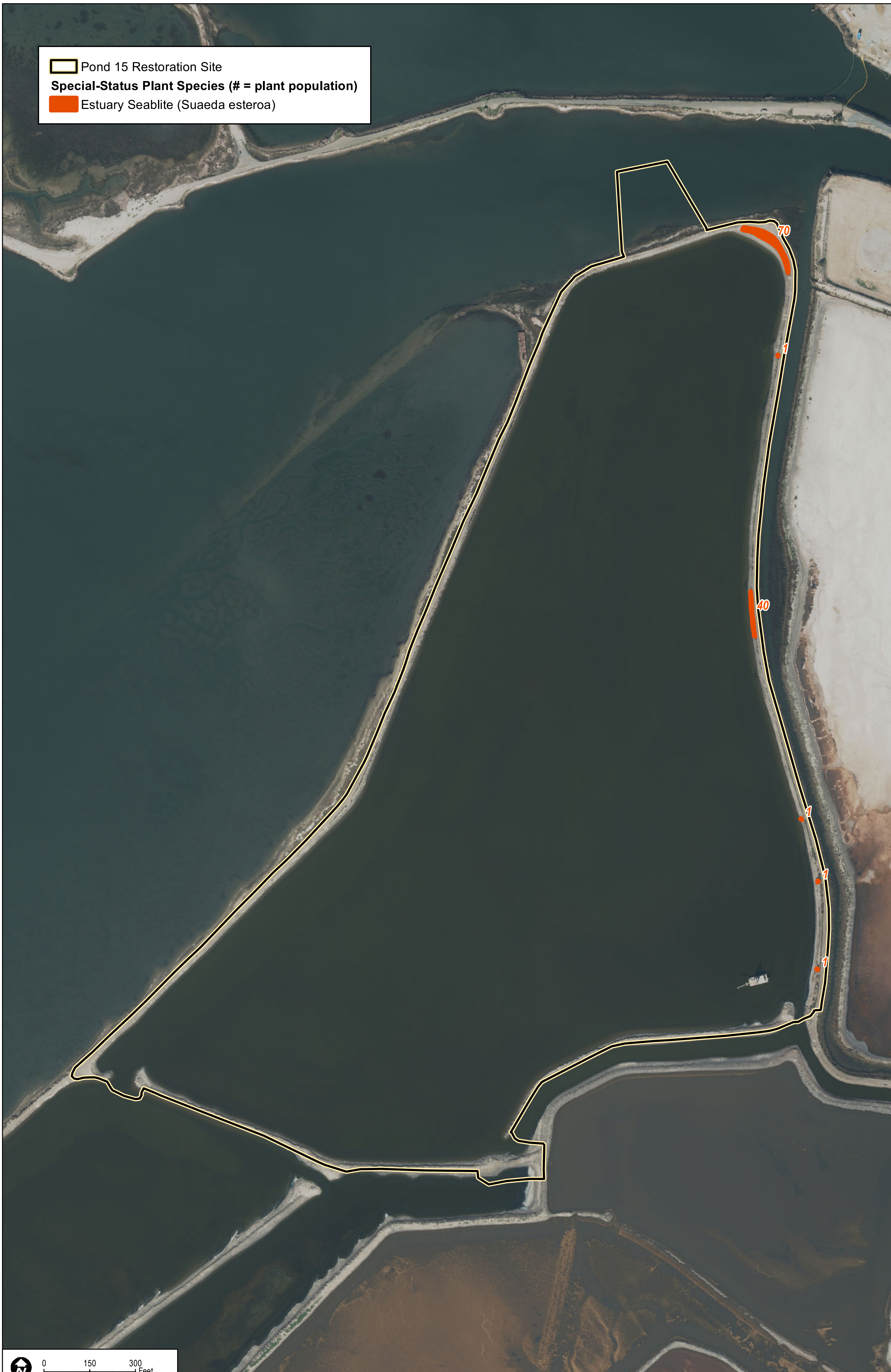

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FIGURE 8

Pond 15 Restoration Site Special-Status Plant Species

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Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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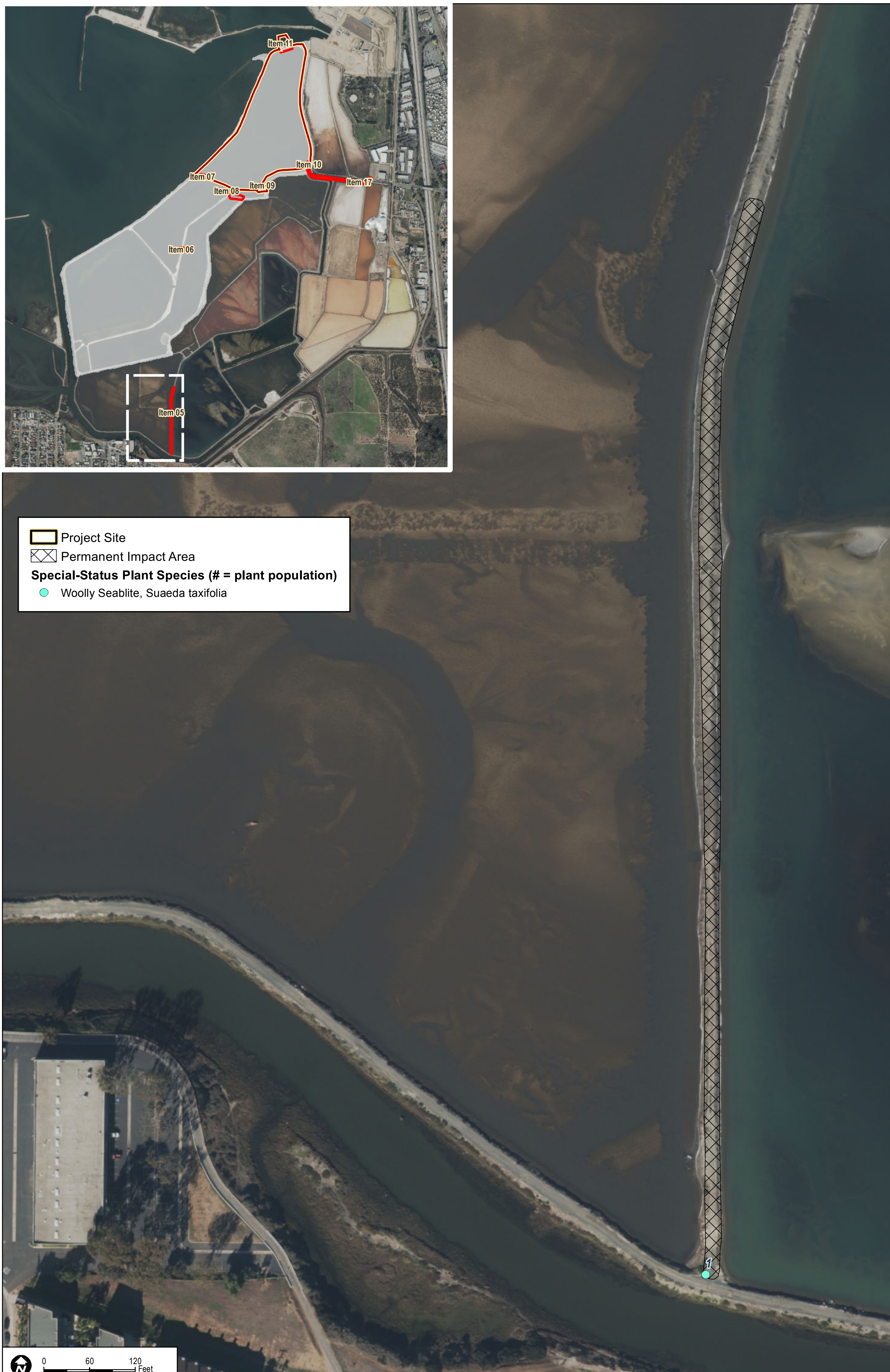

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FIGURE 9

Ponds 22 and 23 Site Special-Status Plant Species

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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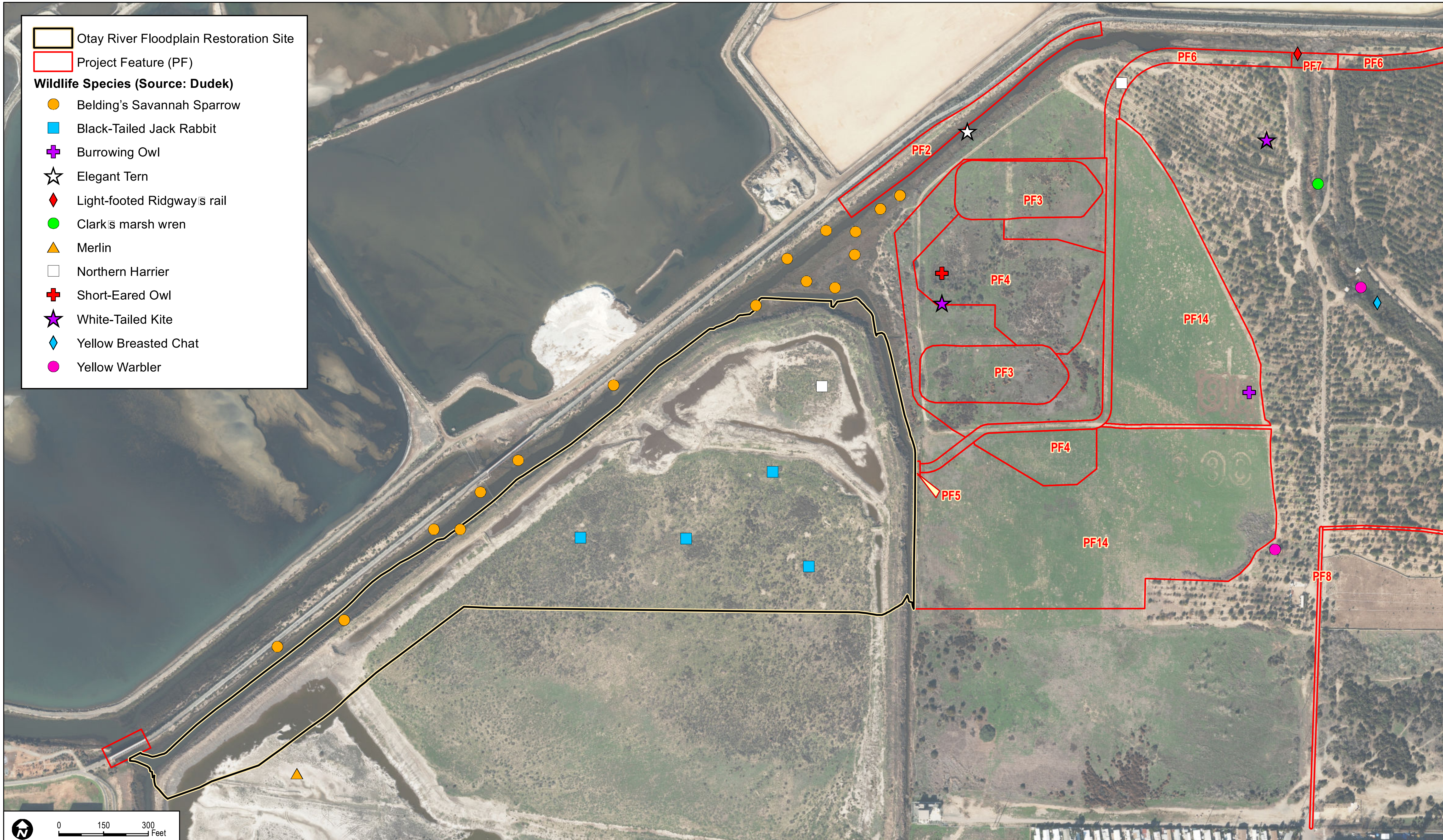

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Figure 10

Otay River Floodplain Restoration Site Special Status Wildlife Species

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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4.3.2 Special-Status Wildlife Species

4.3.2.1 Otay River Floodplain Site

Nine special-status wildlife species were detected within the Otay River Floodplain Site or adjacent to it or the project features during the 2011 surveys: northern harrier, white-tailed kite (*Elanus leucurus*), elegant tern, gull-billed tern, light-footed Ridgway's rail, burrowing owl, short-eared owl (*Asio flammeus*), Belding's Savannah sparrow, and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) (Figure 10, Otay River Floodplain Restoration Site Special-Status Wildlife Species). Six special-status wildlife species were detected off site to the west or in the Otay River drainage immediately off site during the 2011 surveys: merlin (*Falco columbarius*), northern harrier, white-tailed kite, Clark's marsh wren (*Cistothorus palustris clarkae*), yellow warbler (*Dendroica petechia brewsteri*), and yellow-breasted chat (*Icteria virens*) (Figure 10). Focused survey reports for California gnatcatcher and light-footed Ridgway's rail are provided in Appendix C and Appendix D, respectively.

Observed at the Otay River Floodplain Site

Belding's Savannah Sparrow

Belding's Savannah sparrow, a State-listed endangered species, is found year-round in Southern California coastal salt marshes and is endemic to salt marshes. Its habitat, and in turn its population size, has been greatly reduced by the impacts of increasing human populations (Zembal and Hoffman 2010).

Belding's Savannah sparrow makes its nests in dense pickleweed (swampfire) in small, semi-colonial breeding territories. They are secretive birds and forage throughout the marsh habitats, often far from their nests (Zembal and Hoffman 2010).

During focused surveys for Belding's Savannah sparrow, 18 individuals were observed in the disturbed habitat and southern coastal salt marsh habitats in the channel that runs along the northwest boundary of the project site. A number of these locations are outside the boundary of the Otay River Floodplain Site, but Belding's Savannah sparrow could use on-site areas (Figure 11, Otay River Floodplain Restoration Site Special-Status Nesting Locations).

Burrowing Owl

Burrowing owl inhabits open grasslands with low-level vegetation, and occurs in areas with finer soils without many rocks. It will take a vacant burrow created by a small mammal and enlarge it to create a nesting chamber. It will also remove any vegetation immediately around the burrow and raise the opening to provide a raised perch for watching for predators. It feeds primarily on arthropods, small mammals and birds, some amphibians, and some reptiles. Burrowing owl hunts mainly at night, but sometimes during the day (Haug et al. 1993).

Burrowing owls are active year-round in Southern California and winter in Northeastern California in suitable habitat. Breeding occurs from October through March, during which time the male prepares a burrow and the female lays one clutch of six to 11 eggs, incubating them for 28 to 30 days (Haug et al. 1993).

During focused species surveys for burrowing owl, one individual was observed in the eastern part of the project site, outside of the Otay River Floodplain Site but within areas that are part of the project features. It was observed flying from a burrow, but was only seen once. Although it was observed at a burrow, there was very little sign, and a repeat visit determined that no additional sign was present.

Elegant Tern

Elegant tern inhabits coastal and island estuaries and sandy habitats in Southern California, Baja California, and Mexico. It feeds on schooling fish species, primarily northern anchovy (*Engraulis mordax*), and rarely on crustaceans, by flying above salt and estuarine waters and diving to catch prey (Burness et al. 1999).

The breeding distribution of elegant tern is limited to a few isolated mainland or island colonies. Pair formation occurs toward the end of migration and at the nesting colony. In San Diego Bay, most pairs are formed by their arrival in early April. Nesting in San Diego Bay begins shortly after arrival in dense, preexisting groups of mixed species of gulls and terns. They nest in flat, sandy habitat with good visibility on marine islands or in estuaries. The nest itself is formed by scraping soft sediments into depressions or by polishing harder sediments and forming a rim out of nearby debris. Elegant terns usually lay one egg that camouflages with the surrounding ground, and they incubate for approximately 26 days (Burness et al. 1999).

During the focused species surveys, one elegant tern was observed in the southern coastal salt marsh habitat hunting along the channel.

AERIAL SOURCE: BING MAPPING SERVICE

DUDEK

Figure 11

Otay River Floodplain Restoration Site Special Status Nesting Locations

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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Gull-Billed Tern

Gull-billed tern breeds locally in Southern California, south to Baja California Norte, and has a population size estimated to be 600 to 700 pairs (Molina 2008). Within California, breeding locations include a colony at the Salton Sea and a small colony in San Diego Bay. Gull-billed tern nests on small, bare islets of fine clay within the impoundments at the Salton Sea and isolated sections of earthen levees at the South Bay Salt Works in south San Diego Bay (Molina 2008). It forages along inshore marine habitats such as shallow bays, mudflats, sandy beaches, and dunes, as well as along freshwater drainages and over agricultural fields and scrub habitats (Molina 2008). Its diet varies from small fish to a variety of insects, lizards, and crabs (Molina 2008).

During focused surveys, a number of gull-billed terns were observed flying over or possibly foraging on the site. Although they were not observed actively foraging, the species is known to forage in open fields for invertebrate prey.

Light-Footed Ridgway's Rail

Light-footed Ridgway's rail inhabits coastal wetlands in Southern California and northern Baja California. Predators such as raptors and degradation of wetlands have led to the decline of the species. Light-footed Ridgway's rails lay four to eight eggs (Zembal et al. 2007). The prey of this species typically consists of crustaceans (Eddleman and Conway 1998).

During the focused species surveys for light-footed Ridgway's rail, one individual was observed in the far northeastern portion of the site within the Otay River channel (Appendix D). This location is not within the boundary of the Otay River Floodplain Site, but it is adjacent to one of the project features.

Northern Harrier

Northern harrier inhabits meadows, grasslands, open rangelands, desert sinks, and fresh and saltwater emergent wetlands; this species is rarely found in wooded areas. Northern harrier nests in shrubby vegetation on the ground, usually at the edge of a marsh, and feeds on voles and other small mammals, birds, frogs, small reptiles, crustaceans, and insects; northern harriers rarely feed on fish (Zeiner et al. 1990).

Northern harrier is a permanent resident in the northeastern plateau and coastal areas of California, and a less common resident of the Central Valley. This species is a widespread winter resident and migrant in suitable habitat. Northern harriers breed up to 5,700 feet elevation in the Central Valley and Sierra Nevada, and up to 3,600 feet elevation in northeastern California from April through September, with peak activity in June and July (Zeiner et al. 1990).

During the focused surveys for northern harrier, one to three individuals were observed hunting over the project site in *Isocoma* scrub habitat and disturbed habitat. The species was observed frequently, but never exhibited nesting or territorial behavior. Thus, although the species was observed during almost every survey visit, no breeding activity was detected. The species was also observed off site.

Short-Eared Owl

Short-eared owl inhabits marshes, grasslands, and tundra habitats in North America and Eurasia. It is active during the day and night, and hunts low over the ground. It locates prey mainly by following noises made by the prey, but also by sight. Prey includes small mammals, especially voles, and sometimes birds (Wiggins et al. 2006).

Short-eared owl breeds from late March until mid-June. Pair formation begins in the middle of February, and it selects nests based on food abundance, nesting cover, and area. It constructs nests on the ground by scraping a bowl and lining it with grasses and downy feathers in dry areas with dead and matted-down vegetation. Short-eared owls lay one to 11 eggs, and the female incubates them for 21 to 37 days (Wiggins et al. 2006).

During the focused species surveys, one short-eared owl was observed in the mulefat scrub habitat in the northern one-third of the project site within one of the project features. It was only observed one time, so was assumed to not be breeding on site.

White-Tailed Kite

White-tailed kite is found in open grasslands and other similar habitats. It hunts for food by hovering while visually looking for small mammals on the ground and diving to catch prey. It prefers hunting over ungrazed grasslands, grassy wetlands, fence rows, and irrigation ditches near to grazed lands (Dunk 1995).

White-tailed kite breeds from mid-February through early July. Pairs can be found together year-round, although more pairs form from December through August. They nest in 3- to 50-meter-tall trees that are isolated or in forested areas near grasslands. Nests are constructed in the upper one-third of the trees out of small twigs and are lined with grass, hay, or leaves. The females lay and incubate three to six eggs for 30 to 32 days (Dunk 1995).

During the focused species surveys, two white-tailed kites were observed in the disturbed habitat in a project feature, and one white-tailed kite was observed in the disturbed habitat off site to the east of the project site within or near project features.

San Diego Black-Tailed Jackrabbit

San Diego black-tailed jackrabbit occupies many diverse habitats, but primarily is found in arid regions supporting short-grass habitats. Jackrabbits typically are not found in high grass or dense brush where it is difficult for them to move easily, and the openness of open scrub habitat probably is preferred over dense chaparral. Jackrabbits are common in grasslands that are overgrazed by cattle, and they are well adapted to using low-intensity agricultural habitats. In fact, to a point, drought and overgrazing may create better habitat for black-tailed-jackrabbits. Jackrabbit populations exhibit large fluctuations, and the risk of extirpation from marginal isolated habitat patches probably is high (Hall 1981). Suitable habitat linkages, including agriculture, may be important for colonization of unoccupied habitat patches.

Throughout the focused species surveys, four San Diego black-tailed jackrabbits were observed in the *Isocoma* scrub habitat.

Observed Off Site

A number of special-status wildlife species were observed in off-site areas and could occur on site. Six special-status species were observed off site, including northern harrier and white-tailed kite, which are discussed above and were also observed on site.

Merlin

Merlins inhabit forest and prairie habitats of North America, Europe, and Asia. They feed primarily on small to medium-sized birds that are caught in mid-air during short, quick flights. Because of their small size, they are unable to catch larger birds (Warkentin et al. 2005).

Merlins breed from late April through July, forming pairs 1 to 2 months before nesting. They select nesting sites in riparian and coniferous trees with good views of the surrounding area near open prairie habitats. Merlins do not construct nests, but make changes to preexisting hawk or falcon nests. They lay one to eight eggs that are incubated for 28 to 32 days (Warkentin et al. 2005).

During the focused species surveys, one Merlin was observed in the saltpan/mudflat habitat off site to the south of the project site.

Clark's Marsh Wren

Clark's marsh wren inhabits marshland habitats with cattails and bulrush, within which it constructs nests. It feeds on small insects and spiders found near or at the surface of the water, and on vegetation stems and leaves. They are rarely seen because they forage so close to the water in dense vegetation (Kroodsma and Verner 1997).

Marsh wren nests from early April through mid-August. It constructs a nest of cattail, sedge, or grass woven to form a completely enclosed nest with a single entrance above the equator of the nest. Males construct many nests that are not used by the female. Females usually lay four to six chocolate-colored eggs, and the female incubates them for 12 to 14 days (Kroodsma and Verner 1997).

During the focused species surveys, one Clark's marsh wren was observed in the Otay River channel off site to the east.

Yellow-Breasted Chat

Yellow-breasted chat occurs in low, dense vegetation in riparian habitats along streams, swamps, and ponds. They range in south-eastern North America, some places in California and the northwest, and northern Central America. They hunt insects and spiders and will feed on fruits and berries when available (Eckerle and Thompson 2001).

Yellow-breasted chat breeds from mid-May through mid-August, forming pairs at the breeding grounds in the beginning of May. Nests are constructed by females near the ground in dense and concealing vegetation. They are made out of grasses, leaves, bark, and weed stems, and are lined with fine grasses, pine needles, and sometimes roots and hair. Females lay three to five eggs and incubate them for 10 to 12 days (Eckerle and Thompson 2001).

During the focused species surveys, one yellow-breasted chat was observed in the riparian habitat off site to the east of the project site.

Yellow Warbler

Yellow warbler inhabits wet, deciduous riparian habitats containing willow species. They occur in Southern California, Central Mexico, Central America, and most of northern North America. They will sometimes consume wild fruits, but feed primarily on insects by gleaning them from vegetation or by hovering and taking them from vegetation (Lowther et al. 1999).

Yellow warbler breeds from late May through the end of July, forming pairs within 3 days of arriving in breeding locations in northern North America. Nests are formed in vegetation forks from 0 to 14 meters above the ground. They construct their nests out of grasses and bark strips, and the outside is covered in plant down and fine fibers. Females lay four to five eggs, and the female incubates them for 11 to 12 days (Lowther et al. 1999).

During the focused species surveys, two yellow warblers were observed near the project site. One was observed in the riparian habitat off site to the east of the project site.

Not Observed at the Otay River Floodplain Site

Least Bell's Vireo

Least Bell's vireo occurs in riparian habitats in California and Baja California. It feeds on a wide variety of insects primarily by gleaning prey from vegetation, but also by hovering and sometimes by chasing and capturing prey in flight. Foraging occurs mainly in the lower to middle levels of vegetation (Kus 2002).

Breeding begins in mid- to late-March and continues through late September. Least Bell's vireo constructs nests in dense vegetation that is 2.8 to 5 meters tall, especially in willows, mulefat (*Baccharis salicifolia*), California wild rose (*Rosa californica*), poison oak (*Toxicodendron diversilobum*), mugwort (*Artemisia douglasiana*), and cottonwood species. The nests are an open cup placed in a tree or shrub, and are constructed out of pieces of soft plants, leaves, bark, and spider webs. Three to four eggs are laid and are incubated by both sexes for approximately 14 days (Kus 2002).

No least Bell's vireos were observed during any focused species surveys.

California Gnatcatcher

California gnatcatcher is almost exclusively associated with coastal sage scrub habitat, especially in habitats with California sagebrush as the predominant plant species. It can occur in chaparral, riparian, and disturbed habitats. It ranges from southern coastal California into most of Baja California, and is found in elevations below 500 meters above sea level. California gnatcatcher feeds primarily on small, less-active insects by gleaning them from leaves and sometimes by fly-catching (Atwood and Bontrager 2001).

Breeding for California gnatcatcher begins in February and lasts through July. Males select nesting sites and both sexes build the nest in a fork of two branches in a plant. The clutch of two to five eggs is incubated for approximately 14 days (Atwood and Bontrager 2001).

During the focused species surveys for California gnatcatcher, no individuals were observed in the project site, but at least one pair was observed off site to the southeast, at least 1,000 feet away.

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 7 and 8. Special-status wildlife species that were observed or have potential to occur on the Otay River Floodplain Site are listed in Table 7. Special-status wildlife species with low or no potential to occur, based on location and conditions, are provided in Table 8.

Table 7
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
		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.
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.
Thamnophis hammondii	Two-striped garter snake	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.
		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 sandy soils. 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 2011 (Southwest Wetlands Interpretive Association data).
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	Observed. The species was observed once during other focused surveys, resting under a shrub, in March 2011. It was only observed the one time.

Table 7
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
			County, and San Joaquin Valley. Uncommon winter migrant in Southern California, and widespread during winter in Central Valley and coastline.	
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.
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.
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.
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.
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.

Table 7
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
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.
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.
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.
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. Species is well known to forage on shorebirds during the winter (USFWS 2006b).
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.
Passerculus sandwichensis beldingi	Belding's Savannah sparrow	None/SE/ MSCP	Saltmarsh, Pacific swampfire.	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) (Figure 11).

Table 7
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
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).
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 2006b) (Figure 11).
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 2006b).
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 2006b).
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 (USFWS 2006b).

Table 7
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
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 (SDNHM and ARA 2011; USFWS 2006b) (Figure 11).
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 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 2006b).
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 (USFWS 2006b).
Passerculus sandwichensis rostratus (nonbreeding/ wintering)	Large-billed Savannah sparrow	None/SSC/ MSCP	Saltmarsh, pickleweed (swampfire).	High potential to occur on site during winter due to presence of suitable habitat.

Table 7
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
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 (USFWS 2006b).
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 for the area. Salt pans are present (USFWS 2006b) (Figure 11).
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 (USFWS 2006b).
		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.
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.
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.
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).
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.

Table 7
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
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.

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 8
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
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.
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.
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.

Table 8
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
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.
		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 2006b).
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.
Pelecanus occidentalis californicus (nesting colony and communal roosts)	California brown pelican	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 (SDNHM and ARA 2011; USFWS 2006b).

Table 8
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
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.
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 2006b).
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 2006b).
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.
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.
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.
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.

Table 8
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
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 2006b).
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.
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 2006b).
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 2006b).
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.
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.
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.

Table 8
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
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.
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.
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.
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.
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.
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.
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.
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.

Table 8
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
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 around the margins of the salt marsh vegetation that line the Otay River and Nestor Creek channels.

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

4.3.2.2 Pond 15 Site

Due to the limited accessibility of the site, focused wildlife surveys were not conducted by Dudek staff. However, observation data was available through State and Federal agencies (SDNHM and ARA 2011), as well as through California Natural Diversity Database records (CDFG 2011b). Three Federally or State-listed species have been observed within the Pond 15 Site: western snowy plover, Belding's Savannah sparrow, and California least tern. One Federally listed endangered species, East Pacific green sea turtle (*Chelonia mydas*), has been recorded adjacent to the Pond 15 Site (SDSU and NOAA 2011). Additionally, nine special-status wildlife species were observed on the site during the surveys conducted in 2010–2012, as listed in Table 9. Special-status species documented for the salt evaporator area and that have high potential to occur within the Pond 15 Site include American peregrine falcon (*Falco peregrinus* *anatum*), black skimmer, California brown pelican, California gull, California horned lark (*Eremophila alpestris*), Caspian tern, double-crested cormorant, elegant tern, and long-billed curlew (*Numenius americanus*). Special-status wildlife species with low or no potential to occur are provided in Table 10.

Table 9
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
Reptiles				
Chelonia mydas	East Pacific green sea turtle	FT/None/ None	Shallow waters of bays, reefs, inlets, and undisturbed sandy beaches for egg laying.	Has been documented within San Diego Bay.
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. Individuals observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).
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 2006b).
Passerculus sandwichensis beldingi	Belding's Savannah sparrow	None/SE/ MSCP	Nests and forages in coastal salt marsh dominated by Pacific swampfire.	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 in Figure 12.

Table 9
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
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 (SDNHM and ARA 2011; USFWS 2006b); some 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 in Figure 12.
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. Some foraging habitat occurs on the project site. Was not recorded during surveys of the site in 2010–2012 (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 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.
Pelecanus occidentalis californicus (nesting colony and communal roosts)	California brown pelican	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).

Table 9
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
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).
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).
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 in Figure 12.
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 in Figure 12.
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.	High potential to occur. 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 in Figure 12.

Table 9
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
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 in Figure 12.
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 (SDNHM and ARA 2011; USFWS 2006b), and suitable habitat occurs on the project site. 2015 nesting locations are shown in Figure 12.
Passerculus sandwichensis rostratus (nonbreeding/ wintering)	Large-billed Savannah sparrow	None/SSC/ MSCP	Saltmarsh, pickleweed (swampfire).	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).
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, but none were detected in surveys covering the same area in 2010 (SDNHM and ARA 2011).

Table 9
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
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 in Figure 12 (USFWS 2006b).

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 10
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
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 2006b).
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 2006b).

Table 10
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
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).
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, but 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).
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 the site (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.

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

4.3.3 Sensitive Habitats/Regulated Resources

Sensitive habitats are those that are considered to support unique vegetation communities, sensitive plant and/or wildlife species, or function as corridors for wildlife movement. Unique vegetation communities include habitats found only in the San Diego region, a local representative of species not generally found in San Diego County, or are outstanding examples of CDFW sensitive plant communities. Regulated biological resources may or may not be considered sensitive, but are regulated under Federal, State, and/or local laws.

The project site contains a number of sensitive resources, including *Isocoma* scrub and various wetland communities.

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 12 USFWS Nest Data Pond15.mxd

AERIAL SOURCE: BING MAPPING SERVICE

DUDEK

Figure 12

Pond 15 Restoration Site Special Status Nesting Locations

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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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, slough anchovy (*Anchoa delicatissima*), and topsmelt (*Atherinops affinis*). Although not present within the Pond 15 Site, an eelgrass 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 the Pond 15 Site (NAVFAC and Port of San Diego 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 13, San Diego Bay 2014 Eelgrass Survey).

4.3.4 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Wildlife corridors contribute to population viability by ensuring continual exchange of genes between populations, providing access to adjacent habitat areas for foraging and mating, and providing routes for recolonization of habitat after local extirpation or ecological catastrophes (e.g., fires).

Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation. Habitat linkages provide a potential route for gene flow and long-term dispersal of plants and animals, and may also serve as primary habitat for smaller animals such as reptiles and amphibians. Habitat linkages may be continuous habitat or discrete habitat islands that function as stepping stones for dispersal.

The project site is located within the Otay River floodplain and within the South Bay Salt Works. As such, wildlife movement often is directed in the path of least resistance, and could easily move within the Otay River Floodplain Site from upstream, more riparian areas to on-site areas that are open and more functional as grassland, to the more saltmarsh and wetland areas within the southern part of San Diego Bay. Wildlife movement is generally unrestricted within the Pond 15 Site, other than general avoidance of human activity as it occurs as part of the operation of the South Bay Salt Works.

4.3.5 Jurisdictional Waters and Wetlands

The jurisdictional delineation identified 97.11 acres of wetlands and non-wetland waters under the joint jurisdiction of the Corps (under the Preliminary Jurisdictional Determination procedures), RWQCB, and Commission (Figures 14 through 17). The delineation also identified 0.62 acres of Commission-only jurisdictional wetlands within project features.

The results of each Federally defined delineation parameter occurring at each data station for the Otay River Floodplain Site, Pond 15 Site, and project features are provided in Table 11. The type and amount of jurisdictional waters occurring within each site are summarized in Tables 12 and 13. The jurisdictional delineation report (Appendix B) includes a greater area within the delineation so that if the project boundary changes, the area will be addressed thoroughly. The acreages and figures presented in this document reflect the current project boundaries. In addition to conducting a jurisdictional delineation, a California Rapid Assessment Method (CRAM) survey was conducted for the Otay River Floodplain Site and Pond 15 Site (Appendix E). CRAM is the most widely used wetland rapid assessment method in the State. The purpose of the assessment was to determine the functional condition of vegetated resources within the project area prior to the onset of the project.

Table 11
Wetland Delineation Sampling Point Summary for All Three Sites

Otay River Floodplain Site						
Data Station	*Wetland Determination Field Indicators*			*Stream Association?*	*Tidal Channel Association?*	*Jurisdiction*
	Vegetation	*Hydric Soils*	*Hydrology*			
5[1]	✓		✓	Yes	No	Commission
6				Yes	No	None
7	✓	✓	✓	Yes	No	Corps, Regional Board, Commission
8	✓			No	No	Commission
9	✓	✓	✓	No	Yes	Corps, Regional Board, Commission
10	✓	✓	✓	No	Yes	Corps, Regional Board, Commission
11	✓		✓	No	Yes	Corps, Regional Board, Commission[2]
12				No	No	None
13	✓	✓		No	No	Commission
14				No	No	None[3]
15	✓		✓	No	No	Commission
16				No	No	None
17	✓		✓	No	Yes	Corps, Regional Board, Commission[2]
18	✓	✓	✓	No	Yes	Corps, Regional Board, Commission
19				No	No	None
20	✓	✓	✓	No	No	Corps, Regional Board, Commission
21	✓			No	No	None
22			✓	No	No	None

Table 11
Wetland Delineation Sampling Point Summary for All Three Sites

Otay River Floodplain Site						
Data Station	*Wetland Determination Field Indicators*			*Stream Association?*	*Tidal Channel Association?*	*Jurisdiction*
	Vegetation	*Hydric Soils*	*Hydrology*			
23				No	No	None
24		✓	✓	No	No	None
25	✓			No	No	None

Salt Ponds 12–15[4]						
Data Station	*Location*	*Wetland Determination Field Indicators*			*Hydrologic Association?*	*Jurisdiction*
		Vegetation	*Hydric Soils*	*Hydrology*		
1	Inside slope (salt pond side) of levee at Pond 15	✓	✓	✓	Salt Pond	Corps, Regional Board, Commission
2	Outer slope of levee adjacent to Palomar Street tidal channel	✓	✓		Tidal Channel	Corps, Regional Board, Commission
3	Top of levee along access road		✓		None	None*
4	Salt marsh habitat on Bay side of salt pond levee	✓	✓	✓	Bay	Corps, Regional Board, Commission
5	Salt marsh habitat on Bay side of salt pond levee	✓	✓	✓	Bay	Corps, Regional Board, Commission
6	Top of levee between salt ponds		✓		None	None*
7	Top of outer salt pond levee				None	None
8	Top of levee between salt ponds	✓	✓		None	None*
9	Inside slope (salt pond side) of levee at Pond 12		✓	✓	Salt Pond	Corps, Regional Board, Commission
10	Top of outer salt pond levee	✓			None	None
11	Salt marsh habitat on Otay River channel side of salt pond levee	✓	✓	✓	Tidal Channel	Corps, Regional Board, Commission
12	Top of outer salt pond levee		✓		None	None*
13	Top of levee between salt ponds		✓		None	None*
14	Outer slope of levee adjacent to Palomar Street tidal channel	✓	✓		Tidal Channel	Corps, Regional Board, Commission
15	Inside slope (salt pond side) of levee at Pond 15		✓	✓	Salt Pond	Corps, Regional Board, Commission

Table 11
Wetland Delineation Sampling Point Summary for All Three Sites

Project Features						
		Wetland Determination Field Indicators				
Data Station	*Location*	*Vegetation*	*Hydric Soils*	*Hydrology*	*Hydrologic Association?*	*Jurisdiction*
1	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with freshwater marsh	✓	✓	✓	Freshwater marsh	Corps, Regional Board, Commission
2	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with mulefat scrub				Mulefat scrub	Commission
3	Northwestern side of Egger Highlands near Silver Strand Bikeway within the Otay River Floodplain Site				Restoration area	Commission[5]
4	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with mulefat scrub				Mulefat scrub	Commission
5	North side of Egger Highlands near Silver Strand Bikeway associated with the Otay River Floodplain Site	✓			Restoration area	Commission[5]
6	North side central section of Egger Highlands near Silver Strand Bikeway associated with southern coastal salt marsh in the channel	✓	✓	✓	Southern coastal salt marsh	Corps, Regional Board, Commission
7	North side central section of Egger Highlands near Silver Strand Bikeway associated with mulefat scrub				Mulefat scrub	Commission

* Although these soils retain hydric soil indicators, the soils were derived from dredged bay mud that was placed on the top of the salt pond levees.

1 Data stations 1–4 are located outside of the Otay River Floodplain Site.

2 Although not all three parameters were met, Corps jurisdiction was presumed because the area was below the elevation of the high tide line (7.79 feet above mean lower low water). See also the section "Corps/Regional Board/Commission Jurisdiction," below.

3 See Data Stations 2, 4, and 7 for the project features.

4 Ponds 12–15 were delineated based on preliminary project design. Only Pond 15 is included in the graphics and acreage quantification for this report, but the results of the data stations are included for all areas.

5 These areas are within the Otay River Floodplain Site, which was recently planted with riparian species. The site is actively irrigated to promote plant establishment. Evident hydric soils and hydrology per the Corps delineation manual are not yet present within the restoration site; therefore, the areas were not classified as Corps jurisdictional, but may eventually develop the indicators necessary to classify these areas as Corps jurisdictional.

Table 12
Wetland Delineation Existing Acreage Summary

Vegetation Community	Jurisdiction
	Corps, Regional Board, Commission
Otay River Floodplain Site	
Non-Wetlands	—
Brackish Water	0.77
Former Salt Pond Bottom and Borrow Area	3.52
Wetlands	—
Southern Coastal Salt Marsh	1.26
Former Salt Pond Bottom and Borrow Area	0.87
Subtotal	*6.43*
Pond 15 Site[1]	
Non-Wetlands	—
Beach	0.01
Bay	1.15
Open Water	82.33
Salt Pond Levee	3.67
Wetlands	—
Southern Coastal Salt Marsh	0.87
Southern Coastal Salt Marsh – disturbed	0.10
Subtotal	*88.14*

Note: Acreages may not total due to rounding.
[1] Ponds 12–15 were delineated, but only Pond 15 is presented in graphics and for acreage.

Otay River Floodplain Site

The results of the study include areas delineated as jurisdictional by the Corps, Regional Board, and the Commission (Figure 14, Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation). Although the non-tidal portion of the Otay River channel would have qualified for CDFW jurisdiction, the portion is on Federal land, and, thus, not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the study area and sampling locations can be found in Figures 6a and 6b of Appendix B.

Ponds 15 Site

The results of the study include areas delineated as jurisdictional by the Corps, Regional Board, and the Commission (Figure 15, Pond 15 Restoration Site and Project Features Jurisdictional Delineation). The Otay River channel and Palomar Street channel are tidal channels within the study area in the San Diego Bay NWR, and do not qualify for CDFW jurisdiction, and thus are not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the Ponds 12–15 study area and sampling locations can be found in Figures 7a–7c of Appendix B.

Project Features

The results of the study include areas delineated as jurisdictional by the Corps, Regional Board, and the Commission (Figures 14–17; Table 13). Although the non-tidal portion of the Otay River channel would have qualified for CDFW jurisdiction, the portion is on Federal land within the San Diego Bay NWR, and, thus, is not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the access routes study area and sampling locations can be found in Figures 8a and 8b of Appendix B. In addition to the joint jurisdiction, there are areas that are delineated as Commission-only jurisdiction due to lack of hydric soils and/or hydrology. These include areas that are dominated by mulefat scrub vegetation or were recently restored by River Partners to riparian habitat (designated as Otay River floodplain restoration).

Table 13
Jurisdictional Waters within Project Features

Vegetation Community/ Land Cover Type	Project Features (Acres under Corps, Regional Board, and Commission Jurisdiction, except where noted as Commission-only)*														
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Brackish water	0.13	0.08	—	—	—	—	—	—	0.01	—	—	—	—	—	**0.21**
Open water	—	—	—	—	—	—	—	—	—	0.40	0.79	0.08	0.03	—	1.30
Otay River floodplain restoration – Commission only	—	—	—	—	—	0.56	—	—	—	—	—	—	—	—	**0.56**
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**
Total	**0.19**	**0.55**	**—**	**—**	**—**	**0.65**	**0.10**	**—**	**0.07**	**0.59**	**0.79**	**0.08**	**0.03**	**—**	**3.04**

* Commission wetlands define wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology).
1 Otay Channel Protection under Bikeway Bridge (Temporary and Permanent)
2 Otay Channel Protection (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 Restoration Area East of Nestor Creek (Permanent)

Corps/Regional Board/Commission Jurisdiction

Areas meeting all three parameters were classified as wetlands under the jurisdiction of the Corps, Regional Board, and the Commission.

Otay River Floodplain Site

Results of the wetland delineation (summarized in Tables 11 and 12) indicate that approximately 6.43 acres of wetlands and non-wetland waters of the United States under the joint jurisdiction of the Corps, Regional Board, and the Commission occur within the Otay River Floodplain Site. 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 (including 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 include surface water, high water table, and saturation. Areas supporting all three wetland indicators were mapped as Corps, Regional Board, and Commission wetlands. Additionally, in some locations along the tidal channels, there is 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 mean lower low water).

A total of 2.13 acres of wetlands occur within the Otay River Floodplain Site, which supports southern coastal salt marsh and former salt pond bottom and borrow area. Because the site is primarily unvegetated, the hydrophytic vegetation parameter was rarely met at the sampling locations. When present, vegetation consisted of species typical of southern coastal salt marsh habitat, including estuary seablite, alkali seaheath, Pacific swampfire, turtleweed, marsh rosemary (*Limonium californicum*), and dwarf saltwort (*Salicornia bigelovii*). Also observed in the southern coastal salt marsh habitat were coast weed (*Amblyopappus pusillus*), slenderleaf iceplant (*Mesembryanthemum nodiflorum*), common iceplant (*Mesembryanthemum crystallinum*), and arrow grass (*Triglochin concinna*). Outside of the tidally influenced areas adjacent to the two tidal channels that abut portions of the site on the southwestern and northeastern flanks, coastal salt marsh habitat is extremely patchy and disturbed, with low cover and low species diversity.

The site contains a series of low-lying areas that are remnants of construction and operation of the former industrial salt evaporation pond. The areas are surrounded by a tall levee that separates them from the adjacent tidal channels. The levee was constructed, in part, using soil excavated from within the basin (borrow areas) that are lower in elevation than the basin bottom. These unvegetated areas in the bottom of the basin were mapped as former salt pond bottom and borrow areas. Because of their historical long-term use as industrial salt evaporation ponds, the soil conditions are hypersaline, and much of the land does not support vegetation. The functions and values of these areas are considered degraded and low due to the extensive site disturbance, lack of vegetation, lack of surface water hydrologic connectivity, and excessive salinity.

The portions of the former salt pond bottom and borrow area can occasionally become inundated from precipitation, as was the case during the February 2012 site visit. However, with the exception of a few small areas in the southwestern corner, the areas were completely dry during the July 2012 site visit. A review of aerial photographs shows that ponding does not occur in 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 not physically connected to either tidal channels or freshwater channels due to the presence of perimeter berms, the Corps classified the former salt pond bottom and borrow area as jurisdictional for the purposes of the Preliminary Jurisdictional Determination (Appendix B). 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-wetlands waters of the United States.

The CRAM Assessment Areas (AAs) within the site were analyzed for a suite of variables that pertain to common attributes that estuarine systems are expected to perform. CRAM consists of scoring the AAs based on the condition metrics and stressor checklist. Results for the Otay River Floodplain Site are summarized below, and details are provided in Appendix E.

Buffer and Landscape Context: The AA at the Otay River Floodplain Site scored 65 for the Buffer and Landscape Context attribute. The entire AA has a buffer, but the aquatic area abundance, buffer width, and buffer condition are diminished due to surrounding land use associated with the Bayshore Bikeway, unnatural berms surrounding the site, and historic agricultural uses nearby.

SAN DIEGO BAY

2014 EELGRASS SURVEY

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

FIGURE 13
San Diego Bay 2014 Eelgrass Survey

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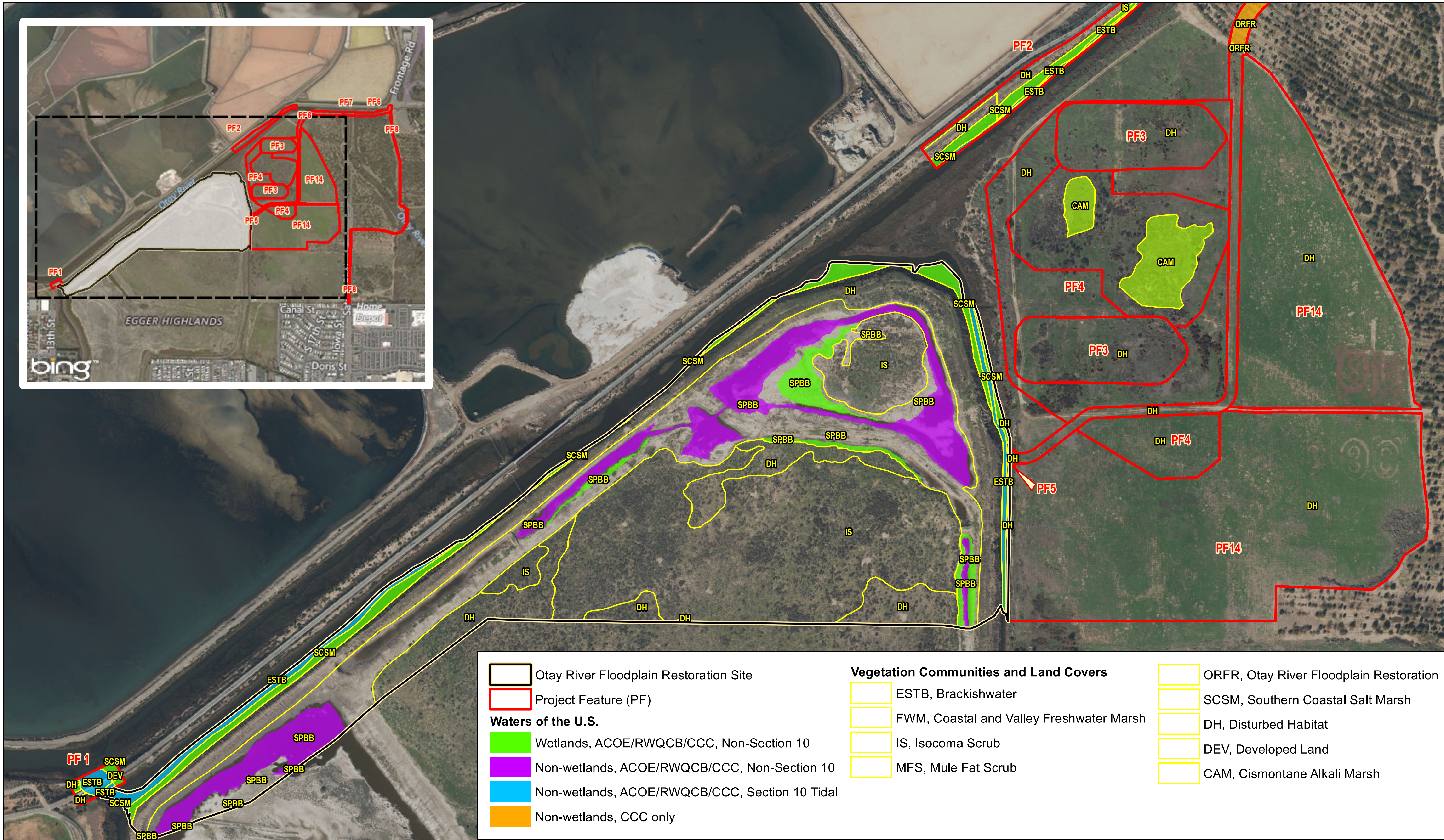

AERIAL SOURCE: SANDAG IMAGERY 2014

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FIGURE 14

Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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FIGURE 15

Pond 15 Restoration Site and Project Features Jurisdictional Delineation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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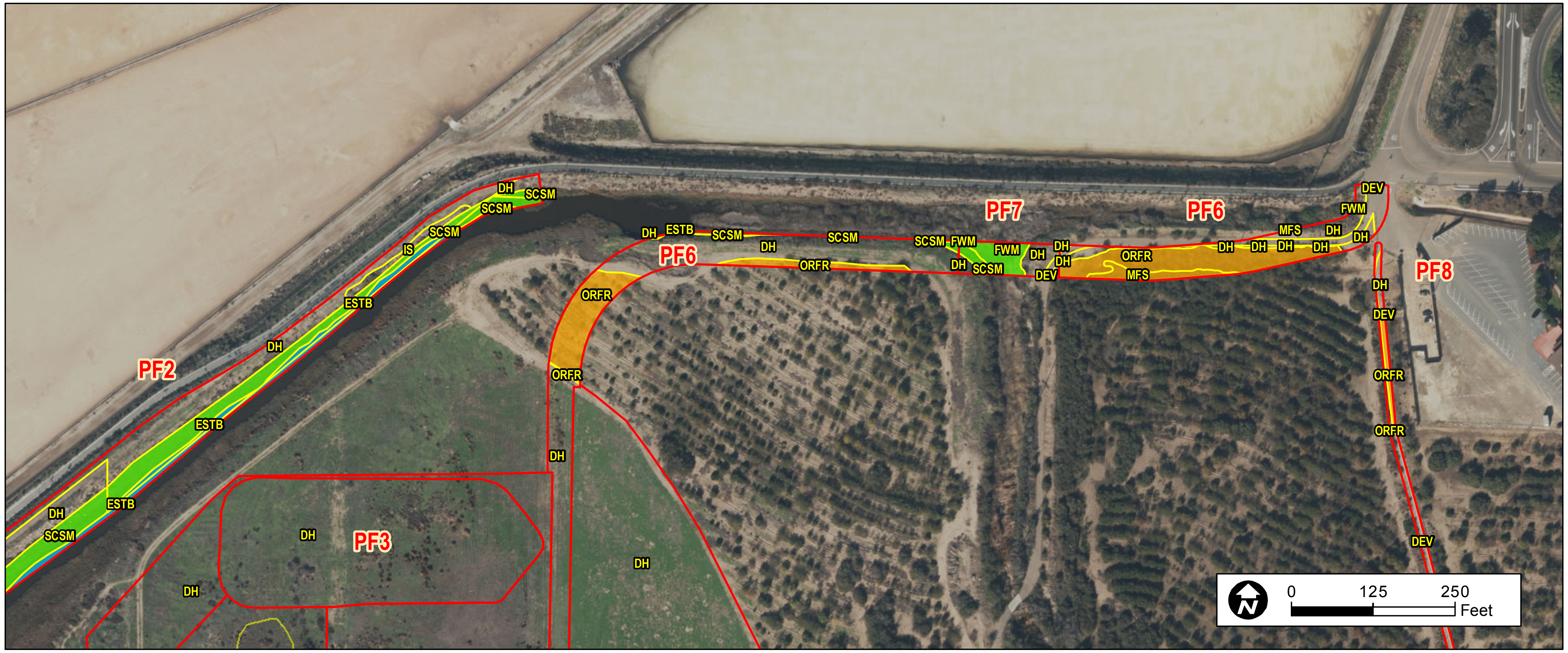

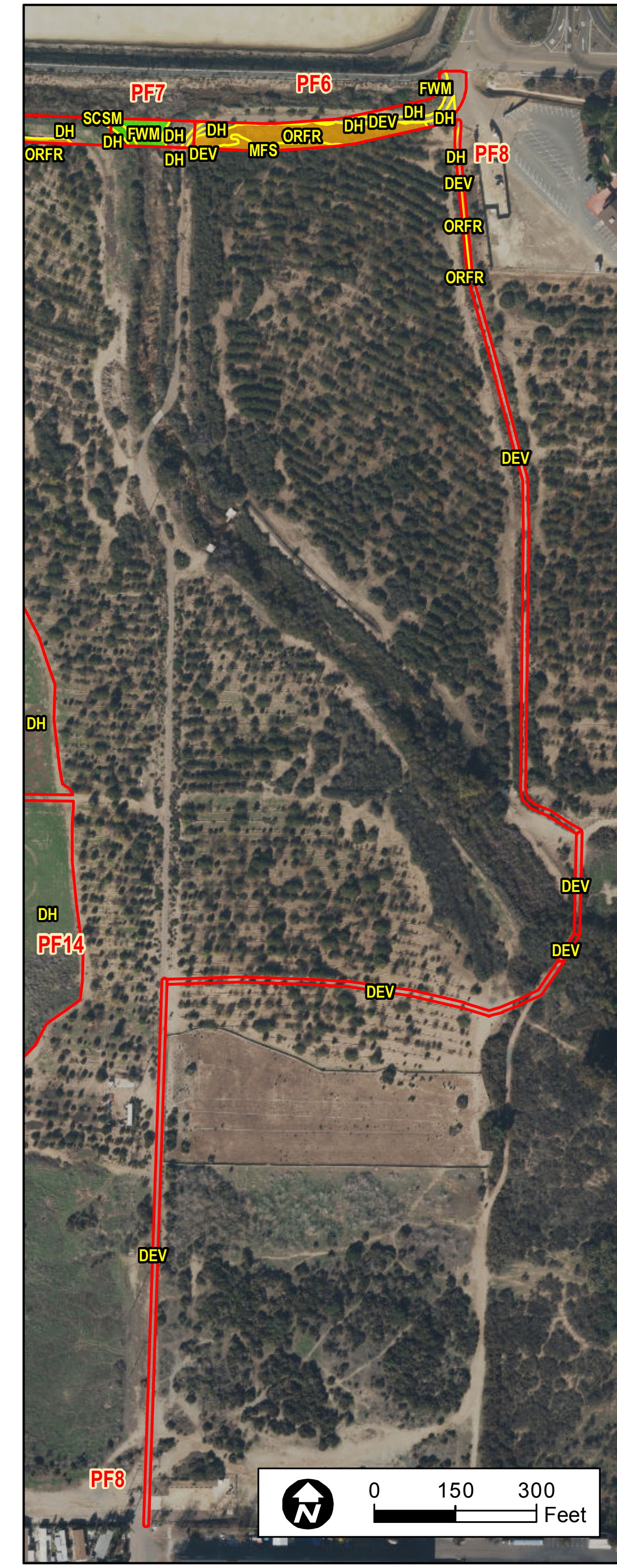

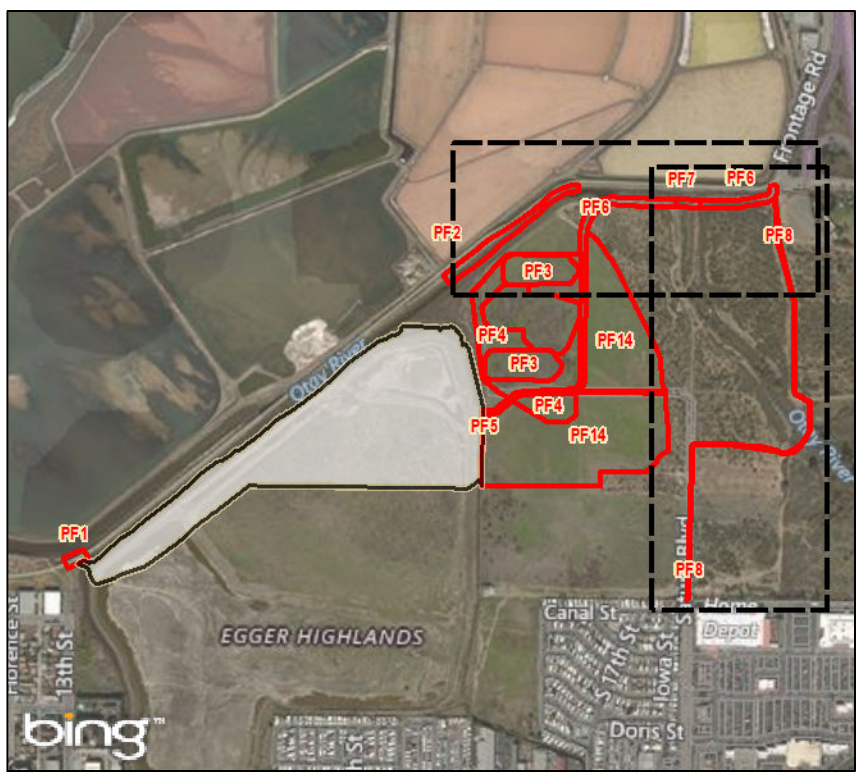

- Otay River Floodplain Restoration Site
- Project Feature (PF)

Waters of the U.S.

