

# **APPENDIX C**

---

## Biological Assessment



**BIOLOGICAL ASSESSMENT  
FOSTER CITY LEVEE PROTECTION PLANNING AND IMPROVEMENTS  
PROJECT (CIP 301-657)  
FOSTER CITY, CALIFORNIA**



**Prepared for:**

Mr. Allan Shu  
City of Foster City  
610 Foster City Boulevard  
Foster City, CA 94404  
650-286-3271 • [ashu@fostercity.org](mailto:ashu@fostercity.org)  
&

Mr. Chuck Anderson  
Schaaf & Wheeler  
1171 Homestead Rd #255  
Santa Clara, CA 95050  
408.246.4848 • [canderson@swsv.com](mailto:canderson@swsv.com)

**Prepared by:**

HUFFMAN-BROADWAY GROUP, INC.  
828 Mission Avenue  
San Rafael, CA 94901  
Contact: Gary Deghi  
Telephone: (415) 925-2000 ▪ Fax: (415) 925-2006

**September 2016**

## TABLE OF CONTENTS

<b>1.0 INTRODUCTION</b> .....	<b>6</b>
<b>2.0 PROJECT DESCRIPTION</b> .....	<b>7</b>
<b>2.1 Background</b> .....	<b>7</b>
<b>2.2 Project Description</b> .....	<b>9</b>
2.2.1 Project Purpose.....	9
2.2.2 Design Considerations .....	10
2.2.3 Project Scenarios.....	11
2.2.4 Levee Improvement Types.....	13
2.2.5 Construction Activity for Each Levee Improvement Type.....	15
2.2.6 Staging Areas .....	16
2.2.7 Schedule/Phasing.....	17
<b>3.0 EXISTING SETTING</b> .....	<b>18</b>
<b>3.1 Site Description</b> .....	<b>18</b>
<b>3.2 Biological Setting</b> .....	<b>20</b>
3.2.1 Plant Communities.....	20
3.2.2 Animal Populations .....	28
3.2.3. Jurisdictional Waters Delineation-Methodology .....	34
3.2.4 Special Status Species .....	38
<b>4.0 REGULATORY AGENCIES AND POLICIES</b> .....	<b>54</b>
<b>5.0 IMPACTS AND MITIGATION MEASURES</b> .....	<b>63</b>
<b>5.1 Standards of Significance</b> .....	<b>63</b>
<b>5.2 Impacts and Mitigation Measures</b> .....	<b>63</b>
5.2.1 Plant Communities and Vegetation .....	63
5.2.2 Wetlands and Waters of the U.S.....	65
5.2.3 Special Status Species .....	68
5.2.4 Animal Species .....	80
5.2.5 Landscaping/Invasive Species .....	84
<b>6.0 REFERENCES</b> .....	<b>86</b>

### List of Tables in the Text

Table 1.	Levee Improvements Associated With Each Project Alternative
Table 2.	Proposed Construction Activity Schedule
Table 3.	Levee Fill Volume Range
Table 4.	Wetlands and Waters of the U.S. Potentially Subject to USACE Jurisdiction Under Section 404 of the Clean Water Act.
Table 5.	Impacts to Wetlands and Waters of the U.S. for Levee Improvements in Levee Segments for Three Improvement Scenarios



## LIST OF ATTACHMENTS

### ATTACHMENT 1. Figures

- Figure 1. Location of the Foster City Levee Protection Planning and Improvements Project
- Figure 2. Foster City Levee Protection Planning and Improvement Project Levee Improvement Type for the 2050 Sea Level Rise Scenario
- Figure 3. Foster City Levee Protection Planning and Improvement Project Levee Improvement Type for the 2100 Sea Level Rise Scenario
- Figure 4. Typical Sheet Pile Floodwall Improvement
- Figure 5. Typical Double Sheet Pile Floodwall Improvement
- Figure 6. Typical Earthen Levee Improvement
- Figure 7. Typical Conventional Floodwall Improvement
- Figure 8. Staging Areas to the North
- Figure 9. Staging Areas to the East
- Figure 10. Staging Areas to the South
- Figure 11. Levee Segment Overview
  - Figure 11a. Segment 1 Levee Overview
  - Figure 11b. Segment 2 Levee Overview
  - Figure 11c. Segment 3 Levee Overview
  - Figure 11d. Segment 4 Levee Overview
  - Figure 11e. Segment 5 Levee Overview
  - Figure 11f. Segment 6 Levee Overview
  - Figure 11g. Segment 7 Levee Overview
  - Figure 11h. Segment 8 Levee Overview
- Figure 12. Soils Map of the Project Area
- Figure 13. 2004 Foster City Dredge Disposal Mitigation Site
- Figure 14. Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction
  - Figure 14a. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 1 of 27
  - Figure 14b. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 2 of 27
  - Figure 14c. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 3 of 27
  - Figure 14d. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 4 of 27
  - Figure 14e. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 5 of 27
  - Figure 14f. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 6 of 27
  - Figure 14g. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 7 of 27
  - Figure 14h. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 8 of 27
  - Figure 14i. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 9 of 27
  - Figure 14j. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 10 of 27
  - Figure 14k. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 11 of 27
  - Figure 14l. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 12 of 27
  - Figure 14m. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 13 of 27
  - Figure 14n. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 14 of 27
  - Figure 14o. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 15 of 27
  - Figure 14p. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 16 of 27

- Figure 14q. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 17 of 27
- Figure 14r. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 18 of 27
- Figure 14s. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 19 of 27
- Figure 14t. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 20 of 27
- Figure 14u. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 21 of 27
- Figure 14v. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 22 of 27
- Figure 14w. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 23 of 27
- Figure 14x. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 24 of 27
- Figure 14y. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 25 of 27
- Figure 14z. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 26 of 27
- Figure 14aa. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 27 of 27

- Figure 15 Ridgway's Rail and California Black Rail Habitat in the Project Area
  - Figure 15a. Ridgway's Rail and California Black Rail Habitat Map, NW Sheet
  - Figure 15b. Ridgway's Rail and California Black Rail Habitat Map, NE Sheet
  - Figure 15c. Ridgway's Rail and California Black Rail Habitat Map, SE Sheet
  - Figure 15d. Ridgway's Rail and California Black Rail Habitat Map, SW Sheet

- Figure 16 Location of Impacts to Wetlands and Waters of the U.S. (2050 Sea Level Rise Scenario)
  - Figure 16a. Location of Impacts Sheet 1 of 4
  - Figure 16b. Location of Impacts Sheet 2 of 4
  - Figure 16c. Location of Impacts Sheet 2 of 4
  - Figure 16d. Location of Impacts Sheet 2 of 4

- Figure 17 Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)
  - Figure 17a. Location of Impacts Sheet 1 of 11
  - Figure 17b. Location of Impacts Sheet 2 of 11
  - Figure 17c. Location of Impacts Sheet 3 of 11
  - Figure 17d. Location of Impacts Sheet 4 of 11
  - Figure 17e. Location of Impacts Sheet 5 of 11
  - Figure 17f. Location of Impacts Sheet 6 of 11
  - Figure 17g. Location of Impacts Sheet 7 of 11
  - Figure 17h. Location of Impacts Sheet 8 of 11
  - Figure 17i. Location of Impacts Sheet 9 of 11
  - Figure 17j. Location of Impacts Sheet 10 of 11
  - Figure 17k. Location of Impacts Sheet 11 of 11

**ATTACHMENT 2.**

**Tables**

- Table 1. Wildlife Species Known to Occur in the Project Area
- Table 2. Special Status Plants with Potential to Occur in the Vicinity of the Project Site, Foster City, California
- Table 3. Special Status Animal Species that Have Been Reported in the Vicinity of the Project Site, Foster City, California

**ATTACHMENT 3.**

**U.S. Fish and Wildlife Service and California Native Plant Society Special Status Species Lists for the Project Area**

This report should be cited as: Huffman-Broadway Group, Inc. 2016. *Biological Assessment, City of Foster City Levee Protection Planning and Improvements Project (CIP 301-657) Project, City of Foster City, California, San Rafael, California.* 93 pp. plus attachments. Prepared for City of Foster City, California. September 2016.

## 1.0 INTRODUCTION

On behalf of the City of Foster City, California, Huffman-Broadway Group, Inc. (HBG) has prepared a Biological Assessment report for the City of Foster City Levee Protection Planning and Improvements Project (CIP 301-657) in Foster City, California. It is expected that this Biological Assessment Report will be incorporated into an environmental document prepared by the City of Foster City to satisfy requirements of the California Environmental Quality Act (CEQA). A Draft Environmental Impact Report (EIR) is currently being prepared by the City of Foster City for the levee improvement project, and this Biological Assessment report will serve as a technical resource document in support of the EIR.

This Biological Assessment report describes biological resources present along the eight-mile levee and ecological constraints to implementation of the levee improvement project, including the presence of sensitive habitats and an evaluation of the potential for rare, threatened, or endangered species of flora and/or fauna to occur along the levee or in the project vicinity. The report also includes a preliminary review of biological impacts associated with implementation of the project and recommended mitigation measures, as needed.

Our analysis included a review of pertinent literature on habitat characteristics of the project area, species of plants and animals expected to occur in the project area, a review of planning documents referencing ecological aspects of the site, and field site surveys. HBG also conducted an investigation of the potential presence of wetlands and other waters of the United States subject to US Army Corps of Engineers (USACE) and US Environmental Protection Agency (US EPA) regulation under Section 404 of the Clean Water Act (CWA) and/or USACE jurisdiction under Section 10 of the Rivers and Harbors Act of 1899 (RHA) within a defined study area along on either side of the levee. The California Natural Diversity Data Base (CNDDB) was consulted to determine if any populations of endangered, threatened, or rare species have occurred historically or currently are known to exist in the project vicinity. The study site was surveyed by HBG biologists between October of 2015 and July of 2016.

## **2.0 PROJECT DESCRIPTION**

### **2.1 Project Location**

Foster City is located in San Mateo County, midway between the cities of San Francisco and San Jose. It is bordered by San Francisco Bay to the north and east, the cities of Belmont and Redwood City to the south, and the City of San Mateo to the west. An overview of the Foster City Levee Protection Planning and Improvements Project is shown in Figure 1. The project site includes approximately 43,000 feet (about 8 miles) of existing levees that surround Foster City along the bayfront, narrow bands of land and vegetation or landscaping on either side of the existing levees, and proposed construction staging areas. The project site starts at the San Mateo city limit in the north (adjacent to East 3rd Avenue), extends parallel to Beach Park Boulevard and Belmont Slough to the east and southeast, and ends adjacent to U.S. Highway 101 in the south at the San Mateo/Belmont city limit. For planning purposes, the levee is divided into eight distinct segments.

The entire project site is open to the public as the levee pathway that is part of the San Francisco Bay Trail; this trail provides both recreational opportunities and pedestrian/bicycle travel routes for the community. The existing levee consists of both raised earthen levees and raised earthen levees with concrete floodwalls. The existing elevation of levee berms and concrete walls ranges from approximately 11 to 13 feet above the North American Vertical Datum of 1988 (NAVD 88).

The project site is bordered by San Francisco Bay to the north and east, Belmont Slough to the southeast and south, and also O'Neill Slough to the south. The Marina Lagoon is situated to the west of the two opposite ends of the project site. Land uses on the landward side of the levee system consist of streets, residential, office and commercial, landscaped open space and recreational, unimproved lots, muted tidal wetlands, and seasonal wetlands. The San Francisco Bay side of the City levee system consists mostly of fully tidal open water, slough channels, wetlands, and mud flats.

### **2.1 Background**

Foster City's eight-mile levee system spans from the City of San Mateo boundary on the north to the O'Neill Slough Tide Gate at the San Mateo/Belmont boundary to the south. The main function of the levee system is to provide flood protection; however the Bay Trail situated on top of or immediately adjacent to the levee also serves recreational purposes. The levee system was originally constructed in the early 1900s and improvements are believed to have been made during the initial development of Foster City in the 1960s. Additional levee improvements were completed in 1995 in response to a June 1988 report by Robert H. Born Consulting Engineers, Inc.

Approximately 9,000 individual properties in Foster City rely on the existing levee system for flood protection. An additional 8,000 individual properties within the City of San Mateo are also protected, in part, by the Foster City levee system. Properties in Foster City also receive flood protection benefit from San Mateo's levee and floodwall systems south of San Mateo Creek and the bayfront levee system. In 2011, the City of San Mateo improved its levee system south of San Mateo Creek and received FEMA accreditation in March 2012. That accreditation is still recognized. Foster City's levee system was last re-accredited by FEMA in 2007.

In 2014 FEMA completed the Central and South San Francisco Bay Coastal Flood Hazard Studies (BakerAECOM 2014) that include hazards associated with tides and waves in the San Francisco Bay and found that Foster City's levees do not meet the required freeboard elevation for accreditation per Title 44 of the Code of Federal Regulations Section 65.10 (44 CFR 65.10). The Coastal Flood Hazard Study indicated that approximately 85 percent of Foster City's levees are deficient. The Foster City levee system will not retain the current accredited status when FEMA remaps San Mateo County for coastal flood hazards. It is anticipated that the new maps will become effective sometime in 2017.

For Foster City to be able to regain their previous Zone X status and to prevent Foster City from being included in a Special Flood Hazard Area (SFHA) improvements to the existing levee system must be made. Foster City has accepted levee seclusion mapping to be able to remain in the Zone X designation for an indefinite period of time while the levee modifications are being made, and can possibly also apply for a Zone A99 designation as the levee improvements progress. The goal of these designations is to "buy time" for the City to raise funds, complete design, and start construction on improvements without impacting the residents with mandatory flood insurance policy requirements.

A Levee Protection Planning Study was completed in February 2015 by Schaaf & Wheeler to analyze the implications of FEMA's San Mateo County Coastal Hazard Study with respect to the Foster City levee system. The planning study discusses the findings of the coastal hazard study and evaluates existing levee conditions and potential design alternatives for the entire levee reach. Preliminary levee deficiencies have been determined using LiDAR data from the 2010 USGS San Francisco Coastal LiDAR fly over and initial cross sections were developed using ESRI's GIS software. Analysis of these initial cross sections shows that the Foster City levee system has up to a 4-foot elevation deficiency relative to required FEMA freeboard elevations. The planning study also states that additional height should be added to the levees to accommodate future sea level rise.

The proposed project is needed to provide flood protection in accordance with updated

FEMA guidelines and to regain FEMA levee accreditation. If FEMA accreditation is not achieved, approximately 17,000 individual properties within Foster City and San Mateo will be located within a FEMA-designated Special Flood Hazard Area (based on the to-be-revised FIRMs) due to the risks associated with levee overtopping.

In November of 2015 Schaaf & Wheeler prepared an alternatives report that builds on the analysis of the levee improvement alternatives in the Planning Study and examines improvement options in more detail based on field reconnaissance undertaken in October 2015 (Schaaf & Wheeler 2015). This report provides the basis for the preliminary project description evaluation in this Biological Assessment report. The alternatives report investigates (i) designated sub-reaches based on points of interest and existing conditions along the levee; (ii) preliminary levee elevation deficiencies within each sub-reach; (iii) preliminary geotechnical conditions within each sub-reach; (iv) design constraints within each sub-reach; and (v) preliminary alternative analyses within each sub-reach. The current project description is based on eight levee segments that are similar but not the same as the original levee subreaches. These levee segments are fully described below.

## **2.2 Project Description**

### **2.2.1 Project Purpose**

The purpose of the Levee Protection Planning and Improvements Project is to regain FEMA accreditation for the levee system. In addition, the City's levee improvement plan design, once implemented to achieve the project purpose, would also provide some level of sea level rise protection (or could be readily modified as needed to adapt to future sea level rise) while maintaining public access along the levee system and protection for sensitive habitat and species.

The City's objectives for implementation of the levee improvement design are as follows:

1. Meet current FEMA standards
2. Regain FEMA levee accreditation
3. Remain on City-owned property and within existing City right-of-way to the extent feasible
4. Provide protection from anticipated sea level rise, including designs that are adaptable to providing increased levels of protection in the future, if needed
5. Maintain public access and recreational opportunities
6. Minimize and/or avoid impacts to sensitive habitats such as jurisdictional waters of the U.S. and state (including wetlands) on the bay side of the existing levee
7. Minimize impacts to sensitive habitats such as jurisdictional waters of the U.S. and state on the landward side of the existing levee

8. Avoid direct impacts to fully tidal waters and wetlands occupied by special-status species such as federal and state-listed species to the maximum extent feasible.

### 2.2.2 Design Considerations

The current elevation of the Foster City levee ranges from 11 to 13 feet NAVD 88. To regain FEMA levee accreditation, the minimum elevation of the modified levee would need to range from 12.5 to 16.5 feet NAVD 88. The minimum required height varies for different segments of the levee because the maximum wave run-up elevation also varies for different segments of the levee. To provide some initial protection from anticipated sea level rise and to accommodate future incremental height increases as needed for sea level rise protection, the modified levee height would need to be greater than the height needed to regain FEMA accreditation for current conditions.

This Biological Assessment evaluates three scenarios with different ranges of levee/floodwall heights as needed to meet FEMA freeboard requirements and/or protect against future sea level rise. The three scenarios are as follows:

- FEMA freeboard with sea level rise for the year 2050 (“2050 Sea Level Rise Scenario”)
- FEMA freeboard with sea level rise for the year 2100 (“2100 Sea Level Rise Scenario”)

Based on currently available data, preliminary evaluations, and City Council direction, the City anticipates that the project will utilize a combination of three different levee improvement types, depending on the location along the existing levee and the adjacent site constraints: (1) sheet pile floodwall (2) earthen levee (3) conventional floodwall. An approach involving a combination of the three types of improvements would provide the most flexibility to meet current FEMA standards and obtain FEMA accreditation. It is anticipated that the majority of levee segments would be improved with sheet pile floodwalls due to several factors: (1) limited width of the City-owned right-of-way; (2) avoidance of environmental impacts; (3) constructability; (4) adaptability to future sea level rise; and (5) cost-effectiveness. In certain levee segments where there is limited space for installing a sheet pile floodwall and raising the levee with additional fill (which requires expanding the width of the levee), a secondary sheet pile floodwall would be installed. The earthen type levee is planned to be utilized within segments where there is sufficient land for an expansion of the levee base, and where such a design would help maintain views along the Bay Trail, provide public access to the shoreline, and/or provide unobstructed access corridors for wildlife to adjacent areas on the landward side of the levee during flood events. The conventional floodwall is planned within segments where constraints make the two other options infeasible.



### 2.2.3 Project Scenarios

Approximate locations for each levee improvement type (sheet pile floodwall, earthen levee, and conventional floodwall) are illustrated in the 2050 Sea Level Rise Scenario (shown in Figure 2) and in the 2100 Sea Level Rise Scenario (shown in Figure 3). No levee improvements are proposed under either scenario along the Mariner's Point Golf Center because the land at this location is adequately elevated to provide the necessary flood protection. The existing levee/floodwall heights, proposed levee/floodwall heights, and improvement types for each levee segment is provided in Table 1.

**Table 1. Levee Improvements Associated With Each Project Alternative**

<b>Segment</b>	<b>Existing Levee Elevation</b>	<b>Levee/Floodwall Elevations for FEMA Freeboard</b>	<b>Levee/Floodwall Elevations for 2050 Sea Level Rise</b>	<b>Levee/Floodwall Elevations for 2100 Sea Level Rise</b>	<b>Proposed Levee Improvement Type for 2050 Sea Level Rise</b>	<b>Proposed Levee Improvement Type for 2100 Sea Level Rise</b>
1	>13	14	15	18.5	Earthen	Sheet Pile
2	12-13	16.5	19	22	Conventional/Sheet Pile	Conventional/Sheet Pile
3	12-13	16	18	21.5	Sheet Pile	Sheet Pile
4	11-12	16	13.5-18	16-21.5	Sheet Pile	Sheet Pile
5	12	12.5	13.5	16	Earthen/Sheet Pile	Sheet Pile
6	12	12.5	13.5	16	Earthen/Sheet Pile	Sheet Pile
7	12-13	12.5	13.5	16	Earthen/Sheet Pile	Sheet Pile
8	12-13	12.5	13.5	16	Earthen/Conventional/Sheet Pile	Conventional/Sheet Pile

Source: Schaaf & Wheeler, 2016.

### **2050 Sea Level Rise Scenario**

As shown in Figure 2, the sheet pile floodwall would be used for at least 5 out of the 8 miles of the levee under the 2050 Sea Level Rise Scenario. A secondary sheet pile wall would be installed along East 3<sup>rd</sup> Avenue and Beach Park Boulevard adjacent to a deviation from the existing levee alignment to retain the raised Bay Trail where space is limited. The earthen levee would be used at three different locations: (1) along East 3<sup>rd</sup> Avenue near Mariner's Point Golf Center; and (2) along the Foster City Lagoon Dredge Disposal Site adjacent to Sea Cloud Park, and (3) near Port Royal Park. The conventional floodwall improvement option would be used under the San Mateo Bridge (due to limited vertical access and the inability to drive piles under the bridge) and along the O'Neill Slough Remnant Channel from west of Port Royal Park to the end of the levee (due to limited space).

### **2100 Sea Level Rise Scenario**

Under the 2100 Sea Level Rise Scenario, more areas of the levee would require the sheet pile floodwall improvement type. Also, a secondary wall would be used for levee segments along East 3<sup>rd</sup> Avenue, along Beach Park Boulevard adjacent to the deviation, and between Port Royal Park and the San Mateo/Belmont city limit (where space is limited for expanding the width of the levee). As shown in Figure 3, the earthen levee improvement type would be replaced by the sheet pile floodwall. Sheet pile floodwall would be used for at least 7 miles of the 8-mile alignment. The conventional floodwall improvement type would only be used under the San Mateo Bridge and along the O'Neill Slough Remnant Channel from west of port Royal Park to the end of the levee, as described in the 2050 Sea Level Rise Scenario.

#### **2.2.4 Levee Improvement Types**

Each levee improvement type is described below followed by additional detail related to the methodology for determining the height of the levee improvements.

##### **Improvement Type 1: Sheet Pile Floodwall**

The sheet pile floodwall improvement type uses sheet pile floodwall sections as a permanent flood protection structure. Sheet pile floodwall is planned where there is insufficient right-of-way width or where encroachment may occur into wetland areas with an earthen levee or conventional floodwall. The sheet pile floodwall design would be composed of a vertical wall that varies in height from 1.5 to 10 feet above the finish grade and is 12–20 inches wide, depending on the adaptive sea level rise scenario selected for design. The sheet piles would be driven sufficiently deep to provide adequate resistance against deflection from the tide and wave loads, as well as seepage protection. It is anticipated that piles would be driven to approximately 10–20 feet underground. The piles would be driven using vibratory hammers, however other

methods such as percussion hammers or a press-type system may be considered in specific locations. Best Management Practices (BMPs) would be implemented including the use of silt fence or straw wattles along the shoreline to control erosion and sedimentation into adjacent waters. The earthen levee could then be raised with additional fill in locations where the finished floodwall elevation is higher than 3.5 feet above the trail. A sheet pile floodwall schematic is shown in Figure 4.

The sheet pile wall structure would also be designed to accommodate loads from future incremental wall height increases necessary to adapt to future sea level rise. Where space is limited along the levee, a secondary retaining wall could be installed on the landward side of the levee with a tieback to the first sheet pile floodwall creating a “double floodwall,” as shown in Figure 5. This would require less right-of-way width than a single sheet pile wall because the fill is confined to the levee crest between the two walls. A safety rail would also be placed on the secondary wall.

### **Improvement Type 2: Earthen Levee**

For earthen levees, the top of the existing levee would be excavated and conditioned to accept new fill (shown as green shading in Figure 6). The earthen levee would range from 14 to 16 feet in elevation and would be 12.5–20.5 feet wide, depending on the adaptive sea level rise scenario selected for design. The weight of the new fill would result in long-term settlement of the levee, and supplemental fill would be placed during construction to account for future settlement. The base of the improved earthen levee would be expanded to support additional fill (see dashed line in Figure 6) that may be placed in future years to provide protection against future sea level rise. Two types of fill may be used for earthen levees: conventional fill or lightweight fill. Using lightweight fill would minimize settlement; however, lightweight fill is relatively porous and would require the construction of sheet pile barriers to minimize seepage.

### **Improvement Type 3: Conventional Floodwall**

The conventional floodwall design would be composed of a vertical wall that varies in height from 4.5 to 10 feet above the finish grade and is 8–12 inches wide, depending on the adaptive sea level rise scenario selected for design. The wall design includes a foundation that is generally as wide as the height for adaptive sea level rise protection. The floodwall would likely be constructed of concrete. The foundation construction would require levee excavation at the top of the existing berm. To ensure that the level of flood protection provided by the existing levee during construction is not compromised as a result of excavation for the foundation, a temporary sheet pile wall would be installed on the water side, as shown in Figure 7.