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

Vegetation Communities and Land Covers

- ESTB, Brackishwater
- FWM, Coastal and Valley Freshwater Marsh
- IS, Isocoma Scrub
- MFS, Mule Fat Scrub
- ORFR, Otay River Floodplain Restoration
- SCSM, Southern Coastal Salt Marsh
- DH, Disturbed Habitat
- DEV, Developed Land
- CAM, Cismontane Alkali Marsh

AERIAL SOURCE: SANDAG IMAGERY 2014

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FIGURE 16

Project Features Jurisdictional Delineation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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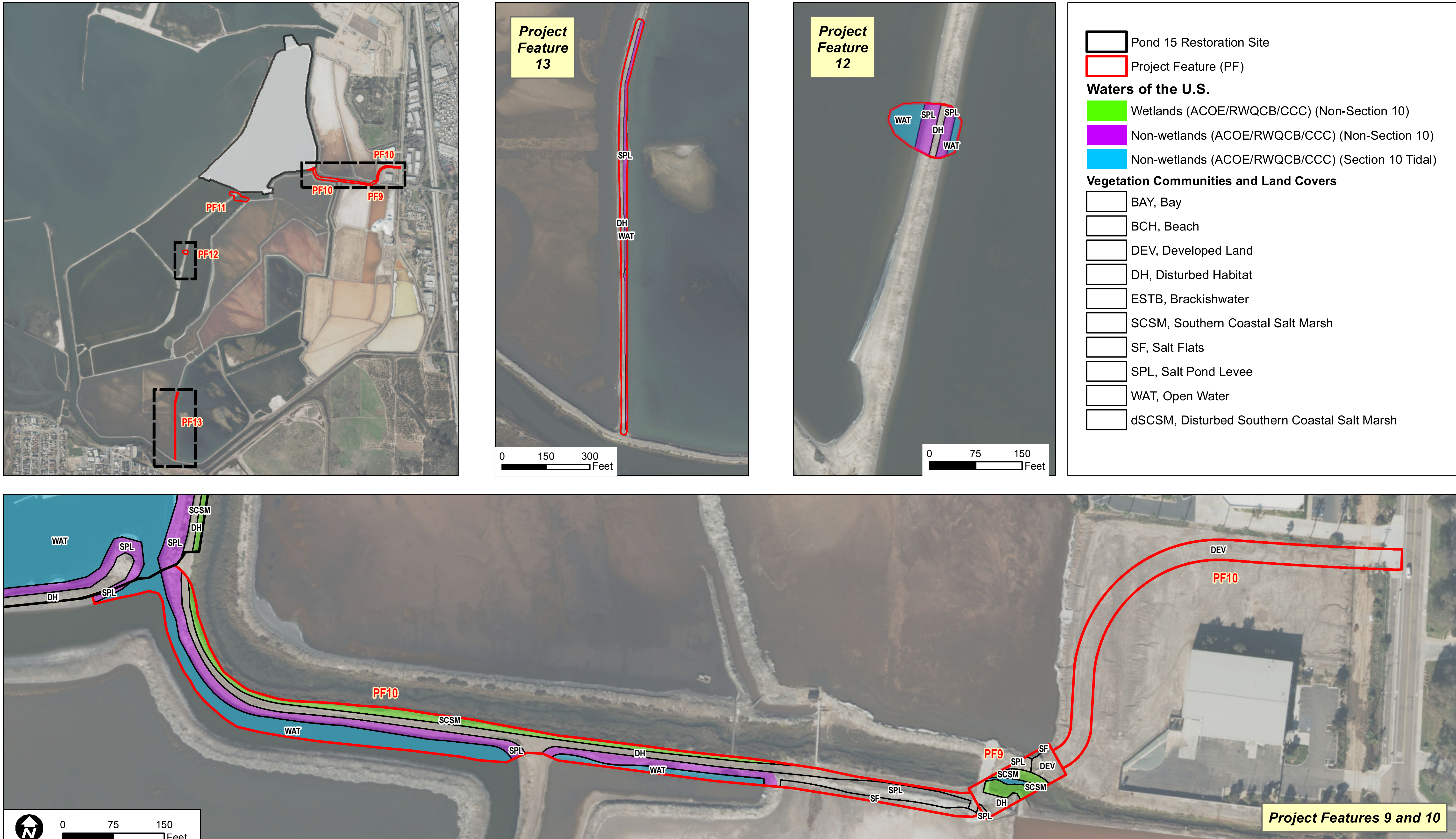

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FIGURE 17

Project Features Jurisdictional Delineation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

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Hydrology: The Hydrology attribute scored 42. All metrics (Water Source, Hydroperiod, and Hydrologic Connectivity) scored low due to the constructed berms surrounding the AA that affect a potential tidal connection. Hydrology at the site is due to a combination of urban runoff and groundwater (elevated water table), rather than tidal inundation.

Physical Structure: The Physical Structure attribute (including Structural Patch Richness and Topographic Complexity metrics) scored low (38) due to a general lack of structural patch types and low topographic complexity as a consequence of the constructed salt pond setting (i.e., dredged pond area and surrounding berms).

Biotic Structure: The AA 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 scores for this category (28). The center island within the AA is vegetated with some sparse coast goldenbush shrubs, with primarily non-native slenderleaf iceplant growing in the interstices and occasionally near seasonally ponded areas.

Pond 15 Site

Results of the wetland delineation (summarized in Tables 11 and 12) indicate that approximately 88 acres of wetlands and non-wetland waters of the United States under the joint jurisdiction of the Corps, Regional Board, and the Commission occur within the Pond 15 Site. Of the total area classified as jurisdictional, 0.97 acres was classified as wetlands and 87.16 acres was classified as non-wetland waters of the United States. In general, the jurisdictional features are unvegetated, with the exception of areas that abut the Otay River and the Palomar Street tidal channels, and a few patchy areas along the salt pond levees. The predominant native vegetation community associated with the wetlands is southern coastal salt marsh. Soils in these areas are characterized by variable textures (including sand, clay, sandy loam, clay loam, sandy clay loam, and silty clay loam), often with a with depleted matrix. Wetland hydrology indicators present included high water table, saturation, oxidized rhizospheres along living roots, and aquatic invertebrates. Areas supporting all three wetland indicators were mapped as Corps, Regional Board, and Commission wetlands.

The majority of the Pond 15 Site contains the active salt pond that is a component of the solar salt evaporation system. The salt ponds are surrounded by levees that separate them from the adjacent San Diego Bay and tidal channels. The levees were constructed using soil excavated from within the San Diego Bay, and they reach a maximum elevation that is slightly greater than the highest observed water level (7.79 feet, NAVD 88), approximately 8 feet and up to 12 feet in some places.

A review of aerial photographs shows that the salt ponds and the levees surrounding them have been in the same configuration for decades. The water elevation within the salt ponds is controlled by a tide gate, and, thus, remains relatively constant.

The portions of the site that met all three parameters were classified as wetlands, and the remaining areas below the high tide line (7.79 feet above mean lower low water) were classified as non-wetland waters of the United States. The top of the salt pond levees that is above the high tide line did not meet the three parameters, and was classified as non-jurisdictional.

The CRAM AAs within the Pond 15 Site were analyzed for a suite of variables similar to what was conducted for the Otay River Floodplain Site. Results for the Pond 15 Site are summarized below, and details are provided in Appendix E.

Buffer and Landscape Context: The AA at the Pond 15 Site scored 81 for the Buffer and Landscape Context attribute. The score was relatively high because the entire AA has a buffer, and the buffer extends well beyond the edge of the AA. 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 buffer between the AA and the open water (as is the case at this AA). 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.

Hydrology: The Hydrology attribute scored 25. All metrics (Water Source, Hydroperiod, and Hydrologic Connectivity) scored low due to the constructed berms surrounding the AA that affect a potential tidal connection. Hydrology at the site is due to manually operated tide gates that route water through the evaporative salt pond cycle, rather than natural tidal inundation. There are no freshwater sources from upstream and no natural tidal connection to affect the hydrology of the AA.

Physical Structure: The Physical Structure attribute (including Structural Patch Richness and Topographic Complexity metrics) scored low (25) due to a general lack of structural patch types and low topographic complexity as a consequence of the constructed salt pond setting.

Biotic Structure: The AA is primarily unvegetated. There are a few small patches of vegetated land on the inside slope of the berm within the AA, dominated by non-native slenderleaf iceplant and native Watson's saltbush (*Atriplex watsonii*). Biotic structural diversity and horizontal interspersion are very low, which is reflected in the score (31) for this category.

Project Features

Results of the wetland delineation (Tables 11 and 13) indicate that approximately 3.04 acres of wetlands and non-wetland waters of the United States. under the joint jurisdiction of the Corps, Regional Board, and Commission occur within the project features. The jurisdictional areas are associated with tidal channels, the salt ponds, and the San Diego Bay. The predominant native vegetation community associated with the wetlands is southern coastal salt marsh along the Palomar Street channel. Soils in these areas are characterized by variable textures (including sand, clay, sandy clay, and clay loam), with the predominant soil texture clay loam. Wetland hydrology indicators present included high water table, saturation, surface water, sediment deposits, drift deposits, and drainage patterns. Areas supporting all three wetland indicators were mapped as Corps, Regional Board, and Commission wetlands.

Salt pond levees below the high tide line elevation (7.79 feet above mean lower low water) were classified as jurisdictional waters of the United States, and salt pond levees above the high tide line were classified as non-jurisdictional where the wetland delineation parameters were not present (e.g., hydrophytic vegetation and hydrology).

Commission-Only Jurisdiction

Otay River Floodplain Site

There were no areas classified as jurisdictional only by the Commission within the Otay River Floodplain Site.

Pond 15 Site

There were no areas classified as jurisdictional only by the Commission within the Pond 15 Site.

Non-Jurisdictional Areas

Two areas were mapped by Dudek as mulefat scrub or Otay River floodplain restoration within the project site. The isolated patch of mulefat scrub in the eastern portion of the project site did not meet any of the three criteria (hydric soils, hydrology, or hydrophytic vegetation).

Data station 14 was placed within the isolated patch of mulefat scrub. For the hydrophytic vegetation, the sample was dominated by mulefat, a facultative wetland species, with garland chrysanthemum (*Glebionis coronaria*), an upland species, dominant in the understory. The coverage of dominants across all strata versus the coverage of hydrophytic dominants (i.e., plants with a Facultative (FAC), Facultative Wet (FACW), or Obligate (OBL) rating) was assessed. The percent cover of dominant hydrophytic species was at 50% but did not exceed 50%, which is necessary to meet the hydrophytic vegetation parameter. This station also failed the prevalence index test, with a value greater than 3.0. Therefore, this location does not support hydrophytic vegetation.

For hydrology, because wetland hydrology indicators are often the most transitory of the three wetland parameters, special attention was paid in assessing the landscape features to determine how water flows through these areas, and, if so, what are the potential sources of hydrology (e.g., rainfall, sheet flow, creek flow). Hydrology indicators such as an ordinary high water mark via a bed and bank, surface cracks, drainage patterns, drift deposits, scour/erosion, saturation, permanence of surface water, and wetland vegetation were not present. The mulefat scrub occurs on a nearly level terrace with a 0–1% slope. This area does not support microtopography conducive to the collection or conveyance of surface flows or groundwater, and no signs of hydrology were identified (e.g., cracked soils, biotic crusts, drainage patterns).

Regarding hydric soils, soils in these areas were composed of a dry, sandy loam with a value of 3 and chroma of 2 with no evidence of mottling. These areas also lacked standard hydric soil indicators typically seen in wetland environments, including sulfate reduction, organic matter accumulation, and presence of saturated or inundated soils (ACOE 2008).

Because the mulefat scrub area lacked all three wetland parameters necessary to define a Corps wetland, and lacked a single parameter needed to define a Commission wetland pursuant to the Cowardin method, this area does not meet the definition of a wetland, and is not jurisdictional by any regulating authority in the context of this analysis.

4.4 Regional Resource Planning Context

The San Diego Multiple Species Conservation Program (MSCP) is a long-term regional conservation plan established to protect sensitive species and habitats in San Diego County. The MSCP is divided into subarea plans that are implemented separately from one another. The entire project site is within the City of San Diego MSCP subarea plan. This subarea encompasses 206,124 acres and is generally characterized by urban land use. The City of San Diego Multi-Habitat Planning Area (MHPA) is a "hard line" preserve developed by the City of San Diego in cooperation with the wildlife agencies, property owners, developers, and environmental groups. The MHPA identifies biological core resource areas and corridors targeted for conservation, within which only limited development may occur (City of San Diego 1997).

The project site is located within the MSCP plan area within southern San Diego. This area is composed of the Otay Mesa and Otay River Valley areas of the MHPA. The Otay River Valley area supports a number of sensitive species and also provides an important linkage from Otay Mountain and Otay Lakes to the San Diego Bay. Where the river delta mouth opens into the San Diego Bay, the area is divided by dikes into salt ponds. These ponds may potentially support several threatened and endangered species.

Covered species that potentially occur within the City of San Diego's MSCP area include Otay tarplant (*Deinandra conjugens*), Orcutt's bird's-beak (*Dicranostegia orcuttiana*), variegated dudleya (*Dudleya variegata*), San Diego barrel cactus (*Ferocactus viridescens*), western snowy plover, long-billed curlew, Belding's Savannah sparrow, large-billed Savannah sparrow (*Passerculus sandwichensis rostratus*), light-footed Ridgway's rail, California least tern, least Bell's vireo, and California gnatcatcher. Various raptors species, including northern harrier, use the valley area for foraging and nesting.

The following MHPA guidelines pertain to the general vicinity of the project site:

- A11. The existing Western Salt Company salt extraction use is expected to continue for an undetermined period. The sensitive animal and plant species should continue to be managed to ensure protection. If the extraction use is terminated, the site should be converted to a use compatible with the resource goals and objectives of the MHPA and other regulations and the policies applicable to the site, or enhanced/restored.
- A12. Work with SANDAG [the San Diego Association of Governments], South Bay jurisdictions, and the Bayshore Bikeway Committee to develop a bike path in or adjacent to the MHPA in the South San Diego Bay area. Design of the bikeway should minimized disturbance to the natural areas.
- A14. The MHPA boundaries within the proposed Special Study Areas of the Otay-Nestor Community Plan may be modified to reflect future changes to land use designations and may require an amendment to the Subarea Plan. Any such modification shall include a wildlife corridor approximately 1,000 feet in width, preserving connections between the Otay River and the San Diego Bay (City of San Diego 1997).

There are also management policies and directives for the Otay River Valley, Otay River Mouth area, as follows :

- In the long-term, should salt production operations cease, restore the tidelands leased for salt mining to baylands by breaching the levees in several locations, if determined appropriate by the MSCP habitat management technical committee in consultation with the wildlife agencies.

- Convert the agricultural area/tilled lands west of I-5 to sustainable agriculture (e.g., grain crops), or restore to native habitats to provide foraging areas for wildlife. Although appropriate habitats for this area appear to include wetlands (e.g., saltmarsh and riparian habitat) and grasslands, research into historic and possibly pre-historic land uses and habitat types in this area should be conducted to help guide restoration efforts if pursued (City of San Diego 1997).

5 ACKNOWLEDGMENTS

This report was prepared by Dudek biologist Anita M. Hayworth, PhD, and Andy Thomson. Figures were provided by Mark McGinnis.

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APPENDIX A

Cumulative List of Vascular Plant and Wildlife Species Observed on the Project Site

APPENDIX A
Cumulative List of Vascular Plant and Wildlife Species Observed on the Project Site

VASCULAR PLANT SPECIES

MONOCOTS

CYPERACEAE—SEDGE FAMILY

Schoenoplectus acutus—hardstem bulrush

JUNCACEAE—RUSH FAMILY

Juncus acutus ssp. *leopoldii*—Leopold's rush

JUNCAGINACEAE—ARROW-GRASS FAMILY

Triglochin maritima—seaside arrowgrass

POACEAE—GRASS FAMILY

Distichlis littoralis—shoregrass
Distichlis spicata—saltgrass
Arundo donax—giant reed
Avena barbata—slender oat
Bromus diandrus—ripgut brome
Bromus madritensis—compact brome
Hordeum murinum—mouse barley
Polypogon monspeliensis—annual rabbitsfoot grass
Schismus barbatus—common Mediterranean grass
Stipa miliacea var. *miliacea*—smilograss

TYPHACEAE—CATTAIL FAMILY

Typha latifolia—broadleaf cattail

EUDICOTS

AIZOACEAE—FIG-MARIGOLD FAMILY

Mesembryanthemum crystallinum—common iceplant
Mesembryanthemum nodiflorum—slenderleaf iceplant

ASTERACEAE—SUNFLOWER FAMILY

Amblyopappus pusillus—dwarf coastweed
Ambrosia psilostachya—Cuman ragweed
Artemisia californica—coastal sagebrush
Baccharis pilularis—coyotebrush

Baccharis sarothroides—desertbroom
Heterotheca grandiflora—telegraphweed
Isocoma menziesii—Menzies' goldenbush
Centaurea melitensis—Maltese star-thistle
Glebionis coronaria—crowndaisy
Sonchus oleraceus—common sowthistle
Baccharis salicifolia—mule-fat

BATACEAE—SALTWORT FAMILY
Batis maritima—turtleweed

BORAGINACEAE—BORAGE FAMILY
Heliotropium curassavicum—salt heliotrope

BRASSICACEAE—MUSTARD FAMILY
Hirschfeldia incana—shortpod mustard
Raphanus raphanistrum—wild radish
Lepidium sp.—pepperweed
Sisymbrium sp.—tumblemustard/rocket

CACTACEAE—CACTUS FAMILY
Cylindropuntia prolifera—coastal cholla
Opuntia littoralis—coastal pricklypear

CARYOPHYLLACEAE—PINK FAMILY
Spergularia marina—salt sandspurry

CHENOPODIACEAE—GOOSEFOOT FAMILY
Arthrocnemum subterminale—Parish's glasswort
Atriplex argentea var. *expansa*—silverscale saltbush
Atriplex serenana var. *serenana*—bractscale
Salicornia pacifica—Pacific swampfire
Suaeda taxifolia—woolly seablite
Suaeda esteroa—seablite
Atriplex semibaccata—Australian saltbush
Salsola tragus—prickly Russian thistle
Kochia scoparia—no common name

CONVOLVULACEAE—MORNING-GLORY FAMILY
Cressa truxillensis—spreading alkaliweed

EUPHORBIACEAE—SPURGE FAMILY

Ricinus communis—castorbean

FABACEAE—LEGUME FAMILY

Astragalus trichopodus—Santa Barbara milkvetch
Melilotus indicus—annual yellow sweetclover

FRANKENIACEAE—FRANKENIA FAMILY

Frankenia salina—alkali seaheath

MALVACEAE—MALLOW FAMILY

Malva parviflora—cheeseweed mallow

ONAGRACEAE—EVENING PRIMROSE FAMILY

Camissoniopsis bistorta—southern suncup

PLUMBAGINACEAE—LEADWORT FAMILY

Limonium californicum—marsh rosemary

POLYGONACEAE—BUCKWHEAT FAMILY

Rumex crispus—curly dock

SALICACEAE—WILLOW FAMILY

Salix lasiolepis—arroyo willow

SAURURACEAE—LIZARD'S-TAIL FAMILY

Anemopsis californica—yerba mansa

SOLANACEAE—NIGHTSHADE FAMILY

Datura wrightii—sacred thorn-apple
Lycium californicum—California desert-thorn
Nicotiana acuminata—manyflower tobacco
Lycium sp.—desert-thorn

URTICACEAE—NETTLE FAMILY

Urtica urens—dwarf nettle

WILDLIFE SPECIES – VERTEBRATES

BIRDS

ACCIPITRIDAE—HAWKS, KITES, EAGLES, AND ALLIES

Accipiter cooperii—Cooper's hawk
Buteo jamaicensis—red-tailed hawk
Buteo lineatus—red-shouldered hawk
Circus cyaneus—northern harrier
Elanus leucurus —white-tailed kite

AEGITHALIDAE—LONG-TAILED TITS AND BUSHTITS

Psaltriparus minimus—bushtit

ALAUDIDAE—LARKS

Eremophila alpestris—horned lark

ALCEDINIDAE—KINGFISHERS

Ceryle alcyon—belted kingfisher

ANATIDAE—DUCKS, GEESE, AND SWANS

Anas americana—American wigeon
Anas clypeata—northern shoveler
Anas crecca—green-winged teal
Anas cyanoptera—cinnamon teal
Anas platyrhynchos—mallard
Anas strepera—gadwall
Aythya affinis—lesser scaup
Bucephala albeola—bufflehead
Oxyura jamaicensis—ruddy duck

APODIDAE—SWIFTS

Chaetura vauxi—Vaux's swift
Aeronautes saxatalis—white-throated swift

ARDEIDAE—HERONS, BITTERNS, AND ALLIES

Ardea herodias—great blue heron
Ardea alba—great egret
Egretta thula—snowy egret
Nycticorax nycticorax—black-crowned night-heron

CARDINALIDAE—CARDINALS AND ALLIES

Passerina caerulea—blue grosbeak

COLUMBIDAE—PIGEONS AND DOVES

Zenaida macroura—mourning dove

CORVIDAE—CROWS AND JAYS

Corvus brachyrhynchos—American crow
Corvus corax—common raven

EMBERIZIDAE—EMBERIZIDS

Melospiza melodia—song sparrow
Passerculus sandwichensis beldingi—Belding's Savannah sparrow
Melozone crissalis—California towhee
Zonotrichia leucophrys—white-crowned sparrow

FALCONIDAE—CARACARAS AND FALCONS

Falco columbarius—merlin
Falco sparverius—American kestrel

FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Carpodacus mexicanus—house finch
Spinus psaltria—lesser goldfinch
Spinus tristis—American goldfinch

HIRUNDINIDAE—SWALLOWS

Hirundo rustica—barn swallow
Petrochelidon pyrrhonota—cliff swallow
Stelgidopteryx serripennis—northern rough-winged swallow
Tachycineta bicolor—tree swallow
Tachycineta thalassina—violet-green swallow

ICTERIDAE—BLACKBIRDS

Agelaius phoeniceus—red-winged blackbird
Icterus cucullatus—hooded oriole
Sturnella neglecta—western meadowlark

LARIDAE—GULLS, TERNS, AND SKIMMERS

Gelochelidon nilotica—gull-billed tern
Larus delawarensis—ring-billed gull
Larus occidentalis—western gull

Rynchops niger—black skimmer
Hydroprogne caspia—Caspian tern
Thalasseus elegans—elegant tern
Sterna forsteri—Forster's tern

MIMIDAE—MOCKINGBIRDS AND THRASHERS
Mimus polyglottos—northern mockingbird

PARULIDAE—WOOD-WARBLERS
Dendroica coronata—yellow-rumped warbler
Dendroica petechia—yellow warbler
Dendroica nigrescens—black-throated gray warbler
Dendroica townsendi—Townsend's warbler
Geothlypis trichas—common yellowthroat
Icteria virens—yellow-breasted chat
Oreothlypis celata—orange-crowned warbler
Wilsonia pusilla—Wilson's warbler

PASSERIDAE—OLD WORLD SPARROWS
* *Passer domesticus*—house sparrow

PHALACROCORACIDAE—CORMORANTS
Phalacrocorax auritus—double-crested cormorant

***RALLIDAE*—RAILS, GALLINULES, AND COOTS**
Fulica americana—American coot

***RECURVIROSTRIDAE*—STILTS AND AVOCETS**
Himantopus mexicanus—black-necked stilt
Recurvirostra americana—American avocet

SCOLOPACIDAE—SANDPIPERS, PHALAROPES, AND ALLIES
Tringa semipalmata—willet
Limosa fedoa—marbled godwit
Numenius americanus—long-billed curlew
Numenius phaeopus—whimbrel

STRIGIDAE—TYPICAL OWLS
Asio flammeus—short-eared owl
Athene cunicularia—burrowing owl

STURNIDAE—STARLINGS

* *Sturnus vulgaris*—European starling

TROCHILIDAE—HUMMINGBIRDS

Calypte anna—Anna's hummingbird

TROGLODYTIDAE—WRENS

Cistothorus palustris clarkae—Clark's marsh wren

TYRANNIDAE—TYRANT FLYCATCHERS

Myiarchus cinerascens—ash-throated flycatcher
Sayornis nigricans—black phoebe
Sayornis saya—Say's phoebe
Tyrannus vociferans—Cassin's kingbird

VIREONIDAE—VIREOS

Vireo gilvus—warbling vireo

MAMMALS

LEPORIDAE—HARES AND RABBITS

Sylvilagus bachmani—brush rabbit
Lepus californicus—black-tailed jackrabbit

CANIDAE—WOLVES AND FOXES

Canis latrans—coyote

SCIURIDAE—SQUIRRELS

Spermophilus beecheyi—California ground squirrel

* signifies introduced (non-native) species

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APPENDIX B

Results of the Jurisdictional Wetlands Delineation

DUDEK

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March 10, 2015 6758-02

Stan Williams
Poseidon Resources
501 West Broadway, Suite 2020
San Diego, California 92101

Subject: Results of a 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

Dear Mr. Williams:

The proposed Otay River Estuary Restoration Project (ORERP [proposed project]) is a partnership between Poseidon Resources (Poseidon), the U.S. Fish and Wildlife Service (Service or USFWS), and San Diego Bay National Wildlife Refuge (Refuge). The purpose of ORERP is to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species and to provide habitat for migratory seabirds, shorebirds and salt marsh-dependent species.

This proposed project would occur at two distinct and non-contiguous sites within the South San Diego Bay Unit of the Refuge and would be consistent with the goals and objectives of the Service's San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan (CCP) (USFWS 2006) (Figures 1 and 2). The proposed project would also follow the terms and conditions of the permits issued by the California Coastal Commission (CCC) and San Diego Regional Water Quality Control Board (Regional Board) for Poseidon's Carlsbad Desalination Project.

When completed the creation and restoration of tidal influenced estuarine, and salt marsh habitats within the Refuge by Poseidon would benefit many species of fish found in south San Diego Bay by providing new and expanded nursery and feeding areas. While avoiding and minimizing impacts to existing seabird and shorebird nesting areas, the proposed project would provide additional and enhanced foraging and nesting habitats for federal and state listed birds. These include species such as the endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*), endangered California least tern (*Sternula antillarum browni*), and threatened western snowy plover (*Charadrius alexandrinus nivosus*) and a diversity of migratory seabirds and shorebirds.

This Preliminary Jurisdictional Delineation report combines the results of field findings for three separate surveys that were conducted as the project design has evolved. The first two surveys were previously submitted to the Corps and confirmed during preliminary jurisdictional determination processes. The third survey consists of access roads and crossings between the two sites. The third location has not been reviewed or confirmed. The Corps recommended that rather than submit a third delineation report for review, to combine all survey results into a single report. Therefore, this report combines the following survey locations:

Site 1: Otay River/Pond 20 Site

On February 22, 2011, Dudek staff conducted a preliminary jurisdictional wetland delineation on the proposed Poseidon salt marsh restoration site (Pond 20 Study Area), located in the South Bay Unit of the San Diego Bay National Wildlife Refuge within the City of San Diego (City), San Diego County, California. The Pond 20 Study Area is located in the southern portion of the City, at the south end of the San Diego Bay (Figure 3). The western portion of the Pond 20 Study Area is owned by the State of California (State) and the eastern portion of the Pond 20 Study Area is owned by the United States of America (US).The U.S. Fish and Wildlife Service manages the Refuge.

Dudek coordinated with the ACOE regarding this delineation. Additional fieldwork was conducted by ACOE in August 2012 to refine ACOE-jurisdictional boundaries. This report presents the results of the analysis and incorporates the additional field information from ACOE (ACOE File #SPL 2011-00743-PJB). The PJD for the Pond 20 Study Area was confirmed by ACOE October 31, 2012 (Attachment 1).

Site 2: Salt Ponds 12-15

On March 13, 2013, Dudek staff conducted a preliminary jurisdictional wetland delineation, on Salt Ponds 12–15 (Salt Ponds 12-15 Study Area) of the Salt Works salt pond complex located in the South Bay Unit of the San Diego Bay National Wildlife Refuge. The Salt Ponds 12-15 Study Area is partially within the City of Chula Vista, National City and the City of San Diego, San Diego County, California. The Salt Ponds 12-15 Study Area is located at the south end of the San Diego Bay (Figures 4a – 4c). The land where the Salt Ponds occur is owned by the California State Lands Commission, State of California (State), but is leased to the U.S. Fish and Wildlife Service (USFWS), which manages the Refuge.

Dudek coordinated with the ACOE regarding this delineation. The PJD for the Salt Ponds 12-15 Study Area was confirmed by ACOE November 12, 2013 (Attachment 2).

Site 3: Access Routes and Crossings

On May 29, 2014, Dudek staff conducted a preliminary jurisdictional wetland delineation on the proposed Poseidon – ORERP access routes (Access Routes Study Area) located in the San Diego

Bay National Wildlife Refuge and northwest of Egger highlands just off of Bay Shore Bikeway (Silver strand Bikeway) San Diego County, California (Figures 5a and 5b). The Access Routes Study Area is owned by the US (southern access route and crossing) and the State (northern access route and crossing). Both areas are within the Refuge boundaries and managed by the USFWS.

The results of the delineation within the Access Routes Study Area are presented in this report, combined with the Pond 20 Study Area and the Salt Ponds 12-15 Study Area.

Initial Focus of Aquatic Resources Subject to Regulation within all Three Sites

Dudek's investigation concentrated on identifying resources that may be subject to regulation under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA) as administered U.S. Army Corps of Engineers (ACOE), the Porter Cologne Act as administered by Regional Water Quality Control Board (RWQCB), Section 1600 *et seq*. of the Fish and Code as administered by the California Department of Fish and Wildlife (CDFW), and/or the Coastal Act as administered by the California Coastal Commission (CCC).

STUDY AREA DESCRIPTIONS

Site 1: Otay River/Pond 20 Site

The Pond 20 Study Area occupies approximately 86 acres of the South Bay Unit of the San Diego Bay National Wildlife Refuge. The site is located within Sections 20 and 21, Township 18 South, Range 2 West on the U.S. Geological Survey (USGS) 7.5-minute Imperial Beach quadrangle map (1966); longitude 117°5'46.02" W and latitude 32°35'29.95" N (Figure 2). The Pacific Ocean is approximately 1.5 miles west of the Pond 20 Study Area. Channelized water flows through the site along the northern boundary (Otay River) and through the center of the site in a north-south direction (Nestor Creek). The western portion of the site contains levees and basins that were constructed as part of the former solar salt evaporation system in southern San Diego Bay (Pond 20a) and the eastern portion of the site is land that was formerly used for sewage treatment facilities and agriculture. Elevations in the Study Area range from sea level to approximately 20 feet above mean sea level (AMSL).

Site 2: Salt Ponds 12-15

The South Bay Salt Works occupies approximately 1,068 acres of the San Diego Bay. The South Bay Salt Works operates with a Special Use Permit as a solar salt production facility. The Study Area (Salt Ponds 12–15) occupies approximately 309 acres of the South Bay Unit of the San Diego Bay National Wildlife Refuge. The site is located within Sections 16, 17, 20 and 21, Township 18 South, Range 2 West on the U.S. Geological Survey (USGS) 7.5-minute Imperial Beach quadrangle map (1966); longitude 117° 6' 24 " W and latitude 32° 36' 05" N (Figure 2). The Pacific Ocean is approximately 1.5 miles west of the Salt Ponds 12-15 Study Area. The Otay River tidal channel flows north into San Diego Bay at the southern and western boundary of the Study Area, and the Palomar Street tidal channel flows north into San Diego Bay at the eastern boundary of the northern portion (Pond 15) of the Study Area. The Salt Ponds 12-15 Study Area contains levees and ponds that were constructed as part of the solar salt evaporation system in southern San Diego Bay. Elevations in the Salt Ponds 12-15 Study Area range from sea level to approximately 12 feet AMSL.

Site 3: Access Routes and Crossings

The study area includes two general locations. One is located northwest of Egger highlands just off of Bay Shore Bikeway (Silver strand Bikeway), west of Interstate 5 (Figure 5a; Southern Location). The second location is within the Salt Works facility located north of Palm Avenue, west of Interstate 5, and east of Silver Strand Boulevard (Figure 5b; Northern Location). These locations are within Sections 16, 17, 20 and 21, Township 18 South, Range 2 West on the U.S. Geological Survey (USGS) 7.5-minute Imperial Beach quadrangle map (1966); longitude 117° 5' 33" W and latitude 32° 35' 40" N and longitude 117° 5' 46 " W and latitude 32° 36' 96" N.

The northern portion of the Access Routes Study Area includes salt ponds (including associated levees and access roads) and the Palomar Street channel, which bisects salt ponds running east to west. The southern portion of the Access Routes Study Area includes the Otay River Floodplain Restoration Site, the Otay River channel, and a tributary channel to the Otay River. Elevations in the Access Routes Study Area range from sea level to approximately 16 feet AMSL.

SUMMARY OF REGULATIONS

The following agencies regulate activities within streams, wetlands, and riparian areas throughout California: ACOE, CDFW, and RWQCB. The ACOE Regulatory Program regulates activities in jurisdictional resources under Section 404 of the CWA and Section 10 of the RHA. The CDFW regulates activities to wetlands and non-wetland waters under Sections 1600–1616 of the Fish and Wildlife Code. The RWQCB regulates activities to wetlands and non-wetland waters exhibiting surface water under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne Act).The CCC also regulates wetlands within the coastal zone pursuant to the California Coastal Act (California Public Resources Code Section 30233).

U.S. Army Corps of Engineers

The ACOE regulates "discharge of dredged or fill material" into "waters of the U.S.," 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 U.S.," the use, degradation, or destruction of which could affect interstate or foreign commerce or which are tributaries to waters subject to the ebb and flow of the tide (33 CFR. 328.3 (a)), pursuant to provisions of Section 404 of the CWA and Section 10 of the RHA. The ACOE jurisdiction within rivers and streams extends to the "ordinary high water mark" (OHWM). The ACOE defines jurisdictional wetlands as areas supporting a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology, in accordance with the procedures established in the ACOE Wetland Delineation Manual (Environmental Laboratory 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 inter-state "waters of the U.S.," are no longer regulated by the ACOE. However, some of these areas (e.g., isolated streams, lakes or ponds) may still be regulated by the CDFW under Section 1600 of the Fish and Code or the RWQCB under the Porter-Cologne 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 ACOE Regulatory program jurisdiction under the Section 10 authorities of the RHA in coastal areas extends to the line on the shore reached by the plane of the mean high water, which is 5 feet above MLLW (Mean Lower Low Water (MLLW) = 0 datum). The shoreward limit for the Regulatory programs jurisdiction under the ACOE Section 404 authorities is based on the high tide line, or in the San Diego Bay 7.79 feet above MLLW. If there are wetlands meeting the ACOE criteria abutting or adjacent the high tide line, then the ACOE jurisdiction under section 404 would extend to the limit of those wetlands.

California Department of Fish and Wildlife

In accordance with Section 1600 et seq. of the California Fish and Game Code (Streambed Alteration), the CDFW regulates activities which "will substantially divert, obstruct, or substantially change the natural flow or bed, channel or bank, of any river, stream, or lake designated by the Department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit." The 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." The exception would be on lands owned by the US, wherein CDFW would not have jurisdiction, as is the case with the Otay River channel on the northeast corner of the Study Area. Applications to the CDFW for Streambed Alteration under Section 1600 et. seq. must include a complete certified California Environmental Quality Act (CEQA) document.

In 14 CCR 1.72, the CDFW defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation."

In 14 CCR 1.56, the CDFW's definition of "lake" includes "natural lakes or man-made reservoirs." Diversion, obstruction, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife requires authorization from CDFW by means of entering into an agreement pursuant to Section 1602 of the Fish and Game Code.

Section 1600 et seq. does not extend to isolated wetlands and waters, such as small ponds not located on a drainage course, wet meadows, vernal pools, or tenajas, nor does it extend over marine waters influenced by the ebb and flow of the tide that lack a bed and bank form typical of stream channels.

Within estuary environments, a preponderance of evidence standard is necessary where it is not readily apparent where Section 1600 jurisdiction ends. Under this standard, the geometry of the water feature, the predominant salinity of the waters, the composition of vegetation, and the predominant fauna are used to determine the limits of CDFW jurisdiction under section 1600. Waters 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 not by fluvial processes, vegetation is saline marsh and not brackish or freshwater vegetation, and marine fish and invertebrate communities are prevalent. Conversely, areas dominated by fresh and brackish salinities and freshwater aquatic species, with fluvial erosion patterns, are regulated under section 1600.

Regional Water Quality Control Board

The RWQCB regulates discharging waste, or proposing to discharge waste, within any region that could affect the "waters of the state" (Water Code Section 13260 (a)), 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" (Water Code Section 13050 (e)). Although the Porter-Cologne Act definition of "Waters of the State" may not apply on federally owned land, the RWQCB may still assert jurisdiction over qualifying aquatic resources on land owned by the US where the CWA Section 401 applies. Before the ACOE will issue a CWA Section 404 permit, applicants must receive a CWA Section 401 Water Quality Certification from the RWQCB. If a CWA Section 404 permit is not required for the project, the RWQCB may still require a permit (i.e., Waste Discharge Requirement) under the Porter-Cologne Act. Applications to the RWQCB must include a completed certified CEQA document.

California Coastal Commission

Under the California Coastal Act (CCA), the CCC regulates impacts to wetlands in the "coastal zone" and requires a coastal development permit for almost all development within this zone. From three miles seaward the coastal zone generally extends approximately 1,000 yards inland. In less developed areas, it can extend up to 5 miles inland from the mean high tide line, but can also be considerably less than 1,000 yards inland in developed areas. While the Coastal Zone Management Act (CZMA) excludes from its definition of the coastal zone "lands the use of which by law is subject solely to the discretion of or which is held in trust by the Federal Government." (15 USC 1453(1)]), CCC regulations may still apply if the proposed project is a private activity (CCC 2011).

The CCA also protects designated sensitive coastal areas by providing additional review and approvals for proposed actions in these areas. Section 30121 of the CCA 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 CCA allows disking, filling, or dredging of wetlands for certain uses, such as restoration. The CCA also directs each city or county within the coastal zone to prepare a Local Coastal Program (LCP) for Coastal Commission certification (CCC 2009).

In contrast to the ACOE, which uses a three-parameter definition to delineate wetlands, the CCC essentially uses the Cowardin method of wetlands classification, which defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology) (Cowardin et al. 1979).

The CCC wetland definition is generally more encompassing than either the ACOE or CDFW definition in most respects. However, Section 13577(b) of the 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.

METHODS

Data regarding jurisdictional resources present within the Study Area were obtained through a review of pertinent literature and field reconnaissance; both are described in detail below.

Literature Review

The following data sources were reviewed to assist in the delineation effort:

- National Wetlands Inventory Maps (U. S. Fish and Wildlife Service (USFWS 2009))
- National Hydric Soils List
- Natural Resource Conservation Service Websoil Survey (U.S. Department of Agriculture (USDA 2009))
- Historic aerial photographs.

Field Assessment

The delineation work was performed in accordance with the methods prescribed in the ACOE's 1987 Wetland Delineation Manual, Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (September 2008), and the ACOE/Environmental Protection Agency (EPA) Rapanos Guidance (Environmental Laboratory 1987, ACOE 2008, ACOE and EPA 2007). The ACOE and RWQCB wetlands delineation consists of the field identification of jurisdictional wetlands using the three parameters described in the ACOE manual: hydric soils, hydrology, and hydrophytic vegetation. A predominance of hydrophytic vegetation, where associated with a stream channel, was used to determine CDFW-regulated riparian areas. Wetlands under the jurisdiction of the CCC were delineated using the Cowardin method of wetlands classification, which, as previously discussed, defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology). In some instances where isolated surface waters are present, the RWQCB may choose to take jurisdiction over these resources under the State's Porter-Cologne Act.

Site 1: Otay River/Pond 20 Site

Dudek biologists Andrew Thomson and Kathleen Dayton performed a formal (routine) wetlands delineation within the approximately 86-acre Pond 20 Study Area on February 22, 2011. An additional analysis of the site was conducted by Dudek's Stuart Fraser on July 20, 2011, to confirm lack of ponding in the former salt pond areas in the western portion of the Study Area. The ACOE conducted fieldwork in August 2012 to refine ACOE-jurisdictional areas. All areas identified as being potentially subject to the jurisdiction of the ACOE, RWQCB, CDFW, and the CCC were field verified and mapped.

Hydrology, vegetation, and soils were assessed at 21 geographically distinct sampling locations (Sampling Points 5-25) (Appendix A) throughout the Pond 20 Study Area to determine the presence or absence of wetland field indicators (Figure 3). The overall area was assessed for evidence of an OHWM, saturation, permanence of surface water, wetland vegetation, and nexus to traditional navigable waters. A more detailed description of the methods is described below.

The location of sampling points and the limits of wetlands were collected in the field using a 100 scale (1 inch = 100 feet) aerial photograph, topographic base, and Global Positioning System (GPS) equipment with sub-meter accuracy. ArcGIS software was used to compile the information into a geospatial database.

Site 2: Salt Ponds 12-15

Dudek biologists Andrew Thomson and Kathleen Dayton performed a formal wetlands delineation within the approximately 309-acre Study Area on March 13, 2013. All areas identified as being potentially subject to the jurisdiction of the ACOE, RWQCB, CDFW, and the CCC were field verified and mapped.

Hydrology, vegetation, and soils were assessed at 15 geographically distinct sampling locations (Sampling Points 1–15) (Appendix B) throughout the Study Area to determine the presence or absence of wetland field indicators (Figures 4a–4c). The overall area was assessed for evidence of an OHWM, saturation, permanence of surface water, wetland vegetation, and nexus to traditional navigable waters. A more detailed description of the methods is described below.

The location of sampling points and the limits of wetlands were collected in the field using a 100 scale (1 inch = 100 feet) aerial photograph, topographic base, and Global Positioning System (GPS) equipment with sub-meter accuracy. ArcGIS software was used to compile the information into a geospatial database.

Site 3: Access Routes and Crossings

Dudek biologist Andrew Thomson performed a formal wetlands delineation within the approximately 20-acre Access Routes Study Area on May 29, 2014. All areas identified as being potentially subject to the jurisdiction of the ACOE, RWQCB, CDFW, and the CCC were field verified and mapped.

Hydrology, vegetation, and soils were assessed at seven geographically distinct sampling locations (Sampling Points 1-7) (Appendix C) throughout the Access Routes Study Area to determine the presence or absence of wetland field indicators (Figures 5a and 5b). The overall area was assessed for evidence of an OHWM, saturation, permanence of surface water, wetland vegetation, and nexus to traditional navigable waters. A more detailed description of the methods is described below.

The location of sampling points and the limits of wetlands were collected in the field using a 100 scale (1 inch = 100 feet) aerial photograph, topographic base, and Global Positioning System (GPS) equipment with sub-meter accuracy. Dudek geographic information system (GIS) technician Lesley Terry digitized the jurisdictional extents based on the GPS data and data collected directly onto field maps into a project-specific GIS using ArcGIS software.

Hydrophytic Vegetation

Dudek consulted the 2012 National Wetland Plant List (NWPL; ACOE 2012) to determine the indicator status of each plant species within each sampling location.

During the delineation, a data station point was considered positive for hydrophytic vegetation if it passed the basic dominance test (Indicator 1), meaning that more than 50% of the dominant species sampled were characterized as either obligate, facultative wetland, and/or facultative per the NWPL. In those cases where the dominance test failed but there were positive indicators of hydric soils and/or hydrology, the vegetation parameter was re-evaluated using the prevalence index (Indicator 2), which takes into account all plant species in the community, not just dominants. The standard plot sampling technique was used to sample vegetation within a two-meter radius for herbaceous vegetation and a four-meter radius for shrubs. All plant species observed during the surveys were identified and recorded.

Hydric Soils

According to the National Technical Committee for Hydric Soils (NTCHS), hydric soils are "soils that are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (USDA Soil Conservation Service 1994). Soil pits were prepared using a shovel to determine if hydric soils were present. The presence of hydric soils was determined through consultations with the 1987 Manual as well as Field Indicators of Hydric Soils in the United States v. 7.0 (NRCS 2010) and the ACOE's Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)(September 2008). Munsell Soil Color Charts were used to determine soil chroma and value. Where feasible, soil pits were prepared to depths ranging from 10–16 inches. Dry soils were moistened to obtain the most accurate color. In general, soils from test pits were determined to be hydric if they exhibited redoximorphic features (e.g., redox concentrations, redox depletions, reduced matrix or depleted matrix).

Hydrology

Per the guidelines prescribed in the Arid West Supplement (September 2008), wetland hydrology indicators are separated into four major groups: Group A, B, C, and D. Group A indicators are based on direct observations of surface flow, ponding, and soil saturation/groundwater. Group B indicators consist of evidence that the site has been or is currently subjected to ponding including, but not limited to, water marks, drift deposits, and sediment deposits. Group C indicators include signs of previous and/or current saturation including oxidized rhizospheres surrounding living roots and the presence of reduced iron or sulfur, both of which are indicative of extended periods of soil saturation. Group D indicators consist of "vegetation and soil features that are indicative of current rather than historic wet conditions and include a shallow aquitard and results of the FAC-Neutral test." Each group is subdivided into primary and secondary categories based on their frequency and reliability to occur in the Arid West region. Signs of hydrology were investigated on site by intensive field review. Please see Appendices A - C for the completed data station forms.

REVIEW OF SITE HISTORY

Site 1: Otay River/Pond 20 Site

The South San Diego Bay Unit was established in 1999 as a Unit of the San Diego National Wildlife Refuge following the execution of a lease from the California State Lands Commission to the USFWS for 2,209 acres of State Tidelands. An additional 91 acres of land in the Otay River floodplain (encompassing the Study Area evaluated in this document) was acquired by the USFWS for inclusion in this Refuge Unit in January 2000.

On July 13, 2004, the acreage in the South San Diego Bay Unit was added to the Sweetwater Marsh National Wildlife Refuge and both areas were renamed the "San Diego Bay National Wildlife Refuge." The Study Area is encompassed by the San Diego Bay National Wildlife Refuge.

The eastern portion of the Study Area was previously used for sewage treatment facilities and agriculture, but is currently dominated by non-native plant species. Most of the native upland and wetland habitat of the Otay River floodplain was removed during the twentieth century as a result of industrial, agricultural, and municipal activities. Maps dating back to 1916 depict the Otay River in its present channelized configuration (USFWS 2006). A narrow corridor of salt marsh, freshwater marsh, and native riparian habitat are supported within the Otay River channel.

In the western portion of the Study Area, remnant conditions from a former industrial salt evaporation pond (Pond 20a) are present. Solar salt production has occurred in the San Diego Bay for over 100 years (USFWS 2006). Pond 20A was last regularly used as an evaporator pond in the 1940s with a failed subsequent effort in the 1960s to reintegrate the pond into the evaporator process of the salt works (Merkel and Associates, 2008).

Due to construction of levees surrounding Pond 20a, the basin is isolated from tributary fresh or saltwater surface input and experiences occasional storm runoff from the internal pond basin and a roadway surface drain from Palm Avenue (Merkel and Associates, 2008). Seasonal water levels in the basin fluctuate significantly and waters are strongly saline due both to the basin’s history as a salt concentrator and the continued closed system evaporative processes occurring in the basin today (Merkel and Associates, 2008). Due to the hypersaline conditions in the basin bottoms of the former industrial salt evaporation ponds, native wetland vegetation and bay invertebrates are essentially absent (USFWS 2006). Highly variable annual precipitation levels influence the location and extent of standing water in the pond.

Site 2: Salt Ponds 12-15

The South Bay Salt Works is an active solar salt production facility that is operated in accordance with a Special Use Permit issued by the Service for solar salt production. The Study Area is entirely within the active South Bay Salt Works production area, and composes Ponds 12–15.

The South San Diego Bay Unit was established in 1999 as a Unit of the San Diego National Wildlife Refuge following the execution of a lease from the California State Lands Commission to the USFWS for 2,209 acres of State Tidelands. An additional 91 acres of land in the Otay River floodplain was acquired by the USFWS for inclusion in this Refuge Unit in January 2000.

On July 13, 2004, the acreage in the South San Diego Bay Unit was added to the Sweetwater Marsh National Wildlife Refuge and both areas were renamed the “San Diego Bay National Wildlife Refuge.” The Study Area is encompassed by the San Diego Bay National Wildlife Refuge.

Site 3: Access Routes and Crossings

The site history of the Access Routes Study Area is effectively described above as these areas occur in the same vicinity of Pond 20 (southern area) and Salt Ponds 12-15 (northern area). The only additional information relative to the site history of the Access Routes Study Area is the recent implementation of the Otay River Floodplain Restoration Project (ORFRP). The ORFRP included a large-scale planting area on the floodplain of the Otay River within the Refuge. The site has been planted with riparian trees and shrubs and was irrigated to promote establishment. The Access Routes Study Area encompasses a portion of the ORFRP (Figure 5a).

RESULTS

The results of each federally defined delineation parameter occurring at each field datapoint (field station) for all three sites are located in Table 1. The type and amount of jurisdictional waters occurring within each site are summarized in Table 2.

Table 1
Wetland Delineation Sampling Point Summary for all three sites

Site 1: Otay River/Pond 20 Site						
Data Station[1]	*Wetland Determination Field Indicators*			*Stream Association?*	*Tidal Channel Association?*	*Jurisdiction*
	Vegetation	*Hydric Soils*	*Hydrology*			
5	✓		✓	Yes	No	CCC
6				Yes	No	None
7	✓	✓	✓	Yes	No	ACOE, RWQCB, CCC
8	✓			No	No	CCC
9	✓	✓	✓	No	Yes	ACOE, RWQCB, CCC
10	✓	✓	✓	No	Yes	ACOE, RWQCB, CCC
11	✓		✓	No	Yes	ACOE, RWQCB, CCC[2]
12				No	No	None
13	✓	✓		No	No	CCC
14				No	No	None[3]
15	✓		✓	No	No	CCC
16				No	No	None
17	✓		✓	No	Yes	ACOE, RWQCB, CCC[2]
18	✓	✓	✓	No	Yes	ACOE, RWQCB, CCC

Table 1
Wetland Delineation Sampling Point Summary for all three sites

Site 1: Otay River/Pond 20 Site						
Data Station[1]	*Wetland Determination Field Indicators*			*Stream Association?*	*Tidal Channel Association?*	*Jurisdiction*
	Vegetation	*Hydric Soils*	*Hydrology*			
19				No	No	None
20	✓	✓	✓	No	No	ACOE, RWQCB, CCC
21	✓			No	No	None
22			✓	No	No	None
23				No	No	None
24		✓	✓	No	No	None
25	✓			No	No	None

Site 2: Salt Ponds 12-15						
Data Station	*Location*	*Wetland Determination Field Indicators*			*Hydrologic Association?*	*Jurisdiction*
		Vegetation	*Hydric Soils*	*Hydrology*		
1	Inside slope (salt pond side) of levee at Pond 15	✓	✓	✓	Salt Pond	ACOE, RWQCB, CCC
2	Outer slope of levee adjacent to Palomar Street tidal channel	✓	✓		Tidal Channel	ACOE, RWQCB, CCC
3	Top of levee along access road		✓		None	None*
4	Salt marsh habitat on bay side of salt pond levee	✓	✓	✓	Bay	ACOE, RWQCB, CCC
5	Salt marsh habitat on bay side of salt pond levee	✓	✓	✓	Bay	ACOE, RWQCB, CCC
6	Top of levee between salt ponds		✓		None	None*
7	Top of outer salt pond levee				None	None
8	Top of levee between salt ponds	✓	✓		None	None*
9	Inside slope (salt pond side) of levee at Pond 12		✓	✓	Salt Pond	ACOE, RWQCB, CCC
10	Top of outer salt pond levee	✓			None	None
11	Salt marsh habitat on Otay Channel side of salt pond levee	✓	✓	✓	Tidal Channel	ACOE, RWQCB, CCC
12	Top of outer salt pond levee		✓		None	None*
13	Top of levee between salt ponds		✓		None	None*
14	Outer slope of levee adjacent to Palomar Street tidal channel	✓	✓		Tidal Channel	ACOE, RWQCB, CCC
15	Inside slope (salt pond side) of levee at Pond 15		✓	✓	Salt Pond	ACOE, RWQCB, CCC

Table 1
Wetland Delineation Sampling Point Summary for all three sites

Site 3: Access Routes and Crossings						
Data Station	*Location*	*Wetland Determination Field Indicators*			*Hydrologic Association?*	*Jurisdiction*
		Vegetation	*Hydric Soils*	*Hydrology*		
1	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with Freshwater Marsh	✓	✓	✓	Freshwater marsh	ACOE, RWQCB, CCC
2	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with Mulefat Scrub				Mulefat Scrub	CCC
3	Northwestern side of Egger Highlands near Silver Strand Bikeway within the Otay River Floodplain Restoration				Restoration area	CCC[4]
4	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with Mulefat Scrub				Mulefat Scrub	CCC
5	North side of Egger Highlands near Silver Strand Bikeway associated with the Otay River Floodplain Restoration	✓			Restoration Area	CCC[4]
6	North side central section of Egger Highlands near Silver Strand Bikeway associated with southern coastal salt marsh in the channel	✓	✓	✓	Southern Coastal Salt Marsh	ACOE, RWQCB, CCC
7	North side central section of Egger Highlands near Silver Strand Bikeway associated with Mulefat Scrub				Mulefat Scrub	CCC

* Although these soils retain hydric soil indicators, the soils were derived from dredged bay mud that has been placed on the top of the salt pond levees.
1 Data stations 1–4 are located outside of the Otay River/Pond 20 Study Area.
2 Although not all three parameters were met, ACOE jurisdiction was presumed because the area was below the elevation of the high tide line (7.79 feet above MLLW). See also the Results section below.
3 See Section Non-Jurisdictional Mulefat Scrub below
4 These areas are within the Otay River Floodplain Restoration site, which has been recently planted with riparian species. The site is actively irrigated to promote plant establishment. Evident hydric soils and hydrology per the ACOE delineation manual are not yet present within the restoration site; therefore, the areas were not classified as ACOE jurisdictional but may eventually develop the indicators necessary to classify these areas as ACOE jurisdictional.

Table 2
Wetland Delineation Existing Acreage Summary

Vegetation Community	Jurisdiction	
	ACOE, RWQCB, CCC	*CCC Only*
Site 1: Otay River/Pond 20		
Brackish water	3.31	—
Cismontane Alkali Marsh	1.28	—
Coastal and Valley Freshwater Marsh	0.31	—
Former Salt Pond Bottom and Borrow Area	4.35	—
Mulefat Scrub	—	0.01
Southern Coastal Salt Marsh	6.07	0.04
Subtotal	*15.31*	*0.05*
Site 2: Salt Ponds 12-15		
Beach	0.89	—
Brackishwater	1.69	—
Open Water	270.42	—
Salt Pond Levee	18.16	—
Southern Coastal Salt Marsh	8.12	—
Subtotal	*299.26*	—
Site 3a: Southern Access Roads and Crossings		
Coastal and Valley Freshwater Marsh	0.59	—
Mulefat Scrub	—	0.70
Otay River Floodplain Restoration	—	5.92
Southern Coastal Salt Marsh	0.26	0.10
Former Salt Pond Bottom and Borrow Area	0.07	—
Subtotal	*0.92*	*6.72*
Site 3b: Northern Access Routes and Crossings		
Bay	0.59	—
Brackish water	0.14	—
Southern Coastal Salt Marsh	2.19	—
Salt Pond Levee	0.76	—
Water	3.29	—
Subtotal	*6.97*	—
Grand Total	**322.46**	**6.77**

Note: Acreages may not total due to rounding.

Site 1: Otay River/Pond 20

The results of the study include areas delineated as jurisdictional by the ACOE, RWQCB and the CCC. Although the non-tidal portion of the Otay River channel would have qualified for CDFW jurisdiction, the portion is on federal land, and thus not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the Study Area and sampling locations can be found in Figures 6a and 6b.

Site 2: Salt Ponds 12-15

The results of the study include areas delineated as jurisdictional by the ACOE, RWQCB and the CCC. The Otay River channel and the Palomar Street channel are tidal channels within the study area in the Refuge and do not qualify for CDFW jurisdiction, and thus are not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the Ponds 12-15 Study Area and sampling locations can be found in Figures 7a – 7c.

Site 3:Access Routes and Crossings

The results of the study include areas delineated as jurisdictional by the ACOE, RWQCB, and CCC. Although the non-tidal portion of the Otay River channel would have qualified for CDFW jurisdiction, the portion is on federal land within the Refuge, and thus not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the Access Routes Study Area and sampling locations can be found in Figures 8a and 8b.

ACOE/RWQCB/CCC Jurisdiction

Areas meeting all three parameters were classified as wetlands under the jurisdiction of the ACOE, RWQCB, and CCC.

Site 1: Otay River/Pond 20

Results of the wetland delineation (summarized in Tables 1 and 2) indicate that approximately 15.31 acres of wetlands and non-wetland Waters of the U.S. under the joint jurisdiction of the ACOE, RWQCB, and CCC occur within the Pond 20 Study Area. 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 (including 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 include surface water, high water table, and saturation. Areas supporting all three wetland indicators were mapped as ACOE, RWQCB, and CCC wetlands. Additionally, in some locations along the tidal channels, there is 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, ACOE jurisdiction was assumed because they are tidally influenced areas that are below the elevation of the high tide line (7.79 feet above MLLW).

There was a total of 8.12 acres of wetlands within the Pond 20 Study Area, all of which supported southern coastal salt marsh. Because the Pond 20 Study Area is primarily unvegetated, the hydrophytic vegetation parameter was rarely met at the sampling locations. When present, vegetation consisted of species typical of southern coastal salt marsh habitat, including estuary seablite (*Suaeda esteroa*), alkali heath (*Frankenia salina*), pacific pickleweed (*Sarcocornia pacifica*), saltwort (*Batis maritima*), sea lavender (*Limonium californica*), and dwarf saltwort (*Salicornia bigelovii*). Also observed in the southern coastal salt marsh habitat were coast weed (*Amblyopappus pusilus*), non-native iceplant (*Mesembryanthemum nodiflorum; M. crystalinum*), and arrow grass (*Triglochin concina*). Outside of the tidally influenced areas adjacent to the two tidal channels that abut portions of the site on the southwestern and northeastern flanks, coastal salt marsh habitat is extremely patchy and disturbed, with low cover and low species diversity.

The Pond 20 Study Area also supports two geographically distinct cismontane alkali marsh areas (1.28 acres) that, based on intensive field review, support greater than 50% hydrophytic vegetation and, in some instances, hydric soils but lack hydrology indicators (Table 1). A sewer treatment facility and settling ponds were formerly located in this area. For the purposes of the PJD, the ACOE determined that although the areas are more than 700 feet from the hydrophytic vegetation associated with the tidal channel, that these areas were close enough to be considered adjacent wetlands under the ACOE's jurisdiction. These areas also meet the definition of wetland pursuant to CCC guidelines. However, because these areas are on federal land and because they are more than 700 feet from the tidal channels, CDFW jurisdiction is not presumed.

The western portion of the Study Area contains a series of low-lying areas that are remnants from the construction and operation of the former industrial salt evaporation pond. The areas are surrounded by a tall levee that separates them from the adjacent tidal channels. The levee was constructed, in part, using soil excavated from within the basin (borrow areas) that are lower in elevation than the basin bottom. These unvegetated areas in the bottom of the basin were mapped as former salt pond bottom and borrow areas. Because of their historical long-term use as industrial salt evaporation ponds, the soil conditions are hypersaline, and much of the land does not support vegetation. The functions and values of these areas are considered degraded and low due to the extensive site disturbance, lack of vegetation, lack of surface water hydrologic connectivity, and excessive salinity.

The portions of the former salt pond bottom and borrow area can occasionally become inundated from precipitation, as was the case during the February site review. However, with the exception of a few small areas in the southwestern corner, the areas were completely dry during the July 2012 site review. A review of aerial photographs shows that ponding does not occur in every year and varies in location and extent. While the borrow areas may exhibit periods of ponding during the rainy season, the surface water evaporates quickly.

While not physically connected to either tidal channels or freshwater channels due to the presence of perimeter berms, the ACOE classified them as jurisdictional for the purposes of the PJD. 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-wetlands Waters of the U.S.

Site 2: Salt Ponds 12-15

Results of the wetland delineation (summarized in Tables 1 and 2) indicate that approximately 299 acres of wetlands and non-wetland Waters of the U.S. under the joint jurisdiction of the ACOE, RWQCB, and CCC occur within the Salt Ponds 12-15 Study Area. Of the total area classified as jurisdictional, 8.12 acres were classified as wetlands and 291.14 acres were classified as non-wetland Waters of the U.S. In general, the jurisdictional features are unvegetated, with the exception of areas that abut the Otay River and the Palomar Street tidal channels, and a few patchy areas along the salt pond levees. The predominant native vegetation community associated with the wetlands is southern coastal salt marsh. Soils in these areas are characterized by variable textures (including sand, clay, sandy loam, clay loam, sandy clay loam, and silty clay loam) often with a with depleted matrix. Wetland hydrology indicators present included high water table, saturation, oxidized rhizospheres along living roots, and aquatic invertebrates. Areas supporting all three wetland indicators were mapped as ACOE, RWQCB, and CCC wetlands.

The majority of the Salt Ponds 12-15 Study Area contains a series of active salt ponds that are components of the solar salt evaporation system. The salt ponds are surrounded by levees that separate them from the adjacent San Diego Bay and tidal channels. The levees were constructed using soil excavated from within the bay and reach a maximum elevation that is slightly greater than the highest observed water level (7.79 feet; North American Vertical Datum (NAVD 88)), approximately eight feet and up to 12 feet in some places.

A review of aerial photographs shows that the salt ponds, and levees surrounding them, have been in the same configuration for decades. The water elevation within the salt ponds is controlled by a tide gate, and thus remains relatively constant.

The portions of the Salt Ponds 12-15 Study Area 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-wetlands Waters of the U.S. The top of the salt pond levees that is above the high tide line did not meet the three parameters, and was classified as non-jurisdictional.

Site 3: Access Routes and Crossings –Poseidon ORERP

Results of the wetland delineation (summarized in Tables 1 and 2) indicate that approximately 7.89 acres of wetlands and non-wetland Waters of the U.S. under the joint jurisdiction of the ACOE, RWQCB, and CCC occur within the Access Routes Study Area (northern and southern areas combined). Of the total area classified as jurisdictional, 3.04 acres were classified as wetlands and 4.85 acres were classified as non-wetland Waters of the U.S. In general, the jurisdictional features are associated with tidal channels, salt ponds and the San Diego Bay. The predominant native vegetation community associated with the wetlands is southern coastal salt marsh along the Palomar Street channel and freshwater marsh along the Otay River channel. Soils in these areas are characterized by variable textures (including sand, clay, sandy clay and clay loam), with the predominant soil texture clay loam. Wetland hydrology indicators present included high water table, saturation, surface water, sediment deposits, drift deposits and drainage patterns. Areas supporting all three wetland indicators were mapped as ACOE, RWQCB, and CCC wetlands.

A large portion of the southern study area of Site 3 is part of the Otay River Floodplain Restoration site. This area was recently planted with riparian trees and shrubs. The site is being irrigated to promote plant establishment. While these areas did not meet hydric soil and hydrology criteria per the delineation manual, these areas may eventually meet those criteria. However, for this study, these areas were not classified as ACOE jurisdictional.

The salt flats in the northern portion of Site 3 were classified as non-jurisdictional. These areas are not subject to tidal inundation, are primarily above the elevation of the high tide line (7.79 feet above MLLW), and are routinely disturbed to harvest salt.

Salt pond levees below the high tide line elevation (7.79 feet above MLLW) were classified as jurisdictional Waters of the U.S., whereas salt pond levees above the high tide line were classified as non-jurisdictional where the wetland delineation parameters were not present (e.g., hydrophytic vegetation and hydrology).

CCC-Only Jurisdiction

Site 1: Otay River/Pond 20

There is a 0.04-acre area of southern coastal salt marsh and a 0.01-acre area of mulefat scrub that would be under the jurisdiction of the CCC that occur in the northeastern portion of the site along the freshwater stream channel but are above the OHWM and outside of ACOE and RWQCB jurisdiction. These areas are dominated by more than 50% hydrophytic vegetation (i.e., saltgrass and mulefat), thus meeting the hydrophytic vegetation parameter, and a high water table and saturation indicate hydrology, but they lack hydric soils needed to meet the ACOE's definition of wetland.

Site 2: Salt Ponds 12-15

There were no areas classified as jurisdictional only by CCC within the Salt Ponds 12-15 Study Area.

Site 3: Access Routes and Crossings –Poseidon ORERP

There are some patches of mulefat scrub that would be under the jurisdiction of the CCC that occur in the southern portion of Site 3. These areas did not meet the ACOE delineation criteria for hydrophytic vegetation, hydric soils, or hydrology, and therefore were not classified as ACOE jurisdictional. However, because they are dominated by mulefat, they were classified as CCC jurisdictional. Similarly, the Otay River Floodplain Restoration site was dominated by riparian trees and shrubs that have been recently planted, but the site did not meet the ACOE delineation criteria for hydric soils or hydrology. Therefore, these areas were classified as CCC jurisdictional, but not ACOE jurisdictional. Lastly, there was a small area (0.10 acre) of southern coastal salt marsh dominated by salt grass that did not meet the ACOE delineation criteria and was thus classified as only CCC jurisdictional.

CONCLUSION

In summary, for all study areas combined, there are 322.46 acres of wetlands and non-wetland waters under the joint jurisdiction of the ACOE, RWQCB, and CCC and 6.77 acres of riparian vegetation under the jurisdiction of the CCC only. As such, any impacts to these areas resulting from project implementation shall be subject to the regulations and requirements of the relevant regulating resource agency authorities. The jurisdictional delineations for two of the study areas (Sites 1 and 2) have already been reviewed and confirmed by ACOE (Appendices D and E). The third study area (Site 3) includes access routes and crossings near both Sites 1 and 2 and will require review and confirmation from ACOE for the preliminary jurisdictional delineation.

If you have any questions or comments regarding the content of this letter, please do not hesitate to call me at 760.479.4282.

Sincerely,

Andrew Thomson
Biologist/Restoration Ecologist

Att: Figure 1, Regional Map
Figure 2, Vicinity Map
Figure 3, Vegetation Communities with Jurisdictional Delineation for the Otay River/Pond 20 Site
Figures 4a–4c, Vegetation Communities with Jurisdictional Delineation for the Salt Ponds 12-15 Site
Figures 5a and 5b, Vegetation Communities with Jurisdictional Delineation for the Access Routes and Crossings Site
Figures 6a and 6b, Representative Site Photos of the Otay River/Pond 10 Study Area
Figures 7a – 7c, Representative Site Photos of the Salt Ponds 12-15 Study Area
Figures 8a and 8b, Representative Site Photos of the Access Routes Study Area

Appendix A, Otay River/Pond 20 Study Area - Wetland Determination Data Forms
Appendix B, Salt Ponds 12-15 Study Area - Wetland Determination Data Forms
Appendix C, Access Routes Study Area - Wetland Determination Data Forms
Appendix D, Otay River/Pond 20 Study Area – Preliminary Jurisdictional Determination Form
Appendix E, Ponds 12-15 Study Area – Preliminary Jurisdictional Determination Form
Appendix F, Site 3 Access Routes Study Area – Preliminary Jurisdictional Determination Form

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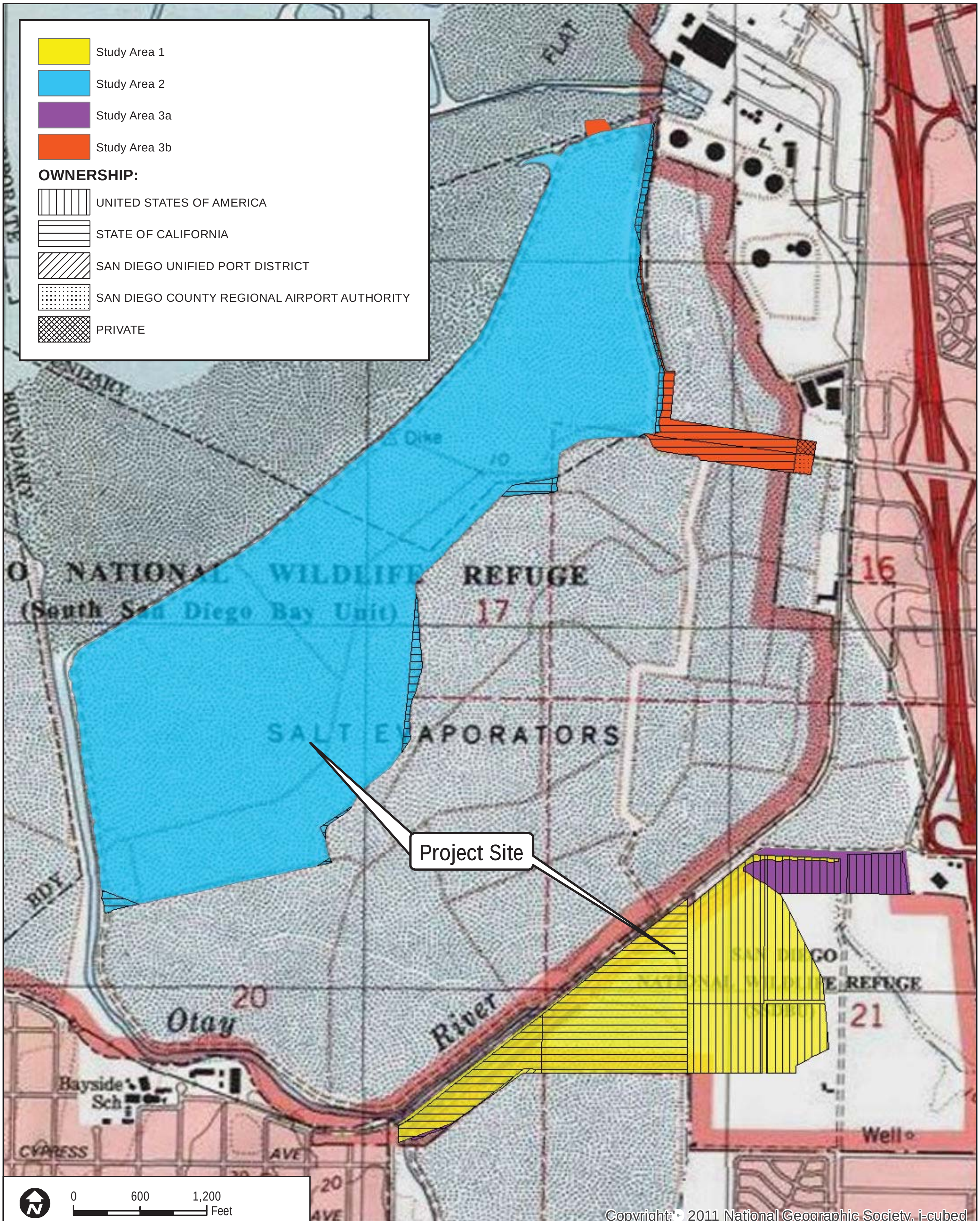
FIGURE 1

Regional Map

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



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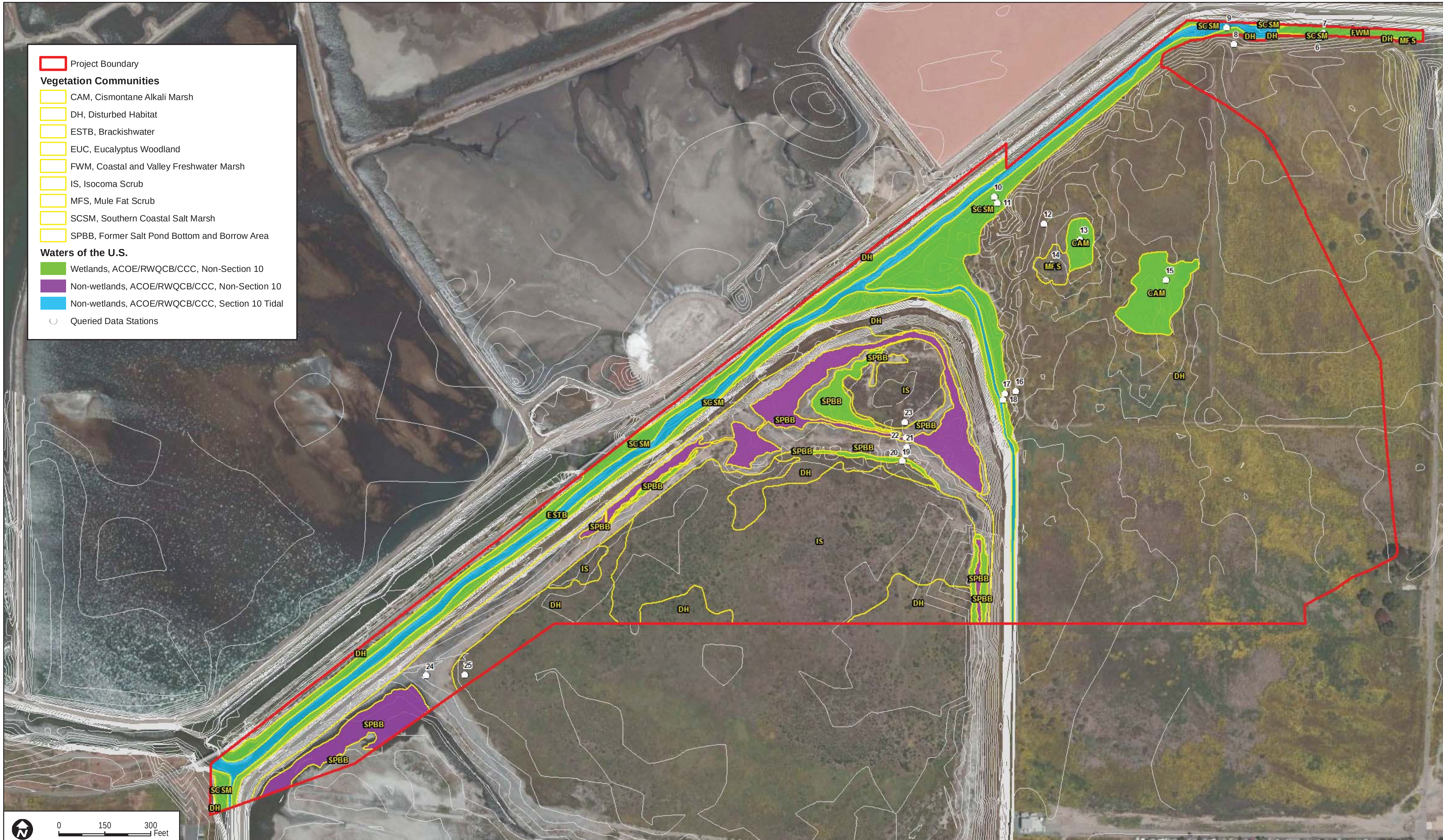
SOURCE: USGS 7.5-Minute Series Quadrangle, USA Topographic Maps Service, Imperial Beach Quadrangle.

FIGURE 2
Vicinity Map

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



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AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 3

Vegetation Communities with Jurisdictional Delineation for the Otay River/Pond 20 Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)

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AERIAL SOURCE: NAIP 2009

FIGURE 4a

Vegetation Communities with Jurisdictional Delineation for the Salt Ponds 12-15 Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)

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AERIAL SOURCE: NAIP 2009

FIGURE 4b

Vegetation Communities with Jurisdictional Delineation for the Salt Ponds 12-15 Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)

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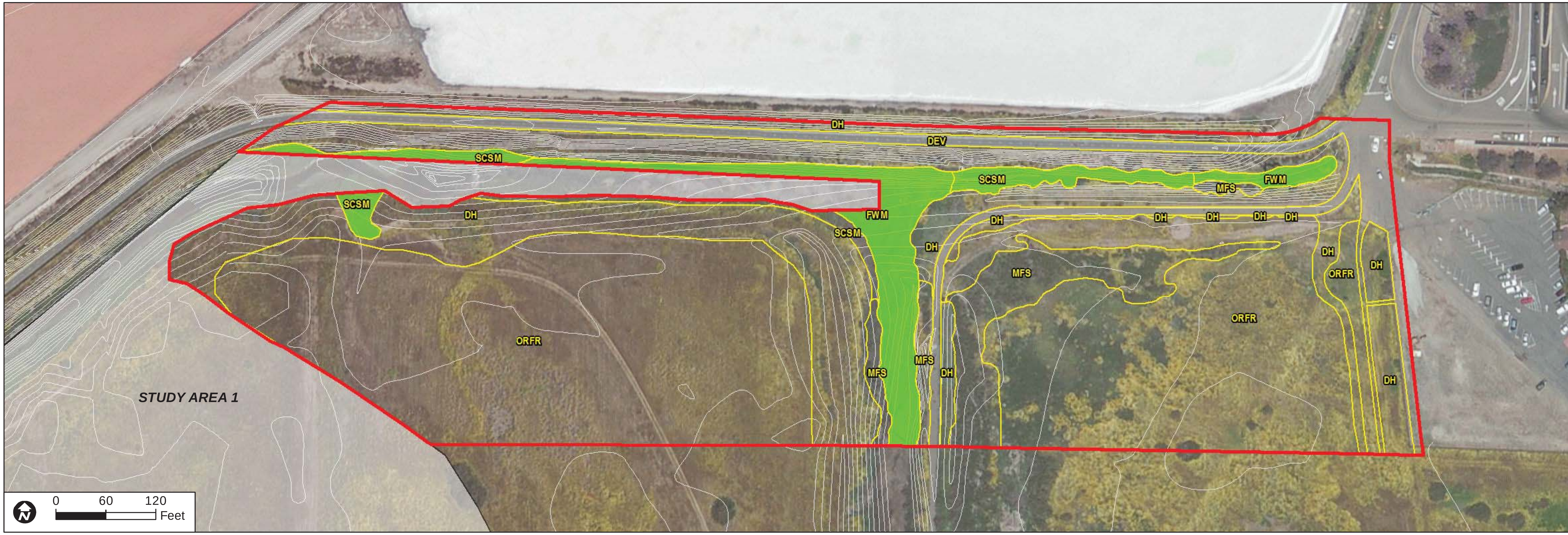
AERIAL SOURCE: NAIP 2009

FIGURE 4c

Vegetation Communities with Jurisdictional Delineation for the Salt Ponds 12-15 Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



Study Area 3a

Waters of the U.S.

Wetlands, ACOE/RWQCB/CCC, Non-Section 10 Wetland

Non-wetlands, ACOE/RWQCB/CCC, Non-Section 10 Non-wetland

Vegetation Communities

FWM, Coastal and Valley Freshwater Marsh

MFS, Mule Fat Scrub

ORFR, Otay River Floodplain Restoration

SCSM, Southern Coastal Salt Marsh

SPBB, Former Salt Pond Bottom and Borrow Area

DEV, Developed Land

DH, Disturbed Habitat

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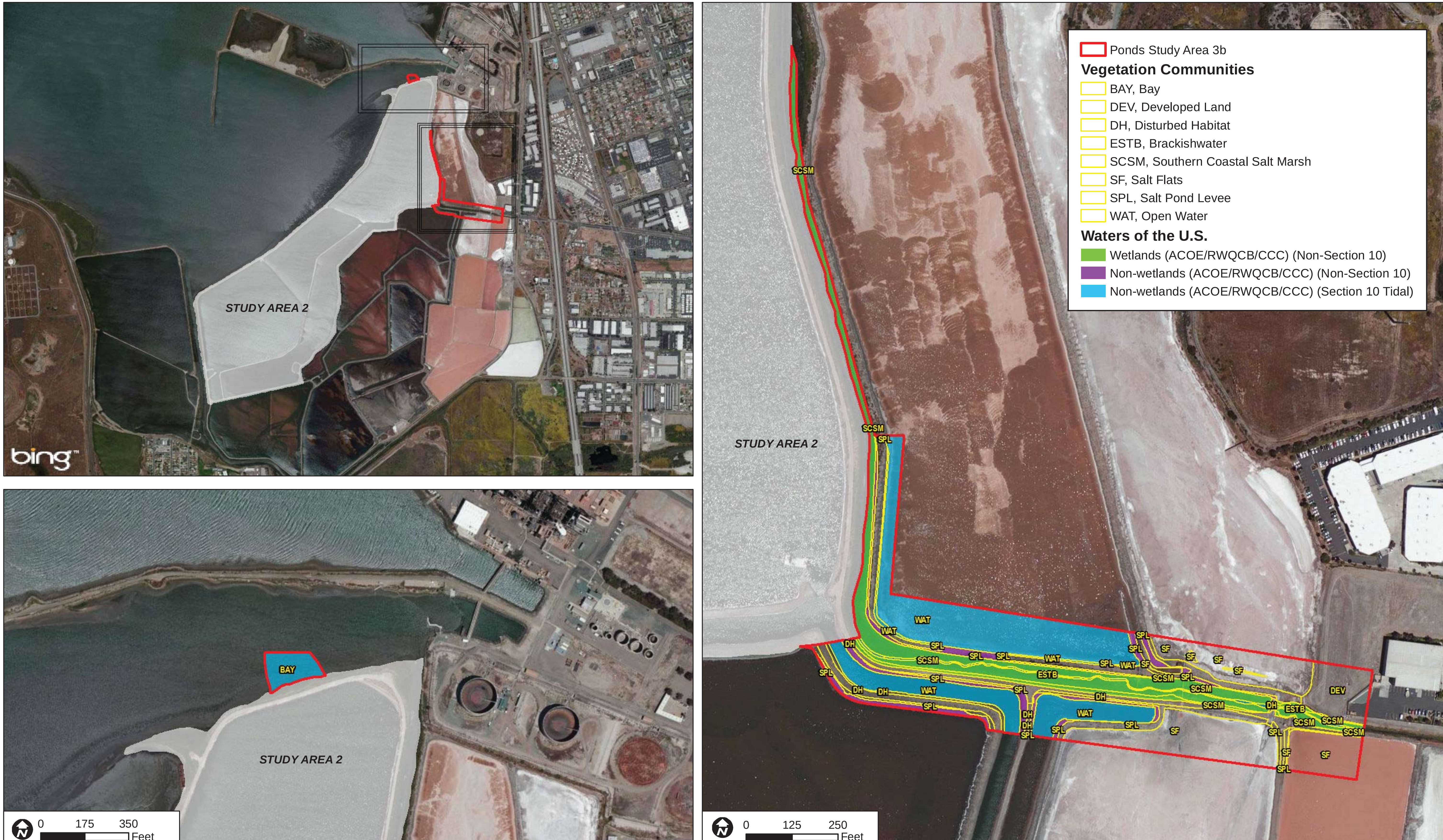
AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 5a

Vegetation Communities with Jurisdictional Delineation for the Southern Access Routes and Crossings Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



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AERIAL SOURCE: NAIP 2009

FIGURE 5b

Vegetation Communities with Jurisdictional Delineation for the Northern Access Routes and Crossings Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)

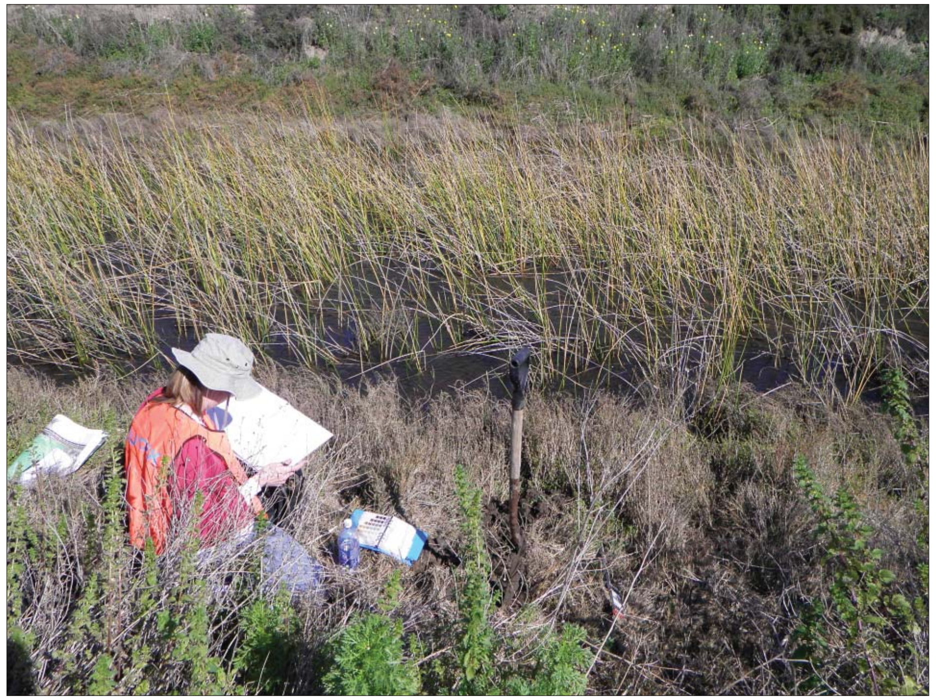

Photo 1: View of the Site Conditions at Data Stations 5, 6 and 7 (February 22, 2011)

Photo 2: View of the Site Conditions at Data Stations 8 and 9 (February 22, 2011)

Photo 3: View of the Site Conditions at Data Stations 10 and 11 (February 22, 2011)

Photo 4: View of the Site Conditions at Data Station 15 (February 22, 2011)

Photo 5: View of the Site Conditions at Data Stations 16, 17 and 18 (February 22, 2011)

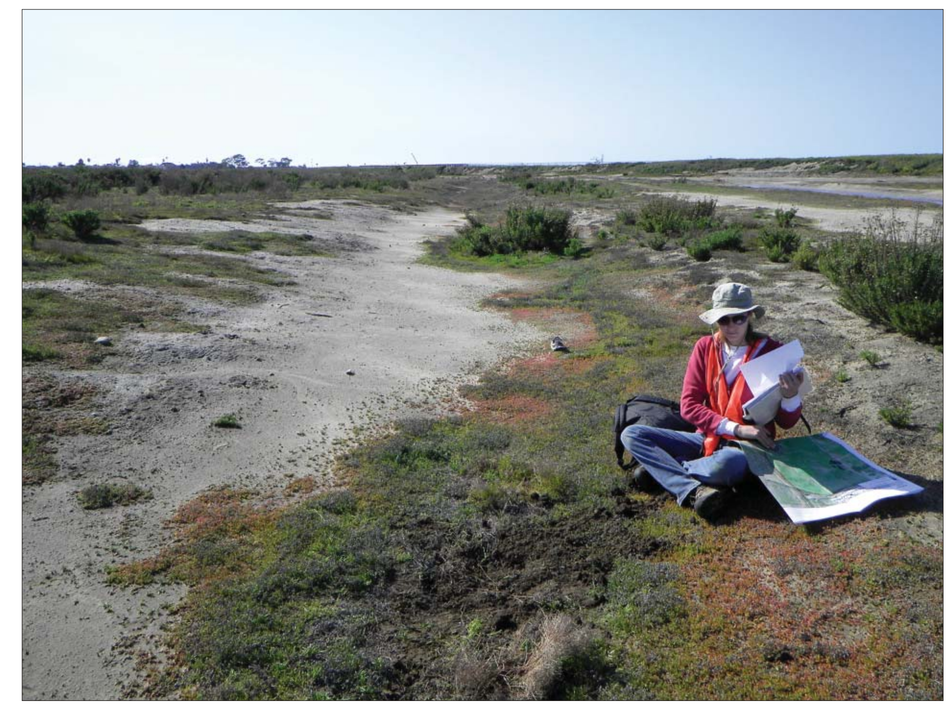

Photo 6: View of the Site Conditions at Data Stations 19, 20 and 21 (February 22, 2011)

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FIGURE 6a

Representative Site Photos of the Otay River/Pond 20 Study Area

Photo 7: View of the Site Conditions at Data Stations 22 and 23 (February 22, 2011)

Photo 8: View of the Site Conditions at Data Station 24 (February 22, 2011)

Photo 9: Representative View of the Salt Panne/Mudflat and Non-vegetated Channel and Floodway Areas (February 22, 2011)

Photo 10: Representative View of the Southern Coastal Salt Marsh Habitat in the Tidal Channel Downstream of the Otay River Channel in the Western Portion of the Site (February 22, 2011)

Photo 11: Representative View of the Southern Coastal Salt Marsh Habitat in the Tidal Channel Downstream of the Otay River Channel in the Eastern Portion of the Site (February 22, 2011)

Photo 12: View of Berm on the Northern Edge of the Old Salt Evaporation Pond (May 19, 2011)


Data Station 1


Data Station 2


Data Station 3


Data Station 4


Data Station 5


Data Station 6

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SOURCE: Dudek 2013

FIGURE 7a

Representative Site Photos of the Salt Ponds 12-15 Study Area


Data Station 7


Data Station 8


Data Station 9


Data Station 10


Data Station 11


Data Station 12

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SOURCE: Dudek 2013

FIGURE 7b

Representative Site Photos of the Salt Ponds 12-15 Study Area

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)


Data Station 13


Data Station 14


Data Station 15

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SOURCE: Dudek 2013

FIGURE 7c

Representative Site Photos of the Salt Ponds 12-15 Study Area

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)

Photo 1: View of the Silver Strand Bikeway that bisects the Study Area (May 27, 2014)

Photo 2: View of the Otay River Floodplain Restoration Project (May 27, 2014)

Photo 3: View of the berm between the Otay River channel and the Otay River Floodplain Restoration Project (May 27, 2014)

Photo 4: View of the soil pit in freshwater marsh habitat associated with the Otay River, data station #1 (May 27, 2014)

Photo 5: View of the soil pit in mulefat scrub habitat along the Silver Strand Bikeway, data station #7 (May 27, 2014)

Photo 6: View of the soil pit in southern coastal salt marsh habitat in the tributary channel to the Otay River, data station #6 (May 27, 2014)

Photo 1: View of typical salt pond levee conditions (March 13, 2013)

Photo 2: View of typical salt flat conditions (March 13, 2013)

Photo 3: View of southern coastal salt marsh habitat associated with the Palomar Street channel (March 13, 2013)

Photo 4: View of the Palomar Street channel at low tide (March 13, 2013)

Photo 5: View of the Bay tie-in point for the Pond 15 salt marsh restoration (March 13, 2013)

Photo 6: View of open water associated with the salt ponds (March 13, 2013)

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FIGURE 8b

Representative Site Photos of the Access Routes Study Area

APPENDIX A

Site 1 Otay River/Pond 20 Study Area – Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 5

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°35'29.95"N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (•)	No ( )
Hydric Soil Present?	Yes ( )	No (•)
Wetland Hydrology Present?	Yes (•)	No ( )

Is the Sampled Area within a Wetland? Yes ( ) No (•)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. Distichlis spicata	50	Yes	FAC
2. Salifornia virginica	15	No	OBL
3. Frankenia salina	35	Yes	FACW
4.			
5.			
Total Cover:	100 %		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Remarks:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (•) No ( )

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-12	7.5 YR 3/2	100					clay loam	
12-15	NA	60					sand	
12-15	7.5 YR 4/1	39	7.5 YR 4/6	1	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?	○	●	0
Water Table Present?	●	○	16
Saturation Present? (includes capillary fringe)	●	○	12

Wetland Hydrology Present? Yes ● No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseiden City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 6

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (•)
Hydric Soil Present?	Yes ( )	No (•)
Wetland Hydrology Present?	Yes ( )	No (•)

Is the Sampled Area within a Wetland? Yes ( ) No (•)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Urtica urens	40	Yes	NI
2. Glebionis coronaria	40	Yes	NI
3. Hirschfeldia incana	20	No	NI
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

( ) Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (•)

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-12	7.5 YR 3/2	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 7

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (•)	No ( )
Hydric Soil Present?	Yes (•)	No ( )
Wetland Hydrology Present?	Yes (•)	No ( )

Is the Sampled Area within a Wetland? Yes (•) No ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. Scirpus maritimus	60	Yes	OBL
2.			
3.			
4.			
5.			
Total Cover:	60 %		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks: Flowing water comprises the remaining 40% cover.

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks: At least one foot of water is covering soil so no soil sample was taken. Hydric soils are assumed based on inundation and cover of dominance of obligate wetland species.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?	◉	○	0
Water Table Present?	◉	○	0
Saturation Present? (includes capillary fringe)	◉	○	0

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 8

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes ( )	No (●)
Wetland Hydrology Present?	Yes ( )	No (●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Distichlis spicata	100	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ✘ Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Flowing water comprises the remaining 40% cover.

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-7	NA	100					sand	
7-14	7.5 YR 3/3	100					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ●	Depth (inches):
Water Table Present?	Yes ○	No ●	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ●	Depth (inches):

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 9

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°35'29.95"N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? Yes (●) No ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Salifornia virginica	90	Yes	OBL
2. Frankenia salina	10	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Flowing water comprises the remaining 40% cover.

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-2	7.5 YR 4/2	100					loamy sand	
2-6	NA	100					sand	
6-7	GLEY 2.5/SPB	100					clay loam	
7-11	7.5 YR 4/1	100					loamy sand	
11-14	NA	100					sand	saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☒ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ◉	No ○	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 5

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 10

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°35'29.95"N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	(●)	( )
Hydric Soil Present?	(●)	( )
Wetland Hydrology Present?	(●)	( )

Is the Sampled Area within a Wetland? Yes (●) No ( )

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Salifornia virginica	98	Yes	OBL
2. Batis maritima	2	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Flowing water comprises the remaining 40% cover.