Modification to the existing levee section below new floodwalls would be necessary if seepage is an issue. A slurry (made of either cement or soil-cement mixed in-situ) or a

permanent sheet pile barrier would be installed to prevent seepage, and additional earthen fill (shown as green shading in Figure 7) may be added to increase the height of the trail and reduce the relative height of the wall to enhance views of San Francisco Bay and ensure that the maximum wall height does not exceed 3.5 feet from the grade adjacent to the Bay Trail (except near the San Mateo Bridge). The base of the conventional floodwall structure would be designed to accommodate an increased wall height if, subsequent to completion, the City wanted to increase the wall height to adapt to future sea level rise (see dashed line in Figure 7).

### 2.2.5 Construction Activity for Each Levee Improvement Type

Construction activities include (1) sheet pile placement and/or wall construction; (2) fill placement and Bay Trail reconstruction; and (3) wall aesthetic enhancement and landscaping. These activities would overlap during different phases of construction. Construction is anticipated to begin in 2018 and would involve two construction crews working five-day work weeks under both scenarios. The estimated timeframes for each activity are presented in Table 2.

**Table 2. Proposed Construction Activity Schedule**

<b>Construction Activity</b>	<b>2050 Sea Level Rise Scenario Estimated Time</b>	<b>2100 Sea Level Rise Scenario Estimated Time</b>
Sheet Pile Placement/Wall Construction	230 days	290 days
Levee Fill and Trail Reconstruction	180 days	285 days
Landscaping/Wall Enhancement	105 days	200 days

Source: Schaaf & Wheeler, 2016.

#### **Construction Activity 1: Sheet Pile Placement and/or Wall Construction**

For areas with the conventional floodwalls, activities would include levee excavation and installation of a temporary sheet pile on the water side. The temporary sheet pile would potentially be needed beneath the San Mateo Bridge and along the O’Neill Slough Remnant Channel from west of Port Royal Park to the end of the levee, as these are the only areas designated for conventional floodwalls under both the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios. Permanent sheet pile would be installed for all other areas of the floodwall improvement type. In areas designated for earthen levees, the top of the existing levee would be excavated and conditioned to accept new fill. In areas where there are existing walls, sheet piles would be driven in front (if sufficient room exists outside of wetlands). Afterward, the existing walls would be demolished. A total of six proposed construction staging areas adjacent to the levee system could be used, as shown in the overview of the levee improvement project in Figure 1. All work would be conducted from the landward side and no existing riprap would be affected.

## Construction Activity 2: Fill Placement and Trail Reconstruction

In areas designated for the conventional and sheet pile floodwall improvement types, the trail would be raised with additional fill in locations where the finished floodwall elevation is higher than 3.5 feet above the trail. Activities would include fill placement and grading followed by paving. The amount of fill for each of the scenarios is shown in Table 3. The source of the fill could include both conventional fill (from a local source) and lightweight levee fill (most likely transported from Susanville, California). The San Francisco Bay Trail would be replaced in-kind or improved; the new trail would be 14–16 feet wide (10 feet paved with a 2-foot shoulder on each side and an additional 1 foot of shoulder adjacent to vertical walls where feasible).

**Table 3. Levee Fill Volume Range**

Scenario	Fill Volume Range (in cubic yards)
2050 Sea Level Rise	34,000–46,000
2100 Sea Level Rise	150,000–162,000

Source: Schaaf & Wheeler, 2016.

## Construction Activity 3: Wall Aesthetic Enhancement and Landscaping

This phase would include replacement landscaping in addition to treatment of the floodwall (if applicable).

### 2.2.6 Staging Areas

Staging areas would be used for (1) temporary stockpiling of fill, so that fill materials do not require transport from their source(s) directly to the work site; (2) construction equipment storage; (3) sheet pile storage and transfer to construction equipment; (4) miscellaneous material storage; (5) parking for workers; and (6) other indirect construction-related activities.

The contractor would use six staging areas to access the project site. A 0.6-acre staging area is located in a parking lot behind three water towers, southeast of the intersection of East 3<sup>rd</sup> Avenue and Foster City Boulevard. Three additional staging areas would be near the base of the San Mateo Bridge, as shown in Figure 8: (1) a 0.8-acre staging area in a dirt lot to the west of CA 92, approximately 0.2 mile southwest of the San Mateo Bridge; (2) a 0.3-acre staging area west of the bridge in a dirt lot; and (3) a 0.2-acre staging area to the east of the bridge in a dirt area with picnic benches. As shown in Figure 9, another 5.4-acre staging area would be located along Beach Park Boulevard between Bridgeview Park and Foster City Boulevard. The final staging area is shown in Figure 10, a 3.8-acre staging area along the edge of the Dredge Disposal Site on the

landward side of the levee, between Sea Cloud Park and the southern end of Wheel House Lane, adjacent to Belmont Slough.

### **2.2.7 Schedule/Phasing**

Proposed levee improvements would be constructed in phases over 1.5 to 2 years for the 2050 Sea Level Rise scenario or over 2 to 2.5 years for the 2100 Sea Level Rise scenario. Three major restrictions would be placed on the contractor, as follows:

1. Only select portions of the Bay Trail may be closed simultaneously, as directed by the City.
2. Habitat for the endangered Ridgway's Rail encompasses all sections of the levee along Belmont Slough from Destination Park to O'Neill Slough. Construction shall be avoided along this portion of the levee during the annual nesting season, which is February 1 to August 31. If work along portions of this levee segment become necessary during the nesting season, a protocol breeding survey for Ridgway's Rail shall be conducted prior to the nesting season to identify the location of all Ridgway's Rail nests within the vicinity of the work area. No work will be allowed within 700 feet of a nest.
3. NOAA Fisheries/National Marine Fisheries Service has indicated in personal communications with HBG that a work window to protect listed fish species or Essential Fish Habitat would not be necessary as long as the project included the following items (all currently included as part of the project description): (i) sheet piles will be installed in uplands (into the existing levee) using land-based equipment, (ii) sheet piles will be installed using vibratory hammering methods, (iii) there would be no in-water work, (iv) the contractor will use BMPs to control erosion and sedimentation into adjacent waters, and (v) widening of the toe of the slope of the levee, if necessary, would be accomplished on the inboard side of the levee if at all possible.

## 3.0 EXISTING SETTING

### 3.1 Site Description

For purposes of planning and impact evaluation, the eight miles of the Foster City levee system are broken down into eight segments. The location of these segments was determined by the project engineer (Schaaf & Wheeler 2015). Factors for determining each segment include: the nature of the segment, physical constraints for construction, potential habitat areas, improvement types, and potential alternatives. The segments are not uniform in length. The location of the segments is shown in Figure 1 (Section 1.0), and a general summary description of the nature of each segment follows.

**Segment 1: San Mateo City Limit to Mariner’s Island Golf Center-** An overview of segment 1 is shown in Figure 11a. Most of segment 1 is bordered by fenced, undeveloped salt marsh wetlands on the bay side and East 3<sup>rd</sup> Avenue on the landward side. At the eastern end of segment 1, the levee extends north for approximately 400 feet along the parking area for the Golf Center. An approximately 0.6-mile long portion of the levee adjacent to and north of the Mariner’s Island Golf Center is not part of the proposed project.

**Segment 2: Mariner’s Island Golf Center to San Mateo Bridge-** An overview of segment 2 is shown in Figure 11b. The western end of this segment is at the City’s Kite Surfing Launch Area. The westernmost 0.4 miles of segment 2 is bordered by the open water of San Francisco Bay (protected with rip-rap) on the bay side with a mix of disturbed upland vegetation and wetlands on the landward side. East of there, a 0.7-mile segment is bordered by the San Francisco Bay on the bay side and East 3<sup>rd</sup> Avenue on the landward side, with industrial and office-related uses located just beyond. Mid-way in this segment is the City’s lagoon outfall structure where the City pumps out lagoon water to maintain water levels in the Central Lagoon. In the eastern portion of this segment, office uses are on the north side of East 3<sup>rd</sup> Avenue and a pedestrian bridge extends from the levee over a wetland area to these offices. The terminus of this segment is just west of San Mateo Bridge.

**Segment 3: San Mateo Bridge to Beach Park Boulevard/Tarpon Street-** An overview of segment 3 is shown in Figure 11c. The western extent of this segment is under the San Mateo Bridge where there is a Caltrans office and equipment yard on the inboard side of the levee. For the northernmost 0.2 mile, segment 3 is bordered by the open water of San Francisco Bay on the bay side and Werder Park on the landward side. For approximately 0.6-mile the levee/Bay Trail is parallel to Beach Park Boulevard with open water of San Francisco Bay



(protected with rip-rap) on the bay side with a strip of landscaping, Beach Park Boulevard and single family residences on the landward side. At the southern end of this segment is the Foster City Shell Bar with shell mounds and wetlands extending into the Bay approximately 250 feet. The Foster City Shell Bar is a spit of land extending into the bay composed of clam and mussel shells. Land uses along the landward side of this segment consist of single family residences, townhouses, apartment buildings, and commercial uses, with the Bayside Community Church and Bowditch Middle School at the southern end.

**Segment 4: Beach Park Boulevard/Tarpon Street to Foster City Boulevard-** An overview of segment 4 is shown in Figure 11d. Along this segment, the levee continues running parallel to Beach Park Boulevard, with a field of vegetation on the bay side and single-family residences on the landward side. Within the vegetated area is the San Francisco International Airport Instrument Landing System (“ILS”) Outer Marker used to signal for approaching airplanes making the descent to San Francisco International Airport. At the southern end of the segment, the levee is separated from Beach Park Boulevard to run east of Destination Park with ruderal and wetland vegetation on the bay side and Destination Park on the landward side of the levee.

**Segment 5: Beach Park Boulevard/Foster City Boulevard to Sea Cloud Park/Dredge Disposal Site-** An overview of segment 5 is shown in Figure 11e. Within the northern 0.3-mile of this segment, the levee is bordered by the salt marshes along Belmont Slough on the bay side and a mix of single-family and multiple-family housing along Beach Park Boulevard on the landward side. Multiple large transmission towers are located within the wetlands along this segment. South of there, this levee segment diverges from Beach Park Boulevard for 0.3 miles with salt marsh wetlands on the bay side and townhouses on the landward side. Beyond Wheel House Lane is the Foster City Central Lagoon Intake Structure consisting of a floodwall and gate valves allowing water to flow from the Bay to the Central Lagoon. The southern end of this segment runs along the east side of the Foster City Dredge Disposal Site with continuing salt marsh of Belmont Slough to the outboard side of the levee.

**Segment 6: Belmont Slough to Gateshead Park-** An overview of segment 6 is shown in Figure 11f. The eastern half of segment 6 is bordered on the landward side by a portion of the Foster City Dredge Disposal Site and sports fields associated with Sea Cloud Park and on the bay side by Belmont Slough. The western half of the segment is bordered by Belmont Slough on the bay side and single-family and multiple-family residences on the landward side, with the terminus of the segment at Gateshead Park.

**Segment 7: Gateshead Park to Port Royal Park-** An overview of segment 7 is shown in Figure 11g. Segment 7 begins at Gateshead Park and extends along Belmont Slough on the outboard side of the levee, with various park uses and the Schooner Bay Apartment Homes on the inboard side of the levee. The terminus of the segment is at Port Royal Park.

**Segment 8: Port Royal Park to Belmont City Limit –** An overview of segment 8 is shown in Figure 11h. The easternmost 0.1 miles of segment 8 extends along Belmont Slough with single-family and multiple-family residences, as well as the Port Royal Park and soccer field on the landward side. West of there, the levee extends for 0.2 miles along a muted tidal channel on the outboard side where there is a floodwall along the levee on the outboard side of the Bay Trail. The landward side consists of multiple-family residences. The westernmost 0.35-mile portion of the levee extends along O’Neill Slough on the outboard side and the Lantern Cove apartment complex on the landward side.

This section of the Biological Assessment describes the nature of each segment of the levee system in terms of vegetation and habitats present, wildlife populations present along the various segments of the levee, the location of wetlands and waters of the U.S. in the vicinity of the levee, and the presence or absence of special status species, including federally or state-listed species.

A review of the Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service, SCS) Soil Survey maps for San Mateo County (USDA 1993) shows three soil types occurring in the project area. A soils map of the project site is shown in Figure 12. Soils along the existing levee are Urban land-Orthents, reclaimed complex, 0 to 2% slopes and Novato clay, 0 to 1% slopes. Soils offshore in San Francisco Bay are Bay Mud. The levee itself is comprised of fill material. Field investigations on the project site confirmed that the NRCS soils mapping is reasonably accurate throughout the project area.

## **3.2 Biological Setting**

### **3.2.1 Plant Communities**

Vegetation communities are assemblages of plant species growing in an area of similar biological and environmental factors. Vegetation communities and habitats at the project site were identified based on the currently accepted List of Vegetation Alliances and Associations (or Natural Communities List) (CDFW 2010). The list is based on A Manual of California Vegetation, Second Edition (Sawyer and Keeler-Wolf 2009), which is the National Vegetation Classification applicable to California. Habitat types discussed in this report are also described based on the California Wildlife Habitat Relationships (CWHR) System for habitat classifications (Mayer and Laudenslayer 1988). The CWHR

System defines aquatic as well as terrestrial habitats, and is one of the few systems that include urban areas. Wetland habitats potentially subject to federal or state jurisdiction were further classified using the U.S. Fish and Wildlife's Service's (USFWS) "Classification System for Wetland and Deepwater Habitats" (Cowardin et al. 1979, see Wetland Delineation discussion in Section 3.2.3).

HBG biologists conducted field surveys of the approximately 8-miles of levee and six staging areas between October of 2015 and July of 2016. Along the levee alignment, including a slight deviation from the existing alignment in segment 4, vegetative habitats were mapped within an area extending approximately 25 feet out from the toe of the levee on the outboard side and 100 to 500 feet on the inland side of the levee, an area that was defined for purposes of conducting the wetland delineation described in Section 3.3. All habitats along the levee alignment were surveyed on foot or bicycle and assessed for similarity to sites known to support special status species within the area. Qualitative information on the composition and distribution of plant species on the site was obtained during the site visits. Plant communities were identified on aerial photographs of the site.

According to criteria of Sawyer and Keeler-Wolf (2009), there are three vegetated communities along the levee alignment: Pacific Coast Salt Marsh, Fennel Patch and Non-native Grassland.

Pacific Coast Salt Marsh is a wetland habitat. Pacific Coast Salt Marsh consists of all the areas mapped in the wetland delineation described as Estuarine Intertidal Emergent or Palustrine Emergent Wetland. Vegetation within this habitat type is primarily Virginia pickleweed (*Salicornia virginica*), and along Belmont Slough and O'Neill Slough included areas of cordgrass (*Spartina foliosa*). Other species found in the Pacific Coast Salt Marsh habitats included saltgrass (*Distichlis spicata*), jaumea (*Jaumea carnosa*), alkali heath (*Frankenia grandifolia*), fat-hen (*Atriplex patula*), marsh rosemary (*Limonium californicum*), marsh dodder (*Cuscuta salina*), and marsh gum plant (*Grindellia stricta* var. *angustifolia*). Pacific Coast Salt Marsh is found outboard of the levee in segment 1, inboard of the levee in segment 2, inboard of the levee in the northern portion of segment 3 just south of Werder Park, outboard of the levee in portions of the Foster City Shell Bar in the southern portion of segment 3, and outboard of the levee along Belmont Slough in the northern portion of segment 4 and all along segments 5, 6 and 7, and along O'Neill Slough in segment 8.

Vegetated upland habitats include a Fennel Patch, which is located in an area outboard of the existing levee in segment 4, and in which the dominant vegetation is the non-native sweet fennel (*Foeniculum vulgare*). Non-native Grassland is often found around the periphery of marsh habitats and on earthen levee slopes and includes non-native grass and herbaceous species such as rip-gut brome (*Bromus diandrus*), wild oat (*Avena*

*fatua*), hare barley (*Hordeum murinum leporinum*), bristly ox-tongue (*Helminthotheca echioides*), bull mallow (*Malva nicaeensis*), Italian thistle (*Carduus pycnocephalus*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativa*) and bull thistle (*Cirsium vulgare*).

Much of the project area consists of urban areas or non-vegetated habitats not included in the Sawyer and Keeler-Wolf (2009) criteria. Wildlife habitats in the project area can also be categorized using the CWHR System. Vegetated habitats in the CWHR System would be classified as Saline Emergent Marsh and Annual Grassland. The CWHR System includes Urban Habitats, which in the project area include considerable areas of lawn, landscaping species or extensive areas along the levee that are vegetated with ice plant (*Caprobrotus edulis*) and weedy non-native species. Additional habitats present include rocky areas of the shoreline (in the project area including rip-rap levee slopes and the Foster City Shell Bar), and mudflats located just offshore in the Bay. Under the CWHR System these areas of rocky shore and mudflat would be considered Barren (or free of vegetation).

A description of vegetative communities present along with dominant vegetation within each segment follows.

**Levee Segment 1- San Mateo City Limit to Mariner's Island Golf Center.** The habitat type on the inboard side of the levee along the entire length of this segment is considered to be Urban Habitat. Vegetation is landscaping species including ice plant and low-profile shrubs. Much of the outboard side of the levee in this segment has also been planted with various shrubs for landscaping purposes, but some portions not so landscaped support Non-native Grassland habitat with species such as wild oat, bull mallow, bristly-ox-tongue, sweet fennel, California poppy (*Eschscholzia californica*), and sweet clover (*Melilotus indica*). Beyond the toe of the slope of the levee, the habitat along the outboard side of the levee along this segment is considered Pacific Coast Salt Marsh according to the CDFW criteria (CDFW 2011). Vegetation within the Pacific Coast Salt Marsh habitat is almost entirely pickleweed with species along the marsh edge including saltgrass, alkali heath, Russian thistle (*Salsola* sp.), pepperweed (*Lepidium latifolium*) and some marsh gum-plant. The salt marsh is part of a wetland restoration area where wetlands were created as part of mitigation for prior City of Foster City projects.

**Levee Segment 2- Mariner's Island Golf Center to San Mateo Bridge.** The western portion of this segment is the recently improved Kite-sailing area which would be considered Urban Habitat. The outboard site of the levee adjacent to the Kite-sailing area is protected with rip-rap. The kite-sailing staging area has been improved with parking lot and artificial turf.

The kiteboard launch/landing beach near the southern rigging area hosts a strip of brackish marsh vegetation at the base of the levee, with vegetation including saltgrass,

pickleweed, marsh rosemary and marsh gum plant, along with upland grasses like wild oat and riggut brome. Vegetation at the east end of the beach is uplands and includes ice plant, pepperweed and sweet fennel.

From the kiteboard launch/landing beach this segment of the levee extends west nearly to the San Mateo-Hayward Bridge. The outboard side of the levee along the entirety of this segment is a rip-rap shore designed to protect the levee from storm run-up from San Francisco Bay. Bay waters are found all along the north side of the levee along this segment.

As the levee extends to the east from the kite-rigging beach, the inboard slope of the levee is vegetated with sweet fennel and a variety of other herbaceous plants and grasses such as Italian thistle, wild radish, sweet clover, rip-gut brome, wild oat, bristly ox-tongue, bull mallow, hare barley and common sow-thistle (*Sonchus oleraceus*). Beyond the toe of the slope, upland vegetation consists of the various upland grasses and sweet fennel with patches of pickleweed and saltgrass. Further out from the slope is a stretch of wetland (would be classified as Pacific Coast Salt Marsh) that extends north along and adjacent to J. Hart Clinton Drive through much of segment 2. Vegetation in this Pacific Coast Salt Marsh is primarily pickleweed.

In the vicinity of the Foster City Lagoon Pump Station outtake structure the levee is very close to J. Hart Clinton Drive and portions of both slopes of the levee and Bay Trail are vegetated with ice plant. The Pacific Coast Salt Marsh resumes to the east of the outtake structure inboard of the levee with a vegetated strip of uplands along the levee slope and beyond the toe of the levee consisting of sweet fennel, Italian thistle, wild oat and other species. The marsh area is crossed by a pedestrian bridge near some corporate buildings where the vegetation in the salt marsh is again primarily pickleweed with some fat-hen and curly dock (*Rumex crispus*) along the edge. Closer to the San Mateo-Hayward Bridge the inboard slope is upland grasses, sweet fennel, pampass grass, planted shrubs and several planted Monterey cypress (*Cupressus macrocarpa*).

**Levee Segment 3: San Mateo Bridge to Beach Park Boulevard/Tarpon Street.** The portion of this segment that passes under the San Mateo-Hayward Bridge and is entirely built infrastructure. No vegetative habitats occur at this location. Weedy species such as sweet fennel and wild oat grow sparsely on either side of the Bay Trail.

Werder Park is found to the west of the levee along the inboard side of the levee at the northern portion of segment 3 just south of the San Mateo-Hayward Bridge. Werder Park was recently developed by the City of Foster City for passive recreational uses. The inboard side of the levee is a slope vegetated with species such as sweet fennel, wild oat, ice plant and wild radish. The area of Werder Park would be considered an Urban Habitat. Immediately south of Werder Park, areas beyond the inboard toe of slope of the levee consist of Pacific Coast Salt Marsh habitat vegetated with pickleweed and other

wetland species such as sturdy bulrush (*Bolboschoenus robustus*), brass buttons (*Cotula coronopifolia*), saltgrass and curly dock.

South of Werder Park and south of the wetland area, this stretch of levee runs along Beach Park Boulevard. The inboard side of the levee along Beach Park Boulevard would be considered as an Urban habitat, with the slopes on the west side of the levee vegetated almost exclusively with ice plant, along with some weedy species such as fennel, wild oat, Italian thistle, common sow-thistle and salsify (*Tragopogon porrifolius*). The outboard side of the levee along the entirety of segment 3 is a rip-rap shore designed to protect the levee from storm run-up from San Francisco Bay. Bay waters are found all along the east side of the levee along this portion of the segment.

In the southern portion of segment 3, the outboard side of the levee is the Foster City Shell Bar, portions of which are subject to tidal action. The inboard levee slope here is vegetated with plants such as sweet fennel, iceplant and wild oat, but the Shell Bar contains pockets of wetlands with vegetation consisting of mostly pickleweed, but with other wetland species such as saltgrass, jaumea, marsh gum plant, and marsh rosemary. The Foster City Shell Bar is an important wildlife habitat (see discussion in Section 3.2.2).

**Levee Segment 4: Beach Park Boulevard/Tarpon Street to Foster City Boulevard.** The outboard side of the levee in the northern portion of this segment is an upland area that could be classified as Fennel Patch. The dominant vegetation in this area is the non-native sweet fennel, but other non-native species occur including black mustard, wild oat, rip-gut brome, common cheat grass (*Bromus hordaceus*), hare barley, sweet clover, pepperweed, bull thistle and bull mallow. Small pockets of wetlands (Pacific Coast Salt Marsh habitat) are also found in this area, vegetated with mostly pickleweed, but also species like salt grass, alkali heath, marsh rosemary, rabbitfoot grass (*Polypogon monspeliensis*) and Mediterranean barley (*Hordeum marinum gussoneanum*).

The southern portion of this segment was recently developed by the City of Foster City as Destination Park, which occupies the area west (inboard) of the levee which curves outward toward the Bay. Destination Park is an Urban Habitat planted with landscape plants to provide for passive recreational uses. The inboard side of the levee is vegetated with most ice plant along with weedy species like sweet fennel, wild oat, bull thistle, and bull mallow. The outboard slope of the levee is an earthen slope vegetated with species such as wild oat, rip-gut brome, bull mallow and bristly ox-tongue.

The parcel adjacent to and just east of the levee beyond Destination Park consists of mostly uplands and non-tidal wetlands on fill. The non-tidal wetlands located east of Destination Park are vegetated with species such as pickleweed, saltgrass, alkali heath, marsh rosemary and pepperweed, and have areas of scattered high ground supporting upland plants such as ice plant, mustard and coyote brush (*Baccharus pilularis*). Just

beyond this fill area, the elevation drops to an unfilled area of native tidal salt marsh (Pacific Coast Salt Marsh) vegetated solely with pickleweed. The landward edge of this tidal marsh is a high marsh zone vegetated with marsh gum plant and herbaceous species such as alkali heath and saltgrass.

**Levee Segment 5: Beach Park Boulevard/Foster City Boulevard to Sea Cloud Park/Dredge Disposal Site.** North of the Central Lagoon Intake, the inboard side of the levee along segment 5 includes the Bay Trail and is Urban habitat vegetated with landscape species including ice plant and non-native grasses. On the outboard side of the earthen levee, a grassy slope is vegetated with primarily non-native grasses such as rip-gut brome, wild oats, Italian thistle and bull mallow, among others. Beyond the toe of the slope of the levee is Pacific Coast Salt Marsh along Belmont Slough vegetated almost exclusively with pickleweed, but with other species along the marsh edge and higher elevations within the marsh including marsh gum plant, alkali heath and marsh rosemary. Near the middle of this segment near the Central Lagoon Intake, the main marsh also includes patches of cordgrass.

South of the Central Lagoon Intake, segment 5 runs along the eastern site of the City of Foster City's Dredge Disposal Site. Both slopes of the earthen levee in this segment along the Disposal Site form an Urban Habitat vegetated with non-native grasses and herbaceous plants. The inboard side of the levee is vegetated with non-native grasses (mostly wild oat and rip-gut brome), along with species such as wild radish, bull mallow and Italian thistle. The outboard side of the earthen slope is vegetated with primarily non-native grasses and herbaceous species such as sweet fennel and Italian thistle. Beyond the toe of the slope of the levee is Pacific Coast Salt Marsh along Belmont Slough vegetated almost exclusively with pickleweed and cordgrass, along with edge and high marsh species such as marsh gum plant, alkali heath, and marsh rosemary. Small areas of previous fill within the marsh in this segment are vegetated with upland species including various non-native grasses and ice plant.

The inboard side of the levee slopes down to the Foster City Lagoon Dredge Disposal site. The central basin for the 19-acre Foster City Lagoon Dredge Disposal site is primarily open water during the winter months and is mostly unvegetated during the dry season. Several small islands within the basin are vegetated with species such as ice plant, pickleweed and Italian thistle, and a fringe of wetland vegetation around the perimeter includes pickleweed, alkali heath, and rabbitsfoot grass as well as ice plant and other species.

**Levee Segment 6: Belmont Slough to Gateshead Park.** The eastern end of levee segment 6 runs along the Foster City Lagoon Dredge Disposal site. Vegetation here is similar to that described along the dredge disposal site and Belmont Slough for the southern end of levee segment 5. West of the disposal site, the inboard side of the levee is Urban habitat

associated with the southern extent of Sea Cloud Park and the rear of single- and multi-family residences, an area vegetated with landscape trees and shrubs, lawns and non-native species like ice plant on the slope of the levee. On the outboard side of the earthen levee bordering Belmont Slough is an earthen slope with various non-native grasses ice plant, bull mallow and others. Beyond the toe of the slope of the levee is Pacific Coast Salt Marsh along Belmont Slough vegetated with pickleweed and cordgrass, along with jaumea, alkali heath, marsh rosemary and some gum plant along the marsh edge and in high marsh areas of previously deposited fill.

**Levee Segment 7: Gateshead Park to Port Royal Park.** The inboard side of the levee is Urban habitat associated with adjacent residential uses, an area vegetated with landscape trees and shrubs, lawns and non-native species like ice plant on the slope of the levee. On the outboard side of the earthen levee bordering Belmont Slough is an earthen slope with various non-native grasses, ice plant, bull mallow and others. Beyond the toe of the slope of the levee is Pacific Coast Salt Marsh along Belmont Slough vegetated with pickleweed and cordgrass, along with jaumea, alkali heath, marsh rosemary and some gum plant along the marsh edge and in high marsh areas of previously deposited fill.

**Levee Segment 8: Port Royal Park to Belmont City Limit.** With the easternmost portion of levee segment 8, the inboard side of the levee in this segment contains the Bay Trail and is Urban Habitat associated with Port Royal Park and a residential neighborhood, and the outboard side of the levee is a narrow strip of Pacific Coast Salt Marsh in a muted tidal channel. Urban infrastructure including the Bay Trail and a floodwall are along the top of the levee and a residential neighborhood is found beyond the inboard side of the levee. The outboard side of the levee is vegetated with species such as non-native grasses (mostly wild oat but also rip-gut brome and other non-native grasses), and other species such as ice plant, mustard, bull mallow, wild radish, sweet fennel, and Italian thistle, along with several artichoke thistle (*Cynara cardunculus*). Beyond the toe of the slope of the levee is Pacific Coast Salt Marsh along the slough channel vegetated almost exclusively with pickleweed, but including species like alkali heath and rabbitsfoot grass along the edge.

The westernmost 0.35-mile portion of the levee within segment 8 extends along O'Neill Slough on the outboard side. The inboard side of the levee includes the Bay Trail and is Urban habitat vegetated with landscape species including ice plant on the slope of the levee. On the outboard side of the earthen levee, a grassy slope is vegetated with primarily non-native grasses and shrubs such as wild oat, curly dock and others. Beyond the toe of the slope of the levee is Pacific Coast Salt Marsh along O'Neill Slough, vegetated almost exclusively with pickleweed and cordgrass, but with species such as marsh gum-plant and saltgrass along the marsh edge.



**Staging Areas.** One of the proposed staging areas is a 0.6-acre area located in an asphalt-paved parking lot and storage area of the City's corporation yard adjacent to the northwest end of the Foster City Lagoon, a site containing only sparse ruderal or weedy vegetation. The three proposed staging areas located near the base of the San Mateo Bridge include a 0.8-acre asphalt-paved access road and adjacent gravel covered area southwest of the bridge, a 0.3-acre landscaped and gravel-covered area north of the bridge, and a 0.2-acre landscaped picnic area south of the bridge. Vegetation is solely landscaping or ruderal species. A proposed 5.4-acre linear staging area located within the east side of Beach Park Boulevard from south of Werder Park to south of Destination Park is within the paved right-of-way of Beach Park Boulevard and free of vegetation. These five staging areas consist of Urban Habitat with weedy species and landscaping and no areas that would be considered Non-native Grassland.

An additional staging area would be located in the upland area within the northern and western perimeter levee adjacent to the Sea Cloud Phase II sedimentation basin within the Foster City Dredge Disposal Site. The Foster City Dredge Disposal Site is a 19-acre area located between the Bay Trail/levee and Sea Cloud Park. The proposed staging area would be located within 3.8 acres of uplands making up the area on the north side of the basin and along the levee between the basin and Sea Cloud Park. Biological studies were recently prepared for this area as part of the Biological Assessment for the Dredging at the Lagoon Intake Structure (CIP 301-629) Project (HBG 2016) that evaluated the vegetation within the northern approximately 1.5-acre portion of the 3.8-acre area as a staging area for the for the Lagoon Intake Structure dredging project and approximately 2.3 acres along the western portion of the 3.8-acre area as an alternative upland disposal site for the material dredged as part of the Lagoon Intake Structure dredging project.

The habitat type within the northern approximately 1.5-acre area is a mix of Non-native Grassland and Urban Habitat (ruderal vegetation). Vegetation within this area is sparse, consisting of mostly non-native herbaceous plants and grasses. The paved pedestrian path between the Bay Trail and Sea Cloud Park traverses this area, and a portion of the area is bare ground. Dominant non-native species include sweet fennel, ice plant, rip-gut brome, wild oats, fescue (*Festuca perennis*), foxtail barley, redstem filaree (*Erodium cicutarium*), bull mallow, sweet clover, and scarlet pimpernel (*Anagalis arvensis*), among others. Saltgrass is found along the edge of the Foster City Lagoon at the west end of the proposed staging area. The remaining approximately 2.3 acres along the western levee is Non-native Grassland habitat with vegetation including ice plant, sweet fennel, rip-gut brome, fescue, wild oats, foxtail barley, sweet clover, and bull mallow and other species such as wild radish, bristly ox-tongue, bull thistle, sow thistle, Italian thistle, chicory (*Cichorium intybus*), velvet grass (*Holcus lanatus*), bird's foot trefoil (*Lotus corniculatus*), batis (*Batis maritima*), and plantain (*Plantago* sp.). Scattered coyote brush, a native species, is also present, along with some non-native pampas grass

(*Cortaderia selloana*). Non-native planted trees, including Monterey pine (*Pinus radiata*), eucalyptus (*Eucalyptus* sp.) and Acacia (*Acacia* sp.), line the western edge of the proposed staging area along the border with Sea Cloud Park.

The central basin for the 19-acre Foster City Lagoon Dredge Disposal site is primarily open water during the winter months and is mostly unvegetated during the dry season. Several small islands within the basin are vegetated with species such as ice plant, pickleweed and Italian thistle, and a fringe of wetland vegetation around the perimeter includes pickleweed and alkali heath, as well as ice plant and other species. A portion of the 19-acre Foster City Lagoon Dredge Disposal Site was used as a wetland mitigation site as part of the Foster City Lagoon Dredge Disposal Project in 2004. Mitigation wetlands were created around the edges of the basin as shown in Figure 13 (obtained from the final monitoring report for the Foster City Lagoon Dredge Disposal Project). The successful mitigation wetlands are adjacent to the proposed staging area for the proposed levee improvement project, and consist of palustrine emergent vegetation (1.89 acres dominated by pickleweed, and 0.97 acres dominated by the obligate submerged aquatic plant widgeongrass, *Ruppia maritima*)(HBG 2012). The boundaries of the proposed staging area follow those identified as part of the previous evaluations as an upland disposal site for the Intake Structure dredging project, boundaries that were specifically drawn to avoid all mitigation wetlands created in 2004 as part of the original Foster City Lagoon Dredge Disposal Project.

### 3.2.2 Animal Populations

The wildlife species discussed in this study are based on review of available literature, visits to the Foster City shoreline area by HBG wildlife biologists over many years, and habitat observations made during qualitative surveys conducted by HBG wildlife biologists during October 2015, and January, May and July of 2016, and a variety of environmental reviews conducted by HBG along the Foster City shoreline for development projects over the last decade. A complete listing of the references from which information was compiled on the flora and fauna inhabiting the region is contained in the References section. Table 1 (Attachment 2) provides species lists based on these reconnaissance level observations and literature reviews for reptiles, amphibians, birds and mammals. The table lists wildlife species known to occur in the project area and includes the scientific names of all species mentioned in the text.

The wetland habitats and the disturbed urban habitats onsite support a variety of wildlife species. The complex of habitats includes the San Francisco Bay and the presence of tidal regimes and marshes which can accommodate wildlife adapted to aquatic areas, and upland vegetation including mostly planted trees and shrubs that provide potential nesting and roosting sites for birds, in addition to foraging areas for species of mammals, reptiles, amphibians and birds.

Much of the project area is an urban area with Urban Habitats that support a variety of wildlife adapted to living in disturbed areas. Such areas support a variety of widespread bird species that are adapted to urban areas and disturbed areas and that are known to occur throughout the project area. Bird species that have been observed in the combination of disturbed habitats along the levee and inland locations include Rock Pigeon, Mourning Dove, Eurasian Collared-dove, Black Phoebe, Anna's Hummingbird, American Crow, Common Raven, European Starling, Northern Mockingbird, American Robin, California Towhee, Yellow-rumped Warbler (winter), White-crowned Sparrow, Golden-crowned Sparrow, Song sparrow, Brewer's Blackbird, Red-winged Blackbird, American Goldfinch, House Finch and House Sparrow. Other species include Canada Goose and Killdeer. Raptors such as Red-tailed Hawk, Red-shouldered Hawk, American Kestrel and occasionally Peregrine Falcons can be found in the area. Mammals include those adapted to the urban environments such as Virginia Opossum, Botta's Pocket Gopher, Deer Mouse, House Mouse, Norway Rat, Striped Skunk and Raccoon. Common amphibians such as Pacific Treefrog would be found within the project area along with reptiles such as Common Garter Snake, Gopher Snake and Western Fence Lizard.

The wildlife populations found within all six of the proposed staging areas consist of the common species of birds, mammals, reptiles and amphibians that would commonly be found in Urban Habitats and disturbed sites in Foster City.

The shoreline of San Francisco Bay, particularly along levee segments 2 through 4, supports a variety of shorebirds along the shoreline and rip-rap levee slopes as well as diving ducks and many other species using the bay waters. Expected species just offshore in the bay along the levee here include Double-crested Cormorant, grebes (Horned, Eared, Western and Clark's), loons (Common and Red-throated), and waterfowl (diving ducks such as Bufflehead, Lesser Scaup, Common Goldeneye and Surf Scoter), among others. Some species that are rare to the Bay Area have been seen in the Bay here such as Long-tailed Duck, Tufted Duck, and Harlequin Duck.

Segments 3 and 4 of the levee are particularly good habitat for a variety of shorebirds, with the focus of shorebird habitat being the Foster City Shell Bar area in segment 3. The Foster City Shell Bar is an often visited area by the San Mateo County birding community and by nature enthusiasts from throughout the region, who come to this area to observe the spectacle of wintering shorebirds. Shorebirds usually present in large numbers here in winter include Black-bellied Plover, Long-billed Curlew, Willet, Marbled Godwit, Ruddy and Black Turnstones, Red Knot, Western and Least Sandpipers, Dunlin, both Short-billed and Long-billed Dowitchers, Forster's Tern, Black Skimmer and gulls such as California, Western and Ring-billed. Other birds along the shoreline may include Great Blue Heron, Great and Snowy Egret and Brown Pelican. Spotted Sandpipers can be found anywhere along the shoreline foraging on the toe of the rip-rap slopes on the outboard side of the levee.

The Foster City Shell Bar is one of the most important shorebird habitats in the South Bay. The Shell Bar is probably the most important wintering site for Red Knots in the South Bay, and one of the few spots where they can reliably be seen, with counts of 100 or 200 birds not uncommon during the winter months.

Salt marsh habitats adjacent to segment 1, also adjacent to Werder Park in segment 3, along Belmont Slough in segments 4 through 7 and along O'Neill Slough in segment 8 are important habitats for songbirds such as Black Phoebe, Say's Phoebe, Song Sparrow, Savannah Sparrow and Common Yellowthroat. These salt marsh habitats also serve as foraging habitats for a variety of herons and egrets and shorebirds; and along Belmont and O'Neill Sloughs (the southern extent of segment 4 and segments 5 through 8), provide suitable foraging and nesting habitat for the federally-listed endangered Ridgway's Rail and to a lesser extent the state-listed threatened California Black Rail (see discussion in Section 3.2.4). The mudflats within Belmont Slough at lower tides provides excellent shorebird foraging habitat for species as mentioned along the Bay frontage, but also along the Slough to include others such as American Avocet and Black-necked Stilt. Also using Belmont Slough are a variety of waterfowl, but here the common ducks are dabbling ducks rather than diving ducks, such as Mallard, Northern Shoveler, Northern Pintail, American Wigeon, Green-winged Teal, Cinnamon Teal, Gadwall, and even the uncommon Hooded Merganser. Diving ducks also occur along the slough channels and may include others not commonly found on the bay such as Canvasback.

The sedimentation basin for the Foster City Dredge Disposal Site inland of levee segments 5 and 6 provides excellent winter foraging habitat for a variety of dabbling ducks, all shorebirds mentioned, herons and egrets, as well as gulls and terns, and nesting habitat for species like American Avocet during wet years. Mammals not commonly seen elsewhere along the levee alignment are commonly seen at the Dredge Disposal Site here as well, including California Ground Squirrel and Black-tailed Jackrabbit. California Ground Squirrels are also common along the levee adjacent to Belmont Slough.

### **3.2.3 Jurisdictional Waters**

#### **3.2.3.1 Jurisdictional Waters Delineation- Regulatory Background**

As indicated in Section 4, the U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency (US EPA) jointly regulate Waters of the United States under Section 404 of the Clean Water Act. The USACE also regulates Navigable Waters under Section 10 of the Rivers and Harbors Act. Section 404 of the Federal Clean Water Act (33 U.S.C. 1251, et seq.) authorizes the USACE and US EPA to regulate activities that discharge dredged or fill material to wetlands and other waters of the United States. As described by USACE regulation 33 CFR 322.1, Section 10 of the RHA of 1899 (33 U.S.C. 403) authorizes USACE to regulate certain structures or work in or affecting navigable

waters.

**USACE and US EPA Waters of the United States.** As defined in USACE regulations (Title 33 *Code of Federal Regulations* [CFR] 328.3(a)), the term “waters of the United States” encompasses the following resources:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
  - i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
  - ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
  - iii. Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under the definition;
5. Tributaries of waters identified in above paragraphs (1-4);
6. The territorial seas; and
7. Wetlands adjacent to waters identified in above paragraphs (1-6) except waters that are themselves wetlands.
8. Waters of the United States do not include prior converted cropland.

Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

**Wetlands.** As defined in USACE regulations (33 CFR § 328.3(b)): The term *wetlands* means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. The term “*under normal circumstances*” refers to situations in which the vegetation has not been substantially altered by human activities as defined in Appendix A of the Corps’ 1987 *Wetlands*

*Delineation Manual* (hereinafter *Corps 1987 Manual*). Implicit in the definition is the need for a site to meet certain water, soil, and vegetation criteria to qualify as a jurisdictional wetland. These criteria and the methods used to determine whether they are met are described in the *Corps 1987 Manual*. See Section 2.3.

**Ordinary High Water Mark.** As defined by USACE regulations (33 CFR 328.3(e)): The term *ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

**Limits of Section 404 CWA Jurisdiction.** The following provides the regulatory definitions and criteria followed in determining the geographic extent or limit of potential EPA/USACE jurisdiction. As described at 33 CFR Part 328.4, the geographic limits of relevant federal jurisdiction are defined in the following manner:

**Non-Tidal Waters of the United States.** The limits of jurisdiction in non-tidal waters: (1) In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or (2) when adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands. (3) When the water of the United States consists only of wetlands the jurisdiction extends to the limit of the wetland. (33 CFR 328.4(c)). The term “adjacent” means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are “adjacent wetlands.” (33 CFR 328.3(c))

**Tidal Waters of the United States.** In tidal waters the landward limit subject to Section 404 CWA Jurisdiction extends up to the high tide line. The term “high tide line” (HTL) is defined by USACE regulations (33 CFR 328.3(d)) and means the line of intersection of the land with the waters surface at the maximum height reached by a rising tide. The HTL may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm or other physical markings or characteristics, vegetation lines, tidal gages or other suitable means that delineate the general height reached by a rising tide.

**Navigable Waters.** Navigable waters are defined in 33 CFR 329.4: Navigable waters of the US are those waters subject to the ebb and flow of the tide and/or

are presently used, or have been used in the past, or might be susceptible for use to transport interstate or foreign commerce. Three factors must be examined when making a determination whether a waterbody is a navigable water (33 CFR 329.5): "... (a) past, present, or potential presence of interstate or foreign commerce; (b) physical capabilities for use by commerce..., and (c) defined geographic limits of the waterbody."

**Limits of Section 10 Jurisdiction** . A determination of navigability, once made by the USACE, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events which impeded or destroy navigable capacity. Based on this provision, the USACE also has the discretion to regulate activities in historically navigable waters. Historically navigable waters are areas that were navigable in the past, but are no longer navigable as a result of artificial modifications, such as levees, dikes, and dams. Jurisdictional limits in tidal and non-tidal navigable waters are determined as follows.

**Tidal Navigable Waters.** In tidal waters the USACE jurisdiction in coastal areas extends to the shore reached by the plane of the mean (average) high water. The mean high water must be surveyed with reference to the available datum, preferably averaged over a period of 18.6 years.

**Non-Tidal Navigable Waters.** The geographic limits of relevant federal jurisdiction for a non-tidal navigable water is defined in the following manner: If a river or lake is determined to be "navigable" the regulatory jurisdiction extends laterally to the entire water surface and bed of a navigable lake or river, which includes all the land and waters below the ordinary high water mark. (33 CFR 329.11).

**RWQCB CWA 401 and Porter Cologne Act Waters.** Waters of the State are defined more broadly than "waters of the US" to mean "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code section 13050(e)). Examples include, but are not limited to, rivers, streams, lakes, bays, marshes, mudflats, unvegetated seasonally ponded areas, drainage swales, sloughs, wet meadows, natural ponds, vernal pools, diked baylands, seasonal wetlands, and riparian woodlands. Waters of the State include all waters within the state's boundaries, whether private or public, including waters in both natural and artificial channels. They include all "waters of the United States"; all surface waters that are not "waters of the United States, e.g. non-jurisdictional wetlands; groundwater; and the territorial seas ([http://www.waterboards.ca.gov/academy/courses/wqstandards/materials/water\\_us\\_ca/ca\\_water\\_042508.pdf](http://www.waterboards.ca.gov/academy/courses/wqstandards/materials/water_us_ca/ca_water_042508.pdf))

The state WQCB and its Regional Boards, including the RWQCBs, routinely rely on the

USACE/US EPA jurisdictional determinations as they have no adopted methodology for the identification and delineation of wetlands or other waters of the State. However, as a matter of policy the WQCB/RWQCB consider wetlands and waters determined non-jurisdictional by the USACE/US EPA under *SWANCC or Rapanos guidance to remain jurisdictional as waters of the State subject to WQCB/RWQCB jurisdiction*. Similarly the WQCB/RWQCB typically takes jurisdiction over wetlands and other waters where the USACE/US EPA has determined a wetland or other water of the US is exempted or excluded from jurisdiction or the USACE/US EPA determines that the proposed project activity is exempt from regulation.

### **3.2.3. Jurisdictional Waters Delineation-Methodology**

For purposes of a delineation of waters of the U.S. along the levee alignment, the study area for the delineation was defined as an area extending approximately 25 feet out from the toe of the levee on the outboard side and 100 to 500 feet on the inland side. The area of the defined study area totals approximately 107.7 acres and encompasses the area of the project footprint and immediately adjacent areas where construction worker access or wetland mitigation may be warranted. HBG conducted field studies for a preliminary wetland delineation within this area between December of 2015 and July of 2016.

The focus of HBG's investigation was to identify and map areas meeting the definition of wetlands and other waters of the U.S. in accordance with definitions of jurisdictional waters, the Corps' 1987 *Wetlands Delineation Manual* (1987 Manual), the Corps' 2008 *Regional Supplement to Corps of Engineers Wetland Delineation Manual: Arid West, Version 2.0* (Arid West Regional Supplement), and supporting guidance documents. The 1987 Manual provides technical guidance and procedures, from a national perspective, for identifying and delineation of wetlands that may be subject to Section 404 of the CWA. Pursuant to the 1987 Manual, key criteria for determining the presence of wetlands are: (a) the presence of inundated or saturated soil conditions resulting from permanent or periodic inundation by groundwater or surface water; and (b) a prevalence of vegetation typically adapted for life in saturated soil conditions (i.e., hydrophytic vegetation). Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and vegetation. The Arid West Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region. The combined use of the 1987 Manual and Arid West Regional Supplement enhances the technical accuracy, consistency, and credibility of wetland determinations.

In preparation for HBG's detailed field survey, existing landforms onsite that would likely contain potential waters of the US, including wetlands, were identified by reviewing USGS topographic mapping; high resolution aerial photography sourced from NAIP; NRCS Soils Map of the Study Area; and light detection and ranging (LIDAR) topographic



survey prepared by Schaaf & Wheeler. Field data (e.g. soil, vegetation and hydrology), and location of the HTL were documented using a hand-held Trimble Geo XH Global Positioning System (GPS) unit with sub-meter accuracy after geo-processing. GPS data were incorporated into an HBG database using ESRI ARCGIS software and geo-referenced in overlay fashion onto orthorectified aerial photographs along with the Schaaf & Wheeler LIDAR topographic survey data. Ground truthing and detailed field studies were conducted on several days between December 2015 and July 2016. The HBG evaluation included the following elements:

- (1) Determine the presence or absence of vegetation, hydric soil, and hydrology indicators of wetland conditions as defined by the Corps methodology;
- (2) Determine if field indicators of wetland conditions may be “significantly disturbed” or “naturally problematic;”
- (3) Within any drainage or depressional area found, determine if indicators of an ordinary high water mark (OHWM) are present and document the location(s) of the OHWM;
- (4) Determine the extent and location of the HTL;
- (5) Determine the extent and location of the MHW<sup>1</sup>; and
- (6) Determine the extent and location of “Non-Tidal Historic Navigable Waters of U.S.”

Eighteen (18) soil pits were excavated within representative landform areas. Soil pit locations were selected based on site topography and landscape and drainage features. The pits were dug by shovel to a depth of at least 12 inches where permissible. Vegetation and hydrologic conditions were observed within 5-foot by 5-foot sampling plots surrounding the pits. Soil, vegetation, and hydrology observations were recorded on Wetland Determination Data Forms-Arid West Region, Version 2.0.