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-9	7.5 YR 2.5/1	99	7.5 YR 4/6	1	C	M	clay loam	
9-15	7.5 YR 3/3	90	7.5 YR 4/6	10	C	M	sandy clay loam	Redox also along pore linings

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [x] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes (●) No ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [x] Surface Water (A1)
- [x] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes (●)	No ( )	Depth (inches): 0
Water Table Present?	Yes (●)	No ( )	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes (●)	No ( )	Depth (inches): 0

Wetland Hydrology Present? Yes (●) No ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 11

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Section 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): Channel | Local relief (concave, convex, none): Concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32 35 29.95 | Long: 117 5 46.02 | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ●	No ○
Hydric Soil Present?	Yes ○	No ●
Wetland Hydrology Present?	Yes ●	No ○

Is the Sampled Area within a Wetland? Yes ● No ○

Remarks: Although not all 3 parameters were met, the sampling point is below the high tide line of 7.79 feet (above MLLW) and therefore ACOE jurisdiction is presumed.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	5	Yes	FAC
2. *Suaeda nigra*	1	No	OBL
3.			
4.			
5.			
Total Cover:	6 %		
Herb Stratum			
1. *Distichlis spicata*	70	Yes	FAC
2. *Salicornia virginica*	10	No	OBL
3. *Frankenia salina*	15	No	FACW
4. *Atriplex semibaccata*	1	No	FAC
5.			
6.			
7.			
8.			
Total Cover:	96 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 4 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	11	x 1 =	11
FACW species	15	x 2 =	30
FAC species	76	x 3 =	228
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	102 (A)		269 (B)

Prevalence Index = B/A = 2.64

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ● No ○

Remarks:

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	7.5 YR 2.5/1	100					sandy clay loam	some organic streaking
4-10	7.5 YR 3/2	100					sandy loam	
10-13	7.5 YR 3/2	80					loam	
10-13	7.5 YR 4/1	19	7.5 YR 4/6	1	C	M	loamy clay	
13-15	7.5 YR 3/1	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sampling location is below the high tide line (7.79 feet above MLL W) and therefore hydrology is presumed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 12

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32 35 29.95 N | Long: 117 5 46.02 W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		●
Hydric Soil Present?		●
Wetland Hydrology Present?		●

Is the Sampled Area within a Wetland? Yes ( ) **No** (●)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	10	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	10 %		
Herb Stratum			
1. *Glebionis coronaria*	75	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	75 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 25 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	10	x 3 =	30
FACU species		x 4 =	0
UPL species	75	x 5 =	375
Column Totals:	85	(A)	405 (B)

Prevalence Index = B/A = 4.76

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	7.5 YR 3/3	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ **No** ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 13

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	(●)	( )
Hydric Soil Present?	(●)	( )
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. Tamarix ramosissima	2	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	2 %		
Herb Stratum			
1. Salicornia virginica	75	Yes	OBL
2. Distichlis spicata	10	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	85 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 15 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	7.5 YR 3/2	90	7.5 YR 4/6	10	C	M	loam	
4-15	10 YR 4/3	100					loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ◯

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ◯ No ◉ Depth (inches): ______

Water Table Present? Yes ◯ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ◯ No ◉ Depth (inches): ______

Wetland Hydrology Present? **Yes** ◯ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 14

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32 35 29.95 N | Long: 117 5 46.02 W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉
Hydric Soil Present?	Yes ○	No ◉
Wetland Hydrology Present?	Yes ○	No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	30	Yes	FAC
2. *Nicotiana glauca*	1	No	FAC
3.			
4.			
5.			
Total Cover:	31 %		
Herb Stratum			
1. *Glebionis coronaria*	50	Yes	NI
2. *Mesembryanthemum nodiflorum*	2	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	52 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 48 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	33	x 3 =	99
FACU species		x 4 =	0
UPL species	50	x 5 =	250
Column Totals:	83 (A)		349 (B)

Prevalence Index = B/A = 4.20

Hydrophytic Vegetation Indicators:

- ○ Dominance Test is >50%
- ○ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	7.5 YR 3/2	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ **No** ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon
City/County: San Diego, San Diego
Sampling Date: 2/22/11
Applicant/Owner: Poseidon Resources
State: CA
Sampling Point: 15
Investigator(s): Andy Thomson and Katie Dayton
Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W
Landform (hillslope, terrace, etc.): channel
Local relief (concave, convex, none): concave
Slope (%): 0-20
Subregion (LRR): C - Mediterranean California
Lat: 32°3 5'29.95 "N
Long: 117°5'46.02W
Datum: NAD83
Soil Map Unit Name:
NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	(●)	( )
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	(●)	( )

Is the Sampled Area within a Wetland? **Yes** ( ) **No** (●)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Suaeda nigra*	5	Yes	OBL
2.			
3.			
4.			
5.			
Total Cover:	5 %		
Herb Stratum			
1. *Salicornia virginica*	90	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	90 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 10 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	95	x 1 =	95
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	95 (A)		95 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [x] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks:

SOIL

Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	7.5 YR 3/1	100					loamy clay	
4-12	7.5 YR 3/2	100					sandy loam	
12-15	10 YR 5/3	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: Dark gray material around roots in soil sample: GLEY2 2.5/ l0B in color; comprised <1% of the sample

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ◉	No ○	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 6

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 16

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°35'29.95"N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation ☒ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(•)
Hydric Soil Present?	( )	(•)
Wetland Hydrology Present?	( )	(•)

Is the Sampled Area within a Wetland? Yes ( ) No (•)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Bromus diandrus	1	No	NI
2. Glebionis coronaria	2	Yes	NI
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	3 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	3 %		

% Bare Ground in Herb Stratum 97 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

( ) Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (•)

Remarks:

SOIL

Sampling Point: 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-15	7.5 YR 3/2	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 17

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Section 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): Channel Local relief (concave, convex, none): Concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32 35 29.95 Long: 117 5 46.02 Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ●	No ○	Is the Sampled Area within a Wetland? Yes ● No ○
Hydric Soil Present?	Yes ○	No ●	
Wetland Hydrology Present?	Yes ●	No ○	

Remarks: Although not all 3 parameters were met, the sampling point is below the high tide line of 7.79 feet (above MLLW) and therefore ACOE jurisdiction is presumed.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Distichlis spicata*	30	Yes	FAC
2. *Salicornia virginica*	40	Yes	OBL
3. *Frankenia salina*	15	No	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	85 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 15 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	45	x 2 =	90
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	85 (A)		130 (B)

Prevalence Index = B/A = 1.53

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ● No ○

Remarks:

SOIL

Sampling Point: 17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-10	7.5 YR 3/2	100					sandy loam	
10-13	7.5 YR 4/3	95					sandy loam	
10-13	7.5 YR 5/1	5	7.5 YR 4/6	<1	C	M	clay loam	
13-15	7.5 YR 4/3	100	7.5 YR 4/6	1	C	M	loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ( ) No (●)

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [x] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ( )	No (●)	Depth (inches):
Water Table Present?	Yes ( )	No (●)	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ( )	No (●)	Depth (inches):

Wetland Hydrology Present? Yes (●) No ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sampling location is below the high tide line (7.79 feet above MLLW) and therefore hydrology is presumed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11
Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 18
Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W
Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20
Subregion (LRR): C - Mediterranean California | Lat: 32°35'29.95"N | Long: 117°5'46.02W | Datum: NAD83
Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	(●)	( )
Hydric Soil Present?	(●)	( )
Wetland Hydrology Present?	(●)	( )

Is the Sampled Area within a Wetland? Yes (●) No ( )

Remarks: Approximately 3-foot wide band of ACOE wetland along an open channel.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Salicornia virginica	100	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: 18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-8	7.5 YR 3/2	90	7.5 YR 4/4	10	C	M	clay loam	
8-12	7.5 YR 4/3	75	7.5 YR 4/4	25	C	M	sandy clay loam	
12-15	7.5 YR 5/1	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [x] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes (●) No ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [x] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ( )	No (●)	Depth (inches):
Water Table Present?	Yes (●)	No ( )	Depth (inches): 10
Saturation Present? (includes capillary fringe)	Yes (●)	No ( )	Depth (inches): 8

Wetland Hydrology Present? Yes (●) No ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon — City/County: San Diego, San Diego — Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources — State: CA — Sampling Point: 19

Investigator(s): Andy Thomson and Katie Dayton — Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel — Local relief (concave, convex, none): concave — Slope (%): 0-20

Subregion (LRR): C - Mediterranean California — Lat: 32°3 5'29.95 "N — Long: 117°5'46.02W — Datum: NAD83

Soil Map Unit Name: — NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? **Yes** ( ) **No** (●)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	10	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	10 %		
Herb Stratum			
1. *Mesembranyanthemum crystallinum*	15	Yes	FACU
2. *Melilotus indica*	2	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	17 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 83 % — % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	10	x 3 =	30
FACU species	17	x 4 =	68
UPL species		x 5 =	0
Column Totals:	27 (A)		98 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ( ) **No** (●)

Remarks:

SOIL

Sampling Point: 19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-10	7.5 YR 3/3	80					loamy sand	
0-10	7.5 YR 3/1	20					clay loam	
10-15	NA	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ **No** ●

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 20

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°3 5'29.95 "N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [X] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? **Yes** (●) **No** ( )

Remarks: Sampling point is within the borrow pit of a former salt evaporation pond where there has been substantial topographic disturbance.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	5	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	5 %		
Herb Stratum			
1. *Mesembranyanthemum nodiflorum*	40	Yes	FAC
2. *Amblyopappus pusillus*	3	No	FACW
3. *Melilotus indica*	1	No	FACU
4.			
5.			
6.			
7.			
8.			
Total Cover:	44 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 56 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	3	x 2 =	6
FAC species	45	x 3 =	135
FACU species	1	x 4 =	4
UPL species		x 5 =	0
Column Totals:	49 (A)		145 (B)

Prevalence Index = B/A = 2.96

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks:

SOIL

Sampling Point: 20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-10	7.5 YR 3/1	80	2.5 YR 4/6	20	C	M	sandy loam	
10-15	7.5 YR 4/1	80	2.5 YR 4/8	20	C	M	loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [x] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** (●) **No** ( )

Remarks: There are white mineral deposits intermixed in soil. The soils exhibit low chroma as they are subsoils and likely former bay muds.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [x] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [x] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches):
Surface Water Present?	( )	(●)	
Water Table Present?	( )	(●)	
Saturation Present? (includes capillary fringe)	( )	(●)	

Wetland Hydrology Present? **Yes** (●) **No** ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: There is salt crust in a small area, which is likely the result of the site's former use as a salt evaporation pond.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 21

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☒ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	(●)	( )
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks: Sampling point is within the borrow pit of a former salt evaporation pond where there has been substantial topographical disturbance.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	20	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	20 %		
Herb Stratum			
1. *Mesembryanthemum nodiflorum*	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	10 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 70 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	30	x 3 =	90
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	30 (A)		90 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: 21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-13	7.5 YR 3/1	90					sandy loam	
0-13	7.5 YR 3/2	10					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: white mineral desposits intermixed in soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 22

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°35'29.95"N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [X] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (•)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(•)
Hydric Soil Present?	( )	(•)
Wetland Hydrology Present?	(•)	( )

Is the Sampled Area within a Wetland? Yes ( ) No (•)

Remarks: Sampling point is within the borrow pit of a former salt evaporation pond where there has been substantial topographical distrubance.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 100 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (•)

Remarks:

SOIL

Sampling Point: 22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-7	7.5 YR 3/1						sandy clay loam	
7-15	7.5 YR 3/2						sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: There is a think layer (about 1/4 -inch thick) of salt crystals approximately 3 inches deep in soil pit.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): 0
Water Table Present?	Yes ◉	No ○	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicators at this sampling location are a result of rainwater temporarily ponding in the borrow pit locations during the rainy season.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 23

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Suaeda nigra*	2	Yes	OBL
2.			
3.			
4.			
5.			
Total Cover:	2 %		
Herb Stratum			
1. *Sisymbrium sp.*	40	Yes	NI
2. *Melilotus indica*	30	Yes	FACU
3. *Mesembryanthemum nodiflorum*	10	No	FAC
4. *Amblyopappus pusillus*	2	No	FACW
5. *Lepidium sp.*	1	No	NI
6.			
7.			
8.			
Total Cover:	83 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 17 % | % Cover of Biotic Crust %

Remarks:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	33.3 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	2	x 2 =	4
FAC species	10	x 3 =	30
FACU species	30	x 4 =	120
UPL species	41	x 5 =	205
Column Totals:	85 (A)		361 (B)

Prevalence Index = B/A = 4.25

Hydrophytic Vegetation Indicators:

- ( ) Dominance Test is >50%
- ( ) Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

SOIL

Sampling Point: 23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-8	7.5 YR 4/2	100					sandy loam	
8-15	NA	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: white mineral desposits intermixed in soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 24

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☒ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	(●)	( )
Wetland Hydrology Present?	(●)	( )

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks: Sampling point is within the borrow pit of a former salt evaporation pond where there has been substantial topographical distrubance.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 100 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: 24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-8	5 YR 2.5/1	97	5 YR 3/4	3	C	M	silty clay	
8-14	7.5 YR 3/1	95	7.5 YR 4/6	5	C	M	sandy silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [x] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes (•) No ( )

Remarks: There is a think layer (about 1/4 -inch thick) of salt crystals approximately 3 inches deep in soil pit. This salt crust is likely a result of the site's former use as a salt evaporation pond. The soils exhibit low chroma as they are subsoils and likely former bay mud.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [x] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?	( )	(•)	
Water Table Present?	( )	(•)	
Saturation Present? (includes capillary fringe)	( )	(•)	

Wetland Hydrology Present? Yes (•) No ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Saltpan. The salt crust is likely a result of the site's former use as a salt evaporation pond.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 25

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	(●)	( )
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis sarothroides*	2	No	FACU
2. *Cylindropuntia prolifera*	1	No	NI
3. *Salicornia subterminalis*	5	Yes	OBL
4. *Isocoma menziesii*	3	Yes	FAC
5.			
Total Cover:	11 %		
Herb Stratum			
1. *Erodium cicutarium*	20	Yes	NI
2. *Melilotus indica*	1	No	FACU
3. *Mesembryanthemum nodiflorum*	10	Yes	FAC
4. *Amblyopappus pusillus*	1	No	FACW
5. *Schismus barbatus*	1	No	NI
6.			
7.			
8.			
Total Cover:	33 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 67 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	75.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	1	x 2 =	2
FAC species	13	x 3 =	39
FACU species	3	x 4 =	12
UPL species	22	x 5 =	110
Column Totals:	44 (A)		168 (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ( ) Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: 25

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-15	5 YR 3/3	100					loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◯ No ◉

Remarks: There is a thick layer (about 1/4-inch thick) of salt crystals approximately 3 inches deep in soil pit.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ◯ No ◉ Depth (inches):

Water Table Present? Yes ◯ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ◯ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◯ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B

Site 2 Salt Ponds 12-15 Study Area – Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon – Salt Ponds City/County: Chula Vista/SD Sampling Date: 7-23-13
Applicant/Owner: Poseidon / Refuge - Salt Works State: CA Sampling Point: 1
Investigator(s): ACT & KD Section, Township, Range: ______
Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): (none circled) Slope (%): ≤ 0
Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______
Soil Map Unit Name: ______ NWI classification: ______
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___
Hydric Soil Present?	Yes ✓	No ___
Wetland Hydrology Present?	Yes ✓	No ___

Is the Sampled Area within a Wetland? Yes ✓ No ___

Remarks: Data station is located on slope of salt pond levee.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. (lined out)			
2.			
3.			
4.			
		= Total Cover	
*Sapling/Shrub Stratum (Plot size: 4m x 4m)			
1. Sueda est	2	N	FACW
2. Atri lind	1	N	N/I
3.			
4.			
5.			
	3	= Total Cover	
Herb Stratum (Plot size: 2m x 2m)			
1. Mes nod	20	Y	FAC
2. Mes cry	1	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	21	= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 79 % Cover of Biotic Crust 0

50/20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: Data station located on inside slope of levee.
* Shrub cover <5% = doesn't count as vegetated layer

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3	—		—				Sand	Sand & shells
3-16	10YR 4/1	99	10YR 3/6	1	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ✓ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 16

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon Salt Ponds City/County: ______ Sampling Date: 3-13-13

Applicant/Owner: ______ State: ______ Sampling Point: 2

Investigator(s): AZT & KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ______	Is the Sampled Area within a Wetland? Yes ______ No ✓
Hydric Soil Present?	Yes ✓ No ______	
Wetland Hydrology Present?	Yes ______ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. Atr. lind	5	Y	N/I
2. Sueda ester	2	N	FACW
3. Sar pac	5	Y	OBL
4. Fran sal	10	Y	FACW
5.			
= Total Cover	22		
Herb Stratum (Plot size: ______)			
1.			
2. Bat mar	30	Y	OBL
3. Mes nod	5	N	FAC
4.			
5.			
6.			
7.			
8.			
= Total Cover	45		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 4/4	100	—				sandy loam	
2-7	10YR 3/1	99	7.5 YR 3/4	1	C	M	"	
7-12	2.5YR 4/3	98	7.5 YR 4/6	2	C	M	sand	
12-16	7.5YR 2.5/1	100	—				clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply) NONE

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: 3-13-13

Applicant/Owner: ______ State: ______ Sampling Point: 3

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______ No ✓	Is the Sampled Area within a Wetland?	Yes ______ No ✓
Hydric Soil Present?	Yes ✓ No ______		
Wetland Hydrology Present?	Yes ______ No ✓		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks: No veg. Sample point is on edge of road above concrete rubble on inside slope of pond levee.

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	—							road base - sand/gravel
* 2-16	10YR 3/1	98	10YR 4/6	2	C	M	clay loam	dredged bay mud
2-16	2.5YR 5/2	99	10YR 5/8	1	C	M	clay loam	"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:
* dredged bay mud, with shells and heterogeneous strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply) NONE

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: 3-13-13

Applicant/Owner: ______ State: ______ Sampling Point: 4

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? NO Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ______	Is the Sampled Area within a Wetland? Yes ✓ No ______
Hydric Soil Present?	Yes ✓	No ______	
Wetland Hydrology Present?	Yes ✓	No ______	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. Sar pac	80	Y	OBL
2. Fra sal	10	N	FACW
3.			
4.			
5.			
= Total Cover	90		
Herb Stratum (Plot size: ______)			
1. Lim cal	1	N	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 99 % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks:
Sample point in pickleweed marsh on Bay side of levee.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	75	5YR 4/6	25	C	M	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): —

Water Table Present? Yes ✓ No ___ Depth (inches): 5

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 2

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: 3-13-13

Applicant/Owner: ______ State: ______ Sampling Point: 5

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? NO Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. Sar ~~[illegible]~~ pac	40	Y	OBL
2. Fra sal	30	Y	FACW
3.			
4.			
5.			
= Total Cover	70		
Herb Stratum (Plot size: ______)			
1. Lim cal	40	Y	FACW
2. Triglochin concinna	5	N	OBL
3. Batis mar	1	N	OBL
4.			
5.			
6.			
7.			
8.			
= Total Cover	46		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 54 % Cover of Biotic Crust ______

Remarks:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Sandy clay	
2-10	10YR 4/2	97	5YR 4/6	3	C	M	Sand	
10-16	10YR 4/2	80	7.5YR 5/8	20	C	M	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 15

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 10

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: ______

Applicant/Owner: ______ State: ______ Sampling Point: 6

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? yes Are "Normal Circumstances" present? Yes ______ No ✓

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______ No ✓	Is the Sampled Area within a Wetland? Yes ______ No ______
Hydric Soil Present?	Yes ✓ No ______	
Wetland Hydrology Present?	Yes ______ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	______ = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	______ = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust ∅

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

Sampling point is on a berm w/in salt ponds. Berm was created by recent dredging.

Sampling Point: 6

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	—	—	—	—	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ✓ No ___

Remarks:

Dredged mud from salt ponds. Heterogeneous Strata & discombobulated texture/constituents.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: 3-13-13

Applicant/Owner: ______ State: ______ Sampling Point: 7

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______ No ✓	Is the Sampled Area within a Wetland? Yes ______ No ✓
Hydric Soil Present?	Yes ______ No ✓	
Wetland Hydrology Present?	Yes ______ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

On levee @ road edge - unvegetated

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 5/4	100	—	—	—	—	Sandy loam	- road fill - gravel/sand
8 = bottom of pit due to heavily compacted rock layer								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Above high tide elevation

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: 3-13-13
Applicant/Owner: ______ State: ______ Sampling Point: 8
Investigator(s): ______ Section, Township, Range: ______
Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______
Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______
Soil Map Unit Name: ______ NWI classification: ______
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)
Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? yes Are "Normal Circumstances" present? Yes ______ No ✓
Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ______
Hydric Soil Present?	Yes ✓	No ______
Wetland Hydrology Present?	Yes ______	No ✓

Is the Sampled Area within a Wetland? Yes ______ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1. Mes nod	90	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover	90		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks:
On levee between salt ~~between~~ ponds.

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 5/3	100					Sand	
6-16	10YR 3/2	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: 3-13-13

Applicant/Owner: ______ State: ______ Sampling Point: 9

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? ✓ Are "Normal Circumstances" present? Yes ______ No ✓

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______ No ✓	Is the Sampled Area within a Wetland? Yes ______ No ✓
Hydric Soil Present?	Yes ✓ No ______	
Wetland Hydrology Present?	Yes ✓ No ______	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	______ = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	______ = Total Cover		

% Bare Ground in Herb Stratum ______ % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

No veg. on inside edge of levee of salt pond

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/2	100	—	—	—	—	silty sand	
6-16	2.5Y 3/1	100	—	—	—	—	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13) shells
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon- Salt Ponds City/County: ______ Sampling Date: 3-13-13

Applicant/Owner: ______ State: ______ Sampling Point: 10

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Y Are "Normal Circumstances" present? Yes ______ No ✓

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ______	Is the Sampled Area within a Wetland? Yes ______ No ✓
Hydric Soil Present?	Yes ______ No ✓	
Wetland Hydrology Present?	Yes ______ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. Sua est	5	Y	FACW
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1. Mes nod	20	Y	FAC
2. Amb pus	4	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 76 % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks:
Sample location is on upper edge of salt pond levee next to access road.

Sampling Point: 10

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5Y 3/3	100	—	—	—	—	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___________

Depth (inches): ___________

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply) NONE

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___
Water Table Present? Yes ___ No ___ Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon – Salt Ponds City/County: ______ Sampling Date: 3-B-13

Applicant/Owner: ______ State: ______ Sampling Point: 11

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? NO Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ______	Is the Sampled Area within a Wetland?	Yes ✓ No ______
Hydric Soil Present?	Yes ✓ No ______		
Wetland Hydrology Present?	Yes ✓ No ______		

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. Sar pac	50	Y	OBL
2. Fra sal	10	N	FACW
3. Sue est	2	N	FACW
4.			
5.			
= Total Cover	62		
Herb Stratum (Plot size: ______)			
1. Tri con	1	N	OBL
2. Bat mar	1	N	OBL
3. Sal big	5	Y	OBL
4.			
5.			
6.			
7.			
8.			
= Total Cover	7		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ______ % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks:
Sampling location is in salt marsh habitat along the otay River channel.

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	2.5Y 4/1	85	5Y 4/6	15	C	M		
7-16	5Y 3/1	97	5Y 4/6	3	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✓	
Water Table Present?	✓		14
Saturation Present? (includes capillary fringe)	✓		8

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon – Salt Ponds City/County: ______ Sampling Date: 3-13-13

Applicant/Owner: ______ State: ______ Sampling Point: 12

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? yes Are "Normal Circumstances" present? Yes ______ No ✓

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No ✓
Hydric Soil Present?	Yes ✓	No ______
Wetland Hydrology Present?	Yes ______	No ✓

Is the Sampled Area within a Wetland? Yes ______ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	______ = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	______ = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

No veg.

Sampling location is on levee btwn salt ponds. Next to road

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	N/A	—	—				Sand	road base
2-16	5Y 2.5/1	95	2.5YR 3/6	5	C	M	Sandy	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

Dredged bay mud.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: 3-13-13

Applicant/Owner: ______ State: ______ Sampling Point: 13

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? y Are "Normal Circumstances" present? Yes ______ No ✓

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No ✓	Is the Sampled Area within a Wetland? Yes ______ No ✓
Hydric Soil Present?	Yes ✓	No ______	
Wetland Hydrology Present?	Yes ______	No ✓	

Remarks: dredged bay mud.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1. Mes nod	3	N/A	FAC
2. ~~Mat~~			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover	3		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 97 % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: Ø (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:
Herb strata <5% so doesn't count as a strata.
Sampling location is on top of levee between ponds.

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5Y 3/1	100	—				silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ✓ No ____

Remarks:

dredged soil. No distinct strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Shells from dredged material are not natural at location

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: ______
Applicant/Owner: ______ State: ______ Sampling Point: 14
Investigator(s): ______ Section, Township, Range: ______
Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______
Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______
Soil Map Unit Name: ______ NWI classification: ______
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)
Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ______
Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ______	Is the Sampled Area within a Wetland? Yes ______ No ✓
Hydric Soil Present?	Yes ✓ No ______	
Wetland Hydrology Present?	Yes ______ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. Sue est	5	Y	FACW
2. Sar pac	5	Y	OBL
3.			
4.			
5.			
= Total Cover	10		
Herb Stratum (Plot size: ______)			
1. Bat mar	50	Y	OBL
2. Son ole	2	N	NI
3. Malva par	1	N	NI
4. Mes nod	5	N	FAC
5. Atr semi	2	N	FAC
6. Hor mur	1	N	FACU
7.			
8.			
= Total Cover	61		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 39 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks:

SOIL

Sampling Point: 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	100	—				loam	
4-10	2.5YR 2.5/1	100	—				clay loam	
10-16	5Y 4/2	100	—				sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: ______ Sampling Date: 3-13-13
Applicant/Owner: ______ State: ______ Sampling Point: 15
Investigator(s): ______ Section, Township, Range: ______
Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______
Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______
Soil Map Unit Name: ______ NWI classification: ______
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)
Are Vegetation ______, Soil ✓, or Hydrology ✓ significantly disturbed? Y Are "Normal Circumstances" present? Yes ______ No ✓
Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No ✓	**Is the Sampled Area within a Wetland?** Yes ______ No ✓
Hydric Soil Present?	Yes ✓	No ______	
Wetland Hydrology Present?	Yes ✓	No ______	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

Sampling point on inside slope of salt pond levee. Unvegetated.

SOIL

Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	5Y 3/1	97	10YR 3/4	3	C	M	silty clay	
8-16	5Y 2.5/1	100	—	—	—	—	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 15

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 12

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX C

Site 3 Access Routes Study Area – Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP   City/County: San Diego, San Diego   Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources   State: CA   Sampling Point: C1

Investigator(s): Andy Thomson   Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel   Local relief (concave, convex, none): concave   Slope (%): 0-20

Subregion (LRR): C - Mediterranean California   Lat: 32°3 5'29.95 "N   Long: 117°5'46.02W   Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed?   Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? **Yes** (●) **No** ( )

Remarks: Sampling point is located at edge of FWM habitat along the Otay River channel.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Heliotropium currassivicum*	30	Yes	FACU
2. *Schoenoplectus californica*	50	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	80 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 %   % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species	30	x 4 =	120
UPL species		x 5 =	0
Column Totals:	80 (A)		170 (B)

Prevalence Index = B/A = 2.13

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks:

SOIL

Sampling Point: C1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-6	7.5 YR 4/2	95	2.5 YR 4/8	5	C	M	clay loam	
6-16	10 YR 4/1	95	2.5 YR 4/8	5	C	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks: The soils exhibit low chroma, with Redox features.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☒ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ◉	No ○	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 6

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data pit began to slowly fill approximately half way with water during analysis.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP City/County: San Diego, San Diego Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources State: CA Sampling Point: C2

Investigator(s): Andy Thomson Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°3 5'29.95 "N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? **Yes** ( ) **No** (●)

Remarks: Sampling point is located in MFS along outer edge of the Otay River channel.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	80	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	80 %		
Herb Stratum			
1. *Ambrosia psilostachya*	30	Yes	FACU
2. *Glebionis coronaria*	30	Yes	Not Listed
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	60 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 40 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	33.3 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	80	x 3 =	240
FACU species	30	x 4 =	120
UPL species	30	x 5 =	150
Column Totals:	140 (A)		510 (B)

Prevalence Index = B/A = 3.64

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ( ) **No** (●)

Remarks:

SOIL

Sampling Point: C2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	10 YR 3/2	100	none				clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C3

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): floodplain terrace | Local relief (concave, convex, none): none | Slope (%): 0-5

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks: Sampling point is located in restoration area along bike path.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	20	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	20 %		
Herb Stratum			
1. *Heliotropium currassivicum*	80	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	80 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	20	x 3 =	60
FACU species	80	x 4 =	320
UPL species		x 5 =	0
Column Totals:	100 (A)		380 (B)

Prevalence Index = B/A = 3.80

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: C3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	7.5 YR 3/3	100	none				clay loam	
4-5	5 YR 3/4	100	none				clay	moist from irrigation
5-16	10 YR 3/2	100	none				clay loam	moist from irrigation

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ●

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):
Water Table Present? Yes ○ No ● Depth (inches):
Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP City/County: San Diego, San Diego Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources State: CA Sampling Point: C4

Investigator(s): Andy Thomson Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): floodplain terrace Local relief (concave, convex, none): none Slope (%): 0-5

Subregion (LRR): C - Mediterranean California Lat: 32°3 5'29.95 "N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)
Hydric Soil Present?	Yes ( )	No (●)
Wetland Hydrology Present?	Yes ( )	No (●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks: Sampling point is located in MFS that was existing prior to implementation of floodplain restoration that surrounds this habitat.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	80	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	80 %		
Herb Stratum			
1. *Heliotropium currassivicum*	2	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	2 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 98 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	80	x 3 =	240
FACU species	2	x 4 =	8
UPL species		x 5 =	0
Column Totals:	82 (A)		248 (B)

Prevalence Index = B/A = 3.02

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: The vegetation at this location was present prior to restoration implementation.

SOIL

Sampling Point: C4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	10 YR 3/2	100	none				clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: None

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Adjacent areas are irrigated for floodplain restoration site.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP City/County: San Diego, San Diego Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources State: CA Sampling Point: C5

Investigator(s): Andy Thomson Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): floodplain terrace Local relief (concave, convex, none): none Slope (%): 0-5

Subregion (LRR): C - Mediterranean California Lat: 32°3 5'29.95 "N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☒ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	(●)	( )
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)

Is the Sampled Area within a Wetland? **Yes** ( ) **No** (●)

Remarks: Sampling point is located in floodplain restoration site between two rows of planted and irrigated shrubs and trees.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix gooddingii*	5	Yes	FACW
2. *Salix lasiolepis*	10	Yes	FACW
3. *Populus fremontii*	5	Yes	Not Listed
4.			
Total Cover:	20 %		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	20	Yes	FAC
2. *Sambucus nigra*	5	No	FAC
3. *Salix exigua*	5	No	FACW
4. *Isocoma menziesii*	5	No	FAC
5. *Rosa californica*	2	No	FAC
Total Cover:	37 %		
Herb Stratum			
1. *Heliotropium currassivicum*	2	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	2 %		
Woody Vine Stratum			
1. *Rubus ursinus*	2	Yes	FACU
2. *Vitis girdiana*	1	Yes	FAC
Total Cover:	3 %		

% Bare Ground in Herb Stratum 98 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57.1 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	20	x 2 =	40
FAC species	33	x 3 =	99
FACU species	4	x 4 =	16
UPL species	5	x 5 =	25
Column Totals:	62 (A)		180 (B)

Prevalence Index = B/A = 2.90

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks: The vegetation at this location was planted as part of the floodplain restoration project. All of the native vegetation is being actively irrigated with drip lines.

SOIL

Sampling Point: C5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-16	10 YR 3/2	100	none				clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: None. Soil is poorly developed and homogeneous from previous agricultural cultivation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators present. Area is actively irrigated for floodplain restoration. Soils are moist below about 2 inches from the irrigation.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C6

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-5

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? **Yes** (●) **No** ( )

Remarks: Sampling point is located in channel north of bike path.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Heliotropium currassivicum*	2	No	FACU
2. *Sarcoconia pacifica*	50	Yes	OBL
3. *Distichlis spicata*	5	No	FAC
4. *Limonium californicum*	5	No	FACW
5. *Ambrosia psilostachya*	5	No	FACU
6. *Pluchea odorata*	2	No	FACW
7. *Atriplex prostrata*	2	No	FACW
8.			
Total Cover:	71 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 29 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	9	x 2 =	18
FAC species	5	x 3 =	15
FACU species	7	x 4 =	28
UPL species		x 5 =	0
Column Totals:	71 (A)		111 (B)

Prevalence Index = B/A = 1.56

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** (●) **No** ( )

Remarks: Vegetation is salt marsh. The vegetation community covers the bottom of the channel (there is no active flow path).

SOIL

Sampling Point: C6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-1	10 YR 2/2	100	none				sandy clay	
1-2	10 YR 4/3	90	2.5 YR 3/6	10	C	M	sand	
2-6	10 YR 4/2	80	2.5 YR 3/6	20	C	M	sand	
6-7	2.5 YR 5/4	100	none				clay	
7-11	10 YR 3/2	90	2.5 YR 3/6	10	C	M	sandy clay	
11-16	10 YR 4/1	100	none				clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ◉ **No** ○

Remarks: Sandy redox at 2-6 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☒ Sediment Deposits (B2) (**Riverine**)
- ☒ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):
Water Table Present? Yes ○ No ◉ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sampling point is within a defined channel. The bottom of the channel is more swale like: fully vegetated with no active flow path.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C7

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	( )	(●)
Hydric Soil Present?	( )	(●)
Wetland Hydrology Present?	( )	(●)
Is the Sampled Area within a Wetland?	( )	(●)

Remarks: Sampling point is located in MFS on inner side slope of perimeter berm along channel.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	90	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	90 %		
Herb Stratum			
1. *Heliotropium currassivicum*	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	5 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 95 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species	90	x 3 = 270
FACU species	5	x 4 = 20
UPL species		x 5 = 0
Column Totals:	95 (A)	290 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks:

SOIL

Sampling Point: C7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	10 YR 3/3	100	none				loam	on berm

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: Sampling point is on berm next to channel. Soil is poorly developed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators.

APPENDIX D

Otay River/Pond 20 Study Area –
Preliminary Jurisdictional Determination Form

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Los Angeles District | File/ORM #: SPL-2011-00743-PJB | PJD Date: Oct 15, 2012

State: CA | City/County: Chula Vista, San Diego

Nearest Waterbody: Otay River and San Diego Bay

Location: TRS, LatLong or UTM: longitude 117°5'46.02" W and latitude 32°35'29.95" N

Name/ Address of Person Requesting PJD:
Stan Williams
Poseidon Resources
501 West Broadway, Suite 2020
San Diego, CA 92101

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 9,000 linear ft | 60 width | 7.08 acres | Stream Flow: Perennial

Wetlands: 8.23 acre(s) | Cowardin Class: Estuarine

Name of Any Water Bodies on the Site Identified as Section 10 Waters:
Tidal: Otay River and Nestor Creek merging into SD Bay
Non-Tidal:

☐ Office (Desk) Determination
☑ Field Determination: Date of Field Trip: multiple dates; see bo

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Dudek JD Report
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☑ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☑ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite quad name:
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Websoil Survey: websoilsurvey.nrcs.usda.gov
- ☑ National wetlands inventory map(s). Cite name: NWI website: www.fws.gov/wetlands
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): NAIP 2009
  - ☑ Other (Name & Date): Field photos in JD report: 2011
- ☐ Previous determination(s). File no. and date of response letter:
- ☑ Other information (please specify): Historic T Sheet Section 10

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

10/31/2012
Signature and Date of Regulatory Project Manager
(REQUIRED)

Signature and Date of Person Requesting Preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:
1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.
2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office: Los Angeles District File/ORM # SPL-2011-00743-PJB PJD Date: Oct 15, 2012

State: CA City/County: Chula Vista/ San Diego Person Requestinq PJD: Stan Williams (Poseidon Resources)

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
1	32°35'34.34" N	117°5'46.34" W	Riverine	1.28 acres	Non-Section 10 wetland
2	32°35'33.46" N	117°5'52.18" W	Estuarine	6.07 acres	Non-Section 10 wetland
3	32°35'27.91" N	117°5'54.36" W	Estuarine	0.89 acre	Non-Section 10 wetland
4	32°35'27.91" N	117°5'54.36" W	Estuarine	3.46 acres	Non-Section 10 non-wetlanc
5	32°35'41.06" N	117°5'34.95" W	Riverine	0.31 acre	Non-Section 10 wetland
6	32°35'32.56" N	117°5'55.56" W	Estuarine	3.31 acres	Section 10 tidal

Notes:

Initial field work conducted by Dudek on February 22, 2011 and July 20, 2011, followed by field work conducted by ACOE August 1 through August 8, 2012.

Site #1 = Cismontane alkali marsh
Site #2 = Salt marsh associated with Otay River and Nestor Creek channels
Site #3 = Wetlands within Salt Pond 20
Site #4 = Non-wetlands within Salt Pond 20
Site #5 = Fresh water marsh on Otay River upstream of tidal influence
Site #6 = Brackish water of Otay River and Nestor Creek tidal channels

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: County of San Diego, DPW		File Number: SPL-2011-00980-MBS	Date:
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
	APPROVED JURISDICTIONAL DETERMINATION		D
X	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/cecw/pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

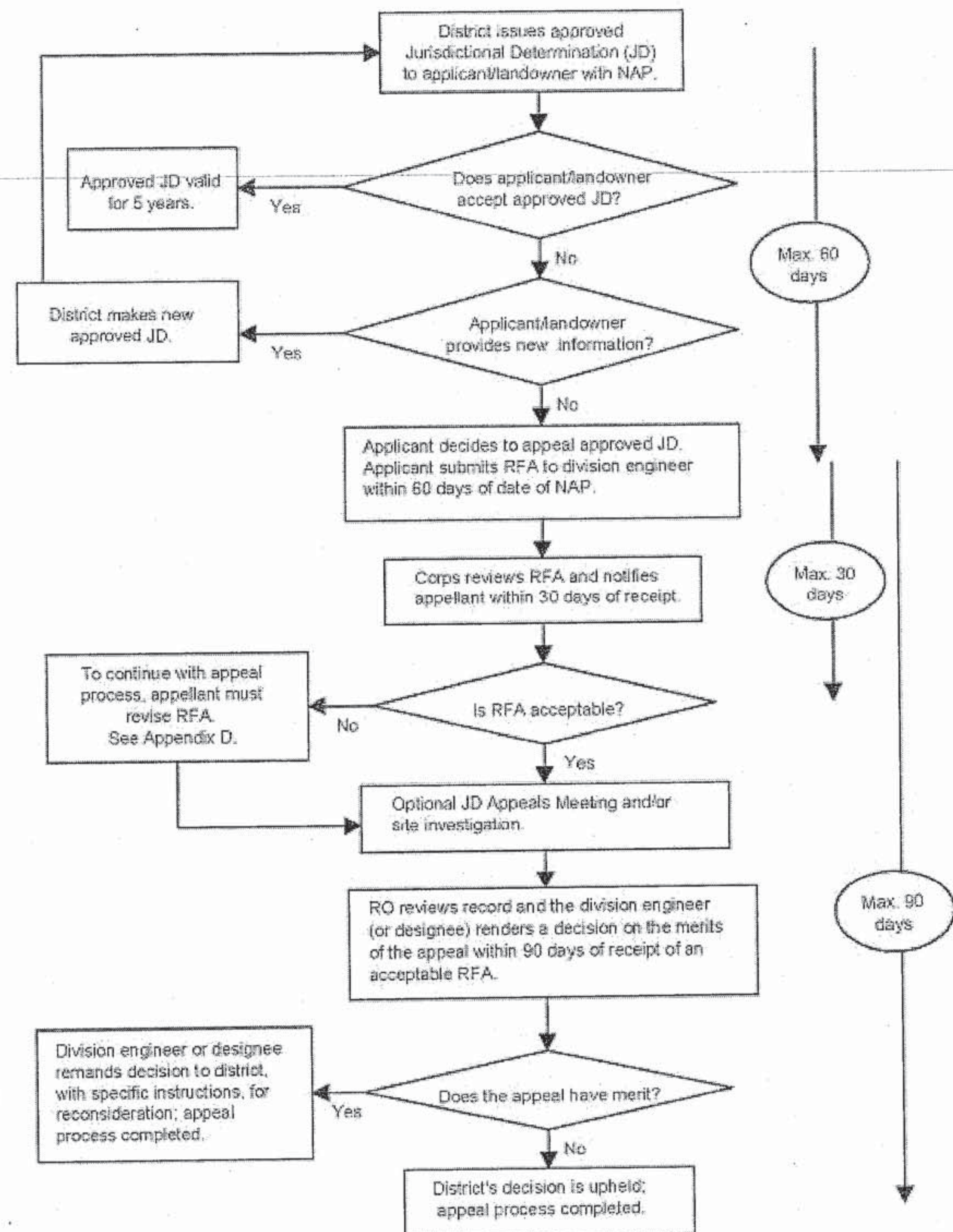
C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

Administrative Appeal Process for Approved Jurisdictional Determinations



Appendix C

APPENDIX E

Ponds 12-15 Study Area –
Preliminary Jurisdictional Determination Form

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT CORPS OF ENGINEERS
REGULATORY DIVISION, CARLSBAD FIELD OFFICE
5900 LA PLACE COURT, SUITE 100
CARLSBAD, CA 92008

November 12, 2013

REPLY TO
ATTENTION OF
Regulatory Division

Mr. Stan Williams
Poseidon Resources
5780 Fleet Street, Suite 140
Carlsbad, CA 92008

SUBJECT: Preliminary Jurisdictional Determination regarding presence/absence of geographic jurisdiction

Dear Mr. Williams:

Reference is made to your request (File No. SPL-2011-00743-MBS) dated July 10, 2013, for a preliminary Department of the Army (DA) jurisdictional determination (JD) for the Poseidon Salt Marsh Restoration Site Ponds 12-15 located in the City of Chula Vista, San Diego County, California (Latitude 32.60321, Longitude -117.10728). As part of the evaluation process, we have made the jurisdictional determination below.

As you may know, the U.S. Army Corps of Engineers' (Corps) evaluation process for determining whether or not a DA permit is needed involves two tests. If both tests are met, then a permit is required. The first test determines whether or not the proposed project is located in a water of the U.S. (i.e., it is within the Corps' geographic jurisdiction). The second test determines whether or not the proposed project is a regulated activity under section 10 of the Rivers and Harbors Act or section 404 of the Clean Water Act (CWA). As part of the evaluation process, pertaining to the first test only, we have made the jurisdictional determination below.

Based on available information, it appears waters of the U.S. may be present on the Poseidon Salt Marsh Restoration Site Ponds 12-15 in the approximate locations noted on the enclosed drawings. The basis for the preliminary JD can be found on the enclosed "Preliminary Jurisdictional Determination Form." Please note preliminary JDs are non-binding ". . . written indications that there may be waters of the United States, including wetlands, on a parcel or indications of the approximate location(s) of waters of the United States or wetlands on a parcel. Preliminary JDs are advisory in nature and may not be appealed" (33 CFR 331.2.). The permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved JD for this site. The option to obtain an approved JD in this instance and at this time has been declined. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all potential waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S.

Please be reminded that preliminary JDs may not be appealed through the Corps' administrative appeal process set out at 33 CFR Part 331. Preliminary jurisdictional determinations are fully explained in the enclosed Regulatory Guidance Letter 08-02, dated June 26, 2008. Further, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 CFR Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 CFR 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

This determination has been conducted to identify the extent of the Corps' CWA jurisdiction on the Poseidon Salt Marsh Restoration Site Ponds 12-15 identified in your request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

If you have any questions, please contact me at 760-602-4836 or via e-mail at Meris.Bantilan-Smith@usace.army.mil.

Please be advised that you can now comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at: http://per2.nwp.usace.army.mil/survey.html.

Sincerely,

Meris Bantilan-Smith

Meris Bantilan-Smith
Senior Project Manager
South Coast Branch

Enclosures

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Los Angeles District
File/ORM #: SPL-2011-00743-MBS
PJD Date: Nov 8, 2013

State: CA
City/County: Chula Vista/San Diego

Nearest Waterbody: San Diego Bay

Location: TRS, LatLong or UTM: 32.60321 N, -117.10728 W

Name/Address of Person Requesting PJD:
Stan Williams
Poseidon Resources
5780 Fleet Street, Suite 140
Carlsbad, CA 92008

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 291.14 linear ft, width, acres; Stream Flow: Perennial

Wetlands: 8.12 acre(s); Cowardin Class: Estuarine

Name of Any Water Bodies on the Site Identified as Section 10 Waters:
Tidal: San Diego Bay, Otay River, Palomar Street Chann
Non-Tidal:

☐ Office (Desk) Determination
☑ Field Determination: Date of Field Trip: Nov 4, 2013

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: See notes.
☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 ☑ Office concurs with data sheets/delineation report.
 ☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps
☐ Corps navigable waters' study:
☐ U.S. Geological Survey Hydrologic Atlas:
 ☐ USGS NHD data.
 ☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite quad name:
☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Websoil Survey: websoilsurvey.nrcs.usda.gov
☑ National wetlands inventory map(s). Cite name: NWI website: www.fws.gov/wetlands
☐ State/Local wetland inventory map(s):
☐ FEMA/FIRM maps:
☐ 100-year Floodplain Elevation is:
☑ Photographs: ☑ Aerial (Name & Date): NAIP 2009
 ☑ Other (Name & Date): Field photos in JD report: 2013
☐ Previous determination(s). File no. and date of response letter:
☑ Other information (please specify): See notes.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Muris Bath Jr 11/12/13
Signature and Date of Regulatory Project Manager
(REQUIRED)

[signature] 11/11/2013
Signature and Date of Person Requesting Preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1 The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2 In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office: Los Angeles District   File/ORM #: SPL-2011-00743-MBS   PJD Date: Nov 8, 2013

State: CA   City/County: Chula Vista/San Diego   Person Requesting PJD: Stan Williams (Poseidon Resources)

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
1	32°36'17.31"N	117° 6'23.71"W	Estuarine	0.89	Section 10 tidal
2	32°35'49.08"N	117° 6'54.03"W	Estuarine	1.69	Section 10 tidal
3	32°36'28.07"N	117° 6'10.83"W	Estuarine	18.16	Non-Section 10 non-wetlanc
4	32°36'19.35"N	117° 6'10.55"W	Estuarine	270.42	Section 10 tidal
5	32°36'42.85"N	117° 6'5.05"W	Estuarine	8.12	Non-Section 10 wetland

Notes:

Site #1 = Beach (associated with the open bay side of the salt pond levees)
Site #2 = Brackishwater (associated with the tidal channels in the Otay River and Palomar Channel)
Site #3 = Salt Pond Levee (area on the salt pond side of the salt pond levees above mean high tide level)
Site #4 = Open Water (includes both the open water in the salt ponds and open water in the bay)
Site #5 = Southern Coastal Salt Marsh and disturbed Southern Coastal Salt Marsh above mean high tide level (salt marsh habitat associated with the tidal channels and the bay side of the shoreline along the salt pond levees)

July 10, 2013. Results of a Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Proposed Poseidon Salt Marsh Restoration Site, City of Chula Vista, California.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Stan Williams, Poseidon Resources	File Number: SPL-2011-00473-MBS	Date: November 12, 2013

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

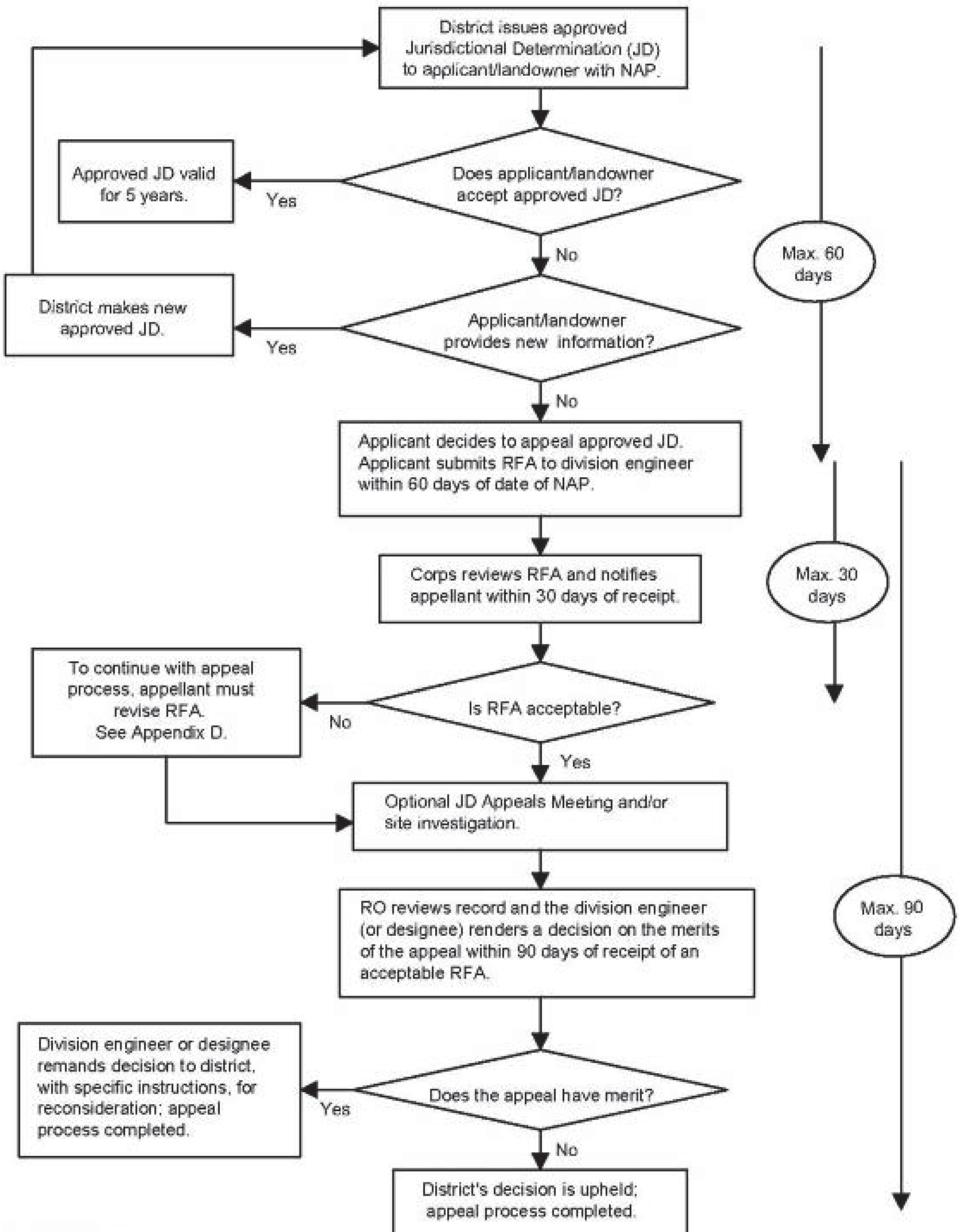
POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
DISTRICT ENGINEER Los Angeles District, Corps of Engineers ATTN: Chief, Regulatory Division P.O. Box 532711 Los Angeles, CA 90053-2325 Tel. (213) 452-3425	DIVISION ENGINEER South Pacific Division, Corps of Engineers Attn: Tom Cavanaugh Administrative Appeal Review Officer South Pacific Division, CESPD-PDS-O, 2052B 1455 Market Street, San Francisco, California 94103-1399 Phone: (415) 503-6574 Fax: (415) 503-6646 Email: thomas.j.cavanaugh@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
______________________________ Signature of appellant or agent.		

Administrative Appeal Process for Approved Jurisdictional Determinations



Appendix C

DUDEK

6758-01

SOURCE: NAIP 2009

FIGURE 3

Vegetation Communities with Jurisdictional Delineation

Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Poseidon Salt Marsh Restoration Site

DUDEK

6758-01

SOURCE: NAIP 2009

FIGURE 3a

Vegetation Communities with Jurisdictional Delineation

Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Poseidon Salt Marsh Restoration Site

DUDEK

6758-01

SOURCE: NAIP 2009

FIGURE 3b

Vegetation Communities with Jurisdictional Delineation

Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Poseidon Salt Marsh Restoration Site

DUDEK

6758-01

SOURCE: NAIP 2009

FIGURE 3c

Vegetation Communities with Jurisdictional Delineation

Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Poseidon Salt Marsh Restoration Site

APPENDIX F

Site 3 Access Routes Study Area – Preliminary Jurisdictional Determination Form

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Los Angeles District | File/ORM #: SPL-2011-00743 | PJD Date: May 27, 2014

State: CA | City/County: Chula Vista/ San Diego

Nearest Waterbody: Otay River and San Diego Bay

Location: TRS, LatLong or UTM: longitude 117°5'46.02" W and latitude 32°35'29.95" N

Name/ Address of Person Requesting PJD: Stan Williams (Poseidon Resources)
5780 Fleet St. Ste. 140
Carlsbad, CA 92008

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 1,000 linear ft | 50 width | 4.85 acres | Stream Flow: Perennial

Wetlands: 3.04 acre(s) | Cowardin Class: Estuarine

Name of Any Water Bodies on the Site Identified as Section 10 Waters:
Tidal: Palomar Channel, salt ponds, San Diego Bay
Non-Tidal:

☐ Office (Desk) Determination
☑ Field Determination: Date of Field Trip: May 27, 2014

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Dudek JD Report
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite quad name:
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Websoil Survey: websoilsurvey.nrcs.usda.gov
- ☑ National wetlands inventory map(s). Cite name: NWI website: www.fws.gov/wetlands
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): Bing 2014
  ☑ Other (Name & Date): Field photos in JD report; May 27, 2014
- ☐ Previous determination(s). File no. and date of response letter:
- ☑ Other information (please specify): Historic T Sheet Section 10

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager
(REQUIRED)

Signature and Date of Person Requesting Preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office: Los Angeles District | File/ORM #: SPL-2011-0000743 | PJD Date: May 27, 2014

State: CA | City/County: Chula Vista/ San Diego | Person Requestinq PJD: Stan Williams (Poseidon Resources)

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
1	32°35'40" N	117°5'33" W	Riverine	0.85 Acres	Non-Section 10 wetland
2	32°35'14" N	117°6'14" W	Estuarine	0.07	Non-Section 10 non-wetland
3	32°36'18" N	117°5'49" W	Estuarine	0.14	Section 10 tidal
4	32°36'46" N	117°5'58" W	Estuarine	0.76	Non-Section 10 non-wetland
5	32°36'16" N	117°5'50" W	Estuarine	3.88	Section 10 tidal
6	32°36'18" N	117°5'47" W	Estuarine	2.19	Non-Section 10 wetland

Notes:

Site #1 = Freshwater marsh on Otay River and salt marsh in tributary channel upstream of tidal influence
Site #2 = Non-wetlands within Salt Pond 20
Site #3 = Palomar Street channel brackish water tidal channel
Site #4 = Salt pond levee (levee slope on the salt pond side of the salt pond levees)
Site #5 = Open water in salt ponds and in San Diego Bay at tie-in point for restoration site
Site #6 = Southern coastal salt marsh along Palomar Street channel

APPENDIX C

California Gnatcatcher Survey Report

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 23, 2011 6758-01

U.S. Fish and Wildlife Service
Attention: Recovery Permit Coordinator
6010 Hidden Valley Road
Carlsbad, California 92009

Subject: 2011 Focused Presence-Absence California Gnatcatcher Survey Report for the Poseidon Desalination Project Mitigation Site, City of San Diego, California. Permit No. TE-781084

Dear Recovery Permit Coordinator:

This report documents the results of three protocol-level presence/absence surveys for the coastal California gnatcatcher (*Polioptila californica californica;* CAGN), which were conducted at the approximately 100-acre Poseidon Desalination Project Mitigation site by a Dudek biologist in March and April 2011. The surveys were conducted in all areas of suitable habitat.

The CAGN is a federally listed threatened species and a California Department of Fish and Game species of special concern. It is closely associated with coastal sage scrub habitat and typically occurs below 950 feet elevation and on slopes less than 40% (Atwood 1990), but CAGN have been observed at elevations greater than 2,000 feet. The species is threatened primarily by loss, degradation, and fragmentation of coastal sage scrub habitat and is also impacted by brown-headed cowbird (*Molothrus ater*; cowbird) nest parasitism.

LOCATION AND EXISTING CONDITIONS

The proposed Poseidon Desalination Project mitigation site occupies approximately 100 acres of the South Bay unit of the San Diego Bay National Wildlife Refuge in the City of San Diego (City). The site is located north of Palm Avenue, south of the Salt Works, west of Interstate 5, and east of the developed area of Imperial Beach (Figures 1 and 2). The property is situated centrally within the U.S. Geological Survey 7.5-minute Imperial Beach quadrangle, T18S, R2W; Section 21 (Figure 2).

Land use within the approximately 100-acre mitigation site is currently as a national wildlife refuge that is owned and managed by the U.S. Fish and Wildlife Service (USFWS). Thus, there is no development on site however there is passive recreational use by pedestrians and bike-riders as well as bird watchers. Some of the property appears to have been used for agriculture in the past due to the presence of weeds and lack of native plant species over a portion of the site. Surrounding land use includes undeveloped refuge lands to the east and south, the salt works to the north, and residential development to the west. Topography at the site is very flat and low elevation, just above sea level and some portions are at or below mean sea level and affected by tidal flows.