A rainfall (“WETS”) analysis was conducted for the Study Area to determine if hydrology conditions were normal for non-tidal areas. The rainfall analysis followed the “Technical Standard for Water-Table Monitoring of Potential Wetland Sites” (USACE 2005), by which normal, below normal, and above normal rainfall conditions can be determined on a monthly basis for any given year of record. The purpose of the WETS analysis was to aid in: (1) determining if the climatic/hydrologic conditions observed on the site are typical for the time of year field investigations were conducted (e.g. rainy season versus dry season); and (2) establishing whether observations made of surface and near

---

1 Tidal data at San Mateo Bridge, West Side, Station ID: 9414458, was used to calculate MHW.

surface hydrology indicators or the lack thereof is the result of naturally problematic hydrology conditions (e.g., drought year, extreme precipitation/stormwater runoff event) preceding the field investigations.

The HTL was typically located up to the extent of the tidal wetlands, where wetlands were present. Along areas where wetlands were not present the HTL was determined by the observation of a more or less continuous deposit of debris and other physical markings such as water staining along the rip-rap. Point locations were documented in several locations using a hand-held Trimble GPS unit with sub-meter accuracy after geo-processing. GPS data were incorporated into an HBG database using ESRI ARCGIS software and geo-referenced in overlay fashion onto orthorectified aerial photographs along with the Schaaf & Wheeler topographic survey data. The HTL GPS point locations were then tied to a topographic elevation and mapped along the shoreline (e.g. connecting the GPS points).

The Schaaf & Wheeler topographic survey data provided topographic contour lines at 1.0-foot intervals. The MHW within the Study Area extended up to 6.22-feet NAVD88. Based on the accuracy of the topographic survey HBG mapped MHW at approximately the 6-foot contour line along the shoreline. In areas that extended out into the marsh the MHW was mapped at the edge of open slough channels. In general, the edge of the open water slough channels followed the 6-foot contour line, sometimes extending further depending on aerial interpretation of the edge of the open slough channel.

The extent and location of “Non-Tidal Historic Navigable Waters of U.S.” was determined by overlaying historic topographic surveys of the San Francisco Bay<sup>2</sup> onto current aerials of the Study Area. All non-tidal areas that have not been improved and are at or below MHW where mapped as “*Non-Tidal Historical Navigable Waters of the U.S.*”.

### **3.2.3.3 Jurisdiction Waters Delineation-Results**

The defined Study Area for delineation encompasses an area of approximately 107.7 acres. Within the Study Area a total of 17.01 acres was determined to satisfy criteria as either wetlands or waters of the U.S. Wetlands and waters of the U.S. are found within the project site as identified in the maps in Figure 14 (Sheets 1 to 27). Four types of areas determined to be under USACE jurisdiction were determined to be present in the project area according the Cowardin (1979) criteria. These areas include (i) Palustrine Emergent Wetland, (ii) Estuarine Intertidal Emergent Wetland, (iii) Estuarine Intertidal Unconsolidated Shore, and (iv) Estuarine Intertidal Artificial Rocky Shore. Some areas within these four categories are determined to be subject to Section 404 jurisdiction

---

<sup>2</sup> Source of the historic survey maps are from Treasury Department U.S. Coast and Geodetic Survey from December 20, 1897 to February 8, 1898. Register No. 2310.

under the CWA and others are subject to Section 10 jurisdiction under the RHA, as shown in Table 6.

<b>Table 4. Wetlands and Waters of the U.S. Potentially Subject to USACE Jurisdiction Under Section 404 of the CWA and Section 10 of the RHA.</b>		
<b>Wetland/Water Type (Cowardin 1979)</b>	<b>Regulatory Jurisdiction</b>	<b>Area (acres)</b>
Palustrine Emergent Wetland	Section 404 CWA <sup>3</sup>	8.28
Estuarine Intertidal Emergent Wetland	Section 404 CWA	4.99
Estuarine Intertidal Emergent Wetland	Section 404 CWA and Section 10 RHA	0.05
Estuarine Intertidal Unconsolidated Shore	Section 404 CWA	0.16
Estuarine Intertidal Unconsolidated Shore	Section 404 CWA and Section 10 RHA	0.72
Estuarine Intertidal Artificial Rocky Shore	Section 404 CWA	1.67
Estuarine Intertidal Artificial Rocky Shore	CWA Section 404 and RHA Section 10	1.14
<b>Total</b>		<b>17.01</b>

Based on current topography and historic survey maps, the Study Area does not support areas that would be considered “Non-Tidal Historical Navigable Waters of the U.S.

Aquatic resources within the Study Area and adjacent to the Study Area were examined with respect to the *Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) exclusion from Clean Water Act regulation. No areas were found that could either potentially be exempted or excluded from regulation in accordance with SWANCC. HBG has also reviewed the wetlands with respect to the *Rapanos v. United States* and *Carabell v. United States* 547 U.S. 715 (2006) and found the areas in question to be jurisdictional pursuant to the USACE criteria.

<sup>3</sup> Approximately 0.12 acres of the Palustrine Emergent Wetlands may be considered “Non-Tidal Historical navigable Waters” and subject to Section 10 RHA jurisdiction.

### 3.2.4 Special Status Species

Sensitive species include those species listed by the federal and state governments as endangered, threatened, or rare or candidate species for these lists. Endangered or threatened species are protected by the federal Endangered Species Act of 1973 as amended, the California Native Plant Protection Act of 1977, and the California Endangered Species Act of 1970. The California Environmental Quality Act (CEQA) provides additional protection for unlisted species that meet the “rare” or “endangered” criteria defined in Title 14, California Code of Regulations, Section 15380.

The CDFW maintains records for the distribution and known occurrences of sensitive species and habitats in the California Natural Diversity Database (CNDDDB). The CNDDDB is organized into map areas based on 7.5 minute topographic maps produced by the U.S. Geological Survey (USGS). All known occurrences of sensitive species and important natural communities are mapped onto the quadrangle map. The database gives further detailed information on each occurrence, including specific location of the individual, population, or habitat (if possible) and the presumed current state of the population or habitat. The project site is located on the San Mateo 7.5-minute quadrangle; the relevant adjacent quads within a nine-quad search area San Francisco South, Hunters Point, San Leandro, Montara Mountain, Redwood Point, Half Moon Bay, Woodside and Palo Alto quadrangles.

A search of the CNDDDB records of occurrence for special status animals, fish and plants and natural communities within these quadrangles indicated that none of the special status species or natural communities is known to occur on the project site itself. However, even the absence of a special animal, plant, or natural community from the report does not necessarily mean they are absent from the area in question, but only that no occurrence data have been entered for that species or natural community in the CNDDDB inventory. The occurrence of special status plant and animal species in the vicinity of the project area may be an indication that they also could occur in the project area. Therefore, occurrences of special status species throughout the quadrangles mentioned above were noted in considering the potential presence of these species on the project site.

The U.S. Fish and Wildlife Service was consulted for their list of species listed as endangered or threatened under the Endangered Species Act within San Mateo County, and this list is included in Attachment 3. In addition, a list of special status plant species found within San Mateo County was obtained from the California Native Plant Society (CNPS), and this list is also included in Attachment 3.

An evaluation of all special status plant species reported in the vicinity of the project site is presented in Table 2 (Attachment 2). Table 3 (Attachment 2) presents an evaluation of special status animal species that have been reported in the project vicinity.

### **3.2.4.1 Special Status Plant Species**

Special status plant species include: (i) species that are listed or proposed for listing as threatened or endangered under the federal Endangered Species Act; (ii) species that are listed, or proposed for listing by the state of California as threatened or endangered under the California Endangered Species Act; (iii) plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered in California and elsewhere; and (iv) plant species that meet the definition of rare or endangered under CEQA.

A target list of special status plants found within 10 miles of the site is shown in Table 2 (Attachment 2), that includes all species mentioned in the CNDDDB occurring within 10 miles of the project site and additional species mentioned in the CNPS inventory search (see Attachment 3). The property does not represent high quality habitat for special status plants. All of the plant species mentioned in Table 2 require habitat conditions that are not found at the site. No special status plant species were observed at the property during floristic surveys conducted at the site, and none of the species included in Table 2 are expected to occur in the project area.

Most of the special status species of plants found in this part of San Mateo County are species adapted to serpentine soils. These soils occur in areas near I-280 such as Pulgas Ridge near Hillsborough, the area around Crystal Springs Reservoir, and Edgewood County Park. Serpentine soils do not occur anywhere near the project site, and none of these species would be found in the project area. The serpentine-adapted species (see Table 3) include fragrant fritillary (*Fritillaria liliacea*), Hillsborough chocolate lily (*Fritillaria biflora ineziana*), Marin western flax (*Hesperolinon congestum*), San Mateo thorn mint (*Acanthomintha duttonii*), fountain thistle (*Cirsium fontinale fontinale*), Franciscan onion (*Allium peninsulare franciscanum*), San Mateo woolly sunflower (*Eriophyllum latilobum*), Crystal Springs lessingia (*Lessingia arachnoidea*), and white-rayed pentachaeta (*Pentachaeta bellidiflora*).

Though not found on serpentine soils, the following species are adapted to other soil types not found in the project area: Congdon's tarplant (*Centromedia parryi congodonii*), San Francisco spineflower (*Chorizanthe cuspidata cuspidata*), and San Francisco campion (*Silene verecunda verecunda*). Habitat conditions are not suitable to support western leatherwood (*Dirca occidentalis*), slender-leaved pondweed (*Potamogeton filiformis*), and Santa Cruz manzanita (*Arctostaphylos andersonii*). One species, lost thistle (*Cirsium praeteriens*), is thought to be extinct. Habitat conditions in the project area are potentially suitable for only one special status species, Point Reyes bird's beak (*Cordylanthus maritimus palustris*), but this species is known only from collections made approximately 100 years ago at the mouth of Redwood Creek and Belmont Slough.

#### **3.4.4.2 Special Status Animal Species**

The special status animal species evaluated in Table 3 (Attachment 2) include those noted in the CNDDDB as occurring within 10 miles of the site, the federally-listed species from San Mateo County highlighted by the USFWS in their list in Attachment 3 (several pelagic species mentioned by USFWS that would only occur in the ocean are not included in Table 3), and those that are known to occur in the general vicinity based on the knowledge of HBG biologists. Key federally- and state-listed species that are either known to occur in the vicinity of the property or with a potential to occur at the site, or that require specific study to determine presence/absence, are discussed below.

In addition to the state and federally-listed species noted below, Burrowing Owl (*Athene cunicularia*) has also been known to occur along the Foster City shoreline. Burrowing Owl is not a listed species but is a state-designated species of special concern and a USFWS-designated Bird Species of Conservation Concern. The last known breeding site for Burrowing Owl in San Mateo County was along the Bay Trail to the west of the Mariner's Island Golf Center in the area between levee segments 1 and 2, but the species has been extirpated from that site.

#### **Salt Marsh Harvest Mouse**

The salt marsh harvest mouse (*Reithrodontomys raviventris*) is designated as an endangered species under the federal ESA (see 16 USC §§ 1531 et seq.) and the state California Endangered Species Act (CESA) (See § 2081 Cal Fish & Game Code). The USFWS has not designated critical habitat for the salt marsh harvest mouse. The ESA prohibits the "take" of such species, unless the taking occurs incidental to an otherwise lawful activity and the USFWS has issued an incidental take statement or permit. The salt marsh harvest mouse is also designated as a fully protected mammal under California law (Fish & Game Code, § 4700) which prohibits even the incidental take of such species, unless the "take" has been permitted by the CDFG for purposes of scientific research.

**Life History.** The salt marsh harvest mouse is generally restricted to saline or subsaline marsh habitats around the San Francisco Bay estuary though it is found in mixed saline/brackish areas in the Suisun Bay area. The basic habitat of the salt marsh harvest mouse is *Salicornia*-dominated vegetation (Dixon 1908; Fidler 1965). Other highly important habitat considerations include high tide/flood refugia (both at the upper edge of the marsh and within mature marshes as areas of emergent gum plant, *Grindelia* sp., even at the highest high tides), seasonal use of terrestrial grassland, exploitation of suboptimal habitats, and habitat selection in brackish marsh vegetation where *Salicornia* is a relatively minor component, as often is the case in Suisun Bay marshes. Though *Salicornia* stands remain important, taller vegetation such as gum plant, or debris are also important for the survival of the species as it provides refugia to the animals during high tide events (Hulst 2000; Bias and Morrison 1993; Shellhammer *et al.*

1988; Johnson and Shellhammer 1988; Rice 1974; Fisler 1965). Overall, though height of the canopy of surrounding vegetation is important to ensuring the survival of a given population, abundance of the species may also depend on the degree of canopy submergence. Salt marsh harvest mice feed on seeds, grasses, forbs, and insects. Salt marsh harvest mice are typically nocturnal, but they may sometimes be active during the day as well (Daiber 1982). They are most active during the moonlit nights. Salt marsh harvest mice quickly re-colonize flood-disturbed areas (Pomeroy and Wiegert 1981).

The destruction of more than 85 percent of the historical tidal marshes in the Bay Area has been cited as the primary cause of salt marsh harvest mouse population declines. Salt marsh harvest mouse populations have been adversely affected by loss of tidal marsh bordering the San Francisco Bay, which has been reduced from 193,800 acres in 1850 to about 30,100 acres by the early 1990s (Dedrick 1993).

The young salt marsh harvest mice have long-distance dispersal abilities. However, dispersal typically does not occur on bare soils or human-developed adjacent areas (these areas constitute a dispersal filter for mice). A narrow buffer zone of vegetation is likely needed for dispersal between adjacent preferable habitats, if they are otherwise isolated from each other (USFWS 1984). Salt marsh harvest mice generally reproduce from March through November for the northern subspecies, and May through November for the southern subspecies (Fisler 1965). Due to this extended period of sexual activity reproduction does not appear to be a limiting factor for the species.

Salt marsh harvest mice are dependent on thick cover of native halophytes in salt marsh environments, typified by salt marsh herbs, grasses, and reeds. Marshlands with low salinities and sparse pickleweed are not utilized by the salt marsh harvest mouse (Suisun Eco Workgroup, 2004). Salt marsh harvest mice use pickleweed as their primary/preferred habitat as long as they have non-submerged, salt-tolerant vegetation for escape during the highest tides (Fisler 1965). The mice prefer the deepest (60-75 cm tall), most dense pickleweed, which is intermixed with salt brush (*Atriplex triangularis*, *A. lentiformis*) and alkali heath. The upper zones of marshes, usually in the stands of fat hen and saltgrass represent refuge from high tides. Throughout much of its range, subsidence and diking have eliminated the important peripheral halophyte zone. Few salt marsh harvest mice survive in such marshes, even though other marsh conditions may be optimal, because there is little or no high tide escape.

**Occurrence in the Project Area.** Although the CNDDDB contains no San Mateo County reports of salt marsh harvest mouse anywhere north of the San Mateo Bridge, there are some records of the species south of the Bridge in Foster City. The nearest known reported occurrence of salt marsh harvest mouse to the project area is located within Foster City in a tidal marsh adjacent to Highway 101 within O'Neill Slough. O'Neill

Slough flows toward the bay and becomes Belmont Slough. This location is adjacent to the western end of segment 8. Salt marsh harvest mouse was collected from this site in 1960, and there have been no documentation of the species at this location since that time. The next nearest populations of salt marsh harvest mouse in the project area are within tidal marshes on Bair Island between Steinberger Slough and Redwood Creek, locations that are about two miles from the nearest location along the Foster City levee. These locations include portions of Bair Island, and encompass not only portions of Steinberger Slough and Corkscrew Slough, but extensive areas along Redwood Creek extending south to Smith Slough. The salt marsh harvest mouse recovery plan (USFWS, 1984) identifies tidal marshes surrounding Bair Island as habitat essential to the species' recovery.

The salt marsh habitat outboard of the levee within Belmont Slough in segments 4 (south of Destination Park), 5, 6 and 7 and within O'Neill Slough in segment 8 would be considered potentially suitable habitat for salt marsh harvest mouse. It is possible that salt marsh harvest mouse could occur within the salt marsh habitats anywhere along these levee segments.

#### **Ridgway's Rail (formerly California Clapper Rail)**

Ridgway's Rail (*Rallus obsoletus obsoletus*) has been listed by the USFWS and CDFW as an endangered species since 1970 (35 Fed. Reg. 16048 (1970)). The USFWS has not designated critical habitat for the Ridgway's Rail. Ridgway's Rail is also listed as endangered by the CDFW and, like the salt marsh harvest mouse, is a fully protected species under California law (Cal. Fish & Game Code § 3511).

Until recently, Ridgway's Rail in the San Francisco Bay area was referred to as the California Clapper Rail (formerly *Rallus longirostris obsoletus*), one of three endangered subspecies of the more widespread Clapper Rail (formerly *Rallus longirostris*). Based on DNA research and other factors, these three listed former subspecies of *Rallus longirostris* are now considered to be con-specific and considered to be subspecies of *Rallus obsoletus*, which is given the English name Ridgway's Rail. The three resident subspecies of Ridgway's Rail (*Rallus obsoletus*) are *yumanensis* (in the lower Colorado River area), *levipes* (in coastal southern California), and *obsoletus* (in coastal marshes of the San Francisco Bay Area). All three subspecies of Ridgway's Rail remain on the federal endangered species list. Ridgway's Rail is now considered a distinct species from the more common Clapper Rail (*Rallus crepitans*) from salt marshes on the east coast of the U.S.

**Life History.** Ridgway's Rails are typically found in the intertidal zone and sloughs of salt and brackish marshes dominated by pickleweed, Pacific cordgrass, gum plant, saltgrass, jaumea, and adjacent upland refugia. They may also occupy habitats with other vegetative components, which include, but are not limited to, bulrush (*Bolboschoenus*



*americanus* and *B. maritimus*), cattails (*Typha* spp.) and Baltic rush (*Juncus balticus*). Ridgway's Rail typically feeds on benthic invertebrates, but its diet is wide ranging, and includes seeds, and occasionally small mammals such as the salt marsh harvest mouse (USFWS 2009).

Evens and Page (1983) concluded from research in a North Bay marsh that the Ridgway's Rail breeding season, including pair bonding and nest construction, may begin as early as February. Field observations in south Bay marshes suggest that pair formation also occurs in February in some areas. The male and female birds share incubation and rearing of the 4 to 14 eggs. The end of the breeding season is typically defined as the end of August, which corresponds with the time when eggs laid during re-nesting attempts have hatched and the young rails are mobile. Ridgway's Rails build their nests near tidal sloughs using cordgrass and pickleweed.

Throughout the San Francisco Bay, artificially high local populations of native predators, especially raccoons, skunks and ravens known to prey on various life stages of the clapper rail may occur due to the presence of landfills and other sources of human food waste adjacent to marshes. Feral cats represent a predation threat on Ridgway's Rail near residential areas and landfills (Albertson 1995). Non-native Norway rats long have been known to be effective predators of Ridgway's Rail nests (DeGroot 1927, Harvey 1988, Foerster *et. al.* 1990). According to Harvey (1988) and Foerster *et al.* (1990) predators such as rats accounted for Ridgway's Rail nest losses of 24 to 29 percent in some South Bay marshes. Placement of shoreline riprap, levees, buildings, and landfills favor rat populations, which results in greater predation pressure on Ridgway's Rail in certain marshes. Encroaching development displaces lower order predators from their natural habitat and decreases higher order predators, such as coyotes, which would normally limit population levels of lower order native and non-native predators, especially red foxes (Albertson 1995). Hunting intensity and efficiency by many predators on Ridgway's Rail is increased by the presence of electric power transmission lines, which cross tidal marshes and provide pathways and hunting perches where they would not be otherwise found (USFWS 2009).

Ridgway's Rail was listed as endangered primarily as a result of habitat loss. The effects of mercury accumulation in eggs as well as the artificially high populations of native predators and proliferation of non-native predators as feral cats and red foxes have also been significant factors that have contributed to the more recent population reduction, which has occurred since the mid-1980s (USFWS 2009). Although Gill (1979) may have overestimated the total Ridgway's Rail population in the mid-1970s at 4,200 to 6,000 birds, surveys conducted by the CDFG and the Service estimated that the Ridgway's Rail population approximated 1,500 birds in the mid-1980s (Harvey 1988). In 1988, the total rail population was estimated to be 700 individuals, with 400-500 rails in the south Bay (Foerster 1989). The total rail population reached an estimated all-time historical low of

about 500 birds in 1991, with about 300 rails in the south Bay. In response to predator management, the south Bay rail population rebounded from this lowest population estimate to an estimated 650 to 700 individuals in 1997-1998. Subsequently, the South Bay population declined again the following year to about 500 individuals and remained at that level through early 2002, and declined again in 2002-2003 to an estimated 400 to 500 individuals, which represented the lowest estimated population level in this area since the late 1980s and early 1990s. The South Bay population increased slightly in 2004 to an estimated 500 individuals.

Breeding season surveys of South Bay marshes for Ridgway's Rail through the early 1990s, summarized by Foin et al. (1997), indicated that the most substantial populations of Ridgway's Rail in the South Bay were in the largest sections of tidal salt marsh, including the Mowry and Dumbarton Marshes in the East Bay between the Dumbarton Bridge and Mowry Slough, the Faber and Laumeister Tracts and other marshes in the Palo Alto/East Palo Alto area, and at Greco Island in Redwood City.

Ridgway's Rails vary in their sensitivity to human disturbance (USFWS 2009). Certain types of disturbances have occurred within or adjacent to some marsh areas for a long period of time with Ridgway's Rails acclimating to these disturbances, while others appear to habituate only after significant periods of time or not at all. Ridgway's Rails at the Palo Alto Baylands are tolerant of pedestrian traffic on the public boardwalk and rail nests have been documented within 10 feet of trails in Elsie Romer and Cogswell Marshes in Alameda County and within 65 feet of a busy street near White Slough in Solano County. Albertson (1995) however, documented a Ridgway's Rail abandoning its territory in Laumeister Tract shortly after a PG&E repair crew worked on a nearby transmission tower.

**Occurrence in the Project Area.** Based on information contained in the CNDDDB, Ridgway's Rail is known to occur within the salt marshes along Belmont Slough. Specific CNDDDB records report Ridgway's Rail breeding populations at Belmont Slough as recently as 1975. Additional reports of Ridgway's Rail are known from northwest of the Mariner's Island Golf Center and beyond the project area near the mouth of Seal Slough. The CNDDDB reports 10 adults observed there in December of 2003 and up to 4 adults observed between January and March of 2006.

Areas of potentially suitable nesting and foraging habitat for Ridgway's Rail were assessed in the field on November 16, 2015 by HBG wildlife biologist Gary Deghi and Ridgway's Rail species expert Jules Evens of Avocet Research Associates. Nesting habitats were identified if certain criteria were met including an abundance of cordgrass (*Spartina foliosa*), presence of higher channel densities including second and third order systems, and a combination of low marsh vegetation with high marsh and presence of gum plant (*Grindelia* sp.).

Pickleweed and cordgrass vegetation occurs within the portion of the Project Site outboard of the levee within Belmont Slough and O'Neill Slough. As shown in Figure 15, nesting and foraging habitats occur along these slough channels. Nesting habitat for Ridgway's Rail can be found in the salt marsh habitats immediately adjacent to the levee in segments 5 (southern portion), 6, and 7 along Belmont Slough (see Figure 15c), and adjacent to the levee in segment 8 (western portion) along O'Neill Slough (Figure 15d). Other areas of pickleweed provide suitable foraging habitats for Ridgway's Rail, and such habitats can be found adjacent to the levee in segment 1 (Figure 15a) and also along Belmont Slough in the eastern portion of segment 8 (Figure 15d), where the marsh within the muted tidal channel lacks complexity in terms of vegetation and presence of small channels to provide suitable nesting areas. Suitable foraging habitat is also found adjacent to segment 4 (southern portion) and 5 (northern portion)(Figure 15b and 15c), and is also found in tidal areas toward the bay east of Destination Park in segment 4 (Figure 15c).

The U.S. Fish and Wildlife Service considers construction activity taking place within 700 feet of an active Ridgway's Rail nest as an impact due to potential nesting disturbance. Therefore, Figure 15 shows a 700 foot buffer zone around all areas of salt marsh determined to be suitable nesting habitat for Ridgway's Rail. Nesting habitat for Ridgway's Rail occurs in segments 5 (southern portion), 6, 7 and 8 (western portion), and the figures show that the 700 foot setback area encompasses all portions of the levee from Destination Park in segment 4 to O'Neill Slough in segment 8. For further information regarding the implications of this constraint, see discussion of Impacts and Mitigation Measures in Section 5.0.

### **California Black Rail**

The California Black Rail (*Laterallus jamaicensis coturniculus*) is a state-listed threatened species and a California Fully Protected Species. The California Black Rail is also a federal Bird Species of Conservation Concern.

**Life History.** The California Black Rail most commonly occurs in tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrush in association with pickleweed. In freshwater marsh, they are usually found in bulrush, cattails, and saltgrass. These rails typically occur in the high wetland zones near the upper limit of tidal influence. In California, the species occurs at San Francisco Bay, the Sacramento-San Joaquin Delta, Morro Bay, the Salton Sea, and the lower Colorado River. Loss of upper marsh zone around San Francisco Bay has reduced numbers considerably.