According to Bowman (1973), the project site supports predominantly three different soil types: Grangeville fine sandy loam, Visalia gravelly sandy loam, and riverwash. The Grangeville series consists of poorly drained, very deep fine sandy loams derived from granitic alluvium. These soils are on alluvial fans and alluvial plains. The Visalia series consists of moderately well drained, very deep sandy loams derived from granitic alluvium. These soils also are on alluvial fans and food plains. Riverwash occurs in intermittent stream channels. The material is typically sandy, gravelly or cobbly. It is excessively drained and rapidly permeable. Many areas are barren of vegetation or support scattered sycamores, coast live oaks, and sparse shrubs and forbs occur in patches.

VEGETATION COMMUNITIES

Based on species composition and general physiognomy, nine vegetation communities (or habitat types) were identified within the Poseidon Desalination Project Mitigation Site: *Isocoma* scrub, mulefat scrub, coastal and valley freshwater marsh, southern coastal salt marsh, cismontane alkali marsh, brackishwater channel, non-vegetated channel, saltpan/mudflat, and eucalyptus woodland. In addition, one land cover is located on site: disturbed habitat. The suitable habitat for the California gnatcatcher, *Isocoma* scrub and mulefat scrub, is described below, the acreages are presented in Table 1, and the configuration of the vegetation communities are shown in Figure 3.

The *Isocoma* scrub is dominated by coast goldenbush (*Isocoma menziesii*). The stands of *Isocoma* scrub vegetation community form a sparse to open shrub layer. The overall height varies from 0–3 feet tall and overall vegetation shrub cover is approximately 50%. The understory also contains cactus including *Opuntia littoralis.*

The mulefat scrub vegetation community is composed of fragmented patches of a continuous shrub layer where mulefat (*Baccharis salicifolia*) dominates. There are several patches of the vegetation community especially scattered in the eastern portion of the site. The vegetation community is virtually a monotypic stand that is tall (6 feet or taller) and dense.

Table 1
Vegetation Communities and Land Cover Types

Vegetation Community/Land Cover Type	Acreage
Isocoma Scrub	12.34
Mulefat Scrub	0.75
Coastal and Valley Freshwater Marsh	0.33
Southern Coastal Salt Marsh	6.17
Cismontane Alkali Marsh	1.32
Saltpan/Mudflats	6.60
Brackishwater Channel or Floodway	3.31
Non-vegetated Channel or Floodway	4.65
Eucalyptus Woodland	0.75
Disturbed Habitat	64.07
Grand Total	**100.29**

METHODS

Surveys were conducted under the authorization of permit TE-781084 (Dr. Anita M. Hayworth) according to the schedule provided in Table 2. The survey followed the most current protocol established by the U.S. Fish and Wildlife Service, *Coastal California Gnatcatcher (Polioptila californica californica) Presence/Absence Survey Protocol, July 28, 1997* (USFWS 1997).

Suitable habitat within the project was surveyed three times for the CAGN and included the *Isocoma* scrub and mulefat scrub habitats. Although these habitat types are not typically occupied by the gnatcatcher, the structure of the habitat is potentially suitable and the species is known to periodically forage in mulefat scrub. The route selected ensured complete coverage of all suitable habitat within the study area (Figure 3). A topographic map of the site (scale 1 inch = 100 feet) overlain with vegetation polygons was used for the survey. Weather conditions during surveys are provided in Table 2. Binoculars (10×50) were used to aid in detecting and identifying bird species. Taped gnatcatcher vocalizations were played frequently in order to elicit a response from the species, if present. The tape was played approximately every 50–100 feet within suitable habitat. If a gnatcatcher was to be detected, playing of the tape would cease in order to avoid harassment and the gnatcatcher location would be recorded on the site map.

Table 2
Schedule for California Gnatcatcher Survey

Date	Hours	Personnel	Focus	Conditions
3/16/2011	0800–1000	A.Hayworth	California gnatcatcher	58 F, clear, 0–1 mph wind
4/4/2011	00730–0930	A.Hayworth	California gnatcatcher	58–63 F, overcast, 0–1 mph wind
4/25/2011	0700–0900	A.Hayworth	California gnatcatcher	58–61 F; overcast; 0–1 mph wind

F = degrees Fahrenheit
mph = miles per hour

RESULTS

No California gnatcatchers were observed on site. The habitat is marginal in that it is not composed of the plant species typically used by the gnatcatcher. In addition, the habitat appears to have been planted or hydroseeded based on the composition. The habitat is relatively isolated from other patches of typical coastal sage scrub in the region however if the species dispersed to the Refuge, the habitat could be potentially suitable for occupation. Thirty species of birds were observed during the surveys of the site. A full list of bird species observed during the focused California gnatcatcher survey is provided in Appendix A.

I certify that the information in this survey report and attached exhibits fully and accurately represents my work. Please feel free to contact me at 760.479.4239 with questions or if you require additional information.

Sincerely,

Anita M. Hayworth, PhD
Senior Project Manager/Senior Biologist

Att: Figure 1, Regional Map
Figure 2, Vicinity Map
Figure 3, Biological Resources and Survey Route
Appendix A, Avian Species Observed or Detected During the Focused Survey

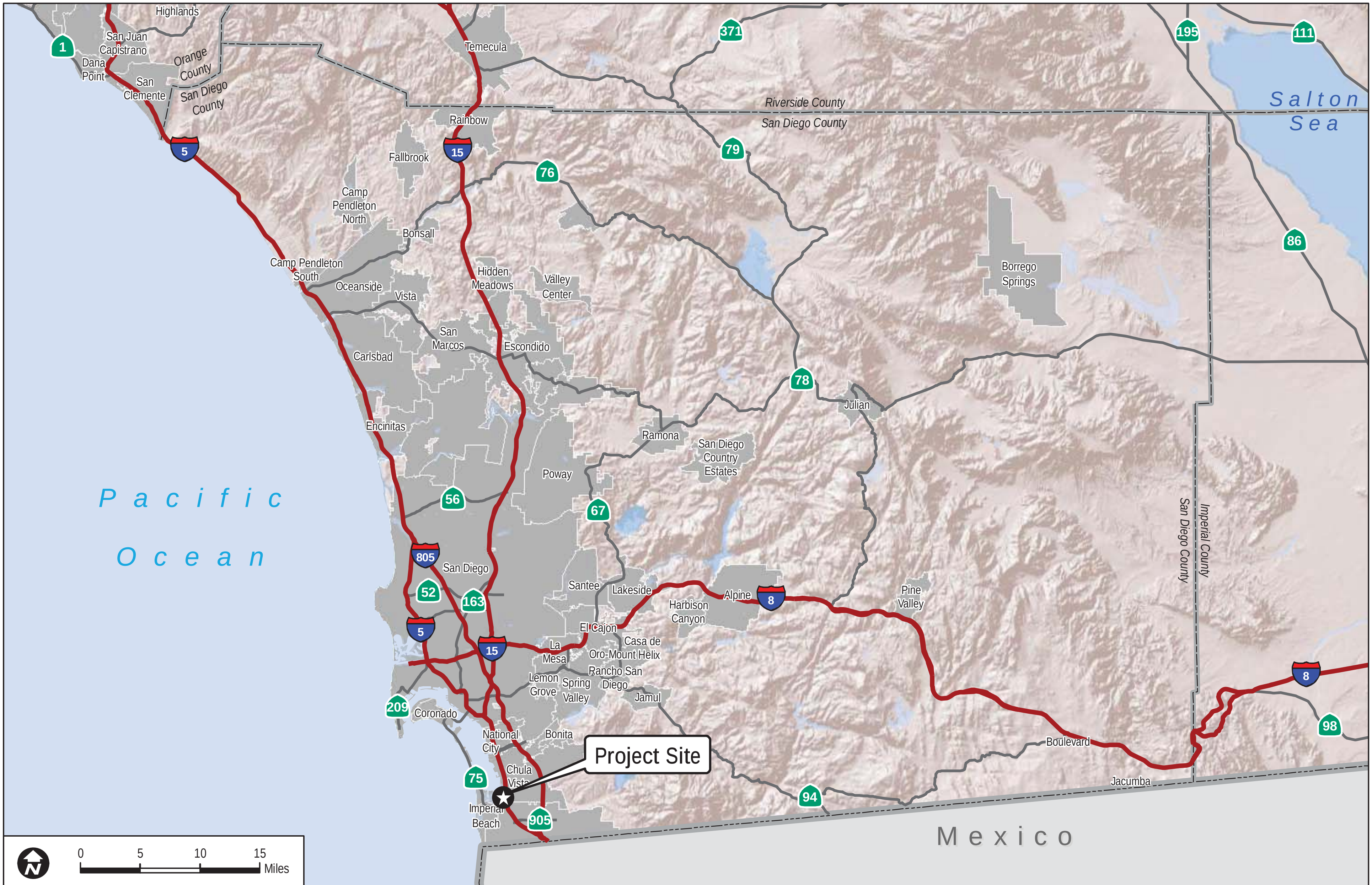
cc: Stan Williams, Poseidon
Brian Collins, USFWS
Joe Monaco, Dudek

REFERENCES

Atwood, J.L. 1990. *Status review of the California gnatcatcher (Polioptila californica).* Unpublished technical report, Manomet Bird Observatory, Manomet, Massachusetts. 79 pp.

Bowman, R.H. 1973. Soil Survey, San Diego Area, California, Part 1. United States Department of the Agriculture. 104 pp. + appendices.

USFWS. 1997. *Coastal California Gnatcatcher (Polioptila californica californica) Presence/Absence Survey Guidelines, July 28, 1997.*



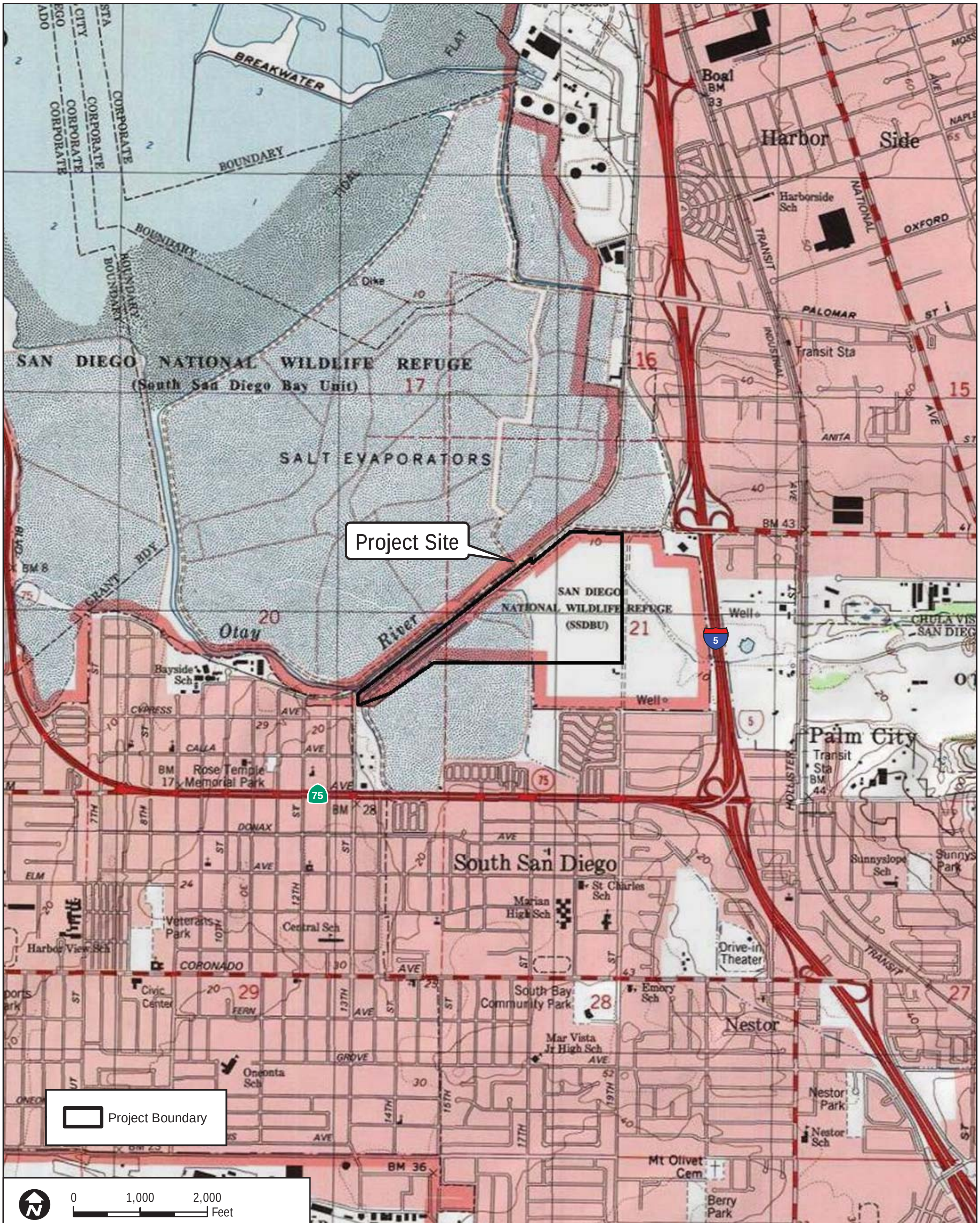
DUDEK

6758-01

FIGURE 1

Regional Map

Carlsbad Desalination Project Mitigation Site - Focused Survey for California Gnatcatcher



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6758-01

SOURCE: USGS 7.5-Minute Series Quadrangle, USA Topographic Maps Service, Imperial Beach Quadrangle.

FIGURE 2
Vicinity Map

Carlsbad Desalination Project Mitigation Site - Focused Survey for California Gnatcatcher

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6758-01

SOURCE: Digital Globe 2008

FIGURE 3

Existing Conditions and Survey Route

Carlsbad Desalination Project Mitigation Site - Focused Survey for California Gnatcatcher

APPENDIX A

Avian Species Observed or Detected During the Focused Survey

APPENDIX A
Avian Species Observed or Detected During the Focused Survey

BIRDS

ACCIPITRIDAE **– HAWKS, KITES, EAGLES, AND ALLIES**

Buteo jamaicensis – red-tailed hawk
Circus cyaneus – northern harrier

FALCONIDAE **– FALCONS**

Falco columbarius – merlin
Falco sparverius – American kestrel

STRIGIDAE **– TRUE OWLS**

Asio flammeus – short-eared owl

COLUMBIDAE **– PIGEONS AND DOVES**

Zenaida macroura – mourning dove

APODIDAE **– SWIFTS**

Chaetura vauxi – Vaux's swift

TROCHILIDAE **– HUMMINGBIRDS**

Calypte anna – Anna's hummingbird

ALCEDINIDAE **– KINGFISHERS**

Ceryle alcyon – belted kingfisher

TYRANNIDAE **– TYRANT FLYCATCHERS**

Sayornis nigricans – black phoebe
Tyrannus vociferans – Cassin's kingbird

HIRUNDINIDAE **– SWALLOWS**

Hirundo rustica – barn swallow
Petrochelidon pyrrhonota – cliff swallow
Stelgidopteryx serripennis – northern rough-winged swallow
Tachycineta bicolor – tree swallow

ALAUDIDAE **– LARKS**

Eremophila alpestris – horned lark

CORVIDAE **– CROWS AND JAYS**

Corvus brachyrhynchos – American crow
Corvus corax – common raven

***AEGITHALIDAE* – LONG-TAILED TITS AND BUSHTITS**

Psaltriparus minimus – bushtit

***MIMIDAE* – MOCKINGBIRDS AND THRASHERS**

Mimus polyglottos – northern mockingbird

***PARULIDAE* – WOOD-WARBLERS**

Dendroica coronata – yellow-rumped warbler
Geothlypis trichas – common yellowthroat
Vermivora celata – orange-crowned warbler

***EMBERIZIDAE* – EMBERIZIDS**

Melospiza melodia – song sparrow
Melozone crissalis – California towhee
Zonotrichia leucophrys – white-crowned sparrow

***ICTERIDAE* – BLACKBIRDS**

Agelaius phoeniceus – red-winged blackbird
Sturnella neglecta – western meadowlark

***FRINGILLIDAE* – FRINGILLINE AND CARDUELINE FINCHES AND ALLIES**

Carpodacus mexicanus – house finch
Spinus psaltria – lesser goldfinch

APPENDIX D

Focused Survey for Light-Footed Clapper Rail

Konecny Biological Services
Biological Consulting, Research, Conservation

November 12, 2012

US Fish and Wildlife Service
Attn: Recovery Permit Coordinator
6010 Hidden Valley Road, Suite 100
Carlsbad, CA 92011

Re: Results of a Focused Survey for the Light-footed Clapper Rail at the Poseidon Mitigation Site, South San Diego Bay, San Diego County, California, 2011.

Dear Recovery Permit Coordinator:

This letter report presents the results of a focused survey for the light-footed clapper rail (*Rallus longirostris levipes*) at the Poseidon Mitigation Site in south San Diego Bay, San Diego County, California. The light-footed clapper rail is listed as an endangered species by the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG).

Surveys for the light-footed clapper rail were conducted by wildlife biologist Mr. John Konecny. The surveys were conducted in accordance with the recommendations provided to the USFWS by the Clapper Rail Study Team (2009). This activity is authorized by Konecny Biological Services's (KBS) USFWS section 10(a) permit number TE837308-5, and a CDFG Memorandum of Understanding.

INTRODUCTION

The light-footed clapper rail is a slender, tawny-breasted bird with grayish edges on brown centered back feathers, olive wing coverts, vertical white bars on the flanks, a white stripe over the eye, and a partially orange bill. Light-footed clapper rail occurred historically along the coast of southern California from Carpinteria Marsh in Santa Barbara County south to San Quintín, Baja California, Mexico (Grinnell and Miller 1944, USFWS 1994).

The light-footed clapper rail is a permanent resident of coastal salt marsh traversed by tidal sloughs, usually characterized by cordgrass (*Spartina foliosa*) and pickleweed (*Salicornia* spp.) (Grinnell and Miller 1944, USFWS 1994). Light-footed clapper rails have also nested in freshwater marsh characterized by cattails (*Typha* sp.) and bulrush (*Scirpus* sp.) at Buena Vista, Agua Hedionda, Batiquitos, San Elijo, and San Dieguito Lagoons in San Diego County (Zembal *et al* 2011); and in spiny rush (*Juncus acutus*) at Naval Air Station (NAS) Point Mugu. There is very limited evidence for inter-marsh movement by light-footed clapper rails.

Light-footed clapper rails forage primarily on crustaceans when present. They will also feed on mollusks, small fish, aquatic insects, grasshoppers, small vertebrates, and in some cases, seeds (Eddleman and Conway 1998). Clapper rails forage within emergent vegetation or along the ecotone between mudflats and marsh (Zembal and Fancher 1988). Light-footed clapper rails forage for crabs in the central drains of tidal creeks at low tide. Surface gleaning and shallow probing compose approximately 90% of foraging time. They very irregularly probe deep into the substrate (Zembal and Fancher 1988).

Populations of light-footed clapper rails have undergone decline in the United States due to the rail's limited distribution and destruction and degradation of coastal salt marsh habitat. The statewide light-footed clapper rail population in 2011 was reported to be 441 pairs in 21 marshes (Zembal *et al* 2011), and represents the second highest count since the statewide census began in 1980. The 2011 total is 17 %

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Tel (760) 489-5276 E-mail jkonecny@cox.net

higher than the 2010 count, and is only two pairs lower than the all time high count in 2007. Fifty-six percent of these pairs were found in two coastal salt marsh complexes at Upper Newport Bay and the Tijuana Marsh National Wildlife Refuge (NWR). Five other marshes at NAS Point Mugu, Batiquitos Lagoon, San Elijo Lagoon, Seal Beach NWR, and Kendall-Frost Marsh in Mission Bay, had between 15 and 43 pairs, representing an additional 34% of the state total. The remaining 12 marshes had between one and seven pairs.

Zembal and Massey (1986) have shown that paired light-footed clapper rails can be detected "clappering" throughout the year, but have a bimodal peak in vocalizing during mid-February to mid-April and again in September to October. The initial peak in vocalizing corresponds to the onset of breeding season. In contrast to "clappering", single male and female "kekking" is highly seasonal, almost exclusively occurring between February and June.

PROJECT LOCATION

The Poseidon Mitigation Site is located at the extreme southern end of San Diego Bay, east of the City of Imperial Beach, California (Figure 1). The site is bordered on the north by the Otay River and the Bayshore Bikeway, and lies west of Interstate-5, and north of State Route 75. Specifically, the Poseidon Mitigation Site is located within Township 18 South, Range 2 West, and in Section 21 of the U.S. Geological Survey Imperial Beach, CA-BCN 7.5-minute quadrangle.

PROJECT SITE DESCRIPTION

The Poseidon Mitigation Site is located within the southern end of the San Diego National Wildlife Refuge. Western Salt and its salt evaporation facility is situated to the north and the industrialized South San Diego is located immediately to the south. The majority of the site is ruderal with non-native vegetation, especially in the southern portion of the site. The Otay River runs just north and northeast and has a dense patch of cattail and bulrush just outside the northeast corner of the site. Southern coastal saltmarsh, characterized by alkali-heath (*Frankenia salina*) is present within the channel of the Otay River, and there are patches of coastal goldenbush (*Isocoma veneta* var. *vernonioides*) scattered throughout southern half of the site, and a band of goldenbush is present along the border with the Otay River. A small tributary of the Otay River extends southward, on the western edge of the site. Elevation of the site is approximately 10-feet (4-meters) above mean sea level.

METHODS

Six focused light-footed clapper rail survey events were conducted at least seven days apart over all appropriate marsh habitat at the Poseidon Mitigation Site between March 27th and May 1st, 2011. Dawn surveys were conducted on April 10th, April 17th, and April 24th. Dusk surveys were conducted on March 27th, April 24th, and May 1st. Each survey lasted approximately one and one-half hours. The surveys were conducted in accordance with the recommendations provided to the USFWS by the Clapper Rail Study Team (2009). A summary of the environmental conditions on the six survey dates is provided in Table 1 below.

Table 1. Summary of Weather Conditions During Six Light-footed Clapper Rail Surveys for the Poseidon Mitigation Site in South San Diego Bay, San Diego County, California, 2011.

Survey #	Date	Surveyor (Species)*	Time	Weather Conditions
1	03/27/2011	JK (LFCR)	1650-1815	10% overcast, 65-61^{o}F, wind 7-10 mph
2	04/03/2011	JK (LFCR)	1645-1815	0% overcast, 62-59^{o}F, wind 5-12 mph

3	04/10/2011	JK, (LFCR)	0645-0815	100% overcast, 60-63^{o}F, wind 5-7 mph
4	04/17/2011	JK (LFCR)	0625-0800	100% overcast, 61-63^{o}F, wind 5-7 mph
5	04/24/2011	JK (LFCR)	0630-0800	100% overcast, 64-65^{o}F, wind 7-10 mph
6	05/01/2011	JK (LFCR)	1840-1910	20% overcast, 63-60^{o}F, wind 9-14 mph

* JK-John Konecny; LFCR-Light-footed Clapper Rail

The surveys were conducted by walking the bike path on the northern boundary of the Poseidon Mitigation Site and stopping at stations approximately 100-feet (30-meters) apart and listening for vocalizing light-footed clapper rails. The site was also accessed from the south end, off Saturn Boulevard. If rails were not detected passively, a digital call-prompt of the light-footed clapper rail "dueting" was played with an iPod and amplified speakers at 30-second intervals. A response was listened for approximately ten minutes before proceeding to the next survey station.

RESULTS and DISCUSSION

One pair of light-footed clapper rails was detected just outside of the project boundary in the northeast corner (Figure 2). The pair responded to a call prompt with a duet on the evening of April 3, 2011. The pair was also detected passively on April 17th and 24th. No other light-footed clapper rails were detected within the Poseidon Mitigation Site. Rail habitat does exist through the reach of the Otay River on the northern border of the site but it is of relatively low quality for rails, being short and sparser.

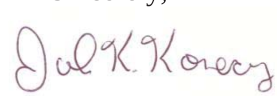
Described as "formerly common in all coastal marshes" by Grinnell and Miller (1944), the light-footed clapper rail has never been a common bird species in the Otay River. Since the light-footed clapper rail range-wide survey was initiated in 1980, there have been one or two light-footed clapper rail pairs in the Otay River dating back to 1995. These pairs were usually located in the cattail patch by the bikeway crossing of the river. Four or five pairs of light-footed clapper rails were in the area in the early 1980's.

The light-footed clapper rail will likely continue to inhabit the freshwater or brackish water marsh in this reach of the Otay River and the numbers may continue to fluctuate depending on the reproductive success of the pair that was identified in 2011. Coastal salt marsh should be incorporated into the design of the mitigation site. With proper planning, a small but sustainable population of light-footed clapper rails may colonize the area.

CERTIFICATION

I certify that the information in this survey report and attached exhibits fully and accurately represent my work. The results of focused surveys for listed species are typically considered valid for one year by the USFWS and CDFG. If you have any questions or require additional information, please call me at (760) 489-5276.

Sincerely,



John K. Konecny
Wildlife Biologist
TE837308-5

REFERENCES CITED

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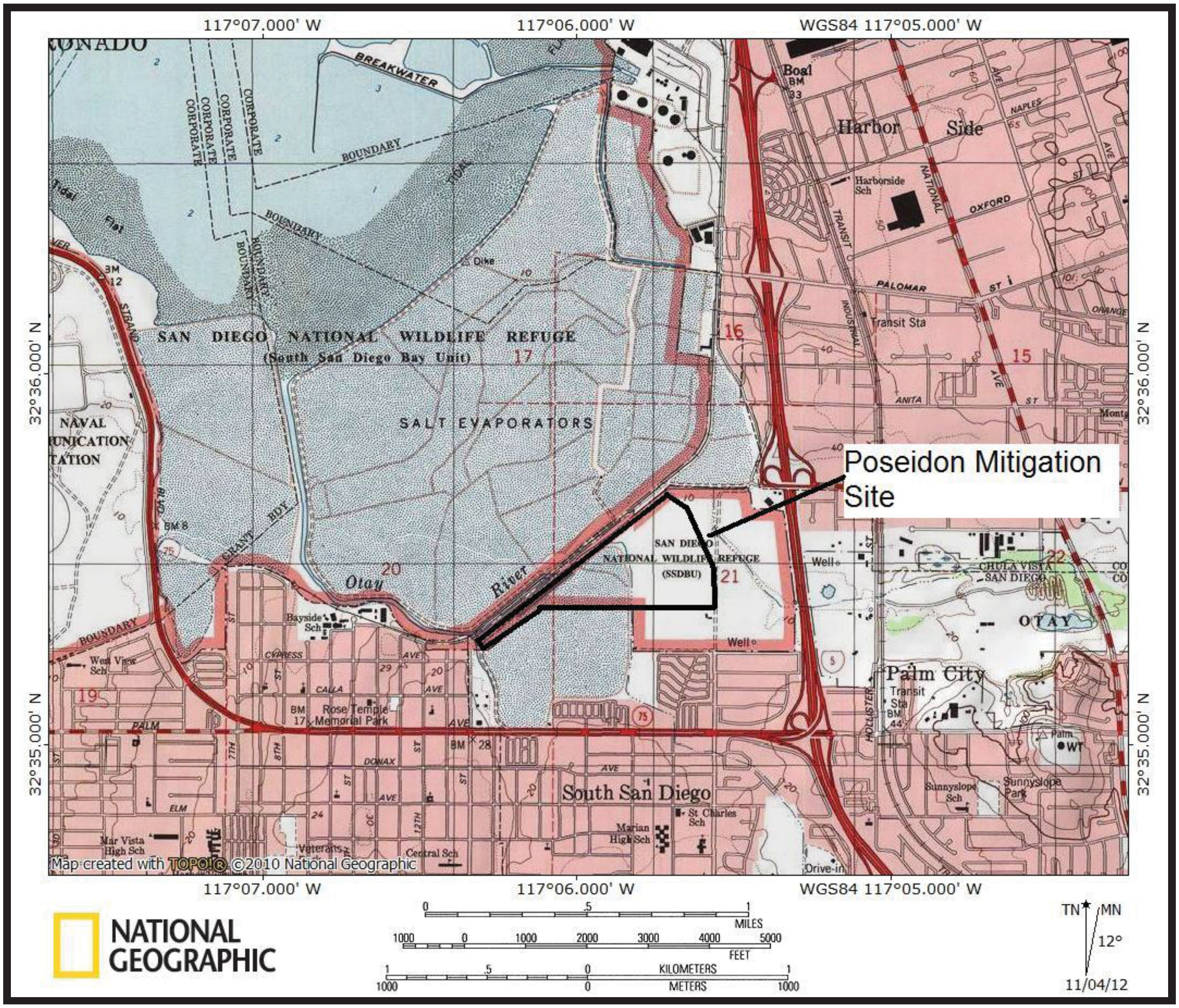

Figure 1. **Location of the Light-footed Clapper Rail Survey Area (black polygon) for the Poseidon Mitigation Site, South San Diego Bay, San Diego County, California, 2011.**

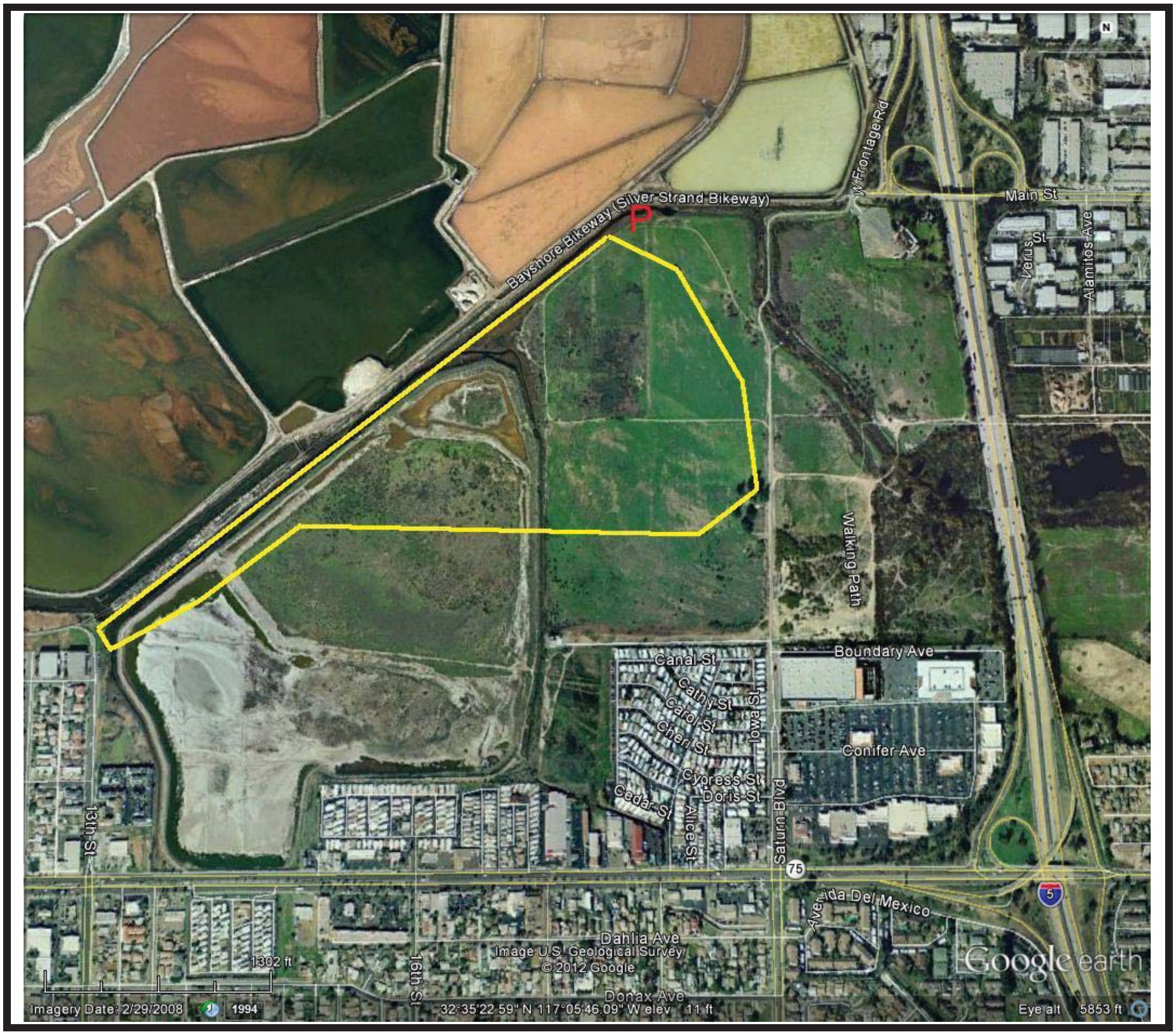

Figure 2. **Location of the Light-footed Clapper Rail Pair (Red P) Detected at the Poseidon Mitigation Site, South San Diego Bay, San Diego County, California, 2011. Project Boundary Shown in Yellow.**

APPENDIX E

CRAM Report

CALIFORNIA RAPID ASSESSMENT METHOD REPORT
for the
Otay River Estuary Restoration Project
San Diego County, California

Prepared for:

Poseidon Resources
5780 Fleet Street, Suite 140
Carlsbad, California 92008
Contact: Stan Williams
Phone: 408.799.3852

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024

JANUARY 2016

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1 INTRODUCTION

This document presents the results of an assessment of the baseline ecological conditions and the predicted post-project conditions of the wetland and riparian resources at the proposed Otay River Estuary Restoration Project (ORERP or Project) (Figures 1 and 2).

The proposed ORERP is a partnership between Poseidon Resources (Poseidon), the U.S. Fish and Wildlife Service (Service or USFWS), and San Diego Bay National Wildlife Refuge (Refuge). The purpose of ORERP is to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species and to provide habitat for migratory seabirds, shorebirds and salt marsh-dependent species.

This proposed Project would occur at two distinct and non-contiguous sites within the South San Diego Bay Unit of the Refuge and would be consistent with the goals and objectives of the Service's San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan (CCP) (USFWS 2006). The proposed project would also follow the terms and conditions of the permits issued by the California Coastal Commission (CCC) and San Diego Regional Water Quality Control Board (Regional Board) for Poseidon's Carlsbad Desalination Project.

When completed the creation and restoration of tidal influenced estuarine, and salt marsh habitats within the Refuge by Poseidon would benefit many species of fish found in south San Diego Bay by providing new and expanded nursery and feeding areas. While avoiding and minimizing impacts to existing seabird and shorebird nesting areas, the proposed project would provide additional and enhanced foraging and nesting habitats for federal and state listed birds. These include species such as the endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*), endangered California least tern (*Sternula antillarum browni*), and threatened western snowy plover (*Charadrius alexandrinus nivosus*) and a diversity of migratory seabirds and shorebirds.

To evaluate the ecological condition of the wetlands and riparian resources that would be affected by the proposed Project, Dudek conducted assessments within the two main components of the Project, including Pond 20 and Pond 15. A total of two Assessment Areas (AAs) were evaluated. The assessment was completed using the most recent version of CRAM, version 6.1 (CWMW 2013). The baseline data collected during this assessment was used as comparative data to evaluate the habitat restoration areas associated with the Project relative to Project goals.

It is important to note that, in this case, a comparison is not being made to the Carlsbad Desalination Project that is mitigating at this site. This is because there were no impacts to wetlands or waters at the desalination plant project site. As part of the Coastal Development Permit (CDP No. E-06-013) for Poseidon's proposal to construct and operate the desalination facility in Carlsbad, the Commission required Poseidon to prepare a Marine Life Mitigation Plan (MLMP) to address the impacts to be caused by the facility's use of estuarine water and its entrainment of marine organisms. Implementation of the required mitigation to satisfy the MLMP is planned to occur at the Otay River Floodplain Site and at Pond 15. Project construction would result in temporary impacts to jurisdictional waters and wetlands. Therefore, the U.S. Army Corps of Engineers (ACOE) requested the preparation of a functional assessment to characterize the effects of the project on the functions and services of the existing resources to be temporarily impacted.

1.1 California Rapid Assessment Method (CRAM)

The State of California and Federal agencies that comprise the California Wetlands Monitoring Workgroup[1] are promoting the use of rapid assessment methods as a core tool to evaluate wetland resource condition. Dudek evaluated the ecological condition of the Project area utilizing the California Rapid Assessment Method (CRAM; CWMW 2013), which is the most widely used wetland rapid assessment method in the state (www.cramwetlands.org).

The CRAM was developed as a rapid, scientifically defensible, and repeatable assessment methodology that can be used routinely 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. CRAM identifies six major wetland classes (or types), four of which have sub-types: riverine (confined and non-confined); depressional (individual vernal pools, vernal pool systems, and other depressional wetlands); estuarine (perennial saline, perennial non-saline, and seasonal); playas; slope wetland (seeps and springs, and wet meadows); and lacustrine. AAs are established within each wetland class separately and can represent a portion or encompass the entire wetland community. Each wetland class has a particular set of narrative descriptions that are used to assist in scoring an established AA. Visual indicators are used to choose the best-fit description of habitat condition for a variety of metrics/submetrics within four universal attributes: Buffer and Landscape Context, Hydrology, Physical Structure, and Biotic Structure. Table 1 presents the attributes and metrics/submetrics developed for CRAM that reflect the common, visible characteristics of all wetlands in all regions of California, based on the conceptual models of wetland form and function (CWMW 2013).

[1] The California Wetlands Monitoring Workgroup is a subcommittee of the California Water Quality Monitoring Council (Senate Bill 1070).

Table 1
CRAM Attributes and Metrics

Attributes		Metrics	
Buffer and Landscape Context		Aquatic Area Abundance	
		Buffer	Submetric A: Percent of AA with Buffer
			Submetric B: Average Buffer Width
			Submetric C: Buffer Condition
Hydrology		Water Source	
		Hydroperiod or Channel Stability	
		Hydrologic Connectivity	
Structure	Physical	Structural Patch Richness	
		Topographic Complexity	
	Biotic	Plant Community	Submetric A: Number of Plant Layers Present or Native Species Richness (vernal pools only)
			Submetric B: Number of Co-Dominant Species
			Submetric C: Percent Invasion
		Horizontal Interspersion and Zonation	
		Vertical Biotic Structure	

Source: CWMW 2013.

Letter scores ranging from A to D are assigned to each metric/submetric to reflect alternative states of function. For each metric/submetric, the letter score is converted into the corresponding numeric score: A=12, B=9, C=6, and D=3. The metric/submetric scores are combined to calculate an attribute score, and the attribute scores are combined to calculate an overall AA score. The attribute scores and overall AA scores have a maximum value of 100 and a minimum value of 25. The scores are intended to represent the condition of an AA relative to its best possible condition. CRAM also provides guidelines for identifying the stressors that might account for any low site scores.

CRAM is supported by a website (www.cramwetlands.org) that provides access to an electronic version of the entire manual and training materials. The website also contains downloadable CRAM software and access to the CRAM database, which can be used to upload, view, and retrieve statewide CRAM results.

1.2 Goals of the Assessment

The purpose of the Project is to mitigate impacts from the Carlsbad Desalination Plant through restoring coastal wetlands to benefit native fish, wildlife, and plant species and to provide habitat for migratory seabirds, shorebirds and salt marsh-dependent species. The purpose of this assessment is to determine the functional condition of vegetated resources within the Project area prior to implementation of the proposed Project relative to anticipated functional condition of restored vegetated resources. This assessment will be used as a tool to compare the ecological baseline conditions of the vegetated resources with the post-Project conditions for the habitat restoration areas.

The three primary goals of this assessment include:

- Assess vegetated jurisdictional resources conditions and identify related stressors;
- Compare existing vegetated jurisdictional resources conditions within the ORERP area to post-construction conditions; and
- Support the application for resource agency permits.

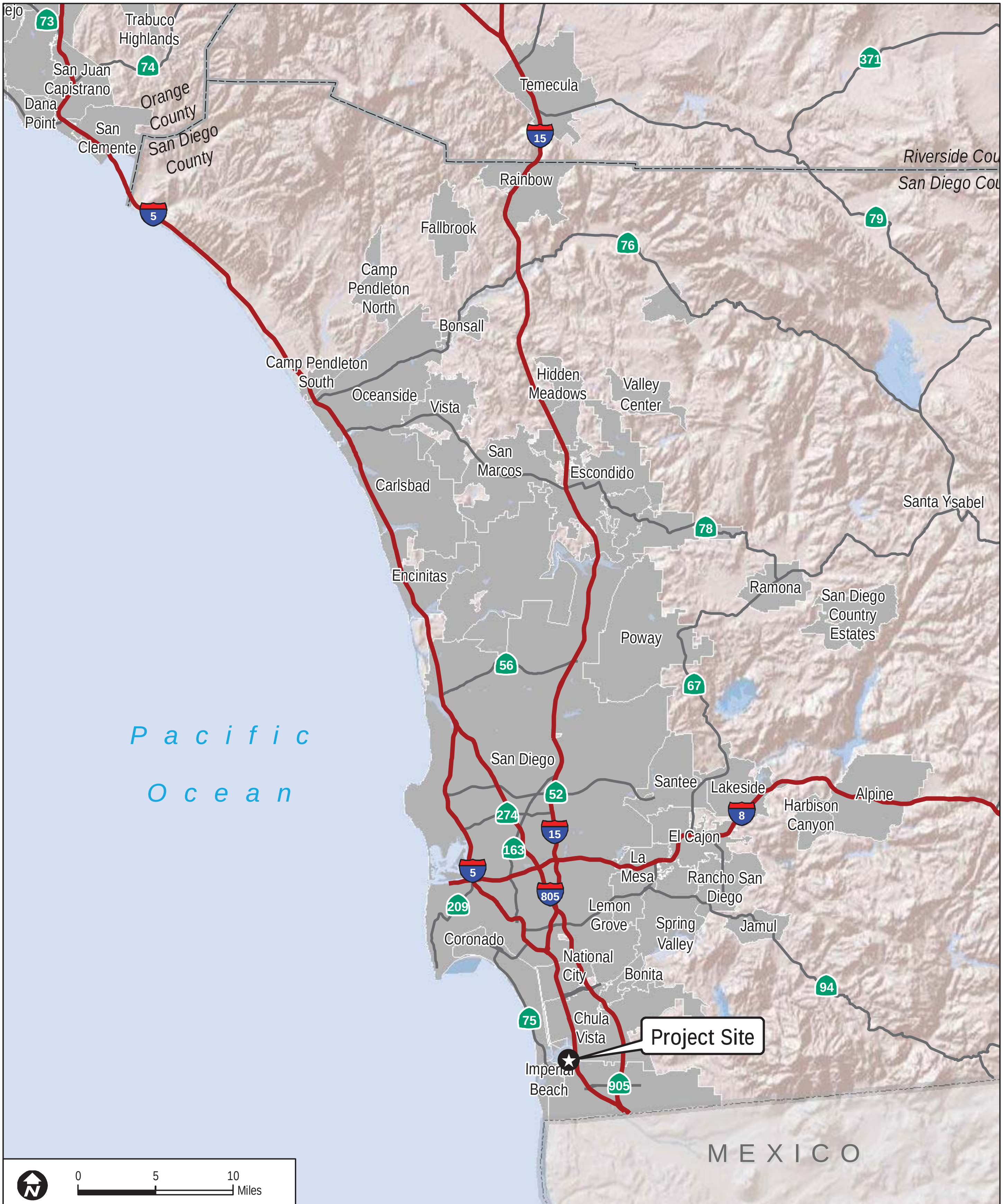

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FIGURE 1

Regional Map

California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

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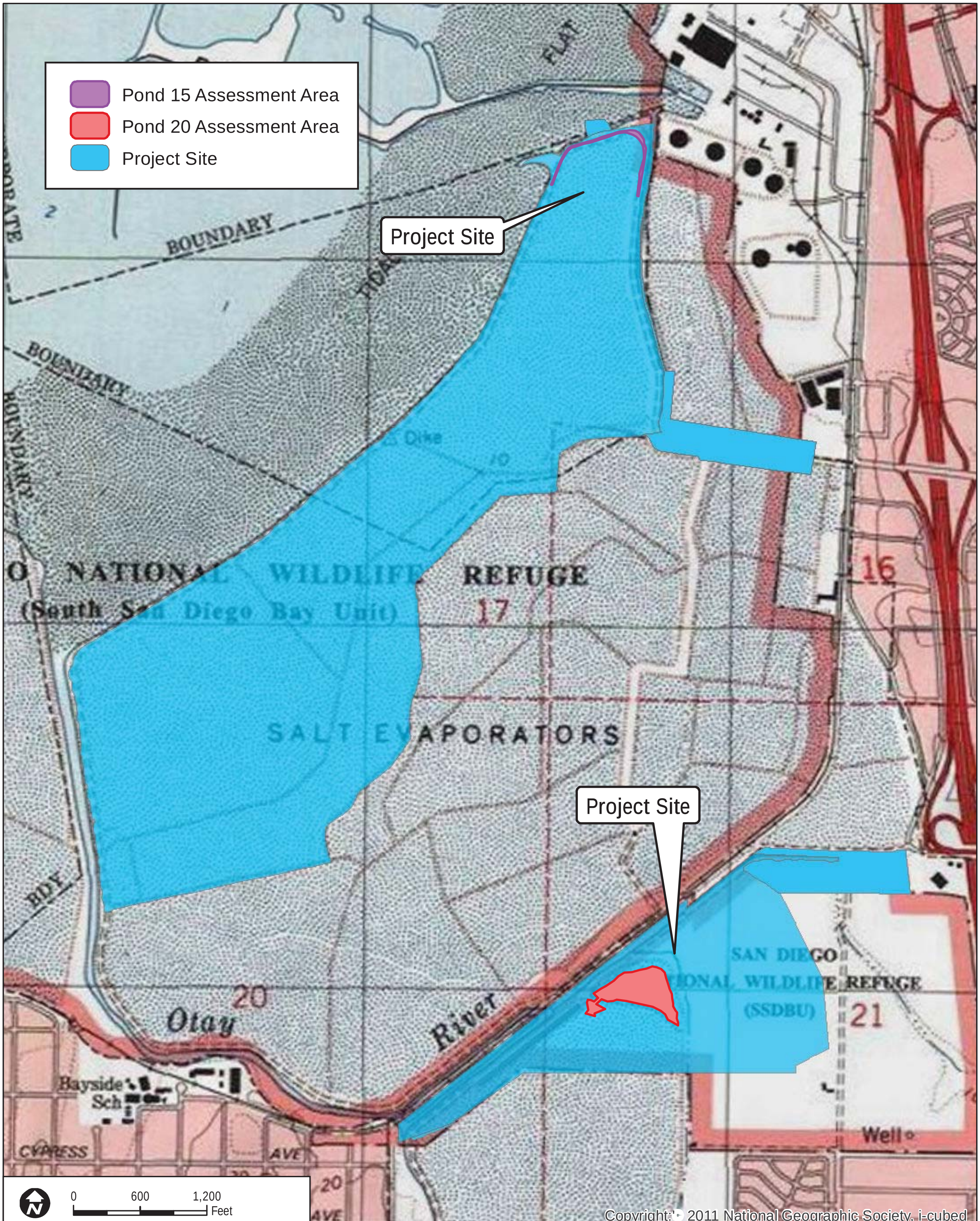

SOURCE: USGS 7.5-Minute Series Quadrangle, USA Topographic Maps Service, Imperial Beach Quadrangle.

FIGURE 2
Vicinity Map

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California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

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2 PROJECT AREA DESCRIPTION

2.1 Project Location

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 Figures 1 and 2). The first site is an approximately 78-acre area of primarily disturbed uplands and a portion of Pond 20 within 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 transition habitats. The second site, a 90-acre active solar salt pond (hereafter referred to as the Pond 15 Site) would be restored to subtidal and intertidal habitats.

2.2 Watersheds

The ORERP is located within the Otay River Watershed in San Diego County, California. The 145-square-mile watershed is situated between the Sweetwater and Tijuana River Watersheds. The Otay River originates in the Cleveland National Forest along Dulzera 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 of San Diego 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.

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 Saltworks, then westward along the perimeter of Ponds 48, 20, and 22. After 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 until discharging into the San Diego Bay.

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. However, neither the Pond 15 site nor the Otay River Floodplain Site are directly connected to the San Diego Bay. Pond 15 is an evaporator pond, and water levels are managed by a series of levees and a tide gate. Pond 20 at the Otay River Floodplain Site is disconnected from the San Diego Bay due to berms surrounding the old evaporator pond.

However, surface elevations in the bottom of Pond 20 are low enough to result in seasonal ponding due to the configuration of the perimeter berms surrounding the old pond that do not allow for a water outlet, and an elevated groundwater level.

2.3 Soils

In general, the Otay River floodplain is characterized by soft Alluvial/Bay Deposits under 3 to 5 feet of uncompacted fill soils. The Otay River Floodplain Site is almost entirely composed of Grangeville fine sandy loam at 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% slope. Visalia gravelly sandy loam is also commonly found in alluvial fans and has a high capacity for transmitting water. However, this soil only contains a moderate available water 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 capacity (NRCS 2011).

2.4 Vegetation

The Otay River Floodplain Site consists mostly of disturbed and native upland habitat, habitat undergoing restoration in the eastern portion of the study area, unvegetated former salt pond, and salt marsh habitat associated with the Otay River and Nestor Creek tidal channels. Historically, some of the upland areas within the Otay River Floodplain Site supported riparian and coastal salt marsh habitat (USFWS 2006). Over time, portions of these former wetland areas were converted to upland due to the channelization of the Otay River, construction of solar salt ponds, and past agricultural activity. The Otay River Floodplain Site includes ten vegetation communities or land covers as listed in Table 2.

Table 2
Otay River Floodplain Site Land Covers and Vegetation Communities

Unvegetated Land Covers and Non-native Communities
Brackishwater
Developed Land
Disturbed Habitat
Former salt pond bottom and borrow area

Table 2
Otay River Floodplain Site Land Covers and Vegetation Communities

Native Communities
Coastal and Valley Freshwater Marsh
Cismontane alkali marsh
Isocoma scrub
Mulefat scrub
Otay River Floodplain Restoration
Southern coastal salt marsh

Source: Dudek 2015

The Pond 15 Site consists of predominantly open water (3-5 feet deep), including the brines contained in the salt ponds, as well as areas mapped as disturbed habitat on the salt pond levees, and small areas of beach and southern coastal salt marsh. 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 Saltworks operation that currently produces salt for commercial purposes using solar radiation to evaporate water from seawater and concentrate 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 six vegetation communities or land covers listed in Table 3.

Table 3
Pond 15 Land Covers and Vegetation Communities

Unvegetated Land Covers and Non-native Communities
Beach
Disturbed habitat
Open water
Salt pond levee
Native Communities
Southern coastal salt marsh
Disturbed southern coastal salt marsh

Source: Dudek 2015

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3 METHODOLOGY

Prior to visiting the Project area, Dudek assembled background information about the management and history of the Project area's wetlands and waters. Background information gathered included USGS topographic maps, National Wetland Inventory maps, road maps, soil maps, aerial photography, and Project-specific information from the *Results of a Preliminary Jurisdictional Wetland Delineation Report for the Otay River Estuary Restoration Project (ORERP), South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge* (Dudek 2015).

CRAM was not designed for use in the assessment of subtidal habitats and intertidal areas with less than 5% vegetated cover of emergent marsh (CWMW 2009). Thus, much of the Project area composed of open water and mud flats could not be assessed using CRAM. However, the functions and services of these areas before and after the proposed Project were evaluated separately in the Poseidon Mitigation Credit Analysis Marine Life Mitigation Plan – Integrated Restoration Plan (WRA 2013).

Each AA and associated wetlands or waters were classified according to the definitions presented in the CRAM User's Manual, version 6.1. The wetlands or waters were classified based on their general ecological character and first-hand knowledge of biologists who previously assessed the property. Dudek determined the boundary and estimated size of each AA. The AAs included the appropriate portion of each wetlands or waters for assessment using CRAM. Each AA consisted of only one wetland class with enough hydrologic and ecological integrity that could allow detection of changes in the condition of the AA due to identified stressors or management actions apart from natural disturbances or other sources of variability in wetland condition.

During the initial office assessment, background information was collected for each potential AA location and base maps were prepared to evaluate the AAs relative to the surrounding land cover/use. Preliminary scores were developed for some metrics based on the information gathered and recorded in the appropriate datasheets (Appendix A).