**Occurrence in the Project Area.** The CNDDDB reports occurrences of California Black Rail in Belmont Slough and O'Neill Sloughs. Nesting and foraging habitats for California Black Rail are generally consistent with areas that provide suitable nesting and foraging areas

for Ridgway's Rail. Thus suitable nesting habitat for California Black Rail occurs in the salt marsh habitats adjacent to the levee in segments 5 (southern portion), 6, and 7 along Belmont Slough (as shown in Figures 15c and 15d), and adjacent to the levee in the western half of segment 8 along O'Neill Slough (Figure 15d). Areas suitable for foraging by Ridgway's Rail in segments 1 (Figure 15a), 4 and 5 (Figure 15c), and the eastern portion of segment 8 (Figure 15d) are also suitable as foraging areas by California Black Rail. In addition, the palustrine emergent marsh area inboard of the levee along segment 2 (Figure 15a), especially higher complexity habitat in the vicinity of the pedestrian bridge over the marsh, can provide suitable winter foraging area for California Black Rail.

### **Western Snowy Plover**

The Western Snowy Plover (*Charadrius alexandrinus nivosus*) was federally-listed as threatened in 1993. Critical habitat was designated in 2005 along the coasts of California, Oregon and Washington. A recovery plan was finalized in September of 2007 and a revised critical habitat designation was finalized on June 19, 2012. The nearest designated critical habitats to the project site are in the Ravenswood area of San Mateo County south of Highway 84 and the Dumbarton Bridge, Half Moon Bay State Beach, and the Eden Landing area in Alameda County at the east end of the San Mateo Bridge. The western snowy plover is a California species of special concern.

**Life History.** The Western Snowy Plover is a small bird that lives in sandy coastal beaches, salt pans, coastal dredged spoils sites, dry salt ponds, salt pond levees and gravel bars. Nests typically occur in flat, open areas with sandy or saline substrates and sparse vegetation. The Pacific Coast Snowy Plover population ranges along the coasts of Washington, Oregon, California and Mexico, with the largest number of breeding birds occurring south of San Francisco Bay to southern Baja California. While some snowy plovers remain in their coastal breeding areas year-round, others migrate south or north for the winter. Most plovers that nest inland migrate to the coast.

The Snowy Plover nesting season extends from March to September. Breeding takes place primarily on coastal beaches from southern Washington to southern Baja California, beginning earlier in more southerly latitudes. A typical clutch contains three eggs, but two to six eggs are not unusual. Snowy Plover chicks leave the nest within hours to look for food, but are not able to fly for about four weeks. Fledging of late-season broods may extend into the third week of September. The average lifespan is about three years. Snowy Plovers feed primarily on invertebrates found in wet sand and kelp washed up on the shore.

The Western Snowy Plover is present in California in fall and winter, common on sandy marine and estuarine shores, uncommon at salt ponds and areas at the Salton Sea. The species nests locally in these habitats from April through August, but the major nesting

habitat now appears to be on salt pond levees, especially in San Francisco Bay. Inland nesting areas occur at the Salton Sea, Mono Lake, and at isolated sites on the shores of alkali lakes in northeastern California, the Central Valley, and southeastern deserts. Threats to the species include loss of nesting habitat and habitat degradation caused by expanding beach-front development, recreation and sea-level rise. Other threats include human disturbance, off-leash dogs, encroachment of European beach grass on nesting grounds, pesticides, and predation.

**Occurrence in the Project Area.** The CNDDDB shows that the Western Snowy Plover has occurred within salt evaporation ponds in the vicinity of Belmont Slough. Adult birds were noted in 1972 and 1978 and nesting was documented in 1975 and 1976. Western Snowy Plover has also been known to occur at Bair Island where they occurred in salt evaporation ponds on Middle Bair Island and at Outer Bair Island. It was not ascertained whether Western Snowy Plovers observed here were nesting.

There are currently no salt ponds (suitable nesting habitat for Western Snowy Plover) anywhere along the levee in Belmont Slough. Appropriate nesting habitat is not present anywhere in the project vicinity. Occasional foraging by the species within the Foster City Lagoon Dredge Disposal Site may be possible when this area is not completely inundated. Foraging by the species is also possible in the areas free of marsh vegetation west of the Golf Center and outboard of the levee in segment 1.

### **California Least Tern**

The California Least Tern (*Sternula antillarum browni*) is a federally-listed endangered species that was placed on the endangered species list on October 13, 1970. The species is also listed as endangered by the State of California and is a California Fully Protected Species. No critical habitat has been designated for the species. A Revised California Least Tern Recovery Plan was released September 27, 1985, but the plan is now considered out of date.

**Life History.** The population of California Least Tern increased from approximately 600 pairs in 1973 to approximately 7,100 pairs by 2005. In addition, the number of California Least Tern sites has nearly doubled since the time of listing. The California Least Tern is a tern with gray upperparts and white underparts, a short forked tail and orange bill and legs. Individuals have a distinctive black cap, with stripes running from the cap across the eyes to the beak, and white forehead. Least Tern is the smallest of the North American terns. California Least Terns eat mainly small fishes, but also shrimp and other invertebrates.

Most California Least Terns begin breeding in their third year. Mating begins in April or May. Males perform elaborate aerial displays after which they offer fish to the female. Nesting starts shortly after this in colonies on relatively open beaches kept free of

vegetation by natural scouring from tidal action. Colonies typically consist of approximately 25 pairs. The nest is a simple scrape in the sand or shell fragments. Typical clutch size is two eggs. Both parents incubate and care for the young. California Least Tern predators include larger birds, mammals such as raccoons and foxes, and domestic dogs and cats.

**Occurrence in the Project Area.** No nesting habitats occur within any areas in the vicinity of the Foster City levee. Roosting by this species during the nesting season and especially during post-breeding dispersal has been noted occasionally at the Foster City Shell Bar adjacent to segment 3.

#### **3.4.4.3 Special Status Fish Species**

##### **Steelhead Trout - Central California Coast DPS**

The Central California coast steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) were listed as threatened under the ESA in August 1997 (62 Fed Reg. 43937). Critical habitat for Central California Coast steelhead was designated in February 2000 (65 Fed Reg. 7764) but later withdrawn and reviewed and critical habitat was re-designated in 2005 (see 70 Fed. Reg. 52488 and 52630, 2005) and 71 Fed. Reg. 833-862, 2006). Critical habitat includes all of San Francisco Bay.

**Life History.** The NMFS has defined the Central California Coast steelhead ESU to include all naturally spawned populations of steelhead in coastal streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers; and tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (commonly referred to as a Red Top Creek), exclusive of the Sacramento-San Joaquin River Basin of the California Central Valley. In addition, the Central California Coast steelhead ESU includes those steelhead reared at the Don Clausen Fish Hatchery, and Kingfisher Flat Hatchery/Scott Creek (Monterey Bay Salmon and Trout Project) steelhead hatchery programs.

Central California coast steelhead has life history characteristics and habitat requirements that are similar to those of the Central Valley steelhead. However, the Central California Coast steelhead migrate shorter distances and spawn in smaller rainfall-fed streams rather than the larger snowmelt-fed streams occupied by the Central Valley steelhead. Outmigrants (smolts) may utilize tidal marshes, non-tidal marshes, and other shallow water habitat in San Francisco, San Pablo, and Suisun Bays as rearing areas for short periods of time before emigrating to the sea. NMFS has indicated that steelhead are most likely to be present within the waters of the Bay in the general project vicinity from the beginning of December through the end of May, and steelhead migrating through San Francisco Bay typically occur in the upper 10-15 feet of the water column where they are susceptible to effects from turbidity/suspended sediment.

In the mid-1960s, 94,000 adult steelhead were estimated to spawn in central California rivers, including 50,000 fish in the Russian River and 19,000 fish in the San Lorenzo River (CDFG 1965). Recent estimates indicate an abundance of about 7,000 fish in the Russian River (including hatchery-produced fish) and about 500 fish in the San Lorenzo River. Central Coast steelhead in most tributaries to the San Francisco and San Pablo bays have been virtually extirpated (McEwan and Jackson 1996). Small steelhead runs of unknown size are known to exist in many creeks tributary to San Francisco Bay (Leidy 2000).

The nearest area where this species is known to spawn is San Mateo Creek, the mouth of which is approximately one mile northwest of levee segment 1. According to NMFS, steelhead trout may use marinas, creeks, and sloughs on the bayshore for resting or foraging during migration, and these areas may include the Bay in the vicinity of Foster City.

A number of factors have combined to cause the decline of steelhead populations including fragmentation and reduction of habitat complexity from forestry, agricultural, mining, and urbanization activities that have resulted in the loss, degradation, simplification and fragmentation of habitat (NMFS 2006). Further, various water Projects (storage, withdrawal, conveyance, and diversions) for agriculture, flood control, domestic, and hydropower purposes (especially in the Columbia River and Sacramento-San Joaquin River Basins) have greatly reduced or eliminated historically accessible habitat. Modification of natural flow regimes have resulted in increased water temperatures, changes in fish community structures, depleted flow necessary for migration, spawning, rearing, flushing of sediments from spawning gravels, reduced gravel recruitment and the transport of large woody debris. Dams and other control structures have also increased mortality of adult and juvenile steelhead.

Land use activities associated with logging, road construction, urban development, mining, agriculture, ranching, and recreation have significantly altered steelhead habitat quantity and quality. Associated impacts of these activities include: alteration of streambank and channel morphology; alteration of ambient stream water temperatures; degradation of water quality; elimination of spawning and rearing habitats; fragmentation of available habitats; elimination of downstream recruitment of spawning gravels and large woody debris; removal of riparian vegetation resulting in increased stream bank erosion; and increased sedimentation input into spawning and rearing areas resulting in the loss of channel complexity, pool habitat, suitable gravel substrate, and large woody debris.

In many western states, about 80 to 90 percent of the historic riparian habitat has been eliminated. Wetland and estuarine habitats have been reduced by over 90 percent in California (Dahl 1990; Jensen et al 1990; Barbour et al 1991). The condition of the

remaining wetland habitats for West Coast steelhead is largely degraded, with many wetland areas at continued risk of loss or further degradation.

Steelhead have also been overharvested through commercial and recreational fisheries, either directly or through interception and by-catch or through recreational and tribal fisheries. More than thirty Native American tribes have guaranteed rights to fish for steelhead under treaties with the U.S. Government. These tribal fisheries serve ceremonial and subsistence and commercial purposes.

Recreational fishing for hatchery-origin steelhead is extremely popular along the West Coast. These fisheries, by law, may only catch and retain visibly marked hatchery-origin fish; however, as much as 50 percent of all fish in a given run can be intercepted and mortality rates for naturally spawned fish that are caught and released is not reliably known. Further, the rate and significance of illegal retention of wild salmon is unknown. The NMFS has concluded harvest is a major limiting factor for several steelhead ESUs.

Diseases and parasites also adversely affect steelhead populations. Little information is available to quantify mortality rates attributable to diseases for steelhead. Further, the introduction of non-native species and modification of habitat have resulted in increased predator populations and salmonid predation in numerous river systems.

**Occurrence in the Project Area.** Steelhead have been known to migrate through the Bay to various creeks, but distribution studies that would allow a forecast of the number of individuals of steelhead that could wander to the area in the vicinity of the project area during the migration has not been conducted. Nevertheless, the number of individuals of this species of fish actually passing in the vicinity of the project area is projected to be small. The proposed Project is unlikely to directly or indirectly affect the Central California Coast Steelhead DPS or designated critical habitat.

### **Green Sturgeon – Southern DPS**

On April 7, 2006, the National Marine Fisheries Service (NMFS) issued a final rule listing the Southern DPS of North American green sturgeon (*Acipenser medirostris*) as a threatened species under the federal Endangered Species Act. Included in the listing is the green sturgeon population spawning in the Sacramento River and living in the Sacramento River, the Sacramento-San Joaquin Delta, and the San Francisco Bay Estuary. This threatened determination was based on the reduction of potential spawning habitat, the severe threats to the single remaining spawning population, the inability to alleviate these threats with the conservation measures in place, and the decrease in observed numbers of juvenile Southern DPS green sturgeon collected in the past two decades compared to those collected historically. Critical habitat was proposed under the federal Endangered Species Act in September 2008 for the Southern DPS of green sturgeon.



**Life History.** Although green sturgeon are anadromous, they are the most marine-oriented species of sturgeon and are found in nearshore marine waters from Mexico to the Bering Sea (70 Fed. Reg. 17386). In freshwater, green sturgeon occur in the lower reaches of large rivers from British Columbia south to San Francisco Bay. The southernmost spawning population of green sturgeon occurs in the Sacramento River system (Moyle 2002).

Green sturgeon have been divided into two distinct population segments: northern and southern. The northern segment consists of green sturgeon populations extending from the Eel River northward, while the southern segment includes populations extending from south of the Eel River to the Sacramento River. Spawning populations have only been confirmed, however, in the Rogue (Oregon), Klamath, and Sacramento Rivers (70 Fed. Reg. 17386). In the Central Valley, spawning occurs in the Sacramento River upstream of Hamilton City, perhaps as far upstream as Keswick Dam (Adams et al. 2002), and possibly in the lower Feather River (Moyle 2002). Although green sturgeon have been documented in the San Joaquin River upstream of the Delta, it is unclear whether they use this system for spawning; however, no efforts have been made to document sturgeon spawning in the San Joaquin River system (70 Fed. Reg. 17386).

Adults migrate upstream into rivers between late February and late July, and spawn between March and July, when the water temperature is 46 to 57°F. Peak spawning occurs from mid-April to mid-June. Green sturgeon are believed to spawn every 3 to 5 years (Tracy 1990), although recent evidence indicates that spawning may be as frequent as every 2 years (70 FR 17386). Little is known about the specific spawning habitat preferences of green sturgeon. It is believed that adults broadcast their eggs in deep, fast water over large cobble substrate where the eggs settle into the interstitial spaces (Moyle 2002). Spawning may also occur over substrates ranging from clean sand to bedrock (Moyle 2002). Eggs hatch in approximately 8 days at 55°F (Moyle 2002).

Larval green sturgeon begin feeding 10 days after hatching, and metamorphosis to the juvenile stage is complete within 45 days of hatching. Larvae grow quickly, reaching 74 millimeters in the first 45 days after hatching and 300 millimeters by the end of their first year. Juveniles spend 1 to 3 years in freshwater before they enter the ocean (70 Fed. Reg. 17386).

Little is known about the movements and habits of green sturgeon. Green sturgeon have been salvaged at the state and federal fish collection facilities in every month, indicating that they are present in the Delta year-round. Between January 1993 and February 2003, 99 green sturgeon were salvaged at the state and federal fish salvage facilities; no green sturgeon were salvaged in 2004 or 2005 (Interagency Ecological Program 2005). Although it is assumed that green sturgeon are present throughout the

Delta and rivers during any time of the year, salvage numbers probably indicate that their abundance, at least in the south Delta, is low. Being a benthic species, the diet of adult green sturgeon seems to mostly include bottom invertebrates and small fish (Ganssle 1966). Juveniles in the Delta feed on opossum shrimp and amphipods (Radtke 1966).

**Occurrence in the Project Area.** Because of the lack of study of green sturgeon in the southern San Francisco Bay, it is hard to determine whether they would be present in the study area. If they are present, they would be in small numbers.

### **Longfin Smelt**

In recent decades, longfin smelt (*Spirinchus thaleichthys*) has experienced significant population declines in San Francisco Bay and throughout California. On March 4, 2009, CDFW listed the longfin smelt as threatened under the California Endangered Species Act. The species is also a candidate for listing under the federal Endangered Species Act. CDFW (2009) listed the greatest threats to longfin smelt as reduced freshwater inflows, entrainment, climatic variation, toxic substances, predation, and introduced species, with effects of dredging also a concern.

**Life History.** Longfin smelt are anadromous fish that spawn in freshwater and disperse to marine environments as they mature and are adapted to a wide range of salinity levels. Spawning of longfin smelt in the San Francisco Bay occurs as early as November and as late as June, but the majority of spawning occurs between January and April. Longfin smelt usually live for two years, spawn, and then die, although individuals may spawn as one- or three-year-old fish before dying (Moyle 2002). Longfin smelt are found throughout San Francisco Bay, though occupying different portions of the estuary at various times of year. Spawning locations in the Delta vary from year to year and depend on environmental conditions including flow, temperature and salinity in areas of appropriate substrate (usually sandy substrates).

In San Francisco Bay-Delta region, longfin smelt spawn primarily in freshwater in the lower reaches of the Sacramento and San Joaquin Rivers. In the Bay-Delta, most longfin smelt spend their first year in Suisun Bay and Marsh and the rest of their life in the San Francisco Bay or coastal waters. Their life cycle in the San Francisco Estuary includes periods during the spring and summer when the population is concentrated in San Pablo Bay, with a gradual shift upstream in fall and winter. In most years, spawning takes place around Suisun Bay/Suisun Marsh upstream to Rio Vista. Larvae and juvenile longfin smelt are generally distributed further downstream and closer to the Golden Gate during years of high freshwater outflows (Dege and Brown 2004). In dry years larvae are concentrated in the West Delta and Suisun Bay and in wet years are found throughout the Bay from the South Bay through the West Delta, with the greatest concentrations in San Pablo and Suisun Bays early in the season and the Central Bay

later in the season (Rosenfield 2009). Longfin smelt can be found in the South Bay as evidenced by sampling conducted in February of 2010 that found high numbers of longfin smelt in Coyote Creek, Alviso Slough, and nearby salt ponds (Robinson and Greenfield 2011).

Longfin smelt eggs are attached to rocks, plants, or other submerged objects, and take about 40 days to hatch. Larvae stay near the water surface, which helps to rapidly transport them downstream to food-rich nursery areas in Suisun and San Pablo Bays. Larvae rapidly grow to juvenile size, reaching 2.4 to 2.8 inches by 9 or 10 months. The main food of adults is opossum (mysid) shrimp, which are epibenthic animals, suggesting that longfin smelt spend much time near the bottom. Adults and juveniles spend most of their time in the middle and bottom of the water column, whereas larvae stay near the surface (Moyle 2002). Smelt are found at higher densities above deepwater channels than above shoals (Rosenfield 2009) and in waters of higher turbidity. Longfin smelt in fact appear to seek refuge from predators in turbid waters (Hobbs 2009). The extent of use in nearshore and shallow locations has not been evaluated in detail to date (Robinson and Greenfield 2011).

**Occurrence in the Project Area.** Although longfin smelt spawn primarily in the lower reaches of the Sacramento and San Joaquin Rivers and spend their first year in the area of Suisun Bay, longfin smelt could occur in small numbers within San Francisco Bay in the vicinity of Belmont Slough near the Project Site, especially in deeper water habitats and especially during wet years.

## 4.0 REGULATORY AGENCIES AND POLICIES

The following is a description of federal, state, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

### FEDERAL

#### ***Clean Water Act-Section 404***

The U.S. Army Corps of Engineers regulates discharges of dredged or fill material into Waters of the United States under Section 404 of the Clean Water Act (CWA). “Discharge of fill material” is defined as the addition of fill material into Waters of the U.S., including but not limited to the following: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and sub-aqueous utility lines (33 C.F.R. §328.2(f)). In addition, Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the United States to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

The U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (US EPA) are responsible for implementing the Section 404 program. Section 404(a) authorizes the USACE to issue permits, after notice and opportunity for comment, for discharges of dredged or fill material into waters of United States. Section 404(b) requires that the USACE issue permits in compliance with EPA guidelines, which are known as the Section 404(b)(1) Guidelines. Specifically, the Section 404(b) (1) guidelines require that the USACE only authorize the “least environmentally damaging practicable alternative” (LEDPA) and include all practicable measures to avoid and minimize impacts to the aquatic ecosystem. The guidelines also prohibit discharges that would cause significant degradation of the aquatic environment or violate state water quality standards.

Waters of the U.S. include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows. Wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 C.F.R. §328.3(b)).

Furthermore, Jurisdictional Waters of the U.S. can be defined by exhibiting a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the

USACE as “that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (33 C.F.R. §328.3(e)).

Tidal waters are also under the jurisdiction of the USACE. The landward limits of jurisdiction in tidal waters extend to the high tide line...“or, when adjacent non-tidal waters of the United States are present, to the limits of jurisdiction for such non-tidal waters” (33 C.F.R. §328.4(b)) High tide is further defined to include the line reached by spring high tides and other high tides that occur with periodic frequency (33 C.F.R. §328.3(d)).

All wetlands in the study area were reviewed to determine if they could be disclaimed from USACE jurisdiction as isolated wetlands following two recent US Supreme Court decisions. In *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers (SWANCC)*, No. 99-1178 (2001), some isolated wetlands may be excluded from USACE Section 404 jurisdiction because they are (1) non-tidal, (2) non-navigable, (3) not hydrologically connected to navigable waters or adjacent to such waters, and (4) not subject to foreign or interstate commerce.

Subsequent to SWANCC, the U.S. Supreme Court decided on *Rapanos v. United States and Carabell v. United States*, 126 U.S. 2208 (2006) (herein referred to as Rapanos). In 2007, guidance was given to EPA regions and Corps districts to implement the Supreme Court’s decision which addresses the jurisdiction over waters of the U.S. under the Clean Water Act. The Rapanos guidance requires the Corps to conduct detailed analysis of the functions and values of wetlands and other waters of the U.S. potentially onsite and in some cases offsite, determine if there is a nexus to traditional navigable waters and the significance of the nexus to the traditional navigable water. Neither the Court nor the recently-issued guidance draw a clear line with regard to the geographic reach of jurisdiction, particularly in drainages where flows are ephemeral and where wetlands are adjacent to but not directly abutting relatively permanent water, such as the wetlands delineated on the study site.

The guidance includes requirements for additional documentation, particularly with regard to whether or not there is a “significant nexus” to a traditionally-navigable water (TNW). For water bodies that are traditionally navigable (and their adjacent wetlands), and for tributaries that are “relatively permanent waters” (RPW’s: streams that are not perennial but that flow for 3 months or more annually, and their adjacent wetlands that directly abut the RPW’s), the USACE and EPA will assert jurisdiction under the Clean Water Act, without the need for any exhaustive documentation of “significant nexus.” There is no dispute that Clean Water Act jurisdiction encompasses traditionally-navigable waters and their perennial and relatively-permanent tributaries. Activities

that result in discharges of pollutants into these waters can adversely affect the physical, chemical, and biological integrity of navigable waters.

For wetlands adjacent to but not directly abutting a RPW, jurisdiction may be asserted under the Clean Water Act if there is a “significant nexus” and for tributaries that typically do not flow more 3 months or more annually, and if there adjacent wetlands associated with these non-relatively permanent waters (non-RPW’s), jurisdiction may be asserted under the Clean Water Act if there is a “significant nexus.” A significant nexus analysis, using the USACE-approved jurisdictional determination form, “will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW.” These factors include (a) the capacity to carry pollutants or flood water into a TNW; (b) the capacity to provide habitat for species that are present in the downstream TNW; (c) the capacity of transferring nutrients and organic carbon to a TNW; or (d) other “relationships to the physical, chemical, or biological integrity of the TNW.

#### ***Clean Water Act-NPDES Requirements***

In 1972, the Clean Water Act was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollution Discharge Elimination System (NPDES) permit. The 1987 amendments established a framework for regulating municipal, industrial, and construction-related storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that establish storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water from construction projects that encompass one or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. The California State Water Resource Control Board has developed a general construction storm water permit to implement this requirement.

#### ***Federal Endangered Species Act***

The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction. The FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend. The FESA establishes an official listing process for plants and animals considered to be in danger of extinction; requires development of specific plans of action for the recovery of listed species; and restricts activities perceived to harm or kill listed species or affect critical habitat (16 USC 1532, 1536).

The FESA prohibits the “take” of endangered or threatened wildlife species. “Take” is defined as harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species, or any attempt to engage in such conduct (16 USC 1532, 50 CFR 17.3) Taking can result in civil or criminal penalties. Federal regulation 50 CFR 17.3 further defines the term harm in the take definition to mean any act that actually kills or injures a federally listed species, including significant habitat modification or degradation. Additionally, FESA prohibits the destruction or adverse modification of designated critical habitat. In the Service’s regulations at 50 CFR 402.2, destruction or adverse modification is defined as a “direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species.

The FESA also requires federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or adversely modify critical habitat (16 USC 1536). Therefore, the FESA is invoked when the property contains a federally-listed threatened or endangered species that may be affected by a permit decision. In the event that listed species are involved and a USACE permit is required for impacts to jurisdictional waters, the USACE must initiate consultation with USFWS (or the National Marine Fisheries Service, NMFS) pursuant to Section 7 of the FESA (16 USC 1536; 40 CFR § 402). If formal consultation is required, USFWS or NMFS will issue a biological opinion stating whether the permit action is likely to jeopardize the continued existence of the listed species, recommending reasonable and prudent measures to ensure the continued existence of the species, establishing terms and conditions under which the project may proceed, and authorizing incidental take of the species.

### ***Magnuson-Stevens Fishery Conservation and Management Act***

The Magnuson-Stevens Fishery Conservation and Management Act (MSFA) conserves and manages the fishery resources found off the coasts of the United States, the anadromous species, and the Continental Shelf fishery resources of the United States, including the conservation and management of highly migratory species through the implementation and enforcement of international fishery agreements. The NMFS enforces the MSFA and regulates commercial and recreational fishing and the management of fisheries resources. The Sustainable Fisheries Act of 1996 amended the MSFA to include new fisheries conservation provisions by emphasizing the importance of fish habitat in regards to the overall productivity and sustainability of U.S. marine fisheries (Public Law 104-267). The revised MSFA mandates the identification and protection of Essential Fish Habitat (EFH) for managed species during the review of projects conducted under federal permits that have the potential to affect such habitat. Federal agencies are required to consult with NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency, which may adversely affect EFH (MSFA 305.b.2).

Under the MSFA, NMFS identifies, conserves, and enhances EFH for those species regulated under a federal fisheries management plan (FMP). EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity and includes all associated physical, chemical and biological properties of aquatic habitat that are used by fish. Projects that have the potential to adversely affect EFH must initiate consultation with NMFS. Adverse effects are any impacts that reduce the quality and/or quantity of EFH and can include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). There are four FMPs in California, Oregon, and Washington that identify EFH for groundfish, coastal pelagic species, Pacific salmon, and Pacific highly migratory fisheries.

The Project Site is within an area identified as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act for various life stages of fish species managed with the following FMPs under the Act: the Pacific Groundfish FMP (various rockfishes, sole and sharks), the Pacific Salmon FMP (Chinook salmon, Coho salmon), and the Coastal Pelagic FMP (northern anchovy, Pacific sardine). In addition, the project occurs within an area designated as Habitat Areas of Particular Concern (HAPC) for various federally-managed fish species within the Pacific Groundfish FMP. HAPC are described in the regulations as subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC are more carefully scrutinized during the consultation process. As defined in the Pacific Groundfish FMP, San Francisco Bay, including the project area, is within estuary HAPC.

### ***Migratory Bird Treaty Act***

The federal Migratory Bird Treaty Act is administered by the USFWS. The Act provides that it is unlawful to: pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product unless permitted by regulations. Most bird species within California fall under the provisions of the Act. Excluded species include nonnative species such as house sparrow, starling, and ring-necked pheasant and native game species such as quail.

### ***Fish and Wildlife Coordination Act***

The USFWS also has responsibility for project review under the Fish and Wildlife Coordination Act. This statute requires that all federal agencies consult with USFWS, NMFS, and the state's wildlife agency (California Department of Fish and Wildlife, CDFW) for activities that affect, control, or modify streams and other water bodies.



Under the authority of the Fish and Wildlife Coordination Act, USFWS, NMFS, and CDFW review applications for permits issued under Section 404 and provide comments to the USACE about potential environmental impacts.

## **STATE**

### ***California Endangered Species Act***

The State of California enacted the California Endangered Species Act (CESA) in 1984. The CESA is similar to the FESA but pertains to state-listed endangered and threatened species. CESA requires state agencies to consult with the California Department of Fish and Wildlife (CDFW) when preparing California Environmental Quality Act (CEQA) documents to ensure that the state lead agency actions do not jeopardize the existence of listed species. CESA directs agencies to consult with CDFW on projects or actions that could affect listed species, directs CDFW to determine whether jeopardy would occur, and allows CDFW to identify “reasonable and prudent alternatives” to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if they determine that “overriding considerations” exist; however, the agencies are prohibited from approving projects that would result in the extinction of a listed species.

The CESA prohibits the taking of state-listed endangered or threatened plant and wildlife species. CDFW exercises authority over mitigation projects involving state-listed species, including those resulting from CEQA mitigation requirements. CDFW may authorize taking if an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy is implemented. CDFW requires preparation of mitigation plans in accordance with published guidelines.

### ***Section 401 of the Federal Clean Water Act/Porter Cologne Water Quality Act***

Pursuant to section 401 of the Federal Clean Water Act, projects that require a USACE permit for the discharge of dredge or fill material must obtain water quality certification that confirms a project complies with state water quality standards before the USACE permit is valid. State water quality is regulated/administered by the State Water Resources Control Board and the nine Regional Water Quality Control Boards (RWQCBs). The state also maintains independent regulatory authority over the placement of waste, including fill, into waters of the State under the Porter-Cologne Act.

The California State Water Resource Control Board has developed a general construction storm water permit to implement the requirements for the federal National Pollution Discharge Elimination System (NPDES) permit. The permit requires submittal of a Notice of Intent to comply, fees, and the implementation of a Storm Water Pollution Prevention Plan.

### ***McAteer-Petris Act***

The San Francisco Bay Conservation and Development Commission (BCDC) has permit jurisdiction over San Francisco Bay. There are two types of BCDC jurisdiction within the Bay Area:

(a) Bay Jurisdiction: San Francisco Bay jurisdiction, being all areas that are subject to tidal action from the south end of the bay to the Golden Gate (Point Bonita-Point Lobos) and to the Sacramento River line (a line between Stake Point and Simmons Point, extended north easterly to the mouth of Marshall Cut), including all sloughs, and specifically, the marshlands lying between mean high tide and five feet above mean sea level; tidelands (land lying between mean high tide and mean low tide); and submerged lands (land lying below mean low tide).

(b) Shoreline Band Jurisdiction: A shoreline band consisting of all territory located between the shoreline of San Francisco Bay as defined above in item (a) and a line 100 feet landward of and parallel with that line; provided that the commission may, by resolution, exclude from its area of jurisdiction any area within the shoreline band that it finds and declares is of no regional importance to the Bay.

BCDC is authorized to issue or deny permits for any filling of the Bay. Section 66605 of the McAteer-Petris Act allows the Commission to authorize Bay fill only for water-oriented uses, and minor fill to improve shoreline appearance or public access. Furthermore, the McAteer-Petris Act requires that the fill only should be authorized if there is no feasible upland location, the fill is the minimum amount necessary, the fill minimizes harmful effects to the Bay, and the public benefits clearly exceed its detriments. The proposed project will require a BCDC permit for shoreline improvements within a 100-foot band from Belmont Slough and the San Francisco Bay.

### ***CDFW Species of Special Concern***

CDFW tracks species in California whose numbers, reproductive success, or habitat may be threatened. Even though not formally listed under FESA or CESA, such plant and wildlife species receive additional consideration during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern" developed by the CDFW. CDFW has also designated special-status natural communities which are considered rare in the region, support special status species or otherwise receive some form of regulatory protection. Documentation pertaining to these communities, as well as special status species (including species of special concern), is kept by CDFW as part of the California Natural Diversity Data Base (CNDDDB).

### ***California Department of Fish and Wildlife-Streambed Alteration Agreement***

Section 1602 of the California Fish and Game Code requires any person, governmental

agency, or public utility proposing any activity that will divert or obstruct the natural flow or change the bed, channel or bank of any river, stream, or lake, or proposing to use any material from a streambed, to first notify CDFW of such proposed activity. CDFW may propose reasonable modifications, based on the information contained in the notification form and a possible field inspection, CDFW may propose reasonable modifications in the proposed construction as would allow for the protection of fish and wildlife resources. Upon request, the parties may meet to discuss the modifications. If the parties cannot agree and execute a Lake and Streambed Alteration Agreement, then the matter may be referred to arbitration.

***California Department of Fish and Wildlife Fish and Game Code 3503 and 3503.5***

Section 3503 of the Fish and Game Code makes it unlawful to take, possess, or needlessly destroy the nests or eggs of any bird. Section 3503.5 makes it unlawful to take or possess birds of prey (hawks, eagles, vultures, owls) or destroy their nests or eggs.

***California Department of Fish and Wildlife Fully Protected Animal Species***

The classification of Fully Protected was an effort by the State of California in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Most Fully-Protected species have also been listed as threatened or endangered species under state endangered species laws and regulations. Species classified as Fully Protected Species by the CDFW may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock (as per California Fish and Game Code Section 3511(a)(1)).

**LOCAL**

***City of Foster City General Plan***

In addition to federal and state regulations, the development of the property must be accomplished consistent with the land use designations and natural resource and other policies of the City of Foster City General Plan. The General Plan Conservation Element acknowledges that “in 1974 a 57-acre wildlife sanctuary was set aside in exchange for a permit to fill 382 acres of seasonal wetlands elsewhere in Foster City. The wildlife refuge is roughly bounded by Belmont Slough on the east, Beach Park Boulevard on the west, and between Tarpon Street and Foster City Boulevard. The tidal wetlands and mudflats in this area contain feeding and resting habitat for numerous and diverse migratory shorebirds and some species of waterfowl who migrate along the Pacific flyway.” This wildlife sanctuary is immediately adjacent to the proposed project.

Policies in the Conservation Element related to biological resources include the following:

- *Policy C-6 Wildlife Habitat.* Protect the wildlife habitat located in the wildlife refuge, 100-foot regulated shoreline band, wetland areas and the Foster City Lagoon System.
- *Policy C-y Wetland Habitat.* Protect wetland habitat from human disturbance by posting signs prohibiting trespassing on vegetation typical of wetland areas.
- *Policy C-z 57-Acre Wildlife Refuge.* Prohibit development within 57-acre wildlife refuge.
- *Policy C-aa Projects in the Vicinity of Shoreline Band.* Strictly control development proposals in the vicinity of the shoreline band.

The proposed Foster City Levee Protection Planning and Improvements Project is consistent with the policies of the Foster City General Plan.

## **OTHER STATUTES, CODES, AND POLICIES AFFORDING LIMITED PROTECTION**

### ***California Native Plant Society***

The California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Plants of California (CNPS 2014: <https://www.cnps.org/cnps/rareplants/inventory/>). Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review.

The following identifies the definitions of the CNPS listings:

<https://www.cnps.org/cnps/rareplants/ranking.php>

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

## 5.0 IMPACTS AND MITIGATION MEASURES

### 5.1 Standards of Significance

According to the Environmental Checklist in Appendix G of the CEQA Guidelines (Title 14, California Code of Regulations, 15000 et seq.), the project would be considered to have a significant impact on biological resources if it would:

- a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Wildlife and Game or U.S. Fish and Wildlife Service.
- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.
- c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

### 5.2 Impacts and Mitigation Measures

#### 5.2.1 Plant Communities and Vegetation

The purpose of the Levee Protection Planning and Improvements Project is to regain FEMA accreditation for the levee system. In addition, the City's levee improvement plan design, once implemented to achieve the project purpose, would also provide some

level of sea level rise protection (or could be readily modified as needed to adapt to future sea level rise) while maintaining public access along the levee system and protection for sensitive habitat and species. Two scenarios with different ranges of levee/floodwall heights as needed to meet FEMA freeboard requirements and/or protect against future sea level rise are evaluated: (1) FEMA freeboard with sea level rise for the year 2050 (“2050 Sea Level Rise Scenario”), and (2) FEMA freeboard with sea level rise for the year 2100 (“2100 Sea Level Rise Scenario”). The City anticipates that the project will utilize a combination of three different levee improvement types, depending on the location along the existing levee and the adjacent site constraints: (1) sheet pile floodwall (2) earthen levee (3) conventional floodwall, and the preferred project involves a combination of the three types of improvements.

The levee improvements are generally designed so that in areas where an extension in the height of the levee will require extension of the toe of the fill slope, this extension will occur on the inboard side of the levee to avoid impacts to the salt marsh habitats and regulatory wetlands located in many areas on the outboard side of the levee (e.g., along segment 1, and along Belmont Slough in segments 4 (southern portion), 5, 6 and 7, and O’Neill Slough in segment 8). With the improvements proposed on the inboard side of the levee, most impacts resulting from construction of the levee improvements will impact Urban habitat types, affecting vegetation such as ice plant and landscaping species. Some removal of non-native grasses and herbaceous species will also occur in many areas. Such impacts to Non-native Grassland and Urban habitats vegetated with non-native grasses and herbaceous species and landscaping species would not be considered significant.

Under the 2050 Sea Level Rise Scenario, nearly all impacts to Pacific Coast Salt Marsh Habitats (total of 0.48 acres) occur either in segment 2 or near the junctions of segments 5 and 6 (small impacts also occur in northern portion of segment 5). Under the 2100 Sea Level Rise Scenario, nearly all impacts to Pacific Coast Salt Marsh Habitat (a total of 1.15 acres) occur in segment 2, segment 3 (near Werder Park), and segments 5 and 6 (near the City’s Phase II Sedimentation Basin), with additional small impacts along Belmont or O’Neill Slough in segments 7 and 8. Details regarding impacts to these wetlands and waters of the U.S. can be found in Section 5.2.2. Sheet pile floodwall is proposed to accomplish the levee improvements to specifically limit impacts to wetlands where there is insufficient right-of-way width or where encroachment may occur into wetland areas with an earthen levee or conventional floodwall.

The staging areas at the City’s corporation yard, in the vicinity of San Mateo Bridge, and along Beach Park Boulevard are either pavement or landscaping, and significant vegetation impacts would not result from use of these areas for staging activities associated with construction of levee improvements. Use of the staging area along the north and west edges of the City’s Dredge Disposal Site may result in temporary impacts

to vegetation consisting almost exclusively of non-native plants and grasses. It is not anticipated that staging activities would result in any impacts to landscape trees present along the border of Sea Cloud Park. Staging activities would occur in the vicinity of mitigation wetlands found adjacent to the proposed staging area, and potential indirect impacts to these wetlands and associated wildlife habitats and recommended mitigation measures can be found in Section 5.2.4.

### 5.2.2 Wetlands and Waters of the U.S.

Wetlands and waters of the U.S. are regulated by state and federal agencies and would be considered sensitive natural communities as defined by CEQA. Wetlands and waters of the U.S. are found within the project site as identified in the maps in Figure 14 (Sheets 1 to 27). Table 7 shows the acreage of wetland impacts within each levee segment for each of the two project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise).

Levee Segment	Existing Wetlands within the Study Area (acres)	Wetland Impacts-2050 Sea Level Rise Scenario (acres)	Wetland Impacts-2100 Sea Level Rise Scenario (acres)
Segment 1	0.36	0	0
Area between Segment 1 and Segment 2	2.42	0	0
Segment 2	4.67	0.34	0.34
Segment 3	2.34	0	0.08
Segment 4	0.70	0	0
Segment 5	3.02	0.003	0.38
Segment 6	1.73	0.14	0.34
Segment 7	0.96	0	0.002
Segment 8	0.81	0	0.001
<b>Total</b>	17.01	0.48	1.15

**2050 Sea Level Rise Scenario.** Under the 2050 Sea Level Rise Scenario, the construction of the levee improvements and extension of the toe of the levee slope on the inboard side of the levee would permanently impact 0.48 acres of Palustrine Emergent Wetlands in segment 2 or near the junctions of segments 5 and 6 (small impacts also occur in northern portion of segment 5). These impacted wetlands are potentially under the

jurisdiction of the USACE under Clean Water Act Section 404 or Rivers and Harbors Act Section 10. The location of specific areas where fill within wetlands for these scenarios would be necessary are graphically portrayed in Figure 16 (see Figures 16a, 16b, 16c and 16d).

Fill within the jurisdictional areas will require a CWA permit from the USACE. The required permit is likely to be a Nationwide Permit (NWP). NWPs apply to waters of the U.S. regulated by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. A Section 401 Water Quality Certification from the San Francisco Bay Regional Water Quality Control Board (RWQCB) will be necessary for the USACE permit to be valid. Without mitigation, project impacts to wetlands or waters of the U.S. would be significant.

**Impact 1a:** The construction of the levee improvements and extension of the toe of the levee slope on the inboard side of the levee would require permanent impacts (fill) within 0.48 acres of Palustrine Emergent Wetland for the 2050 Sea Level Rise Scenario.

**Mitigation Measure 1a:** The City of Foster City will submit applications for a Nationwide permit from the USACE (see Section 4.5, Permit Requirements), and Section 401 water quality certification from the San Francisco Bay RWQCB, required for the USACE permit to be valid. It is anticipated that applications for these permits will be submitted to the respective agencies sometime in the latter part of 2016. Appropriate wetland mitigation will be required by the USACE and RWQCB for impacts to the 0.48 acres of Palustrine Emergent Wetland along the levee alignment, and a wetland mitigation plan to mitigate impacts to jurisdictional areas will need to be developed as part of the USACE and RWQCB permit process. USACE jurisdictional areas must be replaced at a minimum 1:1 ratio through wetland creation (preferably at a Mitigation Bank) to ensure that no net loss of acreage or functions and values to these areas occurs. The required ratio of replacement acreage to impacted acreage will be decided by regulatory agencies on a project-specific basis based on the functions and values present on the project site, but requirement for a mitigation ratio of 2:1 (0.96 acre) would be likely.

To offset the wetland impacts the Permittee will either (1) purchase mitigation credits equivalent to 0.96 acres from an authorized mitigation bank; or (2) implement a Permittee-responsible mitigation plan and establish or restore wetlands within uplands along the levee alignment. If Permittee-responsible mitigation is implemented, a detailed mitigation plan will need to be prepared that includes monitoring and reporting requirements, responsibilities, performance standards, reporting procedures, contingency plan, and plan to



ensure long-term protection through real estate instruments or other available mechanisms, as appropriate. A Permittee-responsible mitigation plan will consider means of incorporating an ecotone levee or horizontal levee feature consisting of a gently-sloped levee designed to mimic the transition from wetlands to uplands and that would provide flood protection, wildlife habitat (including transitional and refugial habitat for Ridgway's Rail and salt marsh harvest mouse) as well as water quality benefits. Such a levee may be feasible in areas adjacent to the City's Phase II Sedimentation Basin in the southern portion of segment 5 and the eastern portion of segment 6.

**2100 Sea Level Rise Scenario.** Under the 2100 Sea Level Rise Scenario, the construction of the levee improvements and extension of the toe of the levee slope on the inboard side of the levee would permanently impact 1.15 acres of Palustrine Emergent Wetlands in segment 2, segment 3 (near Werder Park), and segments 5 and 6 (near the City's Phase II Sedimentation Basin), with additional small impacts along Belmont and O'Neil Slough in segments 7 and 8. These wetlands and waters of the U.S. are potentially under the jurisdiction of the USACE under Clean Water Act Section 404 or Rivers and Harbors Act Section 10. The location of specific areas where fill within wetlands for the 2100 Sea Level Rise Scenario would be necessary are graphically portrayed in Figure 17 (see Figures 17a through 17k).

Fill within the jurisdictional areas will require a CWA permit from the USACE. As the fill impacts are estimated to exceed 0.5 acres, the required permit is likely to be an Individual Permit. The Individual Permit applies to waters of the U.S. regulated by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. A Section 401 Water Quality Certification from the San Francisco Bay RWQCB will be necessary for the USACE permit to be valid. Without mitigation, project impacts to wetlands or waters of the U.S. would be significant.

**Impact 1b:** The construction of the levee improvements and extension of the toe of the levee slope on the inboard side of the levee will require permanent impacts (fill) within 1.15 acres of Palustrine Emergent Wetland for the 2100 Sea Level Rise Scenario.

**Mitigation Measure 1b:** The City of Foster City will submit applications for an Individual permit from the USACE (see Section 4.5, Permit Requirements), and Section 401 water quality certification from the San Francisco Bay RWQCB, required for the USACE permit to be valid. It is anticipated that applications for these permits will be submitted to the respective agencies sometime in the latter part of 2016. The Individual Permit application will include an analysis to comply with EPA's Clean Water Act Section 404(b)(1) alternative analysis guidelines and document that the proposed project is the Least Environmentally

Damaging Practicable Alternative (LEDPA). Appropriate wetland mitigation will be required by the USACE and RWQCB for impacts to the 1.1 acres of Palustrine Emergent Wetland along the levee alignment, and a wetland mitigation plan to mitigate impacts to jurisdictional areas will need to be developed as part of the USACE and RWQCB permit process. USACE jurisdictional areas must be replaced at a minimum 1:1 ratio through wetland creation (preferably at a Mitigation Bank) to ensure that no net loss of acreage or functions and values to these areas occurs. The required ratio of replacement acreage to impacted acreage will be decided by regulatory agencies on a project-specific basis based on the functions and values present on the project site, but requirement for a mitigation ratio of 2:1 (2.3 acres) would be likely.

To offset the wetland impacts, the Permittee will either (1) purchase mitigation credits equivalent to 2.3 acres from an authorized mitigation bank; or (2) implement a Permittee-responsible mitigation plan and establish or restore wetlands within uplands along the levee alignment. If Permittee-responsible mitigation is implemented, a detailed mitigation plan will need to be prepared that includes monitoring and reporting requirements, responsibilities, performance standards, reporting procedures, contingency plan, and plan to ensure long-term protection through real estate instruments or other available mechanisms, as appropriate. A Permittee-responsible mitigation plan will consider means of incorporating an ecotone levee or horizontal levee feature consisting of a gently-sloped levee designed to mimic the transition from wetlands to uplands and that would provide flood protection, wildlife habitat (including transitional and refugial habitat for Ridgway's Rail and salt marsh harvest mouse) as well as water quality benefits. Such a levee may be feasible in areas adjacent to the City's Phase II Sedimentation Basin in the southern portion of segment 5 and the eastern portion of segment 6.

### **5.2.3 Special Status Species**

The proposed project would not result in any significant adverse impacts on special-status plant species as no special status plants are expected to occur within the Project Site or the Project Site vicinity.

The proposed project could result in significant impacts on special status species of animal, including the federally-listed endangered Ridgway's Rail and salt marsh harvest mouse and the state-listed threatened California Black Rail. These three species occur in salt marsh habitats along the San Francisco Bay shoreline in San Mateo County, including both Belmont and O'Neill Sloughs.

Pacific Coast Salt Marsh habitats consisting of pickleweed and, in some areas, cordgrass vegetation occur adjacent to the levee in a number of locations, including segment 1

and the entire length of the levee alignment along Belmont Slough and O'Neill Slough from the southern portion of segment 4 through segment 8. Potentially suitable nesting habitat for Ridgway's Rail can be found adjacent to the outboard side of the levee along the southern half of segment 5, segments 6 and 7, and the western half of segment 8, and suitable foraging habitats can be found adjacent to the outboard side of the levee along segment 1, the southern portion of segment 4, the northern half of segment 5, and the eastern half of segment 8. All areas of the salt marsh along Belmont and O'Neill Sloughs may be suitable habitat for the salt marsh harvest mouse. The salt marsh along Belmont and O'Neill Sloughs may also be suitable habitat for the state-listed threatened California Black Rail, which occupies similar habitats as the Ridgway's Rail. An area of marsh inboard of levee segment 2 may also provide suitable winter foraging habitat for California Black Rail.

The main potential impacts to Ridgway's Rail are as a result of (i) construction activities creating potential disturbances to nesting or foraging Ridgway's Rail, or (ii) impacts related to use of sheet pile walls at the top of the levee that can restrict movements of Ridgway's Rail, especially when seeking cover from predators at retreat sites during extreme high tides. Similar construction impacts and potential impacts related to the use of sheet pile walls during extreme high tides are possible for California Black Rail as well. The main impacts to salt marsh harvest mouse are similar, with the main potential impacts related to (i) direct impacts to potential salt marsh harvest mouse habitat or indirect disturbance to mice during construction, or (ii) impacts related to use of sheet pile walls at the top of the levee that can restrict movements of salt marsh harvest mouse, especially when seeking cover from predators at retreat sites during extreme high tides.

As these species occupy similar habitat areas, the mitigation discussions below address all three species. With the exception that the 2100 Sea Level Rise Scenario would result in greater impact to the wetland habitat of these species (see discussion below and in Section 5.2.2) than the 2050 Sea Level Rise Scenario, and the fact that the 2100 Sea Level Rise scenario would use sheet pile floodwalls in slightly more lengths of the levee, the type of impacts and recommended mitigation measures are the same for the two scenarios. The impacts and mitigation recommendations related to the two scenarios are, therefore, discussed together in the following discussions.