Following the background analysis, a site visit was conducted on December 2, 2015, by Dudek biologist Andrew Thomson. The field portion of the CRAM assessment consisted of finding and confirming the boundaries of the AAs, and scoring the AAs based on the condition metrics and stressor checklist. All relevant CRAM datasheets were completed according to the CRAM User's Manual (CWMW 2013).

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4 RESULTS

4.1 Classification of AAs within the Project Area

Two wetland classification sub-types as defined in CRAM were identified within the Project area: riverine (non-confined) and estuarine. However, the areas classified as riverine will not be subject to permanent impacts, and thus were not evaluated in this assessment.

Estuarine systems, as defined by CRAM, consist of aquatic (i.e., sub-tidal) and semi-aquatic (intertidal) environments that are strongly influenced by mixtures of ocean water and upland runoff due to tidal processes operating through an ocean inlet (CWMW 2013). Estuaries are mostly enclosed by land, with natural or unnatural inlets. Sources of freshwater consist of rivers, streams, lakes and reservoirs, point discharges, and storm drains (CWMW 2013). An estuarine wetland consists of the vegetated marsh plain, natural levees, shell beds, submerged plant beds, and other habitat elements created or supported by tidal processes and associated with tidal channels (CWMW 2013). While the wetlands assessed in this study are not classic estuarine systems with natural tidal influence, they are systems that were historically estuarine that have been degraded or altered. Further, the goal of the restoration program is to return the degraded or altered areas to functioning tidal estuarine systems, which will allow comparison of existing conditions with post-construction conditions. Therefore the estuarine module of CRAM was determined to be the most appropriate module for this analysis.

Two estuarine AAs were established for assessment. Figures 3a and 3b provide a depiction of the locations of the AAs. Representative photos are contained in Figure 4. The AAs were assigned an AA boundary based on the AA parameters in CRAM.

4.2 Prediction of Post Project Functions and Services

The purpose of predicting post Project functions and services is to determine the ecological condition of representative jurisdictional areas within the Project area relative to the conditions that are expected after the Project is completed. Dudek used the same version of the CRAM (version 6.1) for both the existing conditions and post-Project conditions.

Dudek evaluated the estuarine areas in the context of the proposed design concept for the Project. The boundary of the AA at the Pond 20 location within the Otay River Floodplain Site remained unchanged in the post-Project analysis (Figure 5a). However, while the general location remained the same, the boundary of the AA at the Pond 15 location was updated based on the projected restoration design and the CRAM criteria for establishing boundaries of an AA (Figure 5b).

Dudek made several assumptions to conduct the post-Project analysis. Dudek evaluated the site from the perspective of the functions and services expected or anticipated after the passage of several years (e.g., five years) following Project construction to allow for the establishment of vegetation in the Project area following the large-scale disturbances resulting from construction. Extensive areas are currently barren or open water, lacking any vegetation at all, and that condition is expected to change following Project construction. Additionally Dudek assumed that the hydrologic conditions (water source, hydroperiod and hydrologic connectivity) would be significantly altered between the pre-Project condition and the post-Project condition, by developing direct tidal connectivity.

4.3 Pre-construction CRAM Scores

The AAs within the Project area were analyzed for a suite of variables that pertain to common attributes that estuarine systems are expected to perform. The fieldwork consisted of locating and confirming the boundaries of each AA, and scoring the AAs based on the condition metrics and stressor checklist contained in CRAM v.6.1.

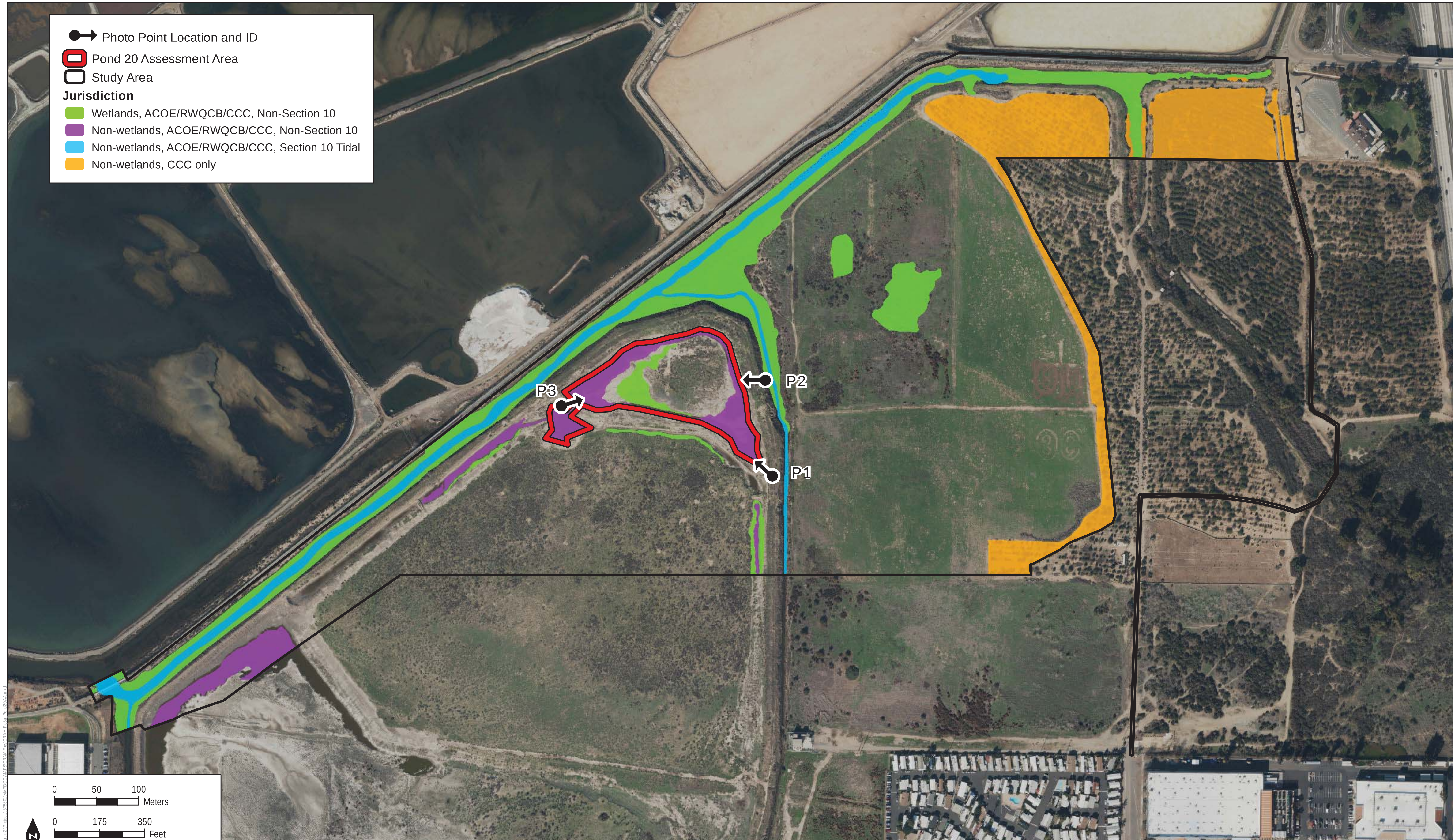
As previously introduced, each of the 14 metrics/submetrics evaluates a specific indicator of ecological condition. Comparisons can be made at the metric/submetric score level where distinctions among the scores are the clearest. The remainder of this section presents a summary of the results contained in the CRAM data sheets (Appendix A). Attribute scores are presented in Chart 1.

4.2.1 Otay River Floodplain Site

Buffer and Landscape Context: The AA at the Otay River Floodplain Site scored 65 for the Buffer and Landscape Context attribute. The entire AA has a buffer, but 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 historic agricultural uses nearby.

Hydrology: The Hydrology attribute scored 42. All metrics (Water Source, Hydroperiod, and Hydrologic Connectivity) scored low due to the constructed berms surrounding the AA that affect a potential tidal connection. The hydrology at the site is due to a combination of urban runoff and groundwater (elevated water table), rather than tidal inundation.

Physical Structure: The Physical Structure attribute (including Structural Patch Richness and Topographic Complexity metrics) scored low (38) due to a general lack of structural patch types and low topographic complexity as a consequence of the constructed salt pond setting (i.e., dredged pond area and surrounding berms).



DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

FIGURE 3A

Pond 20 Assessment Area

California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

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DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

FIGURE 3B

Pond 15 Assessment Area

California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

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Photo 1: Representative view of Pond 20 Assessment Area

Photo 2: View of Pond 20 Assessment Area from the East

Photo 3: View of Pond 20 Assessment Area from the West

Photo 4: Representative view of Pond 15 Assessment Area

Photo 5: View of Pond 15 Assessment Area from the East

Photo 6: View of Pond 15 Assessment Area from the West

DUDEK

FIGURE 4
Site Photographs

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DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

FIGURE 5A

Pond 20 Proposed Project Assessment Area

California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

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APPENDIX K

Cultural Resources Report
(CONFIDENTIAL)

APPENDIX L

Utility Investigation Report

Otay River Estuary Restoration Project

Existing Utility Investigation

Final Report

Prepared For:

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August 2015

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1. INTRODUCTION

This report documents the utility investigation conducted by Everest International Consultants (Everest) for the Otay River Estuary Restoration Project in 2015. The area included in this effort consists of the area within the Otay River Estuary Restoration Project Area Boundary (the Otay River Floodplain (ORF) and Pond 15), as well as the construction impact area. These areas, collectively defined as the study area in this document, are shown in **Figure 1**. Public utility services and facilities that may exist in the study area include gas and oil, power/electric, communications, storm drains, water lines, and sanitary sewer lines and structures.

Figure 1. Study Area

In April 2015, Everest contacted 8-1-1 Underground Service Alert (DigAlert) with a request for information on potential utilities within the study area. The DigAlert research generated a list of the agencies that have existing underground utility facilities in the study area. Responsive agencies on the DigAlert list include AT&T Distribution, Cox Communications of South San Diego, and the City of San Diego; the remaining agencies that may have relevant utilities information include the California American Water Company, City of Chula Vista, City of Imperial Beach, and San Diego Gas & Electric (SDG&E) Gas Mapping & Records. **Table 1** lists the utility agencies provided by DigAlert and summarizes the status of response for each agency. In addition to the information obtained from these agencies, Everest staff also gathered information from other sources, including as-built drawings, the SDNWR CCP 2006[1], and other information provided by U.S. Fish and Wildlife Service (USFWS). The following sections summarize utility information obtained from the responsive agencies and other available sources.

Table 1. List of Utility Agencies in Study Area Provided by DigAlert

LIST OF UTILITY AGENCIES PROVIDED BY DIGALERT	RESPONSE STATUS *
AT&T Distribution	Information received
California American Water Company (CAWC)	CAWC representative's phone reply indicated that their facilities are likely not in the study area. Maps if needed have to be obtained in person at CAWC's office.
City of Chula Vista	No response
City of Imperial Beach	Email response received indicating that formal request with the City's Clerk is required. Request will be initiated if necessary.
City of San Diego	Information received
Cox Communications (South SD)	Information received
SDG&E Gas Mapping & Records	Information received

** Response as of July 2015*

[1] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, "Final Comprehensive Conservation Plan and Environmental Impact Statement." August 2006.

2. GAS AND OIL PIPELINES

Information for existing gas lines within the study area was extracted from City of San Diego, Metropolitan Wastewater Department drawings[2]; San Diego Gas & Electric (SDG&E) maps[3], and corroborated with information in the SDNWR CCP 2006[4]. The existing gas utilities in the study area are shown in **Figures 2a and 2b**. Underground gas lines are found along sections of Saturn Boulevard, Louret Avenue, Bay Boulevard, Ada Street, Stella Street, Palomar Street, Pacific Avenue, and Dorothy Street[5].

Along Bay Boulevard, there are 8-inch and 3-inch/2-inch underground SDG&E gas pipelines. The 3-inch/2-inch pipeline changes from three to two inches in diameter at a point just north of the intersection of Bay Boulevard with Stella Street and continues north as a 2-inch line from that point; at this location, there is also a regulator joining the 3-inch/2-inch gas pipeline with the 8-inch pipeline (see **Figure 3**). It is not clear how far the 8-inch and 3-inch/2-inch pipelines may extend north beyond the intersection of Bay Boulevard with Palomar Street, and south beyond the intersection of Bay Boulevard with Anita Street. The 3-inch/2-inch pipeline has five offshoots that are smaller in size, ranging from one to two inches in diameter. These offshoots include two 2-inch, one 1.5-inch, and two 1-inch pipelines (see **Figure 2A**). Of the two 2-inch offshoots, one joins with Pacific Avenue and continues onto Dorothy Street[4] for an unspecified distance, and another juts out westward toward the bay from Bay Boulevard. The 1.5-inch offshoot travels eastward on Ada Street from its intersection with Bay Boulevard. It is not clear how far east the 1.5-inch offshoot pipeline may extend. The two 1-inch offshoots travel eastward along Stella Street and Palomar Street, from their intersections with Bay Boulevard. Residential gas hookup lines, typically less than 1-inch in diameter, that branch off from the offshoots to the 3-inch pipeline are not shown in the figure for clarity.

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[2] City of San Diego, Metropolitan Wastewater Department. “Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings”, May 2002.

[3] Maps received from SDG&E, 7/9/2015.

[4] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, “Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I”, p. 3-111 to 3-118, August 2006.

[5] The SDG&E map showing the Dorothy Street pipeline appears to erroneously label Dorothy Street as Elise Street.

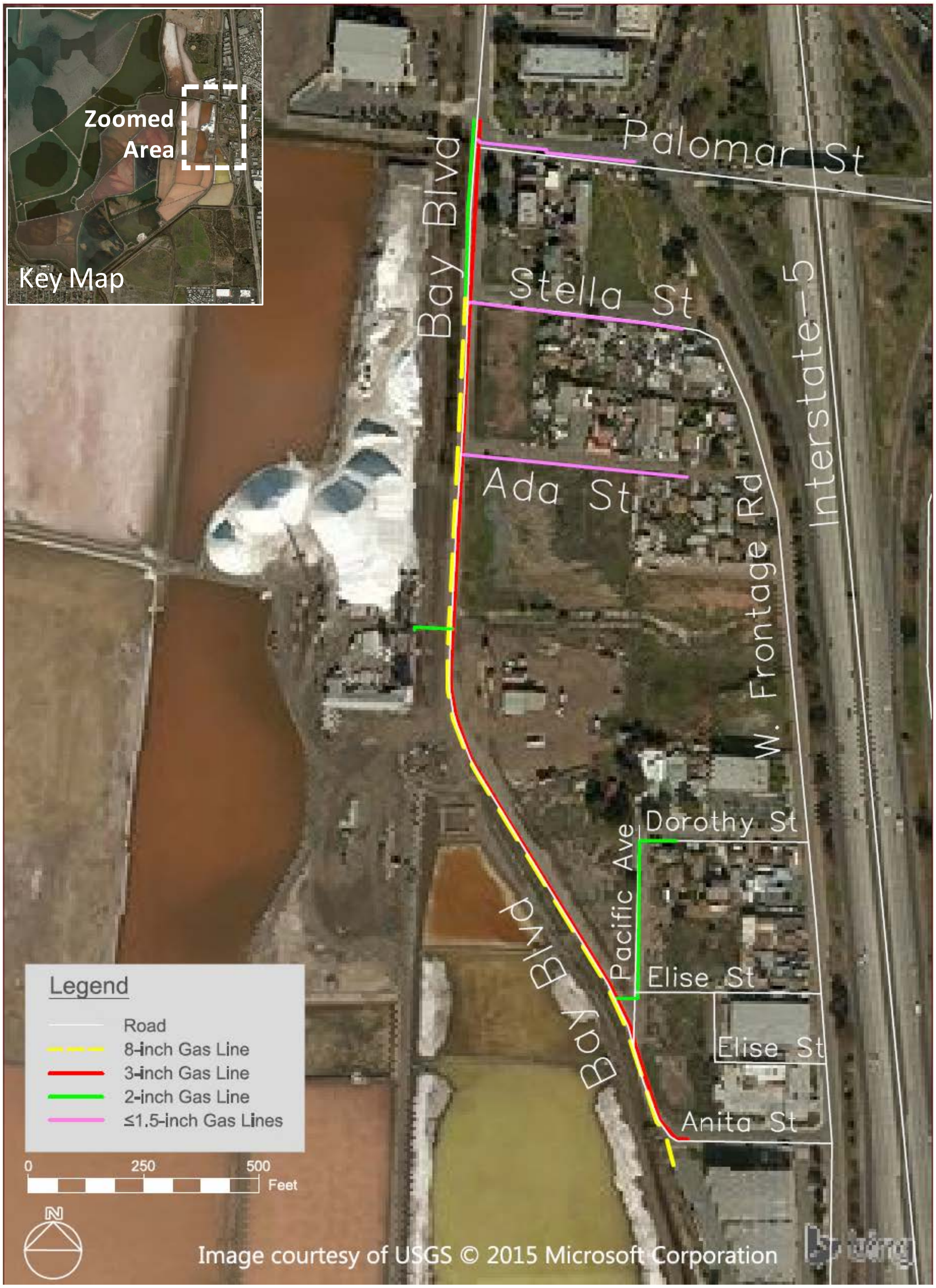

Figure 2a. Approximate Locations of Existing Gas and Oil Pipelines (1 of 2)

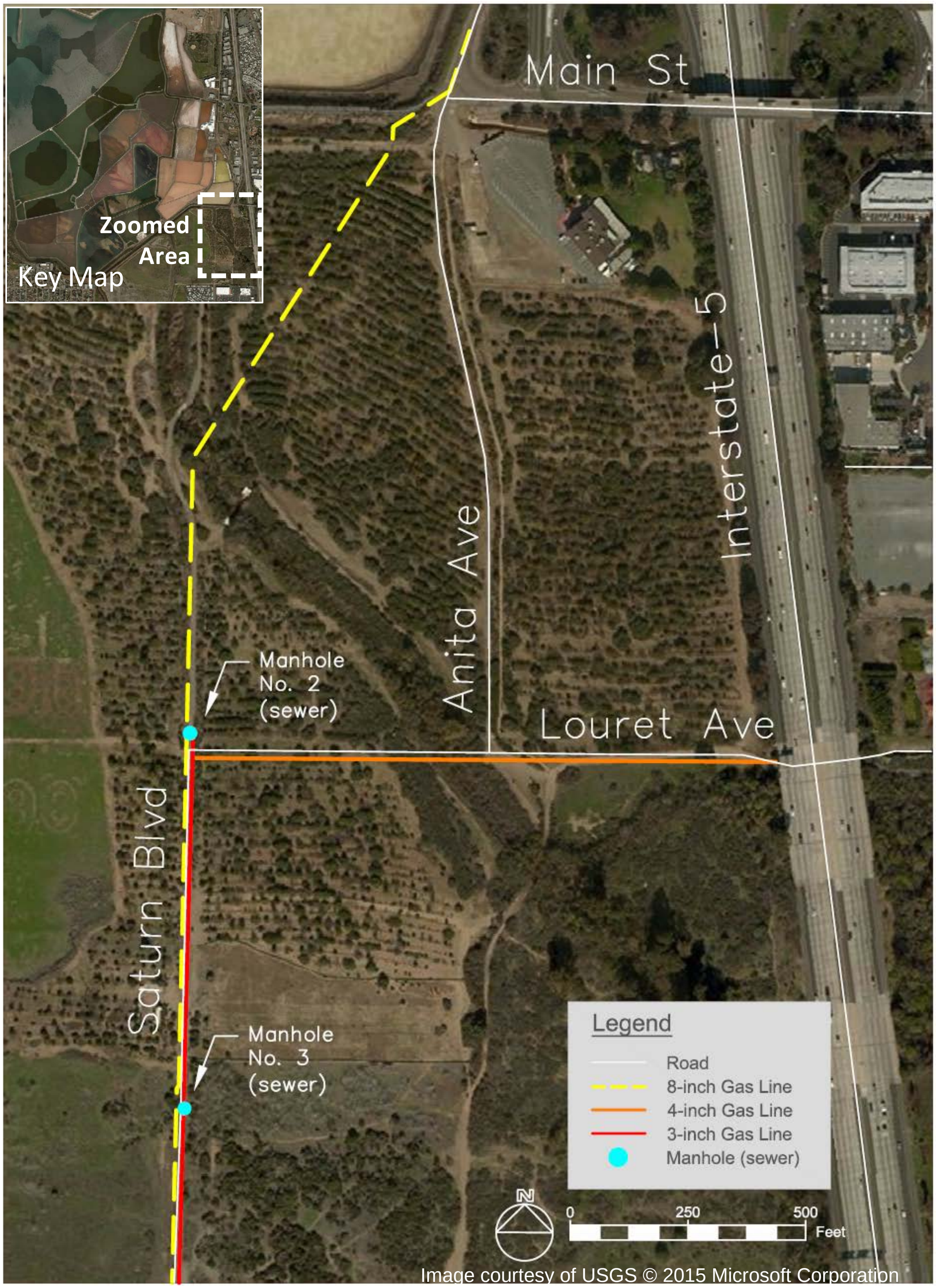

Figure 2b. Approximate Locations of Existing Gas and Oil Pipelines (2 of 2)

There are also 8-inch and 3-inch underground SDG&E gas pipelines along Saturn Boulevard. On Saturn Boulevard, the 8-inch line makes a small southwest deviation from its course just north of Manhole No. 3, approximately 28 feet in length, and continues on south afterwards. The 8-inch line makes another deviation at a point a few hundred feet north of the intersection of Saturn Boulevard and Louret Avenue; this deviation has an 18-foot section oriented in a northwest-southeast direction and a 62-foot section oriented in a northeast-southwest direction. The 3-inch line intersects and splits off from a 4-inch line (described below) at the intersection of Saturn Boulevard and Louret Avenue, and then travels south along Saturn Boulevard and parallel to the 8-inch line (see **Figure 4**). From Saturn Boulevard, the 8-inch gas line appears to extend northeast towards and beyond Main Street. A drawing from the City of San Diego Metropolitan Wastewater Department shows that the section of 8-inch gas line extending northeast from Saturn Boulevard to Main Street runs parallel to two sewer lines; however, the SDG&E maps shows the same 8-inch gas line section oriented at a slightly greater angle from true north, which means the gas line would run alongside but no longer parallel to the two sewer lines (page 86, SDG&E 20153). **Figure 2B** shows an approximation of the SDG&E version of this pipeline section, as SDG&E is likely the definitive source on the utilities under its jurisdiction.

Based on the SDG&E maps, a 2-inch gas pipeline appears to branch off from the 8-inch gas pipeline described above, approximately where the 8-inch pipeline meets Main Street—just south of the intersection of Main Street with West Frontage Road (see **Figure 5**). It is not clear how far east this 2-inch pipeline may extend.

There is a 4-inch underground gas line, also owned/operated by SDG&E, within Louret Avenue that connects with both the 8-inch and 3-inch lines at the intersection of Saturn Boulevard and Louret Avenue (see **Figure 4**); the map shows an elevation of roughly 11 feet (vertical datum unknown) for this pipeline at this intersection. It is not known how far the pipeline extends eastwards beyond the intersection of Louret Avenue with Anita Avenue.

Detailed maps of the SDG&E gas utilities were provided by SDG&E[6]; these maps provide pipeline length measurements, connection locations, and additional details not pictured in the figures in this document. Information about oil utilities, and further information about gas pipelines was not available at the time that this report was prepared.

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[6] Pages 81-86 and 89-93 of the 96-page map book provided by SDG&E 7/9/2015.

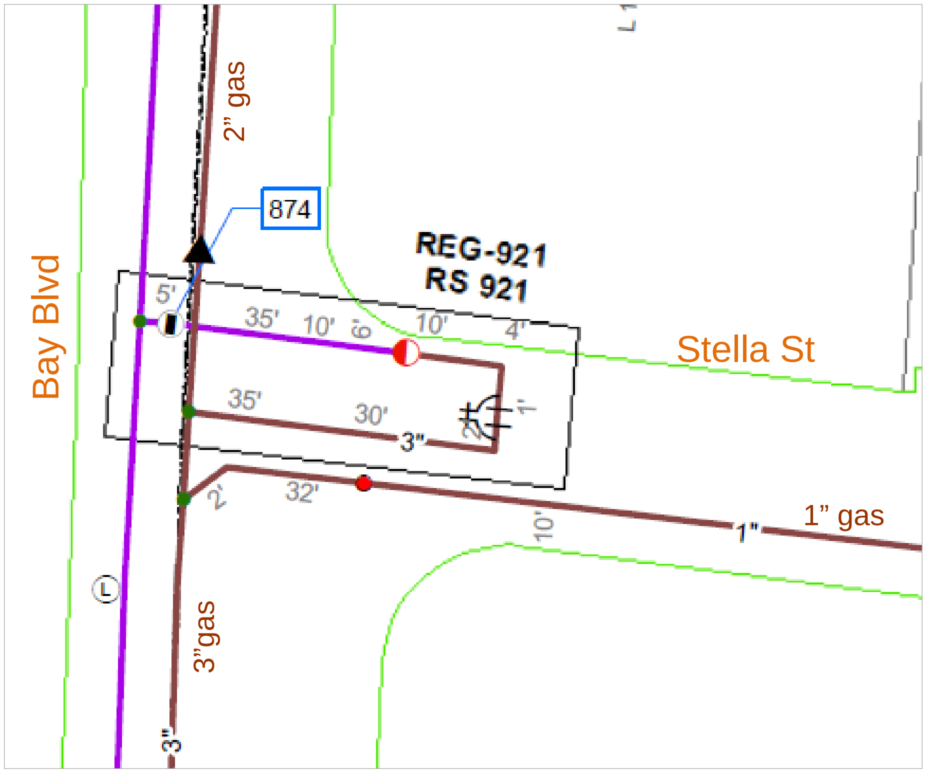

Figure 3. Close-up of Existing SDG&E Gas Pipelines, Regulator, and other Utilities near the Intersection of Bay Boulevard and Stella Street (Adapted from p.93 SDG&E Maps)

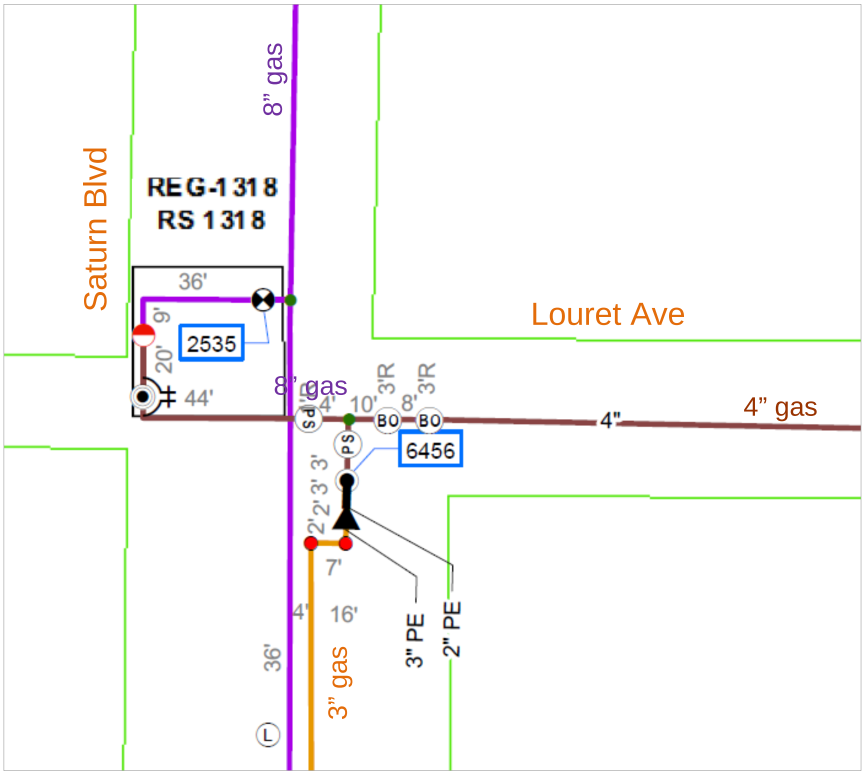

Figure 4. Close-up of Existing SDG&E Gas Pipelines, Regulator, and other Utilities at the Intersection of Saturn Boulevard and Louret Avenue (Adapted from p.84 SDG&E Maps)

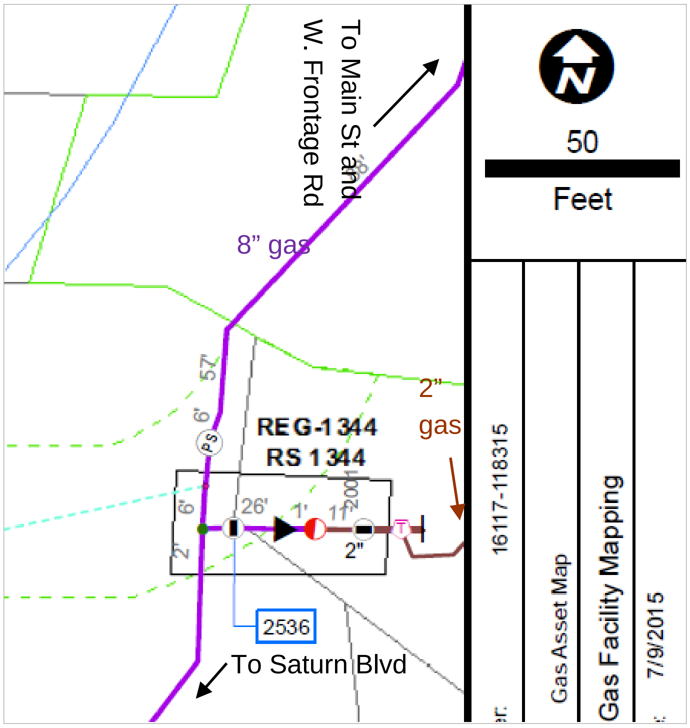

Figure 5. Close-up of Existing SDG&E Gas Pipelines, Regulator, and other Utilities near the Intersection of Main Street and W. Frontage Road (Adapted from p.86 of SDG&E Maps)

3. POWER LINES AND STRUCTURES

Information for existing power lines and structures was obtained from City of San Diego, Metropolitan Wastewater Department drawings[7]; San Diego Gas & Electric (SDG&E) maps[8], and corroborated with both information in an available SDNWR CCP 2206[9] and from Google Earth aerial images. The existing power utilities in the study area are shown in **Figures 6 and 7**. Underground and overhead power utilities are found along Saturn Boulevard, Louret Avenue, Bay Boulevard, West Frontage Road, Stella Street, Ada Street, Dorothy Street, Anita Street, and Palomar Street. Additional power poles and lines may be scattered throughout the study area but are not detailed in this document.

Saturn Boulevard contains an underground 3-inch PVC electrical transmission conduit (Sch. 80, 69 kV/128kV) that continues onto Louret Avenue, and appears to terminate at the intersection of Louret Avenue and Anita Avenue. This conduit appears to be bundled with a communications cable (fiber optic conduit). A short offshoot of the electrical conduit juts out westward from Saturn Avenue, adjacent to and south of the intersection between Saturn Boulevard and Louret Avenue; this offshoot connects to an associated meter pedestal which lies adjacent to and southwest of the intersection between Saturn Boulevard and Louret Avenue.

Power poles (PP) line the sides of Saturn Boulevard, Bay Boulevard, West Frontage Road and are scattered along smaller side streets. Approximate locations of the power poles were estimated based on drawings from the City of San Diego, maps from SDG&E, and corroborated using Google Earth aerial images. Overhead power lines joining these poles were approximated based on the power pole locations and using Google Earth aerial images. **Figure 8** shows two photographs of the power poles and overhead lines.

Two 3-inch underground power lines run parallel along West Frontage road and branch off onto Anita Street. Some additional sections of underground power line are shown on **Figure 6**, though the sections that lie within private property are omitted from this report.

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[7] City of San Diego, Metropolitan Wastewater Department. "Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings", May 2002.

[8] Maps received from SDG&E, 7/14/2015.

[9] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, "Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I", p. 3-111 to 3-118, August 2006.

Figure 6. Approximate Locations of Existing Power Utilities (1 of 2)

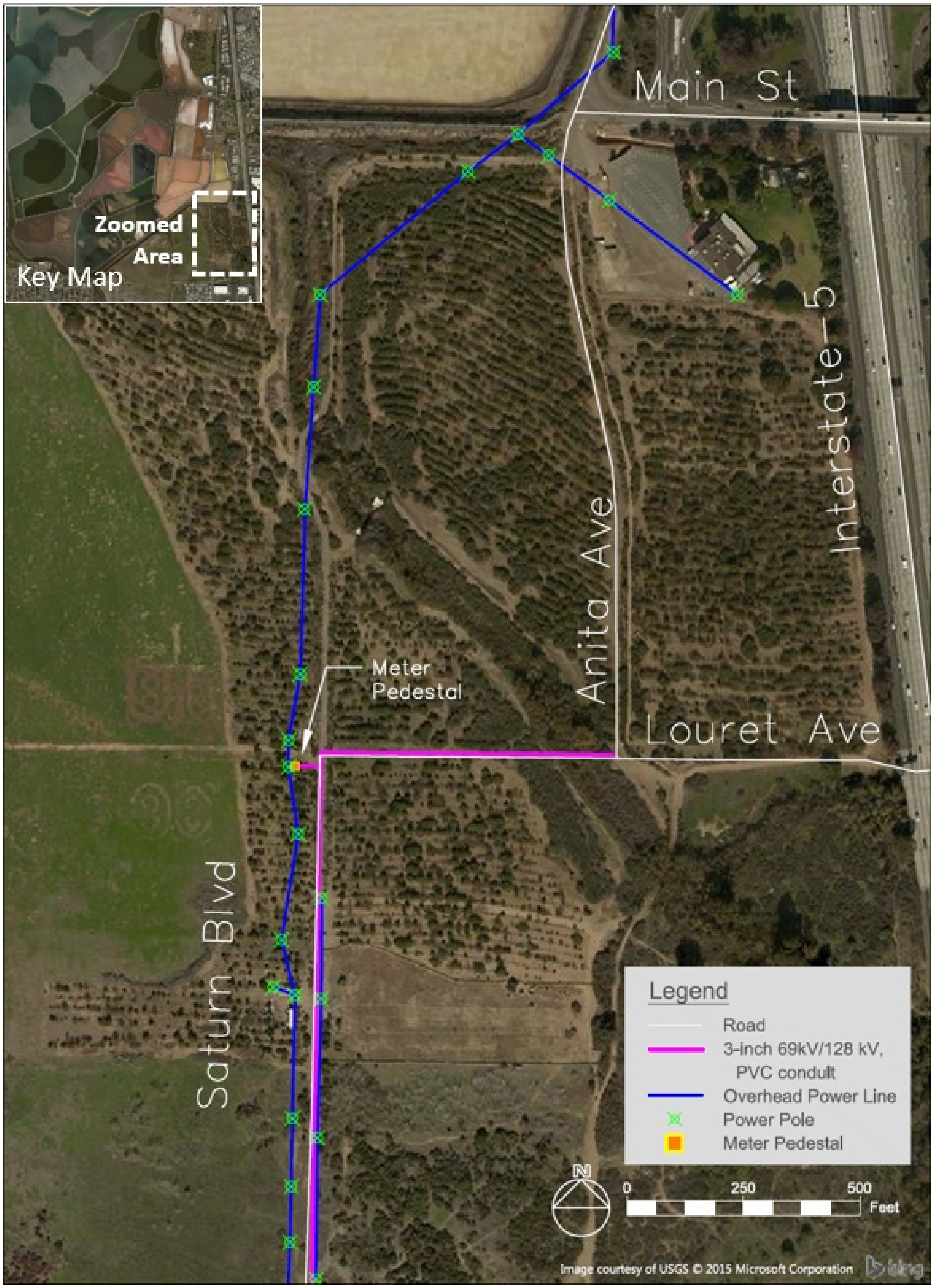

Figure 7. Approximate Locations of Existing Power Utilities (2 of 2)

Photos taken during Site Visit on 4/22/2015

Figure 8. Photos showing Overhead Power Lines and Gas Manhole along the Undeveloped Road North of Saturn Boulevard in ORF

Detailed maps of the SDG&E power utilities were provided by SDG&E[10]; these maps provide power line length measurements, connection locations, power ratios, and additional details not pictured in the figures in this document. Further information about power utilities was not available at the time that this report was prepared.

4. Communications

Information for existing communications utilities within the study area was obtained from City of San Diego, Metropolitan Wastewater Department drawings[11] and Cox Communications maps[12]. The existing communications utilities in the study area are shown in **Figures 9a and 9b**. Communications utilities are found along and adjacent to sections of Saturn Boulevard, West Frontage Road, and Bay Boulevard.

[10] Map pages provided by SDG&E 7/14/2015.

[11] City of San Diego, Metropolitan Wastewater Department. "Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings", May 2002.

[12] Cox Communications. "Cox_Cable_SOUTH SD BAY MAP SCALE 1 to 2000." Received April 2015.

Figure 9a. Approximate Locations of Existing Communications Utilities (1 of 2)

Figure 9b. Approximate Locations of Existing Communications Utilities (2 of 2)

A 2-inch underground fiber optic conduit (Sch. 80) runs parallel with gravity sewer line along Saturn Boulevard from Boundary Avenue to Louret Avenue, and on Louret Avenue, where it appears to terminate at the intersection of Louret Avenue and Anita Avenue. The reference drawings[7] indicate the minimum cover over this 2-inch line is 3 feet. A fiber optic pull box, Pull Box No. 2, is located on Saturn Boulevard, adjacent to (and south of) the intersection between Saturn Boulevard and Louret Avenue.

An underground Cox Communications line runs northwards from a building several hundred feet south of the intersection between West Frontage Road and Anita Street. The line appears to head south for a couple hundred feet, connect to what appears to be a utilities box, and curve northwards along West Frontage Road (on the western side of the road) (see **Figure 10**). The line is connected to additional utilities boxes along West Frontage Road (also see **Figure 10**). It is unclear how far north the line continues since the reference map does not show the entire area of interest. There is another stretch of Cox Communications line that runs through Bay Boulevard (along the eastern side of the road), from a point just south of its intersection with Palomar Street northwards to a point that lies beyond the northeastern extent of the study area; this line includes a short offshoot from Bay Boulevard that juts west towards a cluster of buildings at a point roughly 300 feet north of the intersection between Bay Boulevard and Palomar Street.

Further information about communication utilities was not available at the time that this report was prepared.

Source: Cox Communications

Figure 10. Northernmost Extent of Available Cox Communications Utilities Map, Showing Area around West Frontage Road and Interstate-5

5. WATER LINES AND STORM DRAINS

Information for existing water lines and storm drain utilities within the study area was obtained from City of San Diego, Metropolitan Wastewater Department drawings[13] and GIS data[14]; a survey CAD file prepared for the SDNWR CCP 2006[15]; and corroborated with information obtained in the SDNWR CCP 2006 report[16]. The existing water lines and storm drains in the study area are shown in **Figure 11**.

5.1 Storm Drains

Along Saturn Boulevard is a 24-inch underground storm drain pipeline. This pipeline has an invert elevation (IE) of 6.49 feet (NAVD88) near the intersection of Louret Avenue and Saturn Boulevard, and an IE of 7.42 feet (NAVD88) farther south on Saturn Boulevard, roughly 350 feet north of the intersection between Saturn Boulevard and Boundary Avenue. This pipeline appears to have an offshoot that juts off to the west from a point approximately 350 feet north of the intersection between Saturn Boulevard and Boundary Avenue. It is unclear how far west the line may or may not extend. Associated with the storm drain pipelines are drainage structures (mostly manholes) that are scattered throughout the study area, primarily along Saturn Boulevard.

Based on a qualitative description in the SDNWR CCP, the City of Imperial Beach maintains five storm drain outlets that affect the waters within the Refuge. Out of these five storm drain outlets, the only outlet that appears to be within or adjacent to the study area is a 36-inch underground reinforced concrete pipe that empties into the Otay River channel between 12th Street and Florence Street.

[13] City of San Diego, Metropolitan Wastewater Department. “Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings”, May 2002.

[14] Via http://www.sandiego.gov/publicutilities/customerservices/gis.shtml

[15] Survey conducted by Ducks Unlimited in 2000 for U.S. Fish and Wildlife Service for the preparation of San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, “Final Comprehensive Conservation Plan and Environmental Impact Statement”.

[16] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, “Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I”, p. 3-111 to 3-118, August 2006.

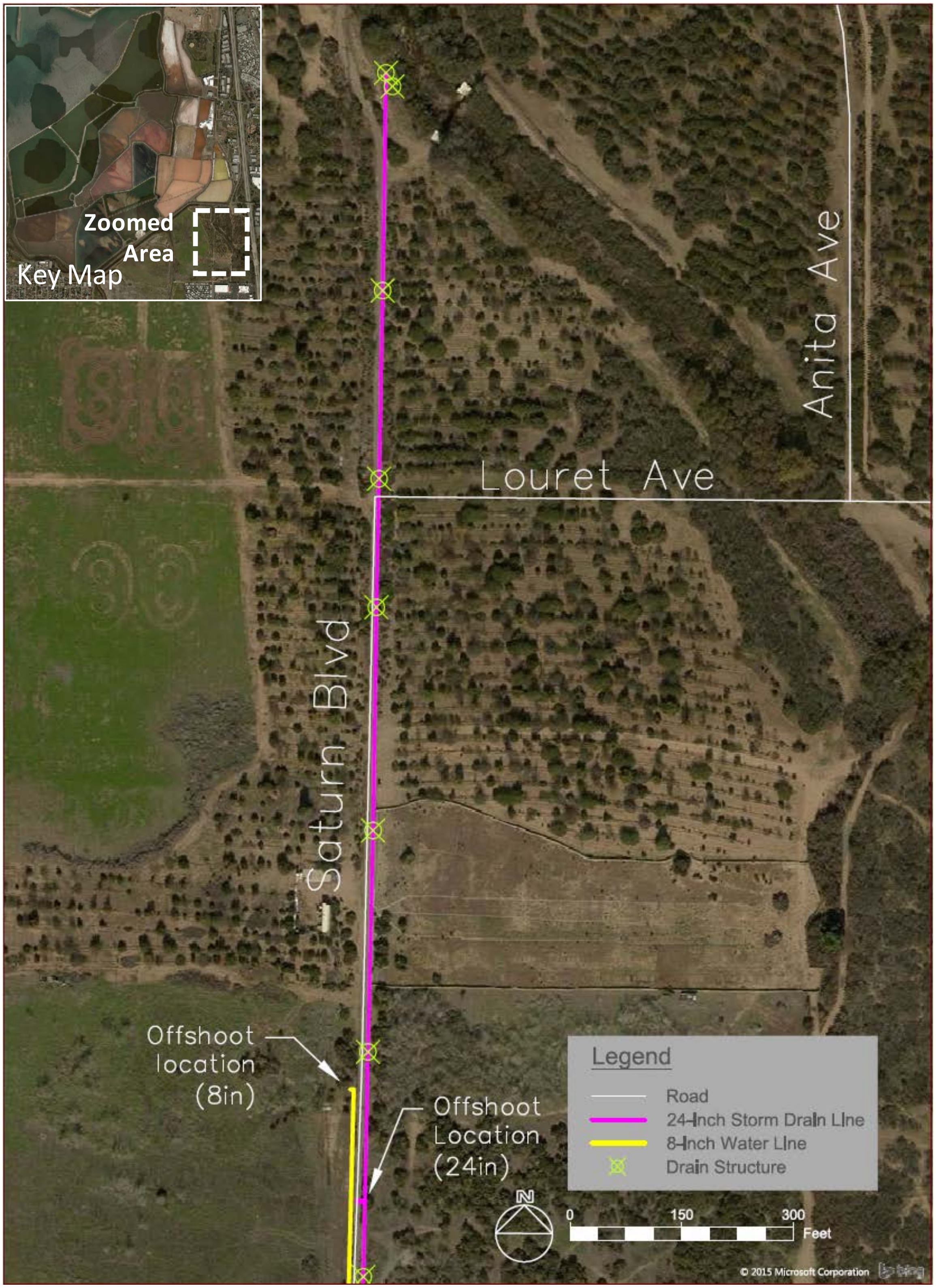

Figure 11. Existing Water Lines and Storm Drains

5.2 Water Lines

Water utilities are found along and adjacent to Saturn Boulevard, and scattered throughout the study area. As shown in **Figure 11**, there is an 8-inch underground water line that also lies along Saturn Boulevard. This 8-inch water line appears to terminate roughly 800 feet south of Louret Avenue, and is owned/operated by the California American Water Company. This pipeline appears to have an offshoot that juts off west from the northern end.

The California American Water Company was contacted in April 2015 and again in June 2015, during which time we were notified that the requested maps and information can only be viewed in-person at their office. As another option, California American Water Company staff may potentially be available to meet a work crew at the job site. Further information about water utilities was not available at the time that this report was prepared.

6. SEWER

Information for existing sanitary sewer utilities within the study area was obtained from the City of San Diego, Metropolitan Wastewater Department drawings[17] and GIS data[18]; a historic map from the San Diego National Wildlife Refuge Complex[19]; and corroborated with information in SDNWR CCP 2006[20]. The existing sewer utilities in the study area are shown in **Figure 12**. Sewer utilities are found along and adjacent to Saturn Boulevard, Louret Avenue, Anita Avenue, and other parts of the study area.

Along Saturn Boulevard is the underground 54-inch South Metro Interceptor pipeline. When this pipeline nears the Otay River, it turns northeast and continues toward and beyond Main Street. Wrapping around the eastern side of the Salt Works and Ponds, this pipeline continues northward along Bay Boulevard. There are also two short pipeline offshoots from Bay Boulevard, which jut eastward from the Bay Boulevard section between Palomar Street and Anita Street.

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[17] City of San Diego, Metropolitan Wastewater Department. "Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings", May 2002.

[18] Via http://www.sandiego.gov/publicutilities/customerservices/gis.shtml

[19] Victoria Touchstone, San Diego National Wildlife Refuge Complex. "old palm sewage site.pdf", received June 2015.

[20] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, "Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I", p. 3-111 to 3-118, August 2006.

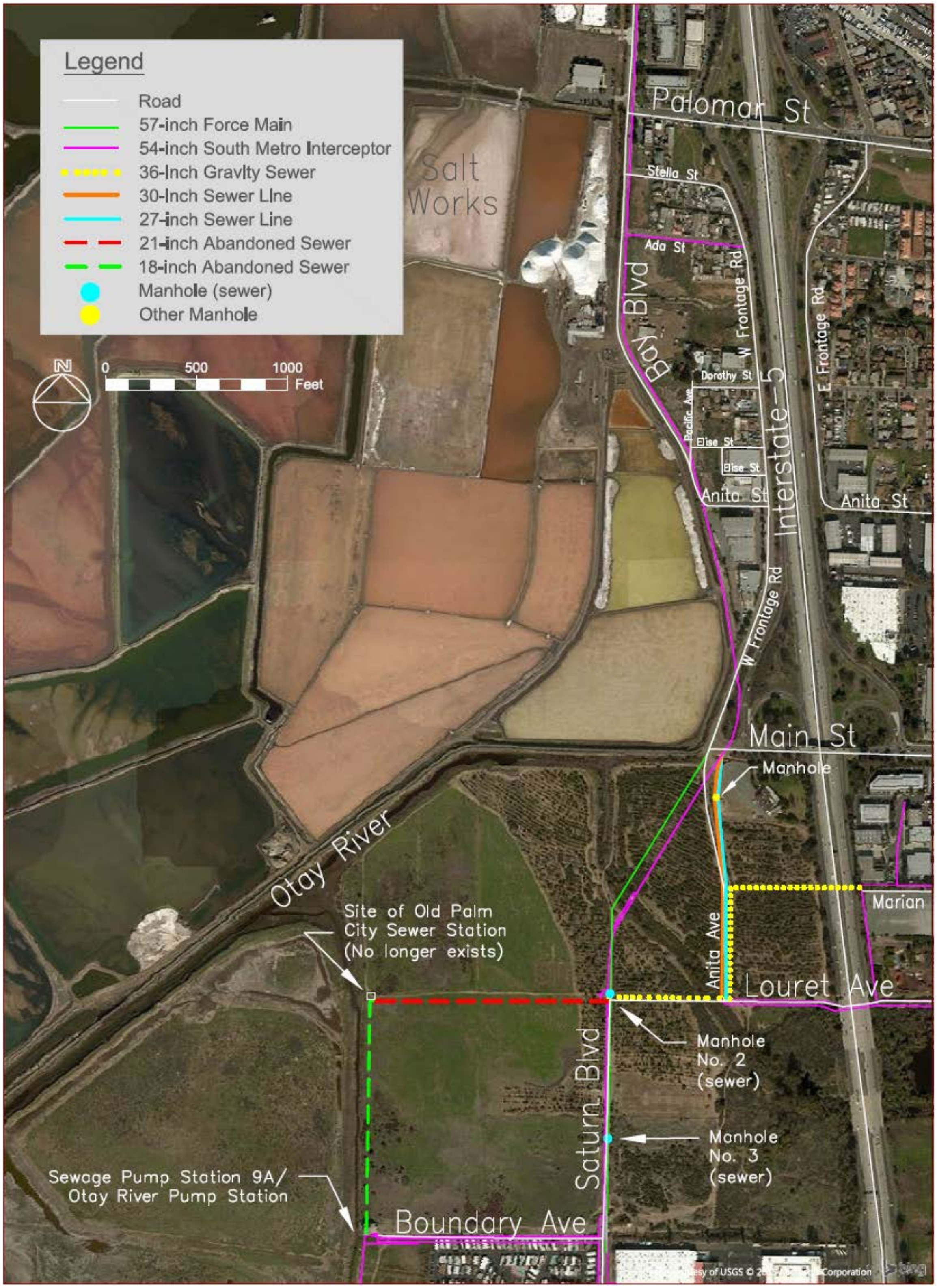


Figure 12. Approximate Locations of Existing Sewer Utilities

A 57-inch underground force main runs parallel to and alongside the 54-inch South Metro Interceptor on Saturn Boulevard, from south of the intersection between Saturn Boulevard and Boundary Avenue, and continuing toward and beyond Main Street. It is not clear how far north the pipeline extends.

A 36-inch underground PVC gravity pipeline extends westward from the intersection of Louret Avenue and Anita Avenue until it intersects with Saturn Boulevard—where it passes under Manhole No. 2, then turns south, continues along Saturn Boulevard from Louret Avenue towards Boundary Avenue—passing under Manhole No. 3 on Saturn Boulevard, and continuing onto Boundary Avenue and appearing to terminate at the Sewage Pump Station 9A/Otay River Pump Station. Manhole No. 2 lies at the intersection of Saturn Boulevard and Louret Avenue, and has a 7-foot diameter, rim EL of 12.38 feet, and an IE of -5.54 feet (vertical datum unknown). Manhole No. 3 has a 5-foot diameter[21], a rim EL of 13 feet, and an IE of -6.44 feet (vertical datum unknown). The 36-inch gravity pipeline slopes downward at -0.11% as it travels south from the Otay River. Additionally, the pipeline extends north on Anita Avenue from the intersection of Anita Avenue and Louret Avenue, enters a diversion structure at Marian Avenue, then travels north as a 30-inch sewer line, paralleling a 27-inch sewer pipeline owned and maintained by the Montgomery Sanitation District.

Based on a qualitative description in the U.S. Fish and Wildlife Service report, the underground 27-inch pipeline that is owned and maintained by the Montgomery Sanitation District extends along Anita Avenue, from Louret Avenue and continuing north within an easement through Refuge property and on towards Main Street.

Also extending along Anita Avenue from Louret Avenue and continuing north beyond Main Street is a 30-inch underground pipeline. A manhole appears to be located between this sewer line and the parallel 27-inch sewer line at a location just south of the intersection of Anita Avenue and Main Street. It is unclear which pipeline(s) to which this manhole is connected.

Just north of the intersection of Louret Avenue with Saturn Boulevard, there is a short underground pipeline offshoot from the 54-inch Saturn Boulevard pipeline which is comprised of a northeast-southwest section of 24-inch pipeline and a north-south section of 21-inch pipeline.