Two other federally-listed species have the potential to occur in the vicinity of the Foster City levee: the federally-listed threatened Western Snowy Plover and the federally-listed endangered California Least Tern. These species are also discussed below, though nesting habitat does not occur in the project area for either species. Nesting by either of these avian species is not expected, and their occurrence would be limited to only sporadic, occasional visits to the project area, most likely during migration or post-breeding dispersal. Significant impacts to these two species are not

anticipated.

**Potential Impacts to Ridgway's Rail.** Potentially suitable nesting habitat for Ridgway's Rail can be found adjacent to the outboard side of the levee along Belmont Slough in the southern half of segment 5, segments 6 and 7, and the western half of segment 8, and suitable foraging habitats can be found adjacent to the outboard side to the levee along segment 1, the southern portion of segment 4, the northern portion of segment 5 and the eastern half of segment 8. Direct impacts to habitat for Ridgway's Rail are possible in areas where construction work takes place within the salt marsh habitat for the species. Under both scenarios ( 2050 Sea Level Rise and 2100 Sea Level Rise), direct fill impacts to wetlands (0.48 acres for 2050 Sea Level Rise Scenario and 1.15 acres for the 2100 Sea Level Rise Scenario) by design would occur on the inboard side of the levee instead of the outboard side of the levee.

Although no direct impacts to the salt marsh habitat of Ridgway's Rail would occur, if a Ridgway's Rail was present in or near the work area, an individual could be disturbed by the operation of equipment and the activities of work crews conducting construction activities at that site. Such indirect disturbance could cause individuals to disperse, could result in harassment, harm or even mortality, or could cause individuals to remain more susceptible to predation during high tide events. In addition, some impact to Ridgway's Rail habitat may be possible adjacent to nesting or foraging areas where loss of vegetation associated with construction of the levee itself could result in removal of some transitional upland vegetation that could support Ridgway's Rail during extreme high tides in the winter when individuals of this species seek refugial habitats in the high marsh or adjacent upland transition area.

As suitable Ridgway's Rail breeding or nesting habitat occurs in the project area and nesting habitat occurs within 700 feet of the proposed levee improvements, there is the potential for nesting disturbance. Such disturbance could result from the activities of construction crews involved in activities associated with the construction of the levee work. Noise and other disturbances could disrupt nesting and breeding activity, as well as other behaviors associated with foraging, reproduction, and other essential activities engaged in by the species. Construction activity near nests could cause nest abandonment, reduced care for young or eggs, or increased dispersal with subsequent potential increases in predation.

Indirect impacts to nesting Ridgway's Rail, especially during construction activity, are possible. Use of construction equipment within the area of the levee along Belmont Slough has the potential to result in disturbances to nests within 700 feet of the construction activity. Figure 15, which shows that nesting habitat for Ridgway's Rail occurs in the southern half of segment 5, segments 6 and 7, and the western half of segment 8 (Figures 15c and 15d), also shows that the 700 foot setback from suitable

nesting habitats encompasses all portions of the levee from Destination Park in segment 4 to O'Neill Slough in Segment 8.

To comply with USFWS requirements, either the construction activity would need to occur at a time during the year when the Ridgway's Rails would not be expected to be nesting, or a protocol breeding survey for Ridgway's Rail would need to be conducted prior to any construction work planned during the nesting season. If nesting surveys are conducted, the results of the surveys must be provided to the USFWS. Nesting locations for Ridgway's Rail, as determined during protocol surveys, would need to be protected by a 700-foot setback and planned construction operations within 700 feet of active nests would not be able to proceed. Construction in some areas within 700 feet of suitable nesting habitat could move forward if protocol surveys demonstrated there were no active Ridgway's Rail nests within 700 feet of the planned construction activity.

To the extent possible, the City of Foster City proposes to conduct construction activity associated with improvements to the levee in segments 4 (south of Destination Park), 5, 6, 7 and 8 (all of which includes potential nesting habitat for Ridgway's Rail) between September 1 and January 31, the allowed work window to avoid impacts to nesting Ridgway's Rail. If construction is confined to the period between September 1 and January 31, the nesting season of Ridgway's Rail would be avoided and this would preclude the need for nesting season surveys. No construction operations would proceed along Belmont Slough between Destination Park and the terminus of segment 8 at Highway 101 within the nesting season unless protocol surveys determine the exact location of active Ridgway's Rail nests so that construction operations can be planned to ensure protection of all active nests with setbacks of at least 700 feet.

Additional impacts to Ridgway's Rail are possible because of the installation of a sheet pile wall along the levee (sheet piles are proposed in both scenarios: 2050 Sea Level Rise and 2100 Sea Level Rise). Upland transition areas provide important refugial habitat for Ridgway's Rail during extreme high tides that occur in the winter months (also referred to as "king tides"). The installation of sheet pile walls along the levee has the potential to prevent rails from finding suitable vegetated refugial areas when they are forced from the marsh plain by rising tides and need to seek cover from predators in high marsh or transitional upland vegetation during these extreme tide events. The installation of sheet pile walls along all salt marsh providing suitable Ridgway's Rail nesting or foraging habitat could render individuals of Ridgway's Rail more susceptible to predation during these extreme high tide events.

Under the 2050 Sea Level Rise Scenario, sheet piles are proposed for installation adjacent to habitat for Ridgway's Rail for the entirety of the length along Belmont and O'Neill Sloughs, with the exception of the portions of segments 5 and 6 along the border of the City's Phase II Sedimentation Basin where an earthen levee is proposed. Earthen

levee would be installed along segment 1 and short stretch of segment 7/8, and a double sheet pile wall would be added along segment 8. Under the 2100 Sea Level Rise Scenario, sheet piles would be installed all along Belmont and O'Neill Sloughs (including along the City's Phase II Sedimentation Basin) and also adjacent to the Ridgway's Rail foraging habitat found along segment 1. One way of mitigating the impacts resulting from installation of sheet pile adjacent to Ridgway's Rail habitat is to require the applicant to plant additional high marsh vegetation, such as gum plant (*Grindelia* sp.) along the outboard side of the sheet pile wall to provide additional much needed cover for prey. Additional predation could result from installation of sheet pile walls because the wall itself could provide perching sites for Common Ravens, Red-tailed Hawks, Peregrine Falcons or other birds of prey who could hunt for prey such as Ridgway's Rails during the high tides. This impact can be mitigated through installation of predator prevention devices on the sheet pile wall.

Despite the City's intent to comply with work windows or conduct protocol surveys to avoid impacts to nesting Ridgway's Rail, other mitigation measures are recommended to protect the Ridgway's Rail during construction phase of the project such as environmental awareness training of all construction personnel, preconstruction surveys, and use of biological monitors during construction activities near the marsh.

#### **Potential Impacts to Salt Marsh Harvest Mouse.**

Salt marsh harvest mouse has never been found along the Peninsula shoreline north of the San Mateo-Hayward Bridge. However, the species has been documented from O'Neill Slough (in the salt marsh adjacent to segment 8), and suitable habitat for salt marsh harvest mouse occurs in all areas of the marsh adjacent to the levee along the south end of segment 4 (south of Destination Park) and all of segments 5 through 8. Direct impacts to habitat for salt marsh harvest mouse are possible in areas where construction work takes place within the salt marsh habitat for the species. Under both scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), direct fill impacts to wetlands (0.48 acres for the 2050 Sea Level Rise Scenario and 1.15 acres for the 2100 Sea Level Rise Scenario) by design would occur on the inboard side of the levee instead of the outboard side of the levee.

Proposed levee improvements include increased levee height that would involve extension of the toe of the slope of the levee only on the inboard side of the levee. As salt marsh harvest mouse habitat is found only outboard of the levee, no direct impacts to habitat for salt marsh harvest mouse is anticipated. The only possibility of direct impact to salt marsh harvest mouse habitat may be adjacent to suitable habitat areas where loss of vegetation associated with construction of the levee itself could result in removal of some transitional upland vegetation that could support salt marsh harvest mouse during extreme high tides in the winter when individuals of this species seek refugial habitats in the high marsh or adjacent upland transition area.

Although no direct impacts to the salt marsh habitat of salt marsh harvest mouse are expected to occur, if a salt marsh harvest mouse was present in or near the work area, the individual could be disturbed by the operation of equipment and the activities of work crews conducting construction activities at that site. Such indirect disturbance could cause individuals to disperse, could result in harassment, harm or even mortality, or could cause individuals to remain more susceptible to predation during high tide events.

Additional impacts to salt marsh harvest mouse are possible because of the installation of a sheet pile wall along the levee (sheet piles are proposed in both scenarios: 2050 Sea Level Rise and 2100 Sea Level Rise). Upland transition areas provide important refugial habitat for salt marsh harvest mouse during extreme high tides that occur in the winter months (also referred to as “king tides”). The installation of sheet pile walls along the levee has the potential to prevent mice from finding suitable vegetated refugial areas when they are forced from the marsh plain by rising tides and need to seek cover from predators in high marsh or transitional upland vegetation during these extreme high tide events.

Under the 2050 Sea Level Rise Scenario, sheet piles are proposed for installation adjacent to habitat for salt marsh harvest mouse for the entirety of the length along Belmont and O’Neill Sloughs, with the exception of the portions of segments 5 and 6 along the border of the City’s Phase II Sedimentation Basin. Under the 2100 Sea Level Rise Scenario, sheet piles would be installed all along Belmont and O’Neill Sloughs (including along the City’s Phase II Sedimentation Basin). Sheet pile walls would also be installed along segment 1, but the salt marsh here is not considered suitable habitat for salt marsh harvest mouse as the species has never been encountered on the Peninsula shoreline north of the San Mateo Bridge. One way of mitigating this potential impact is to require the applicant to plant additional high marsh vegetation, such as gum plant (*Grindelia* sp.) along the outboard side of the sheet pile wall to provide additional much needed cover for prey. Additional predation could result from installation of sheet pile walls because the wall itself could provide perching sites for Common Ravens, Red-tailed Hawks, Peregrine Falcons or other birds of prey who could hunt for prey such as salt marsh harvest mouse during the high tides. This impact can be mitigated through installation of predator prevention devices on the sheet pile wall.

Precautions need to be taken to ensure that indirect impacts to salt marsh harvest mice that may wander near the construction area during project implementation or to habitat for the species do not occur. Mitigation measures incorporated into the project include use of exclusion fencing to ensure mice do not migrate into the construction zone during construction activity. Mitigation measures are also recommended to protect the salt marsh harvest mouse during the implementation phase of the project

including pre-construction surveys, environmental awareness training of all construction personnel and use of biological monitors during construction operations near the marsh.

**Potential Impacts to California Black Rail.** Nesting and foraging habitats for the state-listed threatened California Black Rail are generally consistent with areas that provide suitable nesting and foraging areas for Ridgway's Rail. California Black Rail has been known to occur in Belmont Slough and O'Neill Slough, and all areas noted above as nesting and/or foraging habitat for Ridgway's Rail along Belmont and O'Neill Sloughs would be considered suitable habitat for California Black Rail. Any construction proposed along Belmont Slough or O'Neill Slough during the nesting season for Ridgway's Rail (February 1 to August 31) will require that protocol surveys for Ridgway's Rail be conducted to determine presence/absence of Ridgway's Rail in areas of potential nesting habitat within 700 feet of construction activity. Any such protocol surveys conducted prior to nesting season construction in these areas will also include surveys for California Black Rail. Preconstruction surveys by biological monitors in areas of suitable Ridgway's Rail foraging habitat (e.g., adjacent to segment 1) would also include preconstruction surveys for California Black Rail. In addition, the palustrine emergent marsh located inboard of the levee in segment 2 was not included among the areas described as suitable foraging habitat for Ridgway's Rail, but this marsh area could serve as appropriate winter foraging habitat for California Black Rail. Use of a biological monitor during construction when work is conducted in the vicinity of this marsh would ensure that no harm to California Black Rail occur during construction activities. With the addition of a biological monitor at this location, the mitigation program described below would reduce potential project impacts to Ridgway's Rail, California Black Rail and the salt marsh harvest mouse to levels of insignificance.

**Impact 2:** Construction activity could result in indirect impacts to either the Ridgway's Rail (construction activity near foraging or nesting areas and, in particular, within 700 feet of potential nests for Ridgway's Rail) or salt marsh harvest mouse (construction activity in areas immediately adjacent to suitable habitat). Potential impacts to California Black Rail similar to those identified for Ridgway's Rail are possible within all areas noted as suitable habitat for Ridgway's Rail, and within the marsh inboard of the levee at the east end of segment 2 that provides potentially suitable winter foraging habitat for California Black Rail.

**Mitigation Measure 2:** In order to minimize potential effects to salt marsh harvest mouse, Ridgway's Rail and California Black Rail and their habitats, the applicant proposes the following mitigation measures:



- Levee construction in segment 4 (south of Destination Park), 5, 6, 7 and 8 will be conducted between September 1 and January 31 to avoid the nesting season of the Ridgway's Rail. If construction work is proposed after January 31 or prior to September 1, protocol surveys for Ridgway's Rail will be conducted to determine the extent and location of nesting Ridgway's Rail. Results of protocol breeding surveys will be submitted to the USFWS for a determination of whether work proposed within 700 feet of a Ridgway's Rail nest (or the activity center of vocalizing Ridgway's Rails) discovered during such surveys will be rescheduled to occur during the period from September 1 to January 31. Protocol surveys conducted between January 31 and September 1 will include nesting surveys for California Black Rail. Results of surveys for California Black Rail will be submitted to CDFW to determine if setbacks are warranted to protect nesting California Black Rail.
- A qualified biological monitor(s) will be present during all construction work taking place adjacent to salt marsh providing suitable habitat for Ridgway's Rail, California Black Rail and salt marsh harvest mouse in segments 4 (south end) 5, 6, 7 and 8. A biological monitor(s) will also be present during construction work taking place adjacent to suitable foraging habitat for rails in the marsh adjacent to segment 1 and the marsh inboard of levee segment 2 that provides potentially suitable winter foraging habitat for California Black Rail. The monitors are to have demonstrated experience in monitoring sensitive resource issues on construction projects and knowledge of the biology of salt marsh harvest mouse, Ridgway's Rail and California Black Rail. Prior to the initiation of construction, qualifications of the prospective biological monitor(s) will be submitted to the USFWS for review and approval. The monitor(s) will have the authority to halt construction, if necessary, when noncompliance actions occur. The biological monitor(s) will be the contact person for any employee or contractor who might inadvertently kill or injure a listed species or anyone who finds a dead, injured, or entrapped listed species.
- Exclusion fencing will be placed around the outboard side of the defined work area prior to the start of construction activities to prevent salt marsh harvest mice from moving into affected areas. The fence shall be made of a material that does not allow harvest mice to pass through, and the bottom shall be buried so that mice cannot crawl under the fence. All supports for the exclusion fencing should be placed on the inboard side of the fence.

- Prior to commencement of construction activity each day in segments 1, 4 (south end), 5, 6, 7 and 8, and near marsh habitats inboard of segment 2, the biological monitor(s) shall conduct a preconstruction survey of the anticipated construction zone for that day to ensure that salt marsh harvest mice, Ridgway's Rails or California Black Rails are not present within the work area.
- The biological monitor(s) will provide an endangered species training program to all personnel involved in project construction. At a minimum, the employee education program will consist of a brief presentation by persons knowledgeable about Ridgway's Rail, California Black Rail and salt marsh harvest mouse biology and legislative protection to explain concerns to contractors, their employees, and agency personnel involved with implementation of the project. The program will include the following: a description of the three species and their habitat needs, any reports of occurrences in the action area; an explanation of the status of the Ridgway's Rail, California Black Rail and salt marsh harvest mouse and their protection under state or federal Endangered Species Acts; and a list of measures being taken to reduce impacts to these species during the work. Fact sheets containing this information will be distributed to all involved in the training.
- If any rail or mouse species is observed at any time during construction, work will not be initiated or will be stopped immediately by the biological monitor until the rail or mouse leaves the vicinity of the work area on its own volition and the USFWS is notified. If the rail or mouse does not leave the work area, work will not be reinitiated until the USFWS is contacted and has made a decision on how to proceed with work activities. The biological monitor(s) will direct the contractor on how to proceed accordingly. The biological monitor(s) or any other persons at the site will not pursue, capture, handle or harass any rail or mouse observed.
- Biological monitor(s) shall ensure that construction work is scheduled to avoid extreme high tides when there is potential for salt marsh harvest mice to move to higher, drier grounds. All equipment will be staged on existing roadways away from the project site when not in use.
- All personnel and any equipment will be required to stay within the designated work sites and access corridors to perform job-related tasks, and will not be allowed to enter adjacent salt marsh wetlands, drainages, and habitat of listed species. Pets will not be allowed in or near the work

site. Firearms will not be allowed in or near the work sites. No intentional killing, harassment, or injury of wildlife will be permitted. The work sites will be maintained in a clean condition. All trash (e.g., food scraps, cans, bottles, containers, wrappers, cigarette butts, and other discarded items) will be placed in closed containers and properly disposed of offsite on a daily basis. Trash cans will be “bear proof” to reduce the amount of waste available to vermin and other predators. No fires will be permitted in any of the work sites.

- Interpretative signage will be placed along the Bay Trail to encourage public awareness of wetlands ecology, endangered species life histories, species/predator interactions, and how predation of sensitive species can be minimized. Additional signs will be placed at various points to remind users of the Bay Trail with respect to a prohibition on dogs within the project area during the construction phase of the project.
- Use of the Bay Trail along the shoreline will be limited to pedestrians, bicycles and battery operated wheelchairs or other similar mechanisms associated with access for disabled individuals.
- Appropriate erosion control materials such as silt fence and straw rolls will be installed as needed during construction activities within the project area.
- Hazardous materials used during the work period (e.g., fuels, lubricants, solvents, etc.) will be controlled, cleaned up, and properly disposed of outside the tidal marsh areas. Refueling areas for any equipment will be located at upland sites outside of wetlands.
- After construction, a final clean-up will include removal of all refuse generated by the work. Vegetation will not be removed or disturbed in the clean-up process.
- If requested, before, during, or upon completion of construction, the construction contractor will allow access by USFWS personnel to the work areas to inspect effects, if any, of the actions on the salt marsh harvest mouse or Ridgway’s Rail.
- Subsequent to construction, the project proponent will submit a compliance report, prepared by the biological monitor, to the USFWS within 60 days after completion of the work. This report will detail the dates the work occurred; information concerning the success of the

actions in meeting the recommended mitigation measures; any effects on the salt marsh harvest mouse and Ridgway's Rail; documentation of the worker environmental awareness training; and any other pertinent information.

**Impact 3:** In portions of the levee where sheet pile walls are proposed for flood protection and salt marsh habitats occur on the outboard side of the levee (segment 1 and the entire length of the levee alignment along Belmont Slough and O'Neill Sloughs from the southern portion of segment 4 at Destination Park through segment 8), impacts to Ridgway's Rail, California Black Rail or salt marsh harvest mouse could result from installation of sheet pile walls. The sheet pile walls potentially prevent individuals of these species from seeking suitable refugial sites from predators during extreme high tide events. Additional predation of these species could result from installation of sheet pile walls because the wall itself could provide perching sites for Common Ravens, Red-tailed Hawks, Peregrine Falcons or other birds of prey who could hunt for prey during the extreme high tides.

**Mitigation Measure 3:** In order to minimize potential effects to salt marsh harvest mouse, Ridgway's Rail and California Black Rail resulting from installation of sheet piles walls in areas adjacent to suitable habitats for these species, the applicant proposes the following avoidance and minimization measures:

- To provide high tide refuge and cover for Ridgway's Rail, California Black Rail and salt marsh harvest mouse, vegetation shall be planted along the outboard side of the sheet pile wall in all areas adjacent to salt marsh habitats where sheet pile is installed along the levee. A Detailed Vegetation Planting Plan shall be submitted to the USFWS within 60 days of the start of construction. The Detailed Vegetation Planting Plan shall include establishment of high marsh vegetation (including the planting of gumplant and pickleweed), monitoring period, performance criteria, and erosion control measures.
- Nixalite spikes or other USFWS-approved perching prevention device will be applied to the top of the sheet pile wall in all areas of the levee where sheet pile walls are installed adjacent to salt marsh habitats.

**Potential Impacts to Western Snowy Plover and California Least Tern.** Two other federally-listed species have the potential for occasional occurrence in the vicinity of the Foster City levee: the federally-listed threatened Western Snowy Plover and the federally-listed endangered California Least Tern.

Although Western Snowy Plover was documented within salt evaporation ponds in the vicinity of Belmont Slough in the 1970s, no salt ponds currently occur in the vicinity of the Foster City levee and no nesting habitat is currently found in the vicinity of the project area. Occasional foraging by the species within the Foster City Lagoon Dredge Disposal Site (west of the southern portion of segment 5 and north of the eastern portion of segment 6) may be possible when this area is not completely inundated. Foraging by the species is also possible in the areas free of marsh vegetation west of the Mariner's Island Golf Center and outboard of the levee in segment 1. The construction of the proposed levee improvements would have no direct or indirect impact on the Western Snowy Plover.

Likewise, no nesting habitats for California Least Tern occur within any areas in the vicinity of the Foster City levee, however this species has occasionally been sighted during the nesting season and especially during post-breeding dispersal at the Foster City Shell Bar adjacent to segment 3. The construction of the proposed levee improvements would have no direct or indirect impact on California Least Tern.

**Potential Impacts to Special Status Fish Species.** Listed species of salmonids such as steelhead, or other listed fish species such as green sturgeon and longfin smelt, may pass through San Francisco Bay during their annual migrations. None of the special status fish species mentioned (steelhead trout, green sturgeon or longfin smelt) spawn in the portion of San Francisco Bay located along the Foster City shoreline, and although any of these species could be found offshore at certain times of the year, their number would be very small.

Listed species of fish in the Bay or adjacent sloughs could possibly be impacted by (i) in-water work along the shoreline of San Francisco Bay and Belmont Slough during construction, (ii) unmitigated erosion resulting in an increase in turbidity and siltation that could stress respiratory function in fish, or (iii) excessively loud construction operations such as pile-driving that may result in noise levels and vibration that at high levels could result in physical harm or behavioral impacts to individuals of listed fish that may be present in the area. If potentially significant impacts to fish populations are possible, limiting construction work to periods when fish are least likely to be present (June 1 to November 30) is a possible mitigation.

A potential for impacts to special status fish species resulting from levee construction would be an increase in turbidity and siltation that could stress respiratory function in fish. Green sturgeon and longfin smelt would not be likely to suffer adverse impacts from increased turbidity as both are species that occur in deeper portions of the water column and are adapted to higher levels of turbidity. Species like longfin smelt actually seek refuge from predators by seeking turbid waters. Minor turbidity impacts to steelhead would be addressed with Best Management Practices (including use of silt fence or straw

wattles along the shoreline to control sedimentation in runoff) which are proposed as part of the project description (see additional discussion in Section 5.2.4).

In addition to use of Best Management Practices during project construction, the project description includes several other elements that are intended to minimize project impacts on listed species of salmonids and other listed fish species in adjacent waters. As the proposed levee improvements are planned to extend the toe of the levee slope on the inboard side of the levee, the proposed levee construction does not involve in-water work. Although the project requires installation of sheet pile walls to accomplish flood protection, the project proposes vibratory hammering methods to drive the sheet piles into the existing levee rather than traditional pile-driving methods that could result in higher levels of noise and vibration and that could impact fish populations in adjacent waters. In addition, sheet piles will be installed in upland areas (through portions of existing levee) using land-based equipment to minimize sound and vibration levels in bay waters.

NMFS has concluded that the levee improvement project as proposed would not warrant establishment of a work window allowing construction only during certain times of the year to protect listed fish species (personal communication with Gary Stern, Supervising Fish Biologist with NOAA Fisheries/NMFS, July 2016). A work window would not be necessary as long as the project included the following items (all currently included as part of the project description): (i) sheet piles will be installed in uplands (into the existing levee) using land-based equipment, (ii) sheet piles will be installed using vibratory hammering methods, (iii) there would be no in-water work, (iv) the contractor will use BMPs to control erosion and sedimentation into adjacent waters, and (v) widening of the toe of the slope of the levee, if necessary, would be accomplished on the inboard side of the levee if at all possible. NMFS indicated that details regarding a complete mitigation program for the Foster City Levee Improvement Project would be developed as part of an eventual Endangered Species Act Section 7 consultation and Essential Fish Habitat consultation.

Construction of the proposed levee improvements would not result in impacts to fish migration habitat or impacts to either the Steelhead Trout-Central California Coast DPS, Green Sturgeon-Southern DPS, or to longfin smelt.