[21] Per San Diego Regional Standard Drawings (SDRSD)

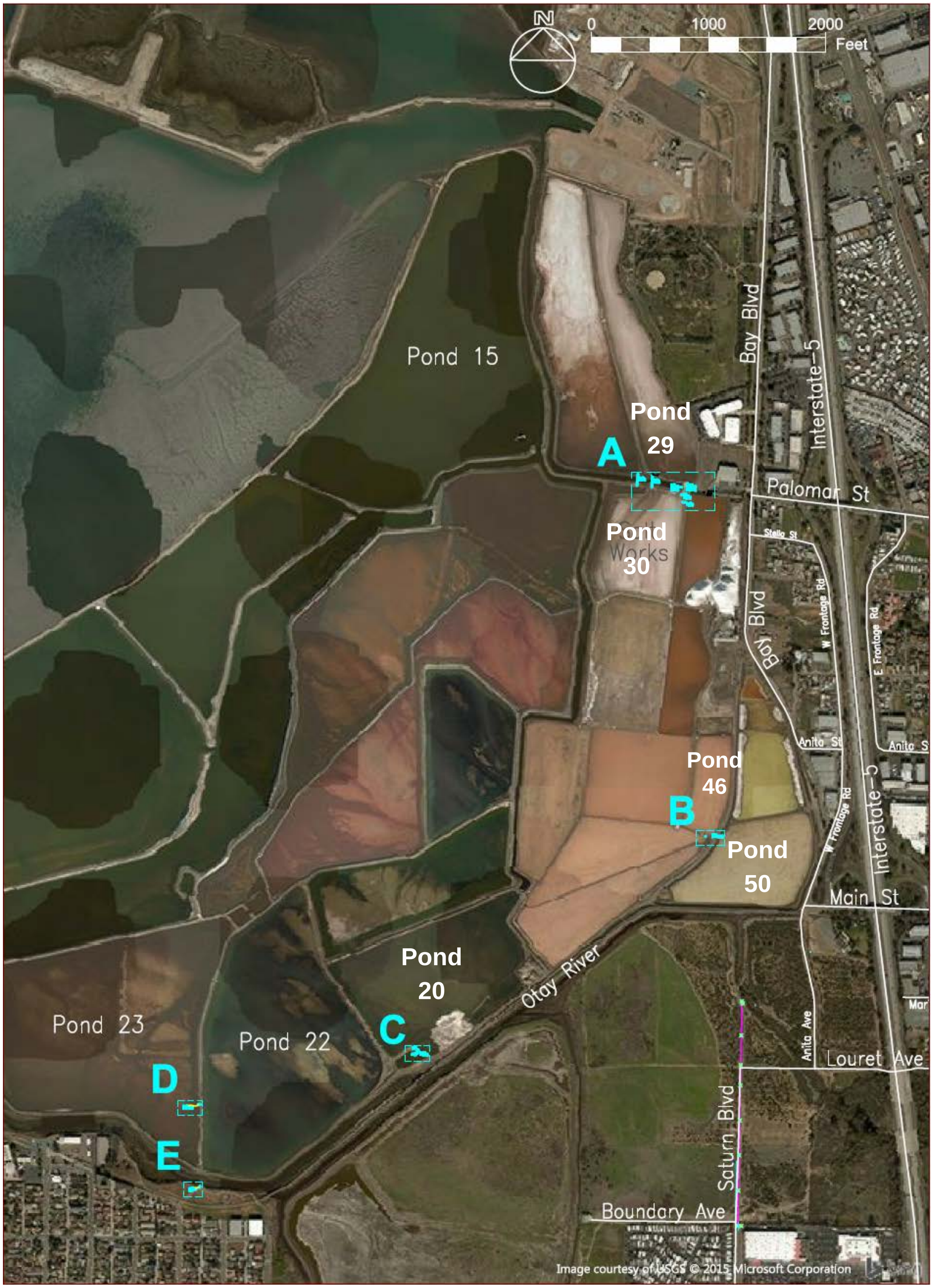
Based on the historic San Diego National Wildlife Refuge Complex map and a qualitative description in the U.S. Fish and Wildlife Service report, an abandoned 18-inch pipeline extends north through Refuge property from the Otay River pump station to the site of the old Palm City sewer pump station (approximate location of the pipeline and pump station shown in **Figure 12**). Also based on the same sources, another abandoned pipeline (21-inch) extends east from the old Palm City sewer pump station through Refuge property to Saturn Boulevard (also shown in **Figure 12**).

Further information about sewer utilities was not available at the time that this report was prepared.

7. Salt Works and Wildlife Refuge Utilities

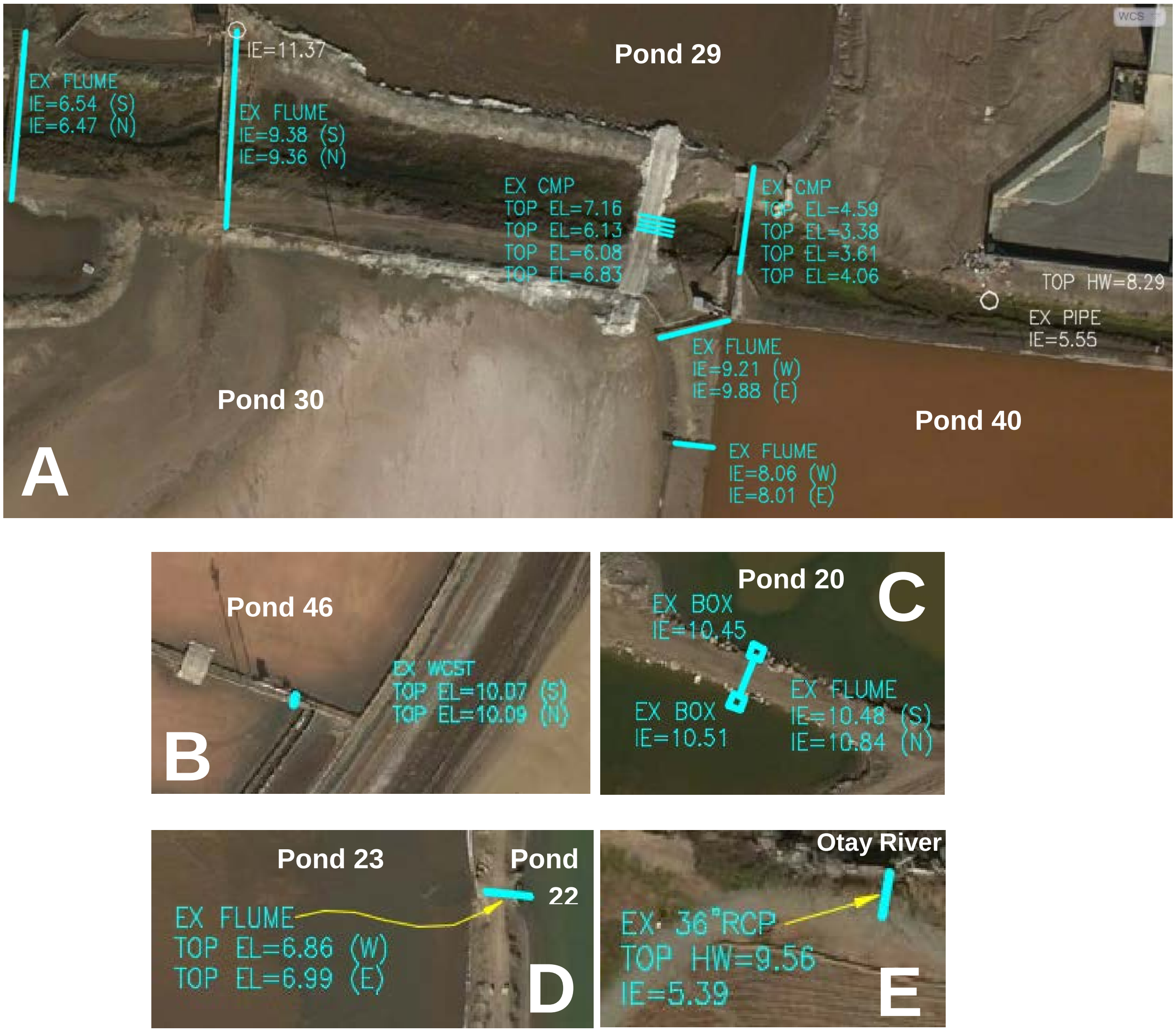
Information for existing Salt Works and San Diego Bay Wildlife Refuge (SDWR) utilities within the study area was obtained from a survey CAD file showing existing features[22]. The existing Salt Works and SDWR utilities in the study area are shown in **Figures 13 to 15**.

[22] Survey conducted by Ducks Unlimited in 2000 for U.S. Fish and Wildlife Service for the preparation of San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, "Final Comprehensive Conservation Plan and Environmental Impact Statement".



Note: See Figure 14 for enlarged details.

Figure 13. Existing Salt Works and SDWR Utilities in Study Area



Notes:

1. *See Figure 13 for Locations A to E.*
2. *Vertical measurements are in feet, NAVD88.*
3. *Abbreviations:*

CMP = Corrugated Metal Pipe	*RCP = Reinforced Concrete Pipe*
E = East;	*HW = Headwall*
EL= elevation	*S = South*
EX = Existing	*W = West*
IE = Invert Elevation	*WCST = Welded Carbon Steel Tube*
N = North	

Figure 14. Details of Existing Salt Works Utilities

As shown in **Figure 14**, there is a 36-inch underground reinforced concrete pipe adjacent to the southwest corner of Pond 22 (Location E). This storm drain has an outlet into the Otay River, with a top elevation of the headwall at 9.56 ft, NAVD88 and invert elevations of 9.56 and 5.39 feet (NAVD88), respectively.

A flume on the western face of Pond 22 spans Pond 22 and Pond 23. The top elevation (EL) of the western end at Pond 23 is 6.86 feet (NAVD88), and the top EL of the eastern end at Pond 22 is 6.99 feet (NAVD88).

There is a flume adjacent to the easternmost point of Pond 22. The flume appears to join a very small pond with a larger pond. The northern end has an invert elevation of 10.84 feet, and the southern end an invert elevation of 10.48 feet. Additionally, there are associated structures/boxes—one on each end of the flume—that have invert elevations of 10.45 and 10.51 feet (NAVD88) for the northern and southern ends, respectively.

On the western side of the Salt Works, there is another utility structure. The top ELs of this WCST structure are 10.09 and 10.07 feet (NAVD88) for the northern and southern ends, respectively.

At the northern end of the Salt Works, there are several structures including flumes and pipes.

Figure 14 A shows a series of four culvert pipes providing hydraulic connectivity at the channel crossing (light-colored) north of Pond 30, only two of the pipes were visible from the photo taken during a site visit conducted on April 22, 2015 (**Figure 15**).

Figure 15. Existing CMP Culverts Providing Hydraulic Connectivity at the Channel Crossing Located North of Pond 30

8. Summary and Notes

- Based on information obtained from the responsive agencies and other available sources, most of the known utilities within the study area are situated in and along the Saturn Boulevard right-of-way, with additional utilities located along Bay Boulevard and West Frontage Road, which may be in the path of the Project construction traffic.
- Additional utilities were observed outside the project area from available sources. This information is not included in this report.
- Utility information documented here represents current condition of the utility facilities found in currently available records. Coordination with the Underground Utilities Alert (DigAlert) and utilities agencies, and utilities investigation updates should be conducted during final engineering design and construction.

APPENDIX M

Air Quality/Greenhouse Gas Output Files

Alternative B – Intertidal

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Truck Haul

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural | **Wind Speed (m/s)** 2.6 | **Precipitation Freq (Days)** 40

Climate Zone 13 | **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 | **CH4 Intensity (lb/MWhr)** 0.029 | **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	130,000.00
tblGrading	MaterialExported	0.00	130,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
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tblTripsAndVMT	VendorTripLength	6.60	7.30
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tblTripsAndVMT	VendorTripNumber	0.00	20.00

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
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tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	18.0438	172.9631	169.9022	0.1961	26.9161	7.5440	34.4601	13.9294	6.9708	20.9003	0.0000	19,363.3301	19,363.3301	3.9682	0.0000	19,446.6617
2018	14.6186	143.2142	148.9192	0.1758	27.9508	6.0793	34.0284	14.1700	5.5929	19.7613	0.0000	17,359.1862	17,359.1862	3.8282	0.0000	17,439.5774
2019	10.5050	115.3185	88.4897	0.1296	25.5597	5.2989	30.8586	13.4879	4.8750	18.3629	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**43.1674**	**431.4958**	**407.3110**	**0.5015**	**80.4266**	**18.9222**	**99.3472**	**41.5873**	**17.4387**	**59.0245**	**0.0000**	**49,426.0818**	**49,426.0818**	**11.5793**	**0.0000**	**49,669.2474**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	8.4899	89.4989	139.4257	0.1961	11.9066	3.3232	15.2298	5.8138	3.3022	9.1160	0.0000	19,363.3301	19,363.3301	3.9682	0.0000	19,446.6617
2018	6.6115	78.4823	129.0325	0.1758	12.9413	2.9093	15.8490	6.0543	2.8910	8.9438	0.0000	17,359.1862	17,359.1862	3.8282	0.0000	17,439.5774
2019	3.2725	60.5324	73.4487	0.1296	10.2998	2.7059	13.0057	5.3498	2.7039	8.0538	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**18.3739**	**228.5137**	**341.9068**	**0.5015**	**35.1477**	**8.9384**	**44.0845**	**17.2179**	**8.8971**	**26.1136**	**0.0000**	**49,426.0818**	**49,426.0818**	**11.5793**	**0.0000**	**49,669.2474**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	57.44	47.04	16.06	0.00	56.30	52.76	55.63	58.60	48.98	55.76	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6057	0.0000	24.6057	13.3043	0.0000	13.3043			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6057**	**6.9021**	**31.5078**	**13.3043**	**6.3499**	**19.6542**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1663	16.8442	52.6262	0.0393	1.0375	0.1700	1.2075	0.2784	0.1563	0.4347		3,826.8409	3,826.8409	0.0374		3,827.6264
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**3.8635**	**21.2177**	**61.3885**	**0.0555**	**1.7669**	**0.2333**	**2.0001**	**0.4783**	**0.2145**	**0.6928**		**5,336.1335**	**5,336.1335**	**0.0661**		**5,337.5222**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5962	0.0000	9.5962	5.1887	0.0000	5.1887			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.5962**	**2.6813**	**12.2775**	**5.1887**	**2.6813**	**7.8700**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1663	16.8442	52.6262	0.0393	1.0375	0.1700	1.2075	0.2784	0.1563	0.4347		3,826.8409	3,826.8409	0.0374		3,827.6264
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**3.8635**	**21.2177**	**61.3885**	**0.0555**	**1.7669**	**0.2333**	**2.0001**	**0.4783**	**0.2145**	**0.6928**		**5,336.1335**	**5,336.1335**	**0.0661**		**5,337.5222**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					24.6057	0.0000	24.6057	13.3043	0.0000	13.3043			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6057**	**5.8513**	**30.4570**	**13.3043**	**5.3832**	**18.6875**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	2.9958	15.4526	51.0292	0.0392	2.6157	0.1675	2.7832	0.6658	0.1540	0.8198		3,761.0794	3,761.0794	0.0379		3,761.8755
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**3.6446**	**19.4032**	**59.3122**	**0.0554**	**3.3450**	**0.2264**	**3.5715**	**0.8656**	**0.2082**	**1.0738**		**5,236.4408**	**5,236.4408**	**0.0651**		**5,237.8073**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					9.5962	0.0000	9.5962	5.1887	0.0000	5.1887			0.0000			0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.5962**	**2.6813**	**12.2775**	**5.1887**	**2.6813**	**7.8700**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9958	15.4526	51.0292	0.0392	2.6157	0.1675	2.7832	0.6658	0.1540	0.8198		3,761.0794	3,761.0794	0.0379		3,761.8755
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**3.6446**	**19.4032**	**59.3122**	**0.0554**	**3.3450**	**0.2264**	**3.5715**	**0.8656**	**0.2082**	**1.0738**		**5,236.4408**	**5,236.4408**	**0.0651**		**5,237.8073**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6107	0.0000	24.6107	13.3049	0.0000	13.3049			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6107**	**5.8513**	**30.4620**	**13.3049**	**5.3832**	**18.6881**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.0246	15.6011	51.5199	0.0396	0.8306	0.1691	0.9997	0.2279	0.1555	0.3833		3,797.2436	3,797.2436	0.0383		3,798.0474
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**3.6734**	**19.5518**	**59.8028**	**0.0558**	**1.5599**	**0.2280**	**1.7879**	**0.4277**	**0.2097**	**0.6374**		**5,272.6051**	**5,272.6051**	**0.0654**		**5,273.9792**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5982	0.0000	9.5982	5.1889	0.0000	5.1889			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.5982**	**2.6813**	**12.2794**	**5.1889**	**2.6813**	**7.8702**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	3.0246	15.6011	51.5199	0.0396	0.8306	0.1691	0.9997	0.2279	0.1555	0.3833		3,797.2436	3,797.2436	0.0383		3,798.0474
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**3.6734**	**19.5518**	**59.8028**	**0.0558**	**1.5599**	**0.2280**	**1.7879**	**0.4277**	**0.2097**	**0.6374**		**5,272.6051**	**5,272.6051**	**0.0654**		**5,273.9792**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Truck Haul

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	130,000.00
tblGrading	MaterialExported	0.00	130,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	17.3834	172.4109	152.0240	0.1970	26.9161	7.5408	34.4568	13.9294	6.9678	20.8973	0.0000	19,473.1448	19,473.1448	3.9659	0.0000	19,556.4293
2018	14.0415	142.7681	131.9918	0.1764	27.9508	6.0764	34.0255	14.1700	5.5902	19.7587	0.0000	17,438.5843	17,438.5843	3.8259	0.0000	17,518.9283
2019	10.4738	115.2677	87.8552	0.1300	25.5597	5.2987	30.8584	13.4879	4.8748	18.3627	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**41.8987**	**430.4467**	**371.8710**	**0.5034**	**80.4266**	**18.9158**	**99.3408**	**41.5873**	**17.4328**	**59.0186**	**0.0000**	**49,642.4278**	**49,642.4278**	**11.5747**	**0.0000**	**49,885.4971**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	7.8295	88.9467	121.5475	0.1970	11.9066	3.3200	15.2266	5.8138	3.2992	9.1130	0.0000	19,473.1448	19,473.1448	3.9659	0.0000	19,556.4293
2018	6.0345	78.0362	112.1051	0.1764	12.9413	2.9064	15.8461	6.0543	2.8883	8.9411	0.0000	17,438.5843	17,438.5843	3.8259	0.0000	17,518.9283
2019	3.2413	60.4816	72.8142	0.1300	10.2998	2.7057	13.0055	5.3498	2.7037	8.0536	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**17.1052**	**227.4646**	**306.4668**	**0.5034**	**35.1477**	**8.9320**	**44.0781**	**17.2179**	**8.8912**	**26.1077**	**0.0000**	**49,642.4278**	**49,642.4278**	**11.5747**	**0.0000**	**49,885.4970**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	59.17	47.16	17.59	0.00	56.30	52.78	55.63	58.60	49.00	55.76	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6057	0.0000	24.6057	13.3043	0.0000	13.3043			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6057**	**6.9021**	**31.5078**	**13.3043**	**6.3499**	**19.6542**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.6235	16.4739	37.1557	0.0395	1.0375	0.1676	1.2051	0.2784	0.1540	0.4325		3,873.5190	3,873.5190	0.0355		3,874.2641
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**3.2414**	**20.7284**	**44.1907**	**0.0561**	**1.7669**	**0.2303**	**1.9971**	**0.4783**	**0.2117**	**0.6900**		**5,416.9055**	**5,416.9055**	**0.0640**		**5,418.2491**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5962	0.0000	9.5962	5.1887	0.0000	5.1887			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.5962**	**2.6813**	**12.2775**	**5.1887**	**2.6813**	**7.8700**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.6235	16.4739	37.1557	0.0395	1.0375	0.1676	1.2051	0.2784	0.1540	0.4325		3,873.5190	3,873.5190	0.0355		3,874.2641
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**3.2414**	**20.7284**	**44.1907**	**0.0561**	**1.7669**	**0.2303**	**1.9971**	**0.4783**	**0.2117**	**0.6900**		**5,416.9055**	**5,416.9055**	**0.0640**		**5,418.2491**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6057	0.0000	24.6057	13.3043	0.0000	13.3043			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6057**	**5.8513**	**30.4570**	**13.3043**	**5.3832**	**18.6875**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.4955	15.1157	35.9177	0.0394	2.6157	0.1651	2.7809	0.6658	0.1518	0.8176		3,807.0047	3,807.0047	0.0359		3,807.7589
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.0723**	**18.9603**	**42.5300**	**0.0560**	**3.3450**	**0.2235**	**3.5685**	**0.8656**	**0.2056**	**1.0712**		**5,315.3974**	**5,315.3974**	**0.0629**		**5,316.7171**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5962	0.0000	9.5962	5.1887	0.0000	5.1887			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.5962**	**2.6813**	**12.2775**	**5.1887**	**2.6813**	**7.8700**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.4955	15.1157	35.9177	0.0394	2.6157	0.1651	2.7809	0.6658	0.1518	0.8176		3,807.0047	3,807.0047	0.0359		3,807.7589
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.0723**	**18.9603**	**42.5300**	**0.0560**	**3.3450**	**0.2235**	**3.5685**	**0.8656**	**0.2056**	**1.0712**		**5,315.3974**	**5,315.3974**	**0.0629**		**5,316.7171**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6107	0.0000	24.6107	13.3049	0.0000	13.3049			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6107**	**5.8513**	**30.4620**	**13.3049**	**5.3832**	**18.6881**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.5195	15.2610	36.2631	0.0398	0.8306	0.1667	0.9973	0.2279	0.1533	0.3812		3,843.6105	3,843.6105	0.0363		3,844.3720
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.0963**	**19.1057**	**42.8754**	**0.0564**	**1.5599**	**0.2251**	**1.7850**	**0.4277**	**0.2070**	**0.6347**		**5,352.0032**	**5,352.0032**	**0.0632**		**5,353.3301**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5982	0.0000	9.5982	5.1889	0.0000	5.1889			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.5982**	**2.6813**	**12.2794**	**5.1889**	**2.6813**	**7.8702**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	2.5195	15.2610	36.2631	0.0398	0.8306	0.1667	0.9973	0.2279	0.1533	0.3812		3,843.6105	3,843.6105	0.0363		3,844.3720
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.0963**	**19.1057**	**42.8754**	**0.0564**	**1.5599**	**0.2251**	**1.7850**	**0.4277**	**0.2070**	**0.6347**		**5,352.0032**	**5,352.0032**	**0.0632**		**5,353.3301**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Truck Haul

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural

Wind Speed (m/s) 2.6

Precipitation Freq (Days) 40

Climate Zone 13

Operational Year 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49

CH4 Intensity (lb/MWhr) 0.029

N2O Intensity (lb/MWhr) 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	130,000.00
tblGrading	MaterialExported	0.00	130,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
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tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.6600	6.5638	6.2964	7.3900e-003	1.3804	0.2845	1.6649	0.7225	0.2621	0.9846	0.0000	666.7576	666.7576	0.1377	0.0000	669.6491
2018	0.9618	9.4310	9.4888	0.0118	2.7085	0.3987	3.1073	1.4272	0.3668	1.7941	0.0000	1,052.6096	1,052.6096	0.2279	0.0000	1,057.3955
2019	0.5574	6.0597	4.7442	7.1200e-003	1.3492	0.2765	1.6257	0.7068	0.2544	0.9612	0.0000	628.5146	628.5146	0.1792	0.0000	632.2778
Total	**2.1791**	**22.0544**	**20.5294**	**0.0263**	**5.4381**	**0.9597**	**6.3978**	**2.8566**	**0.8833**	**3.7399**	**0.0000**	**2,347.8818**	**2,347.8818**	**0.5448**	**0.0000**	**2,359.3224**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.2874	3.3087	5.1078	7.3900e-003	0.5924	0.1199	0.7123	0.2964	0.1190	0.4155	0.0000	666.7571	666.7571	0.1377	0.0000	669.6485
2018	0.4373	5.1910	8.1862	0.0118	1.1399	0.1911	1.3310	0.5791	0.1899	0.7690	0.0000	1,052.6087	1,052.6087	0.2279	0.0000	1,057.3947
2019	0.1813	3.2108	3.9621	7.1200e-003	0.5557	0.1417	0.6973	0.2836	0.1415	0.4251	0.0000	628.5140	628.5140	0.1792	0.0000	632.2771
Total	**0.9060**	**11.7105**	**17.2561**	**0.0263**	**2.2880**	**0.4526**	**2.7406**	**1.1592**	**0.4504**	**1.6096**	**0.0000**	**2,347.8798**	**2,347.8798**	**0.5448**	**0.0000**	**2,359.3203**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	58.42	46.90	15.94	0.00	57.93	52.84	57.16	59.42	49.01	56.96	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Clean Paved Roads

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2918	0.0000	1.2918	0.6985	0.0000	0.6985	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490
Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2918**	**0.2692**	**1.5610**	**0.6985**	**0.2477**	**0.9461**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1151	0.6608	1.8544	1.5400e-003	0.0396	6.5700e-003	0.0461	0.0106	6.0400e-003	0.0167	0.0000	136.3523	136.3523	1.2800e-003	0.0000	136.3792
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.1407**	**0.8323**	**2.1724**	**2.1700e-003**	**0.0674**	**9.0300e-003**	**0.0764**	**0.0183**	**8.3000e-003**	**0.0266**	**0.0000**	**190.0669**	**190.0669**	**2.2900e-003**	**0.0000**	**190.1151**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5038	0.0000	0.5038	0.2724	0.0000	0.2724	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5038**	**0.1046**	**0.6084**	**0.2724**	**0.1046**	**0.3770**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1151	0.6608	1.8544	1.5400e-003	0.0396	6.5700e-003	0.0461	0.0106	6.0400e-003	0.0167	0.0000	136.3523	136.3523	1.2800e-003	0.0000	136.3792
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.1407**	**0.8323**	**2.1724**	**2.1700e-003**	**0.0674**	**9.0300e-003**	**0.0764**	**0.0183**	**8.3000e-003**	**0.0266**	**0.0000**	**190.0669**	**190.0669**	**2.2900e-003**	**0.0000**	**190.1151**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2918	0.0000	1.2918	0.6985	0.0000	0.6985	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2918**	**0.0790**	**1.3708**	**0.6985**	**0.0727**	**0.7712**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0378	0.2098	0.6218	5.3000e-004	0.0344	2.2400e-003	0.0367	8.7700e-003	2.0600e-003	0.0108	0.0000	46.3881	46.3881	4.5000e-004	0.0000	46.3976
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**0.0460**	**0.2635**	**0.7256**	**7.5000e-004**	**0.0441**	**3.0300e-003**	**0.0471**	**0.0114**	**2.7900e-003**	**0.0142**	**0.0000**	**64.5634**	**64.5634**	**7.8000e-004**	**0.0000**	**64.5799**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5038	0.0000	0.5038	0.2724	0.0000	0.2724	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5038**	**0.0362**	**0.5400**	**0.2724**	**0.0362**	**0.3086**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0378	0.2098	0.6218	5.3000e-004	0.0344	2.2400e-003	0.0367	8.7700e-003	2.0600e-003	0.0108	0.0000	46.3881	46.3881	4.5000e-004	0.0000	46.3976
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**0.0460**	**0.2635**	**0.7256**	**7.5000e-004**	**0.0441**	**3.0300e-003**	**0.0471**	**0.0114**	**2.7900e-003**	**0.0142**	**0.0000**	**64.5634**	**64.5634**	**7.8000e-004**	**0.0000**	**64.5799**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2798	0.0000	1.2798	0.6919	0.0000	0.6919	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2798**	**0.3043**	**1.5840**	**0.6919**	**0.2799**	**0.9718**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1469	0.8160	2.4180	2.0700e-003	0.0423	8.7200e-003	0.0510	0.0116	8.0200e-003	0.0197	0.0000	180.3983	180.3983	1.7500e-003	0.0000	180.4351
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.1786**	**1.0226**	**2.8181**	**2.9200e-003**	**0.0794**	**0.0118**	**0.0912**	**0.0218**	**0.0108**	**0.0326**	**0.0000**	**250.4069**	**250.4069**	**3.0200e-003**	**0.0000**	**250.4704**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4991	0.0000	0.4991	0.2698	0.0000	0.2698	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4991**	**0.1394**	**0.6385**	**0.2698**	**0.1394**	**0.4093**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.1469	0.8160	2.4180	2.0700e-003	0.0423	8.7200e-003	0.0510	0.0116	8.0200e-003	0.0197	0.0000	180.3983	180.3983	1.7500e-003	0.0000	180.4351
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.1786**	**1.0226**	**2.8181**	**2.9200e-003**	**0.0794**	**0.0118**	**0.0912**	**0.0218**	**0.0108**	**0.0326**	**0.0000**	**250.4069**	**250.4069**	**3.0200e-003**	**0.0000**	**250.4704**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5289	5.9133	4.3821	6.2400e-003		0.2743	0.2743		0.2523	0.2523	0.0000	560.9061	560.9061	0.1775	0.0000	564.6329
Total	**0.5289**	**5.9133**	**4.3821**	**6.2400e-003**	**1.3009**	**0.2743**	**1.5751**	**0.6937**	**0.2523**	**0.9461**	**0.0000**	**560.9061**	**560.9061**	**0.1775**	**0.0000**	**564.6329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	560.9055	560.9055	0.1775	0.0000	564.6322
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.5073**	**0.1394**	**0.6468**	**0.2706**	**0.1394**	**0.4100**	**0.0000**	**560.9055**	**560.9055**	**0.1775**	**0.0000**	**564.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Conveyor Option

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
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tblOffRoadEquipment	OffRoadEquipmentType		Pumps
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
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tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.8775	156.1189	117.2760	0.1568	25.9120	7.3741	33.2861	13.6561	6.8146	20.4707	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	11.5939	127.6131	97.3993	0.1363	25.3738	5.9102	31.2840	13.5099	5.4374	18.9473	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5300
2019	10.5050	115.3185	88.4897	0.1296	25.5597	5.2989	30.8586	13.4879	4.8750	18.3629	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**36.9764**	**399.0505**	**303.1650**	**0.4227**	**76.8456**	**18.5832**	**95.4287**	**40.6539**	**17.1270**	**57.7808**	**0.0000**	**41,801.9974**	**41,801.9974**	**11.5036**	**0.0000**	**42,043.5736**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2017	5.3236	72.6548	86.7995	0.1568	10.8821	3.1533	14.0354	5.5373	3.1460	8.6833	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	3.5869	62.8812	77.5126	0.1363	10.3407	2.7402	13.0809	5.3908	2.7355	8.1263	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5299
2019	3.2725	60.5324	73.4487	0.1296	10.2998	2.7059	13.0057	5.3498	2.7039	8.0538	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**12.1830**	**196.0684**	**237.7608**	**0.4227**	**31.5226**	**8.5994**	**40.1219**	**16.2779**	**8.5854**	**24.8633**	**0.0000**	**41,801.9973**	**41,801.9973**	**11.5036**	**0.0000**	**42,043.5736**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.05**	**50.87**	**21.57**	**0.00**	**58.98**	**53.73**	**57.96**	**59.96**	**49.87**	**56.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42

Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832

Total	1.2999	7.4064	4.0156	0.0110	0.0000	0.3806	0.3806	0.0000	0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

<u>Mitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Conveyor Option

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
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tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
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tblTripsAndVMT	VendorTripLength	6.60	7.30
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tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
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tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00

tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.7599	155.9369	114.8683	0.1575	25.9120	7.3732	33.2852	13.6561	6.8138	20.4699	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	11.5220	127.5071	95.7287	0.1366	25.3738	5.9096	31.2834	13.5099	5.4369	18.9468	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	10.4738	115.2677	87.8552	0.1300	25.5597	5.2987	30.8584	13.4879	4.8748	18.3627	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**36.7557**	**398.7117**	**298.4522**	**0.4241**	**76.8456**	**18.5815**	**95.4271**	**40.6539**	**17.1255**	**57.7793**	**0.0000**	**41,925.2984**	**41,925.2984**	**11.5030**	**0.0000**	**42,166.8610**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2017	5.2060	72.4728	84.3918	0.1575	10.8821	3.1524	14.0345	5.5373	3.1452	8.6825	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	3.5150	62.7752	75.8420	0.1366	10.3407	2.7397	13.0803	5.3908	2.7350	8.1257	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	3.2413	60.4816	72.8142	0.1300	10.2998	2.7057	13.0055	5.3498	2.7037	8.0536	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**11.9622**	**195.7296**	**233.0481**	**0.4241**	**31.5226**	**8.5977**	**40.1203**	**16.2779**	**8.5839**	**24.8618**	**0.0000**	**41,925.2984**	**41,925.2984**	**11.5030**	**0.0000**	**42,166.8610**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.45**	**50.91**	**21.91**	**0.00**	**58.98**	**53.73**	**57.96**	**59.96**	**49.88**	**56.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42

Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832

Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

ORERP - Alt B - Intertidal Conveyor Option - Annual Equipment

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00

tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
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tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
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tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripNumber	0.00	50.00
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tblTripsAndVMT	WorkerTripNumber	40.00	50.00

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tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.5448	5.9030	4.4421	5.8500e-003	1.3426	0.2779	1.6205	0.7121	0.2561	0.9682	0.0000	530.4053	530.4053	0.1364	0.0000	533.2698
2018	0.7771	8.4051	6.4491	9.1800e-003	2.6353	0.3878	3.0231	1.4074	0.3567	1.7641	0.0000	825.8232	825.8232	0.2257	0.0000	830.5629
2019	0.5574	6.0597	4.7442	7.1200e-003	1.3492	0.2765	1.6257	0.7068	0.2544	0.9612	0.0000	628.5146	628.5146	0.1792	0.0000	632.2778
Total	**1.8793**	**20.3678**	**15.6353**	**0.0222**	**5.3271**	**0.9421**	**6.2693**	**2.8263**	**0.8672**	**3.6935**	**0.0000**	**1,984.7431**	**1,984.7431**	**0.5413**	**0.0000**	**1,996.1105**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2017	0.1722	2.6479	3.2535	5.8500e-003	0.5536	0.1133	0.6668	0.2859	0.1130	0.3989	0.0000	530.4048	530.4048	0.1364	0.0000	533.2693
2018	0.2526	4.1652	5.1465	9.1800e-003	1.0645	0.1801	1.2447	0.5589	0.1798	0.7387	0.0000	825.8223	825.8223	0.2257	0.0000	830.5620
2019	0.1813	3.2108	3.9621	7.1200e-003	0.5557	0.1417	0.6973	0.2836	0.1415	0.4251	0.0000	628.5140	628.5140	0.1792	0.0000	632.2771
Total	**0.6062**	**10.0239**	**12.3620**	**0.0222**	**2.1737**	**0.4351**	**2.6088**	**1.1285**	**0.4343**	**1.5627**	**0.0000**	**1,984.7411**	**1,984.7411**	**0.5413**	**0.0000**	**1,996.1084**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.75**	**50.79**	**20.94**	**0.00**	**59.20**	**53.82**	**58.39**	**60.07**	**49.92**	**57.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42

Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302

Total	0.0176	0.1000	0.0542	1.5000e-004	0.0000	5.1400e-003	5.1400e-003	0.0000	5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490
Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2936**	**0.2692**	**1.5627**	**0.6987**	**0.2477**	**0.9464**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

<u>Mitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5289	5.9133	4.3821	6.2400e-003		0.2743	0.2743		0.2523	0.2523	0.0000	560.9061	560.9061	0.1775	0.0000	564.6329
Total	**0.5289**	**5.9133**	**4.3821**	**6.2400e-003**	**1.3009**	**0.2743**	**1.5751**	**0.6937**	**0.2523**	**0.9461**	**0.0000**	**560.9061**	**560.9061**	**0.1775**	**0.0000**	**564.6329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	560.9055	560.9055	0.1775	0.0000	564.6322
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.5073**	**0.1394**	**0.6468**	**0.2706**	**0.1394**	**0.4100**	**0.0000**	**560.9055**	**560.9055**	**0.1775**	**0.0000**	**564.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

ORERP - Alt B - Intertidal Conveyor Option - Generator Only

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	542.77	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor adjusted for 32.2% RPS for 2014 SDG&E

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.25	0.00
tblEnergyUse	NT24E	4.27	5,605.40
tblEnergyUse	NT24NG	7.25	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	4.54	0.00
tblLandUse	LotAcreage	0.02	91.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	542.77

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2014	2020

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Pipeline Option

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00

tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.8775	156.1189	117.2760	0.1568	25.9120	7.3741	33.2861	13.6561	6.8146	20.4707	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	11.5939	127.6131	97.3993	0.1363	25.3738	5.9102	31.2840	13.5099	5.4374	18.9473	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5300
2019	0.3344	1.6018	4.2190	9.5900e-003	0.5435	0.0246	0.5681	0.1468	0.0227	0.1695	0.0000	813.3120	813.3120	0.0210	0.0000	813.7539
2020	9.7480	105.0507	83.3542	0.1296	25.3215	4.7553	30.0768	13.3609	4.3749	17.7358	0.0000	12,418.9157	12,418.9157	3.7816	0.0000	12,498.3299
Total	**36.5538**	**390.3845**	**302.2484**	**0.4323**	**77.1508**	**18.0642**	**95.2149**	**40.6736**	**16.6495**	**57.3231**	**0.0000**	**42,330.6595**	**42,330.6595**	**11.5233**	**0.0000**	**42,572.6490**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	5.3236	72.6548	86.7995	0.1568	10.8821	3.1533	14.0354	5.5373	3.1460	8.6833	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	3.5869	62.8812	77.5126	0.1363	10.3407	2.7402	13.0809	5.3908	2.7355	8.1263	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5299
2019	0.3344	1.6018	4.2190	9.5900e-003	0.5435	0.0246	0.5681	0.1468	0.0227	0.1695	0.0000	813.3120	813.3120	0.0210	0.0000	813.7539
2020	3.2541	60.3091	73.2561	0.1296	10.2069	2.7036	12.9105	5.3003	2.7019	8.0021	0.0000	12,418.9157	12,418.9157	3.7816	0.0000	12,498.3299
Total	**12.4989**	**197.4469**	**241.7872**	**0.4323**	**31.9731**	**8.6217**	**40.5948**	**16.3752**	**8.6059**	**24.9811**	**0.0000**	**42,330.6595**	**42,330.6595**	**11.5233**	**0.0000**	**42,572.6490**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**65.81**	**49.42**	**20.00**	**0.00**	**58.56**	**52.27**	**57.37**	**59.74**	**48.31**	**56.42**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	

11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42

Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412

Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412

Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.7780	0.0000	24.7780	13.2141	0.0000	13.2141			0.0000			0.0000
Off-Road	9.4321	103.6722	79.3277	0.1201		4.7330	4.7330		4.3543	4.3543		11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**9.4321**	**103.6722**	**79.3277**	**0.1201**	**24.7780**	**4.7330**	**29.5110**	**13.2141**	**4.3543**	**17.5684**		**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1821	1.2138	2.5106	4.7000e-003	0.1327	0.0194	0.1522	0.0379	0.0179	0.0557		439.3301	439.3301	3.3200e-003		439.3999
Worker	0.1339	0.1648	1.5159	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		349.0359	349.0359	0.0168		349.3876
Total	**0.3159**	**1.3785**	**4.0264**	**9.5800e-003**	**0.5435**	**0.0223**	**0.5658**	**0.1468**	**0.0206**	**0.1674**		**788.3660**	**788.3660**	**0.0201**		**788.7875**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6634	0.0000	9.6634	5.1535	0.0000	5.1535			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6634**	**2.6813**	**12.3447**	**5.1535**	**2.6813**	**7.8348**	**0.0000**	**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1821	1.2138	2.5106	4.7000e-003	0.1327	0.0194	0.1522	0.0379	0.0179	0.0557		439.3301	439.3301	3.3200e-003		439.3999
Worker	0.1339	0.1648	1.5159	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		349.0359	349.0359	0.0168		349.3876
Total	**0.3159**	**1.3785**	**4.0264**	**9.5800e-003**	**0.5435**	**0.0223**	**0.5658**	**0.1468**	**0.0206**	**0.1674**		**788.3660**	**788.3660**	**0.0201**		**788.7875**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Pipeline Option

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

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tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
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tblGrading	AcresOfGrading	420.00	34.00
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tblOffRoadEquipment	HorsePower	84.00	20.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.7599	155.9369	114.8683	0.1575	25.9120	7.3732	33.2852	13.6561	6.8138	20.4699	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	11.5220	127.5071	95.7287	0.1366	25.3738	5.9096	31.2834	13.5099	5.4369	18.9468	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	0.3032	1.5510	3.5846	9.9400e-003	0.5435	0.0244	0.5679	0.1468	0.0225	0.1693	0.0000	840.4452	840.4452	0.0209	0.0000	840.8850
2020	9.7190	105.0066	82.7358	0.1300	25.3215	4.7551	30.0766	13.3609	4.3747	17.7356	0.0000	12,445.0445	12,445.0445	3.7815	0.0000	12,524.4565
Total	**36.3040**	**390.0017**	**296.9173**	**0.4341**	**77.1508**	**18.0624**	**95.2131**	**40.6736**	**16.6479**	**57.3215**	**0.0000**	**42,480.0894**	**42,480.0894**	**11.5226**	**0.0000**	**42,722.0630**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	5.2060	72.4728	84.3918	0.1575	10.8821	3.1524	14.0345	5.5373	3.1452	8.6825	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	3.5150	62.7752	75.8420	0.1366	10.3407	2.7397	13.0803	5.3908	2.7350	8.1257	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	0.3032	1.5510	3.5846	9.9400e-003	0.5435	0.0244	0.5679	0.1468	0.0225	0.1693	0.0000	840.4452	840.4452	0.0209	0.0000	840.8850
2020	3.2250	60.2650	72.6377	0.1300	10.2069	2.7034	12.9103	5.3003	2.7017	8.0020	0.0000	12,445.0445	12,445.0445	3.7815	0.0000	12,524.4565
Total	**12.2491**	**197.0641**	**236.4561**	**0.4341**	**31.9731**	**8.6199**	**40.5930**	**16.3752**	**8.6043**	**24.9795**	**0.0000**	**42,480.0893**	**42,480.0893**	**11.5226**	**0.0000**	**42,722.0630**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**66.26**	**49.47**	**20.36**	**0.00**	**58.56**	**52.28**	**57.37**	**59.74**	**48.32**	**56.42**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766

Total	12.4921	142.3947	99.7062	0.1200	24.6392	6.9021	31.5413	13.3094	6.3499	19.6593		12,279.5654	12,279.5654	3.7624		12,358.5766

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day							lb/day			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day							lb/day			
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day							lb/day			

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.7780	0.0000	24.7780	13.2141	0.0000	13.2141			0.0000			0.0000

Off-Road	9.4321	103.6722	79.3277	0.1201		4.7330	4.7330		4.3543	4.3543		11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**9.4321**	**103.6722**	**79.3277**	**0.1201**	**24.7780**	**4.7330**	**29.5110**	**13.2141**	**4.3543**	**17.5684**		**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1595	1.1875	1.8225	4.7300e-003	0.1327	0.0193	0.1520	0.0379	0.0177	0.0556		442.7617	442.7617	3.2200e-003		442.8294
Worker	0.1274	0.1469	1.5856	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		371.7330	371.7330	0.0168		372.0848
Total	**0.2869**	**1.3345**	**3.4081**	**9.9300e-003**	**0.5435**	**0.0222**	**0.5656**	**0.1468**	**0.0204**	**0.1672**		**814.4948**	**814.4948**	**0.0200**		**814.9141**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6634	0.0000	9.6634	5.1535	0.0000	5.1535			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6634**	**2.6813**	**12.3447**	**5.1535**	**2.6813**	**7.8348**	**0.0000**	**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1595	1.1875	1.8225	4.7300e-003	0.1327	0.0193	0.1520	0.0379	0.0177	0.0556		442.7617	442.7617	3.2200e-003		442.8294
Worker	0.1274	0.1469	1.5856	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		371.7330	371.7330	0.0168		372.0848
Total	**0.2869**	**1.3345**	**3.4081**	**9.9300e-003**	**0.5435**	**0.0222**	**0.5656**	**0.1468**	**0.0204**	**0.1672**		**814.4948**	**814.4948**	**0.0200**		**814.9141**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Pipeline Option - Annual Equipment

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	110.00	24.00
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tblConstructionPhase	NumDays	60.00	27.00
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tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017

tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
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tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
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tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
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tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.5448	5.9030	4.4421	5.8500e-003	1.3426	0.2779	1.6205	0.7121	0.2561	0.9682	0.0000	530.4053	530.4053	0.1364	0.0000	533.2698
2018	0.7771	8.4051	6.4491	9.1800e-003	2.6353	0.3878	3.0231	1.4074	0.3567	1.7641	0.0000	825.8232	825.8232	0.2257	0.0000	830.5629
2019	0.0122	0.0628	0.1552	3.8000e-004	0.0207	9.5000e-004	0.0217	5.6100e-003	8.8000e-004	6.4900e-003	0.0000	28.9751	28.9751	7.4000e-004	0.0000	28.9907
2020	0.5108	5.5155	4.3638	6.8100e-003	1.3287	0.2497	1.5784	0.7013	0.2297	0.9310	0.0000	591.7386	591.7386	0.1801	0.0000	595.5208
Total	**1.8449**	**19.8864**	**15.4102**	**0.0222**	**5.3274**	**0.9163**	**6.2436**	**2.8264**	**0.8434**	**3.6698**	**0.0000**	**1,976.9421**	**1,976.9421**	**0.5430**	**0.0000**	**1,988.3441**

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
2017	0.1722	2.6479	3.2535	5.8500e-003	0.5536	0.1133	0.6668	0.2859	0.1130	0.3989	0.0000	530.4048	530.4048	0.1364	0.0000	533.2693
2018	0.2526	4.1652	5.1465	9.1800e-003	1.0645	0.1801	1.2447	0.5589	0.1798	0.7387	0.0000	825.8223	825.8223	0.2257	0.0000	830.5620
2019	0.0122	0.0628	0.1552	3.8000e-004	0.0207	9.5000e-004	0.0217	5.6100e-003	8.8000e-004	6.4900e-003	0.0000	28.9751	28.9751	7.4000e-004	0.0000	28.9907
2020	0.1698	3.1665	3.8337	6.8100e-003	0.5352	0.1419	0.6771	0.2781	0.1418	0.4200	0.0000	591.7379	591.7379	0.1801	0.0000	595.5201
Total	**0.6069**	**10.0424**	**12.3888**	**0.0222**	**2.1740**	**0.4363**	**2.6103**	**1.1285**	**0.4355**	**1.5640**	**0.0000**	**1,976.9400**	**1,976.9400**	**0.5430**	**0.0000**	**1,988.3421**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**67.10**	**49.50**	**19.61**	**0.00**	**59.19**	**52.38**	**58.19**	**60.07**	**48.36**	**57.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490

Total	0.4872	5.5534	3.8885	4.6800e-003	1.2936	0.2692	1.5627	0.6987	0.2477	0.9464	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.4952	5.4428	4.1647	6.3000e-003		0.2485	0.2485		0.2286	0.2286	0.0000	553.9305	553.9305	0.1792	0.0000	557.6927
Total	**0.4952**	**5.4428**	**4.1647**	**6.3000e-003**	**1.3009**	**0.2485**	**1.5493**	**0.6937**	**0.2286**	**0.9223**	**0.0000**	**553.9305**	**553.9305**	**0.1792**	**0.0000**	**557.6927**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0600e-003	0.0642	0.1197	2.5000e-004	6.8300e-003	1.0100e-003	7.8400e-003	1.9500e-003	9.3000e-004	2.8900e-003	0.0000	21.0189	21.0189	1.6000e-004	0.0000	21.0221
Worker	6.5100e-003	8.5200e-003	0.0795	2.6000e-004	0.0211	1.5000e-004	0.0212	5.5900e-003	1.4000e-004	5.7400e-003	0.0000	16.7892	16.7892	8.0000e-004	0.0000	16.8059
Total	**0.0156**	**0.0727**	**0.1991**	**5.1000e-004**	**0.0279**	**1.1600e-003**	**0.0290**	**7.5400e-003**	**1.0700e-003**	**8.6300e-003**	**0.0000**	**37.8081**	**37.8081**	**9.6000e-004**	**0.0000**	**37.8281**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1543	3.0939	3.6346	6.3000e-003		0.1408	0.1408		0.1408	0.1408	0.0000	553.9298	553.9298	0.1792	0.0000	557.6920
Total	**0.1543**	**3.0939**	**3.6346**	**6.3000e-003**	**0.5073**	**0.1408**	**0.6481**	**0.2706**	**0.1408**	**0.4113**	**0.0000**	**553.9298**	**553.9298**	**0.1792**	**0.0000**	**557.6920**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0600e-003	0.0642	0.1197	2.5000e-004	6.8300e-003	1.0100e-003	7.8400e-003	1.9500e-003	9.3000e-004	2.8900e-003	0.0000	21.0189	21.0189	1.6000e-004	0.0000	21.0221
Worker	6.5100e-003	8.5200e-003	0.0795	2.6000e-004	0.0211	1.5000e-004	0.0212	5.5900e-003	1.4000e-004	5.7400e-003	0.0000	16.7892	16.7892	8.0000e-004	0.0000	16.8059
Total	**0.0156**	**0.0727**	**0.1991**	**5.1000e-004**	**0.0279**	**1.1600e-003**	**0.0290**	**7.5400e-003**	**1.0700e-003**	**8.6300e-003**	**0.0000**	**37.8081**	**37.8081**	**9.6000e-004**	**0.0000**	**37.8281**

ORERP - Alt B - Intertidal Pipeline Option - Generator Only

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 542.77 **CH4 Intensity (lb/MWhr)** 0.022 **N2O Intensity (lb/MWhr)** 0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor adjusted for 32.2% RPS for 2014 SDG&E

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.25	0.00
tblEnergyUse	NT24E	4.27	5,605.40
tblEnergyUse	NT24NG	7.25	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	4.54	0.00
tblLandUse	LotAcreage	0.02	91.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	542.77

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2014	2020

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Alternative C – Subtidal

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Truck Haul

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	33,550.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	33,550.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
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tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	18.6490	176.1822	179.9596	0.2036	27.1478	7.5765	34.7243	13.9877	7.0007	20.9884	0.0000	20,094.6783	20,094.6783	3.9753	0.0000	20,178.1600
2018	15.1966	146.1958	158.7651	0.1834	28.4841	6.1116	34.5938	14.3023	5.6226	19.9231	0.0000	18,084.8780	18,084.8780	3.8355	0.0000	18,165.4228
2019	10.5050	115.3185	88.4897	0.1296	25.5597	5.2989	30.8586	13.4879	4.8750	18.3629	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**44.3505**	**437.6964**	**427.2144**	**0.5166**	**81.1917**	**18.9870**	**100.1767**	**41.7779**	**17.4983**	**59.2744**	**0.0000**	**50,883.1219**	**50,883.1219**	**11.5938**	**0.0000**	**51,126.5912**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	9.0950	92.7180	149.4831	0.2036	12.1179	3.3557	15.4736	5.8690	3.3321	9.2010	0.0000	20,094.6783	20,094.6783	3.9753	0.0000	20,178.1600
2018	7.1896	81.4639	138.8784	0.1834	13.4542	2.9416	16.3939	6.1835	2.9207	9.1025	0.0000	18,084.8780	18,084.8780	3.8355	0.0000	18,165.4228
2019	3.2725	60.5324	73.4487	0.1296	10.2998	2.7059	13.0057	5.3498	2.7039	8.0538	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**19.5571**	**234.7143**	**361.8102**	**0.5166**	**35.8719**	**9.0032**	**44.8732**	**17.4023**	**8.9567**	**26.3572**	**0.0000**	**50,883.1218**	**50,883.1218**	**11.5938**	**0.0000**	**51,126.5912**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	55.90	46.38	15.31	0.00	55.82	52.58	55.21	58.35	48.81	55.53	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.7714	20.0633	62.6836	0.0468	1.2358	0.2025	1.4382	0.3316	0.1861	0.5177		4,558.1891	4,558.1891	0.0446		4,559.1247
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**4.4686**	**24.4368**	**71.4459**	**0.0630**	**1.9651**	**0.2658**	**2.2309**	**0.5315**	**0.2444**	**0.7758**		**6,067.4817**	**6,067.4817**	**0.0733**		**6,069.0205**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.7714	20.0633	62.6836	0.0468	1.2358	0.2025	1.4382	0.3316	0.1861	0.5177		4,558.1891	4,558.1891	0.0446		4,559.1247
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**4.4686**	**24.4368**	**71.4459**	**0.0630**	**1.9651**	**0.2658**	**2.2309**	**0.5315**	**0.2444**	**0.7758**		**6,067.4817**	**6,067.4817**	**0.0733**		**6,069.0205**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.5684	18.4057	60.7814	0.0467	3.1156	0.1995	3.3151	0.7930	0.1834	0.9765		4,479.8599	4,479.8599	0.0452		4,480.8082
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**4.2171**	**22.3563**	**69.0643**	**0.0629**	**3.8449**	**0.2584**	**4.1034**	**0.9929**	**0.2377**	**1.2305**		**5,955.2213**	**5,955.2213**	**0.0723**		**5,956.7400**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.5684	18.4057	60.7814	0.0467	3.1156	0.1995	3.3151	0.7930	0.1834	0.9765		4,479.8599	4,479.8599	0.0452		4,480.8082
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**4.2171**	**22.3563**	**69.0643**	**0.0629**	**3.8449**	**0.2584**	**4.1034**	**0.9929**	**0.2377**	**1.2305**		**5,955.2213**	**5,955.2213**	**0.0723**		**5,956.7400**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	3.6027	18.5827	61.3658	0.0471	0.9893	0.2014	1.1907	0.2714	0.1852	0.4566		4,522.9355	4,522.9355	0.0456		4,523.8929
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**4.2515**	**22.5333**	**69.6488**	**0.0633**	**1.7187**	**0.2603**	**1.9790**	**0.4712**	**0.2394**	**0.7107**		**5,998.2969**	**5,998.2969**	**0.0728**		**5,999.8246**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

Hauling	3.6027	18.5827	61.3658	0.0471	0.9893	0.2014	1.1907	0.2714	0.1852	0.4566		4,522.9355	4,522.9355	0.0456		4,523.8929
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**4.2515**	**22.5333**	**69.6488**	**0.0633**	**1.7187**	**0.2603**	**1.9790**	**0.4712**	**0.2394**	**0.7107**		**5,998.2969**	**5,998.2969**	**0.0728**		**5,999.8246**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

ORERP - Alt C - Subtidal Truck Haul

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
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tblConstructionPhase	NumDays	110.00	131.00
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tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
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tblGrading	AcresOfGrading	420.00	34.00

tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	33,550.00
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tblVehicleTrips	CC_TL	6.60	7.30

tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	17.8848	175.5592	159.1248	0.2046	27.1478	7.5728	34.7206	13.9877	6.9973	20.9850	0.0000	20,213.4137	20,213.4137	3.9727	0.0000	20,296.8406
2018	14.5230	145.6847	138.9220	0.1840	28.4841	6.1082	34.5904	14.3023	5.6195	19.9200	0.0000	18,173.1374	18,173.1374	3.8328	0.0000	18,253.6269
2019	10.4738	115.2677	87.8552	0.1300	25.5597	5.2987	30.8584	13.4879	4.8748	18.3627	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**42.8816**	**436.5116**	**385.9020**	**0.5186**	**81.1917**	**18.9797**	**100.1695**	**41.7779**	**17.4915**	**59.2677**	**0.0000**	**51,117.2497**	**51,117.2497**	**11.5884**	**0.0000**	**51,360.6069**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	8.3309	92.0951	128.6483	0.2046	12.1179	3.3520	15.4699	5.8690	3.3286	9.1976	0.0000	20,213.4137	20,213.4137	3.9727	0.0000	20,296.8405
2018	6.5160	80.9528	119.0353	0.1840	13.4542	2.9382	16.3906	6.1835	2.9176	9.0994	0.0000	18,173.1374	18,173.1374	3.8328	0.0000	18,253.6269
2019	3.2413	60.4816	72.8142	0.1300	10.2998	2.7057	13.0055	5.3498	2.7037	8.0536	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**18.0881**	**233.5295**	**320.4979**	**0.5186**	**35.8719**	**8.9959**	**44.8659**	**17.4023**	**8.9500**	**26.3505**	**0.0000**	**51,117.2497**	**51,117.2497**	**11.5884**	**0.0000**	**51,360.6068**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	57.82	46.50	16.95	0.00	55.82	52.60	55.21	58.35	48.83	55.54	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42

Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41

Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1249	19.6223	44.2565	0.0471	1.2358	0.1996	1.4354	0.3316	0.1835	0.5151		4,613.7878	4,613.7878	0.0423		4,614.6754
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**3.7427**	**23.8767**	**51.2915**	**0.0637**	**1.9651**	**0.2623**	**2.2274**	**0.5315**	**0.2412**	**0.7726**		**6,157.1744**	**6,157.1744**	**0.0708**		**6,158.6603**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1249	19.6223	44.2565	0.0471	1.2358	0.1996	1.4354	0.3316	0.1835	0.5151		4,613.7878	4,613.7878	0.0423		4,614.6754
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**3.7427**	**23.8767**	**51.2915**	**0.0637**	**1.9651**	**0.2623**	**2.2274**	**0.5315**	**0.2412**	**0.7726**		**6,157.1744**	**6,157.1744**	**0.0708**		**6,158.6603**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9724	18.0044	42.7820	0.0470	3.1156	0.1967	3.3123	0.7930	0.1809	0.9739		4,534.5619	4,534.5619	0.0428		4,535.4604
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.5493**	**21.8491**	**49.3943**	**0.0635**	**3.8449**	**0.2551**	**4.1000**	**0.9929**	**0.2346**	**1.2274**		**6,042.9547**	**6,042.9547**	**0.0697**		**6,044.4185**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9724	18.0044	42.7820	0.0470	3.1156	0.1967	3.3123	0.7930	0.1809	0.9739		4,534.5619	4,534.5619	0.0428		4,535.4604
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.5493**	**21.8491**	**49.3943**	**0.0635**	**3.8449**	**0.2551**	**4.1000**	**0.9929**	**0.2346**	**1.2274**		**6,042.9547**	**6,042.9547**	**0.0697**		**6,044.4185**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	3.0010	18.1776	43.1933	0.0474	0.9893	0.1986	1.1879	0.2714	0.1826	0.4540		4,578.1635	4,578.1635	0.0432		4,579.0706
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.5778**	**22.0222**	**49.8057**	**0.0640**	**1.7187**	**0.2570**	**1.9756**	**0.4712**	**0.2363**	**0.7075**		**6,086.5562**	**6,086.5562**	**0.0701**		**6,088.0287**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	3.0010	18.1776	43.1933	0.0474	0.9893	0.1986	1.1879	0.2714	0.1826	0.4540		4,578.1635	4,578.1635	0.0432		4,579.0706
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.5778**	**22.0222**	**49.8057**	**0.0640**	**1.7187**	**0.2570**	**1.9756**	**0.4712**	**0.2363**	**0.7075**		**6,086.5562**	**6,086.5562**	**0.0701**		**6,088.0287**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Truck Haul

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural

Wind Speed (m/s) 2.6

Precipitation Freq (Days) 40

Climate Zone 13

Operational Year 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49

CH4 Intensity (lb/MWhr) 0.029

N2O Intensity (lb/MWhr) 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
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tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
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tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.6820	6.6901	6.6508	7.6800e-003	1.3898	0.2857	1.6755	0.7248	0.2633	0.9881	0.0000	692.8159	692.8159	0.1379	0.0000	695.7125
2018	0.9971	9.6270	10.0697	0.0123	2.7267	0.4008	3.1275	1.4317	0.3688	1.8004	0.0000	1,095.9508	1,095.9508	0.2283	0.0000	1,100.7456
2019	0.5574	6.0597	4.7442	7.1200e-003	1.3492	0.2765	1.6257	0.7068	0.2544	0.9612	0.0000	628.5146	628.5146	0.1792	0.0000	632.2778
Total	**2.2364**	**22.3768**	**21.4647**	**0.0271**	**5.4656**	**0.9630**	**6.4287**	**2.8633**	**0.8864**	**3.7497**	**0.0000**	**2,417.2813**	**2,417.2813**	**0.5455**	**0.0000**	**2,428.7359**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.3094	3.4350	5.4622	7.6800e-003	0.6007	0.1211	0.7218	0.2986	0.1202	0.4188	0.0000	692.8154	692.8154	0.1379	0.0000	695.7120
2018	0.4726	5.3871	8.7672	0.0123	1.1559	0.1932	1.3491	0.5832	0.1918	0.7750	0.0000	1,095.9499	1,095.9499	0.2283	0.0000	1,100.7447
2019	0.1813	3.2108	3.9621	7.1200e-003	0.5557	0.1417	0.6973	0.2836	0.1415	0.4251	0.0000	628.5140	628.5140	0.1792	0.0000	632.2771
Total	**0.9633**	**12.0328**	**18.1914**	**0.0271**	**2.3122**	**0.4560**	**2.7682**	**1.1654**	**0.4535**	**1.6189**	**0.0000**	**2,417.2793**	**2,417.2793**	**0.5455**	**0.0000**	**2,428.7338**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	56.93	46.23	15.25	0.00	57.69	52.65	56.94	59.30	48.84	56.83	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490
Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2936**	**0.2692**	**1.5627**	**0.6987**	**0.2477**	**0.9464**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1371	0.7871	2.2087	1.8300e-003	0.0471	7.8300e-003	0.0550	0.0127	7.2000e-003	0.0199	0.0000	162.4106	162.4106	1.5300e-003	0.0000	162.4427
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.1627**	**0.9586**	**2.5267**	**2.4600e-003**	**0.0750**	**0.0103**	**0.0852**	**0.0203**	**9.4600e-003**	**0.0298**	**0.0000**	**216.1252**	**216.1252**	**2.5400e-003**	**0.0000**	**216.1786**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1371	0.7871	2.2087	1.8300e-003	0.0471	7.8300e-003	0.0550	0.0127	7.2000e-003	0.0199	0.0000	162.4106	162.4106	1.5300e-003	0.0000	162.4427
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.1627**	**0.9586**	**2.5267**	**2.4600e-003**	**0.0750**	**0.0103**	**0.0852**	**0.0203**	**9.4600e-003**	**0.0298**	**0.0000**	**216.1252**	**216.1252**	**2.5400e-003**	**0.0000**	**216.1786**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0450	0.2499	0.7406	6.3000e-004	0.0410	2.6700e-003	0.0437	0.0104	2.4600e-003	0.0129	0.0000	55.2534	55.2534	5.4000e-004	0.0000	55.2646
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**0.0532**	**0.3036**	**0.8445**	**8.5000e-004**	**0.0506**	**3.4600e-003**	**0.0541**	**0.0131**	**3.1900e-003**	**0.0163**	**0.0000**	**73.4287**	**73.4287**	**8.7000e-004**	**0.0000**	**73.4469**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0450	0.2499	0.7406	6.3000e-004	0.0410	2.6700e-003	0.0437	0.0104	2.4600e-003	0.0129	0.0000	55.2534	55.2534	5.4000e-004	0.0000	55.2646
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**0.0532**	**0.3036**	**0.8445**	**8.5000e-004**	**0.0506**	**3.4600e-003**	**0.0541**	**0.0131**	**3.1900e-003**	**0.0163**	**0.0000**	**73.4287**	**73.4287**	**8.7000e-004**	**0.0000**	**73.4469**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1750	0.9720	2.8801	2.4600e-003	0.0504	0.0104	0.0608	0.0139	9.5500e-003	0.0234	0.0000	214.8743	214.8743	2.0900e-003	0.0000	214.9180
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.2067**	**1.1786**	**3.2802**	**3.3100e-003**	**0.0875**	**0.0134**	**0.1009**	**0.0240**	**0.0124**	**0.0364**	**0.0000**	**284.8828**	**284.8828**	**3.3600e-003**	**0.0000**	**284.9534**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.1750	0.9720	2.8801	2.4600e-003	0.0504	0.0104	0.0608	0.0139	9.5500e-003	0.0234	0.0000	214.8743	214.8743	2.0900e-003	0.0000	214.9180
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.2067**	**1.1786**	**3.2802**	**3.3100e-003**	**0.0875**	**0.0134**	**0.1009**	**0.0240**	**0.0124**	**0.0364**	**0.0000**	**284.8828**	**284.8828**	**3.3600e-003**	**0.0000**	**284.9534**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5289	5.9133	4.3821	6.2400e-003		0.2743	0.2743		0.2523	0.2523	0.0000	560.9061	560.9061	0.1775	0.0000	564.6329
Total	**0.5289**	**5.9133**	**4.3821**	**6.2400e-003**	**1.3009**	**0.2743**	**1.5751**	**0.6937**	**0.2523**	**0.9461**	**0.0000**	**560.9061**	**560.9061**	**0.1775**	**0.0000**	**564.6329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	560.9055	560.9055	0.1775	0.0000	564.6322
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.5073**	**0.1394**	**0.6468**	**0.2706**	**0.1394**	**0.4100**	**0.0000**	**560.9055**	**560.9055**	**0.1775**	**0.0000**	**564.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Conveyor Option

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
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tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
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tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
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tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00

tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.8775	156.1189	117.2760	0.1568	25.9120	7.3741	33.2861	13.6561	6.8146	20.4707	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	11.5939	127.6131	97.3993	0.1363	25.3738	5.9102	31.2840	13.5099	5.4374	18.9473	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5300
2019	10.5050	115.3185	88.4897	0.1296	25.5597	5.2989	30.8586	13.4879	4.8750	18.3629	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**36.9764**	**399.0505**	**303.1650**	**0.4227**	**76.8456**	**18.5832**	**95.4287**	**40.6539**	**17.1270**	**57.7808**	**0.0000**	**41,801.9974**	**41,801.9974**	**11.5036**	**0.0000**	**42,043.5736**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2017	5.3236	72.6548	86.7995	0.1568	10.8821	3.1533	14.0354	5.5373	3.1460	8.6833	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	3.5869	62.8812	77.5126	0.1363	10.3407	2.7402	13.0809	5.3908	2.7355	8.1263	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5299
2019	3.2725	60.5324	73.4487	0.1296	10.2998	2.7059	13.0057	5.3498	2.7039	8.0538	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**12.1830**	**196.0684**	**237.7608**	**0.4227**	**31.5226**	**8.5994**	**40.1219**	**16.2779**	**8.5854**	**24.8633**	**0.0000**	**41,801.9973**	**41,801.9973**	**11.5036**	**0.0000**	**42,043.5736**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.05**	**50.87**	**21.57**	**0.00**	**58.98**	**53.73**	**57.96**	**59.96**	**49.87**	**56.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38

Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968

Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

3.4 Earthwork 1 - 2018

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

<u>Mitigated Construction On-Site</u>

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639

Total	0.3344	1.6018	4.2190	9.5900e-003	0.5435	0.0246	0.5681	0.1468	0.0227	0.1695		813.3120	813.3120	0.0210		813.7539

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Conveyor Option

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural

Wind Speed (m/s) 2.6

Precipitation Freq (Days) 40

Climate Zone 13

Operational Year 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49

CH4 Intensity (lb/MWhr) 0.029

N2O Intensity (lb/MWhr) 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	110.00	51.00
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tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
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tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
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tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
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tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.7599	155.9369	114.8683	0.1575	25.9120	7.3732	33.2852	13.6561	6.8138	20.4699	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	11.5220	127.5071	95.7287	0.1366	25.3738	5.9096	31.2834	13.5099	5.4369	18.9468	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	10.4738	115.2677	87.8552	0.1300	25.5597	5.2987	30.8584	13.4879	4.8748	18.3627	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**36.7557**	**398.7117**	**298.4522**	**0.4241**	**76.8456**	**18.5815**	**95.4271**	**40.6539**	**17.1255**	**57.7793**	**0.0000**	**41,925.2984**	**41,925.2984**	**11.5030**	**0.0000**	**42,166.8610**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2017	5.2060	72.4728	84.3918	0.1575	10.8821	3.1524	14.0345	5.5373	3.1452	8.6825	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	3.5150	62.7752	75.8420	0.1366	10.3407	2.7397	13.0803	5.3908	2.7350	8.1257	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	3.2413	60.4816	72.8142	0.1300	10.2998	2.7057	13.0055	5.3498	2.7037	8.0536	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**11.9622**	**195.7296**	**233.0481**	**0.4241**	**31.5226**	**8.5977**	**40.1203**	**16.2779**	**8.5839**	**24.8618**	**0.0000**	**41,925.2984**	**41,925.2984**	**11.5030**	**0.0000**	**42,166.8610**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.45**	**50.91**	**21.91**	**0.00**	**58.98**	**53.73**	**57.96**	**59.96**	**49.88**	**56.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42

Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832

Total	1.2999	7.4064	4.0156	0.0110	0.0000	0.3806	0.3806	0.0000	0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Conveyor Option - Annaul Equipment

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural | **Wind Speed (m/s)** 2.6 | **Precipitation Freq (Days)** 40

Climate Zone 13 | **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 | **CH4 Intensity (lb/MWhr)** 0.029 | **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
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tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
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tblOffRoadEquipment	HorsePower	84.00	1,000.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
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tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
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tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.5448	5.9030	4.4421	5.8500e-003	1.3426	0.2779	1.6205	0.7121	0.2561	0.9682	0.0000	530.4053	530.4053	0.1364	0.0000	533.2698
2018	0.7771	8.4051	6.4491	9.1800e-003	2.6353	0.3878	3.0231	1.4074	0.3567	1.7641	0.0000	825.8232	825.8232	0.2257	0.0000	830.5629
2019	0.5574	6.0597	4.7442	7.1200e-003	1.3492	0.2765	1.6257	0.7068	0.2544	0.9612	0.0000	628.5146	628.5146	0.1792	0.0000	632.2778
Total	**1.8793**	**20.3678**	**15.6353**	**0.0222**	**5.3271**	**0.9421**	**6.2693**	**2.8263**	**0.8672**	**3.6935**	**0.0000**	**1,984.7431**	**1,984.7431**	**0.5413**	**0.0000**	**1,996.1105**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2017	0.1722	2.6479	3.2535	5.8500e-003	0.5536	0.1133	0.6668	0.2859	0.1130	0.3989	0.0000	530.4048	530.4048	0.1364	0.0000	533.2693
2018	0.2526	4.1652	5.1465	9.1800e-003	1.0645	0.1801	1.2447	0.5589	0.1798	0.7387	0.0000	825.8223	825.8223	0.2257	0.0000	830.5620
2019	0.1813	3.2108	3.9621	7.1200e-003	0.5557	0.1417	0.6973	0.2836	0.1415	0.4251	0.0000	628.5140	628.5140	0.1792	0.0000	632.2771
Total	**0.6062**	**10.0239**	**12.3620**	**0.0222**	**2.1737**	**0.4351**	**2.6088**	**1.1285**	**0.4343**	**1.5627**	**0.0000**	**1,984.7411**	**1,984.7411**	**0.5413**	**0.0000**	**1,996.1084**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.75**	**50.79**	**20.94**	**0.00**	**59.20**	**53.82**	**58.39**	**60.07**	**49.92**	**57.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38

Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490
Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2936**	**0.2692**	**1.5627**	**0.6987**	**0.2477**	**0.9464**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057

Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5289	5.9133	4.3821	6.2400e-003		0.2743	0.2743		0.2523	0.2523	0.0000	560.9061	560.9061	0.1775	0.0000	564.6329
Total	**0.5289**	**5.9133**	**4.3821**	**6.2400e-003**	**1.3009**	**0.2743**	**1.5751**	**0.6937**	**0.2523**	**0.9461**	**0.0000**	**560.9061**	**560.9061**	**0.1775**	**0.0000**	**564.6329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	560.9055	560.9055	0.1775	0.0000	564.6322
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.5073**	**0.1394**	**0.6468**	**0.2706**	**0.1394**	**0.4100**	**0.0000**	**560.9055**	**560.9055**	**0.1775**	**0.0000**	**564.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450

Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Pipeline Option - Generator Only

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 542.77 **CH4 Intensity (lb/MWhr)** 0.022 **N2O Intensity (lb/MWhr)** 0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor adjusted for 32.2% RPS for 2014 SDG&E

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.25	0.00
tblEnergyUse	NT24E	4.27	5,605.40
tblEnergyUse	NT24NG	7.25	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	4.54	0.00
tblLandUse	LotAcreage	0.02	91.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	542.77

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2014	2020

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Pipeline Option

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00

tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.8775	156.1189	117.2760	0.1568	25.9120	7.3741	33.2861	13.6561	6.8146	20.4707	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	11.5939	127.6131	97.3993	0.1363	25.3738	5.9102	31.2840	13.5099	5.4374	18.9473	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5300
2019	0.3344	1.6018	4.2190	9.5900e-003	0.5435	0.0246	0.5681	0.1468	0.0227	0.1695	0.0000	813.3120	813.3120	0.0210	0.0000	813.7539
2020	9.7480	105.0507	83.3542	0.1296	25.3215	4.7553	30.0768	13.3609	4.3749	17.7358	0.0000	12,418.9157	12,418.9157	3.7816	0.0000	12,498.3299
Total	**36.5538**	**390.3845**	**302.2484**	**0.4323**	**77.1508**	**18.0642**	**95.2149**	**40.6736**	**16.6495**	**57.3231**	**0.0000**	**42,330.6595**	**42,330.6595**	**11.5233**	**0.0000**	**42,572.6490**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	5.3236	72.6548	86.7995	0.1568	10.8821	3.1533	14.0354	5.5373	3.1460	8.6833	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	3.5869	62.8812	77.5126	0.1363	10.3407	2.7402	13.0809	5.3908	2.7355	8.1263	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5299
2019	0.3344	1.6018	4.2190	9.5900e-003	0.5435	0.0246	0.5681	0.1468	0.0227	0.1695	0.0000	813.3120	813.3120	0.0210	0.0000	813.7539
2020	3.2541	60.3091	73.2561	0.1296	10.2069	2.7036	12.9105	5.3003	2.7019	8.0021	0.0000	12,418.9157	12,418.9157	3.7816	0.0000	12,498.3299
Total	**12.4989**	**197.4469**	**241.7872**	**0.4323**	**31.9731**	**8.6217**	**40.5948**	**16.3752**	**8.6059**	**24.9811**	**0.0000**	**42,330.6595**	**42,330.6595**	**11.5233**	**0.0000**	**42,572.6490**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**65.81**	**49.42**	**20.00**	**0.00**	**58.56**	**52.27**	**57.37**	**59.74**	**48.31**	**56.42**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766

Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.7780	0.0000	24.7780	13.2141	0.0000	13.2141			0.0000			0.0000

Off-Road	9.4321	103.6722	79.3277	0.1201		4.7330	4.7330		4.3543	4.3543		11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**9.4321**	**103.6722**	**79.3277**	**0.1201**	**24.7780**	**4.7330**	**29.5110**	**13.2141**	**4.3543**	**17.5684**		**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1821	1.2138	2.5106	4.7000e-003	0.1327	0.0194	0.1522	0.0379	0.0179	0.0557		439.3301	439.3301	3.3200e-003		439.3999
Worker	0.1339	0.1648	1.5159	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		349.0359	349.0359	0.0168		349.3876
Total	**0.3159**	**1.3785**	**4.0264**	**9.5800e-003**	**0.5435**	**0.0223**	**0.5658**	**0.1468**	**0.0206**	**0.1674**		**788.3660**	**788.3660**	**0.0201**		**788.7875**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6634	0.0000	9.6634	5.1535	0.0000	5.1535			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6634**	**2.6813**	**12.3447**	**5.1535**	**2.6813**	**7.8348**	**0.0000**	**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1821	1.2138	2.5106	4.7000e-003	0.1327	0.0194	0.1522	0.0379	0.0179	0.0557		439.3301	439.3301	3.3200e-003		439.3999
Worker	0.1339	0.1648	1.5159	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		349.0359	349.0359	0.0168		349.3876
Total	**0.3159**	**1.3785**	**4.0264**	**9.5800e-003**	**0.5435**	**0.0223**	**0.5658**	**0.1468**	**0.0206**	**0.1674**		**788.3660**	**788.3660**	**0.0201**		**788.7875**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Pipeline Option

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00

tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.7599	155.9369	114.8683	0.1575	25.9120	7.3732	33.2852	13.6561	6.8138	20.4699	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	11.5220	127.5071	95.7287	0.1366	25.3738	5.9096	31.2834	13.5099	5.4369	18.9468	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	0.3032	1.5510	3.5846	9.9400e-003	0.5435	0.0244	0.5679	0.1468	0.0225	0.1693	0.0000	840.4452	840.4452	0.0209	0.0000	840.8850
2020	9.7190	105.0066	82.7358	0.1300	25.3215	4.7551	30.0766	13.3609	4.3747	17.7356	0.0000	12,445.0445	12,445.0445	3.7815	0.0000	12,524.4565
Total	**36.3040**	**390.0017**	**296.9173**	**0.4341**	**77.1508**	**18.0624**	**95.2131**	**40.6736**	**16.6479**	**57.3215**	**0.0000**	**42,480.0894**	**42,480.0894**	**11.5226**	**0.0000**	**42,722.0630**

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
2017	5.2060	72.4728	84.3918	0.1575	10.8821	3.1524	14.0345	5.5373	3.1452	8.6825	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	3.5150	62.7752	75.8420	0.1366	10.3407	2.7397	13.0803	5.3908	2.7350	8.1257	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	0.3032	1.5510	3.5846	9.9400e-003	0.5435	0.0244	0.5679	0.1468	0.0225	0.1693	0.0000	840.4452	840.4452	0.0209	0.0000	840.8850
2020	3.2250	60.2650	72.6377	0.1300	10.2069	2.7034	12.9103	5.3003	2.7017	8.0020	0.0000	12,445.0445	12,445.0445	3.7815	0.0000	12,524.4565
Total	**12.2491**	**197.0641**	**236.4561**	**0.4341**	**31.9731**	**8.6199**	**40.5930**	**16.3752**	**8.6043**	**24.9795**	**0.0000**	**42,480.0893**	**42,480.0893**	**11.5226**	**0.0000**	**42,722.0630**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**66.26**	**49.47**	**20.36**	**0.00**	**58.56**	**52.28**	**57.37**	**59.74**	**48.32**	**56.42**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766

Total	12.4921	142.3947	99.7062	0.1200	24.6392	6.9021	31.5413	13.3094	6.3499	19.6593		12,279.56 54	12,279.565 4	3.7624		12,358.576 6

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.877 9	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.386 6**	**1,543.3866**	**0.0285**		**1,543.9850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.56 54	12,279.565 4	3.7624		12,358.576 6
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.56 54**	**12,279.565 4**	**3.7624**		**12,358.576 6**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.7780	0.0000	24.7780	13.2141	0.0000	13.2141			0.0000			0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	9.4321	103.6722	79.3277	0.1201		4.7330	4.7330		4.3543	4.3543		11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**9.4321**	**103.6722**	**79.3277**	**0.1201**	**24.7780**	**4.7330**	**29.5110**	**13.2141**	**4.3543**	**17.5684**		**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1595	1.1875	1.8225	4.7300e-003	0.1327	0.0193	0.1520	0.0379	0.0177	0.0556		442.7617	442.7617	3.2200e-003		442.8294
Worker	0.1274	0.1469	1.5856	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		371.7330	371.7330	0.0168		372.0848
Total	**0.2869**	**1.3345**	**3.4081**	**9.9300e-003**	**0.5435**	**0.0222**	**0.5656**	**0.1468**	**0.0204**	**0.1672**		**814.4948**	**814.4948**	**0.0200**		**814.9141**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6634	0.0000	9.6634	5.1535	0.0000	5.1535			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6634**	**2.6813**	**12.3447**	**5.1535**	**2.6813**	**7.8348**	**0.0000**	**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1595	1.1875	1.8225	4.7300e-003	0.1327	0.0193	0.1520	0.0379	0.0177	0.0556		442.7617	442.7617	3.2200e-003		442.8294
Worker	0.1274	0.1469	1.5856	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		371.7330	371.7330	0.0168		372.0848
Total	**0.2869**	**1.3345**	**3.4081**	**9.9300e-003**	**0.5435**	**0.0222**	**0.5656**	**0.1468**	**0.0204**	**0.1672**		**814.4948**	**814.4948**	**0.0200**		**814.9141**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Pipeline Option - Annual Equipment

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Rural | **Wind Speed (m/s)** 2.6 | **Precipitation Freq (Days)** 40

Climate Zone 13 | **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 | **CH4 Intensity (lb/MWhr)** 0.029 | **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00

tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.5448	5.9030	4.4421	5.8500e-003	1.3426	0.2779	1.6205	0.7121	0.2561	0.9682	0.0000	530.4053	530.4053	0.1364	0.0000	533.2698
2018	0.7771	8.4051	6.4491	9.1800e-003	2.6353	0.3878	3.0231	1.4074	0.3567	1.7641	0.0000	825.8232	825.8232	0.2257	0.0000	830.5629
2019	0.0122	0.0628	0.1552	3.8000e-004	0.0207	9.5000e-004	0.0217	5.6100e-003	8.8000e-004	6.4900e-003	0.0000	28.9751	28.9751	7.4000e-004	0.0000	28.9907
2020	0.5108	5.5155	4.3638	6.8100e-003	1.3287	0.2497	1.5784	0.7013	0.2297	0.9310	0.0000	591.7386	591.7386	0.1801	0.0000	595.5208
Total	**1.8449**	**19.8864**	**15.4102**	**0.0222**	**5.3274**	**0.9163**	**6.2436**	**2.8264**	**0.8434**	**3.6698**	**0.0000**	**1,976.9421**	**1,976.9421**	**0.5430**	**0.0000**	**1,988.3441**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.1722	2.6479	3.2535	5.8500e-003	0.5536	0.1133	0.6668	0.2859	0.1130	0.3989	0.0000	530.4048	530.4048	0.1364	0.0000	533.2693
2018	0.2526	4.1652	5.1465	9.1800e-003	1.0645	0.1801	1.2447	0.5589	0.1798	0.7387	0.0000	825.8223	825.8223	0.2257	0.0000	830.5620
2019	0.0122	0.0628	0.1552	3.8000e-004	0.0207	9.5000e-004	0.0217	5.6100e-003	8.8000e-004	6.4900e-003	0.0000	28.9751	28.9751	7.4000e-004	0.0000	28.9907
2020	0.1698	3.1665	3.8337	6.8100e-003	0.5352	0.1419	0.6771	0.2781	0.1418	0.4200	0.0000	591.7379	591.7379	0.1801	0.0000	595.5201
Total	**0.6069**	**10.0424**	**12.3888**	**0.0222**	**2.1740**	**0.4363**	**2.6103**	**1.1285**	**0.4355**	**1.5640**	**0.0000**	**1,976.9400**	**1,976.9400**	**0.5430**	**0.0000**	**1,988.3421**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**67.10**	**49.50**	**19.61**	**0.00**	**59.19**	**52.38**	**58.19**	**60.07**	**48.36**	**57.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

<u>Construction Phase</u>

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490

Total	0.4872	5.5534	3.8885	4.6800e-003	1.2936	0.2692	1.5627	0.6987	0.2477	0.9464	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.4952	5.4428	4.1647	6.3000e-003		0.2485	0.2485		0.2286	0.2286	0.0000	553.9305	553.9305	0.1792	0.0000	557.6927
Total	**0.4952**	**5.4428**	**4.1647**	**6.3000e-003**	**1.3009**	**0.2485**	**1.5493**	**0.6937**	**0.2286**	**0.9223**	**0.0000**	**553.9305**	**553.9305**	**0.1792**	**0.0000**	**557.6927**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0600e-003	0.0642	0.1197	2.5000e-004	6.8300e-003	1.0100e-003	7.8400e-003	1.9500e-003	9.3000e-004	2.8900e-003	0.0000	21.0189	21.0189	1.6000e-004	0.0000	21.0221
Worker	6.5100e-003	8.5200e-003	0.0795	2.6000e-004	0.0211	1.5000e-004	0.0212	5.5900e-003	1.4000e-004	5.7400e-003	0.0000	16.7892	16.7892	8.0000e-004	0.0000	16.8059
Total	**0.0156**	**0.0727**	**0.1991**	**5.1000e-004**	**0.0279**	**1.1600e-003**	**0.0290**	**7.5400e-003**	**1.0700e-003**	**8.6300e-003**	**0.0000**	**37.8081**	**37.8081**	**9.6000e-004**	**0.0000**	**37.8281**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1543	3.0939	3.6346	6.3000e-003		0.1408	0.1408		0.1408	0.1408	0.0000	553.9298	553.9298	0.1792	0.0000	557.6920
Total	**0.1543**	**3.0939**	**3.6346**	**6.3000e-003**	**0.5073**	**0.1408**	**0.6481**	**0.2706**	**0.1408**	**0.4113**	**0.0000**	**553.9298**	**553.9298**	**0.1792**	**0.0000**	**557.6920**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0600e-003	0.0642	0.1197	2.5000e-004	6.8300e-003	1.0100e-003	7.8400e-003	1.9500e-003	9.3000e-004	2.8900e-003	0.0000	21.0189	21.0189	1.6000e-004	0.0000	21.0221
Worker	6.5100e-003	8.5200e-003	0.0795	2.6000e-004	0.0211	1.5000e-004	0.0212	5.5900e-003	1.4000e-004	5.7400e-003	0.0000	16.7892	16.7892	8.0000e-004	0.0000	16.8059
Total	**0.0156**	**0.0727**	**0.1991**	**5.1000e-004**	**0.0279**	**1.1600e-003**	**0.0290**	**7.5400e-003**	**1.0700e-003**	**8.6300e-003**	**0.0000**	**37.8081**	**37.8081**	**9.6000e-004**	**0.0000**	**37.8281**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Pipeline Option - Generator Only

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2020

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 542.77 **CH4 Intensity (lb/MWhr)** 0.022 **N2O Intensity (lb/MWhr)** 0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor adjusted for 32.2% RPS for 2014 SDG&E

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.25	0.00
tblEnergyUse	NT24E	4.27	5,605.40
tblEnergyUse	NT24NG	7.25	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	4.54	0.00
tblLandUse	LotAcreage	0.02	91.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	542.77

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2014	2020

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

APPENDIX N

Coastal Commission Consistency

APPENDIX N
Coastal Commission Consistency

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 2 Section 30210.In carrying out the requirement of Section 4 of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.	This alternative would not result in any permanent changes to the current public access routes along the south end of San Diego Bay. The Bayshore Bikeway, which accommodates bicycle and pedestrian access, extends around the south end of the Bay to the west of the Otay River Floodplain Site and south and east of the Pond 15 Site providing coastal access for the public. No public access onto the project site is currently available and no public access would be provided into this area following restoration due to the sensitivity of the resources that would be supported. However, ample visual access into the site would continue to be provided from the Bayshore Bikeway. During the mobilization, demobilization, site grading, and soil transport phases of the project, there would be disruption in travel along the Bayshore Bikeway and Saturn Boulevard bike path. To minimize any conflicts between construction vehicles and the public, the contractor would be required to have a flagger present at the Main Street and Bay Boulevard construction access and egress points to ensure safe crossing onto the Bayshore Bikeway. In addition, the bike path on Saturn Boulevard would temporarily be rerouted along the eastern perimeter of the Otay River Floodplain, as shown in Figure 2-2, Project Features. This alternative would be consistent with this provision of the CCA.	Consistent with the discussion for Alternative B, Alternative C would not result in any permanent changes to the current public access routes along the south end of San Diego Bay. In addition, the measures described for Alternative B to minimize any conflicts between construction vehicles and the public would also be implemented under Alternative C. This alternative would be consistent with this provision of the CCA.
Article 2 Section 30211.Development not to interfere with access. Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.	The proposed project sites are not located adjacent or in proximity to the beach, therefore, the implementation of Alternative B would not interfere with the public's right to access the sea.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 2 Section 30212. New development projects. Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or, (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.	Alternative B involves the restoration of coastal wetlands, and does not propose development. This section of the CCA is not applicable to the project.	Same as Alternative B.
Article 2 Section 30212.5 Public facilities; distribution. Wherever appropriate and feasible, public facilities, including parking areas or facilities, shall be distributed throughout an area so as to mitigate against the impacts, social and otherwise, of overcrowding or overuse by the public of any single area.	Alternative B does not include any public facilities, this section of the CCA is not applicable to the project.	Same as Alternative B.
Article 2 Section 303213. Lower cost visitor and recreational facilities; encouragement and provision; overnight room rentals. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. The Commission shall not: (1) require that overnight room rentals be fixed at an amount certain for any privately owned and operated hotel, motel, or other similar visitor-serving facility located on either public or private lands; or (2) establish or approve any method for the identification of low or moderate income persons for the purpose of determining eligibility for overnight room rentals in any such facilities.	Alternative B does not propose any recreational facilities. In addition, the site does not include any areas that could support development of these facilities. This section is not applicable to the project.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 2 Section 30214(a)Implementation of public access policies; legislative intent. The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case.	Although public access within the restored project site is not proposed, Alternative B is consistent to the maximum extent practicable with this section of the CCA. The anticipated presence of federally and state listed endangered and threatened species within the restored sites, as well as the sensitive coastal wetland habitat that supports them necessitates the need to regulate public access within this site.	Same as Alternative B/
Article 3 Section 30220. Protection of certain water-oriented activities: Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.	Alternative B would not impact the limited existing water-oriented recreational activities that surround the project site in south San Diego Bay. However, to protect sensitive resources, no new public access would be granted to the project site following restoration.	Same as Alternative B.
Article 3 Section 30221. Oceanfront land; protection for recreational use and development: Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and forseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.	Alternative B would not be implemented on oceanfront land, therefore, this section is not applicable.	Same as Alternative B.
Article 3 Section 30222 Private lands; priority of development purposes: The use of private lands suitable for visitor-serving commercial recreational facilities designed to enhance public opportunities for coastal recreation shall have priority over private residential, general industrial, or general commercial development, but not over agriculture or coastal dependent industry.	Alternative B would implement restoration on the San Diego National Wildlife Refuge public lands acquired to conserve listed species, migratory birds, and coastal wetlands. This section of the CCA is not applicable to this action.	Same as Alternative B.
Article 3 Section 30222.5. Oceanfront lands; aquaculture; priority: Oceanfront land that is suitable for costal dependent aquaculture shall be protected for that use, and proposals for aquaculture facilities located on those sites shall be given priority, except over other coastal dependent developments or uses.	Alternative B would implement restoration on the San Diego NWR, which was established to conserve listed species, migratory birds, and coastal wetlands. Aquaculture is not considered a compatible use on this NWR.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 3 Section 30223. Upland Areas: Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.	The uplands within the Otay River Floodplain Site are not currently open to public access, although opportunities for public access are and will continue to be provided further to the east on the Refuge. The implementation of Alternative B would restore existing uplands to coastal wetland habitat, consistent with the recommendation of the San Diego Bay NWR Comprehensive Conservation Plan (USFWS 2006). It is not feasible to reserve this area for coastal recreational uses.	Same as Alternative B.
Article 3 Section 30224. Recreational boating use; encouragement; facilities. Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water-dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.	The Otay River Floodplain Site is upland area not suitable for boating, and the Pond 15 Site is not appropriate for recreational boating due to the shallow water habitat, need to protect sensitive species and habitat, and the public access restriction in this area.	Same as Alternative B.
Article 4 Section 30230. Marine resources; maintenance: Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that would sustain the biological productivity of coastal waters and that would maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.	The implementation of Alternative B involves the restoration of coastal wetlands, include shallow, subtidal marine habitat. The restored habitat, which would be managed to sustain the biological productivity of the habitat, is intended to support a range of organisms from plants and benthic invertebrates to fish and a variety of avian species. This alternative is consistent with this section of the CCA.	The implementation of Alternative C would be similar to Alternative B, but additional subtidal habitat would be provided under this alternative. This alternative is consistent with this section of the CCA.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article4 Section 30231.Biological productivity; water quality: The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.	The implementation of Alternative B would restore tidal influence to the Otay River Floodplain and Pond 15 sites; sites that historically supported intertidal habitat. The restored wetlands in these areas would provide benefits to water quality within south San Diego Bay. This alternative is consistent with this section of the CCA.	Same as Alternative B.
Article 4 Section 30232 Oil and hazardous substance spills. Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.	Under Alternative B, best management practices would be implemented during project construction to avoid or minimize the potential for impacts to water quality related to spills. In addition, these best management practices include measures to ensure that effective containment and cleanup procedures are in place and can be rapidly executed to fully address any accidental spills that might occur. This alternative is consistent to the maximum extent practicable with this section of the CCA.	Same as Alternative B.
Article 4 Section 30233 Diking, filling, or dredging; continued movement of sediment and nutrients (a)The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited. (b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and	Under Alternative B, excavation of the Otay River Floodplain is proposed to restore coastal wetlands to an area filled in the early 1900s. The excavated material would be used to fill Pond 15 to achieve elevations suitable for supporting subtidal and intertidal wetlands including shallow subtidal, intertidal mudflat, and salt marsh habitat. Best management practices would be implemented during construction to avoid or minimize siltation within San Diego Bay that could lead to increased turbidity levels in the south end of the Bay. In addition, the plans to restore the two project sites under Alternative B have been designed to ensure that tidal	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
wildlife habitats and water circulation. Dredge points suitable for beach replenishment should be transported for these purposes to the appropriate beaches or into suitable longshore current systems. (c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. (d) Erosion control and flood control facilities construction on watercourses can impede the movement of sediment and nutrients that would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects.	velocities moving in and out of the site would not result in erosion within or downstream of the project site, nor would it impact marine or wildlife habitat. Post-construction monitoring would be conduct to ensure that the restored systems are functioning as planned. This alternative is consistent with this section of the CCA.	
Article 4 Section 30234 Commercial fishing and recreational boating facilities. Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded. Existing commercial fishing and recreational boating harbor space shall not be reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry.	The project site does not currently support commercial fishing or recreational boating activity. Following restoration, the restored wetlands would support resources that are highly susceptible to disturbance, therefore, fishing and boating within the restored project site is not considered compatible with the purposes for which the San Diego Bay NWR was established. This section of the CCA is not applicable to this alternative.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 4 Section 30234.5 Economic, commercial, and recreational importance of fishing. The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.	Refer to the response for Article 4 Section 30234. Note that under Alternative B, restoration of wetland habitat would expand the acreage of habitat available to support fish in San Diego Bay, including nursery areas for commercial and recreational fish species.	Same as Alternative B.
Article 4 Section 30235 Construction altering natural shoreline Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shorelines processes shall be permitted when required to serve coastal dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline can supply. Existing marine structures causing water stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible.	No natural shoreline is present within the project boundary; all of the area to be restored has been disturbed in the past by development of the salt ponds, the salt pond levees, and/or adjacent transportation routes including, a railroad and the Bayshore Bikeway. This section of the CCA is not applicable to this alternative.	Same as Alternative B.
Article 4 Section 30236 Water Supply and Flood Control. Channelization, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.	The project proposes an additional berm in the southern portion of the Otay River Floodplain Site to ensure flood control in this area. However, the main purpose of this project is the improvement of wildlife habitat. Alternative B is consistent with this section of the CCA.	Same as Alternative B.
Article 5 Section 30240 Environmentally Sensitive Habitat Areas (a)Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent of those resources shall be allowed within those areas.	Management of lands included within the National Wildlife Refuge System is consistent with this section of the CCA to the maximum extent possible under existing laws, policies, and guidelines. Adequate measures have been incorporated into the scope of the project under Alternative B to reduce the potential for impacts to environmentally sensitive	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.	lands on-site and adjacent to the restoration site to below a level of significance. These measures include avoiding construction during the nesting season, restricting construction activity to the project footprint, and implementing pre- and post-construction monitoring of biological resources. In addition, this alternative would restore additional acreage of environmentally sensitive lands within San Diego Bay.	
Article 5 Section 30241 Prime Agricultural Land; Maintenance in Agricultural Production The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the areas' agricultural economy, and conflicts shall be minimized between agricultural and urban land uses through all of the following.	The project site does not include any areas identified as prime agricultural land. This section of the CCA is therefore not applicable to Alternative B.	Same as Alternative B.
Article 5 Section 30241.5 Agricultural land; determination of viability of uses; economic feasibility evaluation If the viability of existing agricultural uses is an issue pursuant to subdivision (b) of Section 30241 as to any local coastal program or amendment to any certified local coastal program submitted for review and approval under this division, the determination of viability shall include, but not be limited to, consideration of an economic feasibility evaluation containing at least both of the following elements.	There are no existing agricultural uses on the proposed project site; therefore this section of the CCA is not applicable to Alternative B.	Same as Alternative B.
Article 5 Section 30242 Lands suitable for agricultural use; conversion All other lands suitable for agricultural use shall not be converted to non-agricultural uses unless (1) continued or renewed agricultural use is not feasible, or (2) such conversion	Neither the Otay River Floodplain Site (a former salt pond), nor the Pond 15 Site (an active salt pond) are suitable for agriculture uses. This section of the CCA is therefore not applicable to Alternative B.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 5 Section 30243 Productivity of soils and timberlands; conversion The long-term productivity of soils and timberlands shall be protected, and conversions of coastal commercial timberlands in units of commercial size to other uses or their division into units of noncommercial size shall be limited to providing for necessary timber processing and related facilities.	This section of the CCA is not applicable to Alternative B.	This section of the CCA is not applicable to Alternative C.
Article 5 Section 30244 Archeological or Paleontological Resources Where development would adversely impact archeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.	Based on the formations underlying the project site, there is low potential for paleontological resources. Based on the results of a cultural resources investigation, the construction design proposed under Alternative B has been modified to avoid known archaeological resources in the vicinity of the project. In addition, cultural resource monitors would be present during all excavation. If resources are encountered, excavation would be stopped and the appropriate entities, including the SHPO would be consulted. This alternative is consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30250: Location; existing developed area (a) New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it would not have significant adverse effects, either individually or cumulatively, on coastal resources. In addition, land divisions, other than leases for agricultural uses, outside existing developed areas shall be permitted only where 50 percent of the usable parcels in the area have been developed and the created parcels would be no smaller than the average size of surrounding parcels.	The project does not involve the development of residential, commercial, or industrial uses. Therefore this section of the CCA is not applicable to Alternative B.	The project does not involve the development of residential, commercial, or industrial uses. Therefore this section of the CCA is not applicable to Alternative C.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
(b) Where feasible, new hazardous industrial development shall be located away from existing developed areas. (c) Visitor-serving facilities that cannot feasibly be located in existing developed areas shall be located in existing isolated developments or at selected points of attraction for visitors.		
Article 6 Section 30251 Scenic and Visual Qualities The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.	Alternative B proposes the restoration of native coastal wetland habitat. No obstruction of views from surrounding public or private properties would occur and the existing scenic quality of the area would not be degraded. This alternative is therefore consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30252 Maintenance and enhancement of public access The location and amount of new development should maintain and enhance public access to the coast by (1) facilitating the provision or extension of transit service, (2) providing commercial facilities within or adjoining residential development or in other areas that would minimize the use of coastal access roads, (3) providing nonautomobile circulation within the development, (4) providing adequate parking facilities or providing substitute means of serving the development with public transportation, (5) assuring the potential for public transit for high intensity uses such as high-rise office buildings, and by (6) assuring that the recreational needs of	This section only addresses access issues related to the development of residential, commercial, or industrial uses and no such uses are proposed. This section of the CCA is therefore not applicable to Alternative B.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
new residents would not overload nearby coastal recreation areas by correlating the amount of development with local park acquisition and development plans with the provision of onsite recreational facilities to serve the new development.		
Article 6 Section 30253 (1) New development shall: Minimize risks to life and property in areas of high geologic, flood, and fire hazard.	Fluvial and tidal hydraulics modeling was conducted for the restoration design that would be implemented under Alternative B. Fluvial modeling identified the potential for projected increase over existing conditions of increased flooding levels downstream of the Otay River Floodplain Site during the 100-year flood as a result of lowering the site elevations to accommodate restoration. To address this effect, the following measure has been incorporated into the scope of the project to avoid exacerbating current predicted flood levels downstream of the project: the height of the existing levee between Ponds 22 and 23 would be raised by 2 to 3 feet to direct floodwaters through the salt works to the east of the Otay River rather than allowing the water to overtop the levee and flow down the river toward the residential development of the southwest. In addition, to restrict tidal flows to the project site and avoid introducing tidal action to the Port property located immediately to the south of the Otay River Floodplain Site, a berm would be constructed between the restored wetland habitat and the adjacent Port property. As a result, no changes to the existing tidal or flood regime within the Port property would occur. Implementing these measures would avoid significant adverse effects related to flooding. This alternative is consistent to the maximum extent practicable with this section of the CCA.	

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 6 Section 30253 (2) New development shall: Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.	Implementing Alternative B would not create or contribute significantly to erosion within San Diego Bay or the outer levees of the existing salt ponds. The proposal to increase the elevation of the levee between Ponds 22 and 23 and to construct a berm between the Port property and the restoration site within the Otay River Floodplain would not occur in proximity to any existing coastal bluffs or cliffs and . This would not substantially alter the natural landform in the area. This alternative is consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30253(3) New development shall: Be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development.	Impacts related to air quality and greenhouse gas emissions were analyzed as part of the environmental impact analysis for this project. As a result, measures were incorporated into the scope of the project to ensure that PM_{10} emissions and fugitive dust generated during project construction would not exceed acceptable levels and would be consistent with the requirements imposed by the San Diego Air Pollution Control District (SDAPCD) and the State Air Resources Control Board. Following construction, the only air emission that would be associated with this project would involve occasional vehicle trips associated with habitat management, maintenance, and monitoring. The emissions generated from post-construction activities would not exceed established thresholds. This alternative would be consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30253 (4) New development shall: Minimize energy consumption and vehicle miles traveled.	Although the final construction method has not yet been finalized, two of the potential options for moving the excavated material from the Otay River Floodplain Site to the Pond 15 Method would eliminate the need to truck the material around the south end of San Diego Bay, resulting in significant reductions in fuel consumption and vehicle miles traveled. The third option would involve haul truck trips between	This alternative would require increased truck trips from the Alternative B. However, once construction is complete, only minimal increase in vehicle miles traveled would be required to ensure proper monitoring and maintenance. Therefore, This alternative would be consistent with this policy.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
	the two project sites. However, these would only be during construction. During operations, truck trips would minimally increase over the existing condition for maintenance and monitoring. This alternative would not reduce vehicle miles traveled, but would minimize vehicle miles traveled. This alternative would be consistent with this policy.	
Article 6 Section 30253(5) New development shall: Where appropriate, protect special communities and neighborhoods which, because of their unique characteristics, are popular visitor destination points for recreational uses.	No significant adverse impacts to the communities or neighborhoods surrounding the project site are anticipated as a result of implementing Alternative B. This alternative would be consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30254 Public Works Facilities New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division; provided, however, that it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road. Special districts shall not be formed or expanded except where assessment for, and provision of, the service would not induce new development inconsistent with this division. Where existing or planned public works facilities can accommodate only a limited amount of new development, services to coastal dependent land use, essential public services and basic industries vital to the economic health of the region, state, or nation, public recreation, commercial recreation, and visitor-serving land uses shall not be precluded by other development.	The project does not involve the development of public works facilities. This section is not applicable to Alternative B.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 6 Section 30254.5 Terms or conditions on sewage treatment plant development; prohibition Notwithstanding any other provision of law, the Commission may not impose any term or condition on the development of any sewage treatment plant which is applicable to any future development that the Commission finds can be accommodated by that plant consistent with this division. Nothing in this section modifies the provisions and requirements of Sections 30254 and 30412.	The project does not propose a sewage treatment plant. This section is not applicable to Alternative B.	Same as Alternative B.
Article 6 Section 30255 Priority of Coastal Dependent Developments Coastal-dependent developments shall have priority over other developments on or near the shoreline. Except as provided elsewhere in this division, coastal-dependent developments shall not be sited in a wetland. When appropriate, coastal-related developments should be accommodated within reasonable proximity to the coastal-dependent uses they support.	The implementation of Alternative B would result in coastal wetland restoration, which is a coastal dependent project, However, this project does not involve development, therefore, this section of the CCA is not applicable to this alternative.	Same as Alternative B.
Article 7 Industrial Development	The project does not propose new or expanded industrial development. This Article is not applicable to Alternative B.	Same as Alternative B.