#### **5.2.4 Animal Species**

The Foster City levee is primarily within an Urban Habitat with sensitive habitats in adjacent areas including Pacific Coast Salt Marsh. Adjacent habitats such as the marshes of Belmont and O'Neill Sloughs, the open waters of the San Francisco Bay, and especially the Foster City Shell Bar, provide quality habitats for a variety of wildlife species. Under both scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), loss of vegetation associated within construction areas of the levee itself would result removal of some

upland vegetation that could support special status species such as salt marsh harvest, Ridgway's Rail or California Black Rail during extreme high tides in the winter when individuals of these species seek refugial habitats in the high marsh and perhaps adjacent uplands (especially the outboard side of the levee from the south end of segment 4 through segment 8).

For both scenarios and throughout the project, most of the vegetation affected by the levee improvements is non-native grasses and landscaping species, and removal of this vegetation would result in only minor disruptions for regularly-occurring wildlife species. Such disruptions include potential elimination of some bird roosting, nesting, and foraging areas or displacement of various species of reptiles, amphibians, and small mammals (including California ground squirrels that burrow into the levee at some locations) to remaining undisturbed areas. Undeveloped properties near the levee would be capable of accommodating the few species that may be displaced by construction. As described in Section 5.2.1 and 5.2.3, limiting construction to involve extension of the toe of the levee slope to the inboard side of the levee and away from important habitats along both Belmont and O'Neill Sloughs and the bay shore, including the Foster Shell Bar, will help ensure that wildlife impacts are kept to a minimum.

**Nesting Birds.** Nesting bird species protected by the federal Migratory Bird Treaty Act could be impacted during project construction. Although work related to levee improvements along levee segments 4 (south end), 5, 6, 7 and 8 is planned to occur during the period between September 1 and January 31, which is outside the nesting season for migratory birds, work on levee segments 1, 2, 3 and most of 4 is proposed to occur at any time of year. Work within levee segments 1 through 4 involving the removal of trees, shrubs or other vegetation during the February 1 to August 1 breeding season of birds could result in mortality or nest failure of nesting avian species if they are present. Such impacts could also occur with use of the 3.8-acre construction staging area proposed on the perimeter levee for the Foster City Phase II Sedimentation Basin if activities occurred during the bird nesting season. Many species of raptors (birds of prey) are sensitive to human incursion and construction activities, and it is necessary to ensure that nesting raptor species are not present in the vicinity of construction sites. Therefore, mitigation measures are recommended below.

**Impact 4:** The removal of vegetation during the February 1 to August 1 breeding season could result in mortality of nesting avian species if they are present.

**Mitigation Measure 4:** If feasible, construction work should take place outside of the February 1 to August 1 breeding window for nesting birds. If construction is to be conducted during the breeding season, a qualified biologist should conduct a pre-construction breeding bird survey in areas of suitable habitat within 15 days prior to the onset of construction activity. If bird nests are found,

appropriate buffer zones should be established around all active nests to protect nesting adults and their young from construction disturbance. Size of buffer zones should be determined in consultation with wildlife agency staff based on site conditions and species involved. Buffer zones should be maintained until it can be documented that either the nest has failed or the young have fledged.

**Water Quality.** Under both scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), construction activities on the project site would involve disturbance and exposure of soils through removal of existing pavement and vegetative cover, excavation for construction of concrete flood wall bases, and placement and grading of fill material to raise the levee. These activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. If not managed properly, the runoff could cause increased sedimentation and turbidity in surface waters outside of the project site, resulting in degradation of water quality.

Construction of levee improvements are proposed to occur immediately adjacent to wetlands in many locations. Such locations include the outboard side of the levee for the entirety of the shoreline of San Francisco Bay, Belmont Slough and O’Neill Slough, locations where wetlands are present along the inboard side of the levee (e.g., portions of segment 2, segment 3 adjacent to wetlands south of Werder Park, segments 5 and 6 adjacent to the City’s Phase II Sedimentation Basin), and along existing wetlands (including mitigation wetlands) at the proposed staging area within the western and northern perimeter levee for the Phase II Sedimentation Basin, and including a short section adjacent to the main Foster City Lagoon. Grading, placement of fill material and other ground-disturbing activities associated with construction of levee improvements could promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream, resulting in indirect impacts to wetlands and potential impacts to fish and wildlife resources. In the absence of water quality controls, indirect impacts to adjacent wetlands and resident animal populations could result from the proposed project due to elevated contaminants in stormwater runoff. The requirement for the implementation of a Stormwater Pollution Prevention Plan (SWPPP), with identification of proper construction techniques and Best Management Practices (BMPs) will minimize adverse effects associated with these activities. In particular, silt fence and straw wattles should be installed along both sides of the work area to protect adjacent wetlands and recreational areas from increased sedimentation.

**Impact 5:** Disturbances related to the proposed construction of levee improvements in areas immediately adjacent to wetlands could promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and downstream aquatic areas, potentially affecting fish and wildlife resources.

**Mitigation Measure 5:** Best Management Practices and all requirements as



detailed in the Stormwater Pollution Prevention Plan shall be implemented to control erosion and migration of sediments off-site. These requirements are necessary along the outboard side of the levee for the entirety of the shoreline of San Francisco Bay, Belmont Slough and O'Neill Slough, locations where wetlands are present along the inboard side of the levee (e.g., portions of segment 2, segment 3 adjacent to wetlands south of Werder Park, segments 5 and 6 adjacent to the City's Phase II Sedimentation Basin), and along existing wetlands (including mitigation wetlands) at the proposed staging area within the western and northern perimeter levee for the Phase II Sedimentation Basin, and at a sort section adjacent to the main Foster City Lagoon. Implementation of water quality controls shall be consistent with the BMP requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. Silt fence in combination with straw wattles should be installed along both sides of the work areas mentioned above to protect adjacent wetlands from increased sedimentation. In addition, vegetation should only be cleared from the permitted construction footprint. Areas cleared of vegetation, pavement, or other substrates should be stabilized as quickly as possible to prevent erosion and runoff.

**Essential Fish Habitat.** The project site is adjacent to an area identified as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act for various life stages of fish species managed with the following FMPs under the Act: the Pacific Groundfish FMP (various rockfishes, sole and sharks), the Pacific Salmon FMP (Chinook salmon, Coho salmon), and the Coastal Pelagic FMP (northern anchovy, Pacific sardine). In addition, the project occurs within an area designated as Habitat Areas of Particular Concern (HAPC) for various federally-managed fish species within the Pacific Groundfish FMP. HAPC are described in the regulations as subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC are more carefully scrutinized during the consultation process. As defined in the Pacific Groundfish FMP, San Francisco Bay, including the project area, is within estuary HAPC. Species that may be near the project area are, among other species, starry flounder (*Platichthys stellatus*), northern anchovy (*Engraulis mordax*), and Chinook salmon (*Oncorhynchus tshawytscha*).

Essential Fish Habitat in the bay or adjacent sloughs could possibly be impacted by (i) in-water work along the shoreline of San Francisco Bay and Belmont Slough, (ii) unmitigated erosion resulting in an increase in turbidity and siltation that could stress respiratory function in fish, or (iii) excessively loud construction operations such as pile-driving that may result in noise levels and vibration that at high levels could result in physical harm or behavioral impacts to fish species that may be present in the area. The

project description for the City of Foster City Levee Improvement Project includes use of Best Management Practices, including use of silt fences and straw wattles, to control erosion and consequent sedimentation in adjacent waters, so significant impacts to fish resulting from increased turbidity levels would not occur. Also, as the proposed levee improvements are planned to extend the toe of the levee slope on the inboard side of the levee, the proposed levee construction does not involve in-water work. Although the project requires installation of sheet pile walls to accomplish flood protection, the project proposes vibratory hammering methods to drive the sheet piles into the existing levee rather than traditional pile-driving methods that could result in higher levels of noise and vibration and that could impact fish populations in adjacent waters. In addition, all driving of sheet piles will be accomplished on land to minimize sound and vibration levels in bay waters.

NMFS has concluded that the levee improvement project as proposed would not warrant establishment of a work window allowing construction only during certain times of the year to protect listed fish species (personal communication with Gary Stern, Supervising Fish Biologist with NOAA Fisheries/NMFS, July 2016). A work window would not be necessary as long as the project included the following items (all currently included as part of the project description): (i) sheet piles will be installed in uplands (into the existing levee) using land-based equipment, (ii) sheet piles will be installed using vibratory hammering methods, (iii) there would be no in-water work, (iv) the contractor will use BMPs to control erosion and sedimentation into adjacent waters, and (v) widening of the toe of the slope of the levee, if necessary, would be accomplished on the inboard side of the levee if at all possible. NMFS indicated that details regarding a complete mitigation program for the Foster City Levee Improvement Project would be developed as part of an eventual Endangered Species Act Section 7 consultation and EFH consultation.

### **5.2.5 Landscaping/Invasive Species**

Invasive, exotic weeds compete with native vegetation and can degrade the quality of wildlife habitats. Project landscaping and construction activity has the potential to introduce invasive, exotic, non-native vegetation, some of which may not now exist in the area. Also, construction projects provide a pathway for dispersal of invasive plants. Invasive plant species include those designated as noxious weeds by the U.S. Department of Agriculture, problem species listed by the California Department of Food and Agriculture, and other invasive plants designated by the California Invasive Plant Council. Where appropriate, vegetation removed as a result of project activities should be replaced with native species which are of value to local wildlife. Native plants generally are more valuable as wildlife food sources and require less irrigation, fertilizers, and pesticides than exotic species.

**Impact 6:** Project landscaping and construction activity is expected to introduce exotic, non-native vegetation, some of which may not exist in the area.

**Mitigation Measure 6:** Landscaping will be designed to enhance the wildlife value and aesthetic quality of undeveloped portions of the project site. Where appropriate, vegetation removed as a result of project activities will be replaced with native species which are of value to local wildlife, and native vegetation will be retained. If deemed necessary by the City Public Works Department, weed management practices will be implemented, including identification and removal of infestations of noxious weeds prior to construction, use of construction equipment and materials such as fill and erosion control devices that are known to be weed-free, power washing of construction vehicles to remove mud, dirt and vegetative material before working in relatively weed-free areas, and removal of invasive species from areas within the project boundary set aside for open space uses.

## 6.0 REFERENCES

- Adams, P.B., C.B. Grimes, J.E. Hightower, S.T. Lindley, and M.L. Moser. 2002. Status Review for North American Green Sturgeon, *Acipenser medirostris*. June. Prepared for National Marine Fisheries Service and North Carolina Cooperative Fish and Wildlife Research Unit.
- Albertson, J.D. 1995. Ecology of the California Clapper Rail in South San Francisco Bay. Master's thesis. San Francisco State University, San Francisco, California. 147 pp.
- Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, and T.J. Rosatti, editors. 2012. *The Jepson Manual. Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded*. University of California Press, Berkeley, California.
- BakerAECOM, "A Central San Francisco Bay Coastal Flood Hazard Study (San Mateo County, California) Coastal Analysis Report," July 25, 2014; and BakerAECOM, "A South San Francisco Bay Coastal Flood Hazard Study (San Mateo County, California) Study Report," May 7, 2014.
- Barbour, M. B. Pavlik, F. Drysdale, and S. Lindstrom. 1991. California vegetation: diversity and change. *Fremontia* 19(1):3-12.
- Bias, M.A., and M.L. Morrison. 1999. Movements and home range of salt marsh harvest mice. *Southwestern Naturalist* 44(3):348–353.
- California Department of Fish and Game. 1965. California Fish and Wildlife Plan. Three volumes. Sacramento, CA.
- California Department of Fish and Game. 2009. A Status Review of the Longfin Smelt (*Spirinchus thaleichthys*) in California. Report to the Fish and Game Commission. California Department of Fish and Game.
- California Department of Fish and Wildlife. 2010. List of Vegetation Alliances and Associations. Vegetation Classification and Mapping Program. September. [http://www.dfg.ca.gov/biogeodata/vegcamp/natural\\_comm\\_list.asp](http://www.dfg.ca.gov/biogeodata/vegcamp/natural_comm_list.asp).
- California Department of Fish and Wildlife. 2013. State and Federally Listed Endangered, Threatened, and Rare Plants of California. April. <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEPlants.pdf>.
- California Department of Fish and Wildlife. 2016. Special Animals List For State of

California produced by Biogeographic Data Branch, California Natural Diversity Database, California Department of Fish and Wildlife. List dated July 2016. Current as of July 2016.

California Department of Fish and Wildlife. 2016. Natural Heritage Division, Natural Diversity Data Base for the San Mateo Quadrangle Map and surrounding areas, May 2016.

California Native Plant Society, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website <http://www.rareplants.cnps.org>

Cowardin, Lewis M., Virginia Carter, Francis C. Golet and Edward T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*, for Office of Biological Services, Fish and Wildlife Service, U.S. Department of the Interior.

Dahl, T. E. 1990. Wetland losses in the United States 1780's to 1980's. U.S. Fish and Wildlife Service, Washington, D.C.

Daiber, F. C. 1982. *Animals of the Tidal Marsh*. New York, N.Y: Van Nostrand Reinhold Company

Dedrick, K. 1993. San Francisco Bay tidal marshland acreages: recent and historic values. In: O.T. Magoon, ed. *Proceedings of the Sixth Symposium on Coastal and Ocean Management (Coastal Zone '89)*. Charleston, South Carolina, July 11-14, 1989. Published by the American Society of Civil Engineers.

Dege, M. and L. R. Brown. 2004. Effect of Outflow on Spring and Summertime Distribution and Abundance of Larval and Juvenile Fishes in the Upper San Francisco Estuary. Pages 49-65 in L. R. B. Feyrer, R. L. Brown and J. J. Orsi, editor. *Early Life History of Fishes in the San Francisco Estuary and Watershed*. American Fisheries Society, Bethesda, Maryland.

DeGroot, D.S. 1927. The California clapper rail: its nesting habitats, enemies, and habitat. *Condor* 29:259-270.

Dixon, J. 1908. A new harvest mouse from the salt marshes of San Francisco Bay, California. *Proc. Biol. Soc. Wash.* 21:197-198.

Evens, J. and G. Page. 1983. *The Ecology of Rail Populations at Corte Madera Ecological*

Preserve with Recommendations for Management. Prepared for Marin Audubon Society. 62pp.

Fisler, G.F. 1965. Adaptations and speciation in harvest mice of the marshes of San Francisco Bay. University of California Publications in Zoology, Volume 77. Berkeley, C.A.: University of California Press.

Foerster, K.S. 1989. Summary of California clapper rail winter populations in the San Francisco Bay National Wildlife Refuge, November 1988 to January 1989. U.S. Fish and Wildlife Service Report, Newark, CA. 17 pp.

Foerster, K.S. and J.E. Takekawa. 1991. San Francisco Bay National Wildlife Refuge Predator Management Plan and Final Environmental Assessment. San Francisco Bay National Wildlife Refuge, Newark, California. 54pp.

Foerster, K.S., J.E. Takekawa, and J.D. Albertson. 1990. Breeding density, nesting habitat, and predators of the California clapper rail. Unpubl. Rpt. No. SFBNWR-116400-90-1, prep. for San Francisco Bay NWR, Newark, CA. 46 pp.

Foin, T.C., E.J. Garcia, R.E. Gill, S.D. Culberson, and J.N. Collins. 1997. Recovery Strategies for California Clapper Rail (*Rallus longirostris obsoletus*) in the heavily-urbanized San Francisco Estuarine Ecosystem. Landscape and Urban Planning 38(1997): 229-243.

Ganssle, D. 1966. Fishes and Decapods of San Pablo and Suisun Bays. Pages 64 to 94 in D.W. Kelley (comp.), Ecological Studies of the Sacramento-San Joaquin Estuary, Part I. (California Department of Fish Game Fish Bulletin 133.)

Gill, R. 1979. Status and distribution of the California clapper rail (*Rallus longirostris obsoletus*). California Fish and Game 65(1): 36-49.

Gold, J. 2009. Fish Community and Dredge Entrainment Monitoring on the Delta's Federal Shipping Channels. Green Sturgeon, Longfin Smelt, and Dredging Operations Symposium. San Francisco Estuary Institute, Oakland, California.

Harvey, T.E. 1988. Breeding biology of the California clapper rail in South San Francisco Bay. Transactions of the Western Section of the Wildlife Society 24:98-104.

Hobbs, J. A. 2009. Special Studies Relevant to Dredging Impacts on Longfin Smelt. Green Sturgeon, Longfin Smelt, and Dredging Operations Symposium. San Francisco Estuary Institute, Oakland, California.

- Huffman-Broadway Group, Inc. 2014. Biological Assessment, Werder Park Project. Prepared for City of Foster City, Estero Municipal Improvement District. February 2014.
- Huffman-Broadway Group, Inc. 2014. Biological Assessment, Destination Park Project. Prepared for City of Foster City, Estero Municipal Improvement District. February 2014.
- Huffman-Broadway Group, Inc. 2014. Biological Assessment, East Third Avenue Kiteboard/Windsurf Site. Prepared for City of Foster City, City Manager's Office. April 2014.
- Huffman-Broadway Group, Inc. 2016. *Biological Assessment, Dredging at the Lagoon Intake Structure (CIP 301-629) Project, City of Foster City, California*, April 27, 2016. San Rafael, California. 63 pp. plus attachments. Prepared for City of Foster City, California.
- Hulst, M.D. 2000. Salt marsh harvest mouse habitat use and habitat quality at San Pablo Bay, CA. Master's Thesis, California State University, Sacramento.
- Interagency Ecological Program. 2005. Bay Delta and Tributaries Project. Available: <http://www.iep.ca.gov>.
- Interagency Ecological Program Steelhead Project Work Team. 1999. Interagency Ecological Program Steelhead Project Work Team. 1999. Monitoring, Assessment, and Research on Central Valley Steelhead: Status of Knowledge, Review Existing Programs, and Assessment Needs. In Comprehensive Assessment, and Research Program Plan, Tech. App. VII.
- Jensen, D. B., M. Torn, and J. Harte. 1990. In our own hands: A strategy for conserving biological diversity in California. California Policy Seminar Research Report. University of California, Berkeley.
- Leidy, R. A. 2000. Steelhead. *Onchorynchus mykiss irideus*. pp. 101-104 in: Olofson, P. R. (Goals Project), Baylands ecosystem species and community profiles: life histories and environmental requirements of key plants, fish and wildlife. SFB RWQCB, Oakland, CA xvi+407pp.
- Mayer, E. Kenneth and William F. Laudenslayer, Jr., (Eds.). 1988. *A Guide to Wildlife Habitats of California*.

- McEwan, D. and T.A. Jackson. 1996. Steelhead Restoration and Management Plan for California. California Department of Fish and Game.
- McGowan, M. F. 2010. Longfin Smelt Monitoring During Dredging of the Pinole Shoal Channel in San Pablo Bay, California in June 2010. Report Prepared for U. S. Army Corps of Engineers, San Francisco.
- Moyle, P.B. 2002. Inland Fishes of California. Second edition. Davis, CA: University of California Press.
- Munz, Philip A. and David D. Keck 1973. *A California Flora and Supplement*. University of California Press.
- National Geographic Society. 2011. *Field Guide to North American Birds*. Sixth edition. National Geographic Society. Washington, D.C.
- National Marine Fisheries Service (NMFS). 2006. Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead. Federal Register 71 (3): 856. January 5, 2006. [Online] Available: <http://www.epa.gov/fedrgstr/EPA-IMPACT/2006/January/Day-05/i47.htm>
- Pomeroy L. R., and Wiegert R. G. 1981. The Ecology of the Salt Marsh. New York, N.Y.: Springer-Verlag.
- Radtke, L.D. 1966. Distribution of Smelt, Juvenile Sturgeon, and Starry Flounder in the Sacramento-San Joaquin Delta with Observations on Food of Sturgeon. Pages 115 to 129 in J.L. Turner and D.W. Kelley (comp.), Ecological Studies of the Sacramento-San Joaquin Delta, Part II, California Department of Fish and Game Fish Bulletin 136.
- Reed, Porter B. 1988. *National List of Plant Species That Occur in Wetlands: National Summary*. U.S. Fish and Wildlife Service, Washington, D.C. Biol. Rpt. 88(24). 244pp.
- Reed, Porter B. 1988. *National List of Plant Species that Occur in Wetlands: California (Region O)*.
- Reid, Fiona A. 2006. *Mammals of North America*. Peterson Field Guides. Fourth Edition. Houghton Mifflin Co., Boston.
- Rice, V. C. 1974. The population ecology of the salt marsh harvest mouse at Triangle Marsh. M. A. Thesis, San Jose State University, San Jose, CA.
- Robinson, April and Ben K. Greenfield. 2011. LTMS Longfin Smelt Literature Review and



- Study Plan, Final Technical Report. Prepared for the Long-Term Management Strategy for Dredged Material in San Francisco Bay. San Francisco Estuary Institute. August 2011.
- Rosenfield, J. A. 2009. Distribution and Abundance Trends of Longfin Smelt in the San Francisco Estuary. Green Sturgeon, Longfin Smelt, and Dredging Operations Symposium. San Francisco Estuary Institute, Oakland, California.
- Sawyer, J. O. and T. Keeler-Wolf. 2009. *A Manual of California Vegetation*. Second Edition. In cooperation with The Nature Conservancy and the California Department of Fish and Game. California Native Plant Society. Sacramento, California.
- Shellhammer, H.S., R.R. Duke, H.T. Harvey, V. Jennings, V. Johnson, and M. Newcomer. 1988. Salt marsh harvest mice in the diked salt marshes of Southern San Francisco Bay. *Wasmann J. Bio.* 46: 89-103.
- Sibley, David A. 2014. *The Sibley Guide to Birds*. Second Edition. National Audubon Society. Chanticleer Press, Inc. New York, N.Y. 624 pp.
- Stebbins, R.C. 2003. *Western Reptiles and Amphibians*. Peterson Field Guides. Houghton Mifflin Co., Boston. Third edition.
- Suisun Eco Workgroup. 2004. Wildlife of the Suisun Marsh, Salt Marsh Harvest Mouse. [Online] Available: [http://www.iep.water.ca.gov/suisun\\_eco\\_workgroup/workplan/report/wildlife/shmouse.html](http://www.iep.water.ca.gov/suisun_eco_workgroup/workplan/report/wildlife/shmouse.html) (Accessed April, 2005)
- Swedberg, B. and J. Zentner. 2009. Longfin Smelt Entrainment: Lessons from Port Sonoma. Green Sturgeon, Longfin Smelt, and Dredging Operations Symposium. San Francisco Estuary Institute, Oakland, California.
- Tracy, C. 1990. Green Sturgeon Meeting and Comments. Memorandum. Olympia, WA: Washington Department of Fisheries.
- U.S. Army Corps of Engineers. 1987. *Corps of Engineers Wetland Delineation Manual*, Technical Report Y-87-1. Prepared by the Environmental Laboratory, Department of the Army, Waterways Experiment Station, Vicksburg, Miss.
- U.S. Army Corps of Engineers. 2005. *Technical Standard for Water-Table Monitoring of Potential Wetland Sites*. WRAP Technical Notes Collection (ERDC-TN-WRAP-05-2), US Army Engineer Research and Development Center, Vicksburg, MS.

- U.S. Army Corps of Engineers. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U.S. Department of Agricultural, Soil Conservation Service. 1993. *Soil Survey of San Mateo County, Eastern Part San Francisco County*.
- U.S. Fish and Wildlife Service. 2014. Listings and occurrences for California. Federally listed threatened and endangered plant and animal species in California.  
[http://ecos.fws.gov/tess\\_public/pub/stateListingAndOccurrenceIndividual.jsp?state=CA](http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=CA)
- U.S. Fish and Wildlife Service. 2014. Species proposed for listing in California based on published population data.  
[http://ecos.fws.gov/tess\\_public/pub/stateListingIndividual.jsp?state=CA&status=proposed](http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=CA&status=proposed).
- U.S. Fish and Wildlife Service. 2014. Candidate species in California based on published population data.  
[http://ecos.fws.gov/tess\\_public/pub/stateListingIndividual.jsp?state=CA&status=candidate](http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=CA&status=candidate).
- U.S. Fish and Wildlife Service. 2009. Biological Opinion on the Proposed Levee Improvement Project in the City of Redwood City, San Mateo County, California (Corps File Number 2009-00306S). December 23, 2009.
- U.S. Fish and Wildlife Service. 1984. Salt Marsh Harvest Mouse and California Clapper Rail Recovery Plan. Portland, Oregon. [Online] Available:  
[http://ecos.fws.gov/docs/recovery\\_plans/1984/841116.pdf](http://ecos.fws.gov/docs/recovery_plans/1984/841116.pdf)
- Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White. 1990a. *California's Wildlife, Volume I. Amphibians and Reptiles*. State of California, the Resources Agency, Department of Fish and Game, Sacramento, California.
- Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White. 1990b. *California's Wildlife, Volume II: Birds*. State of California, the Resources Agency, Department of Fish and Game, Sacramento, California.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White. 1990c. *California's Wildlife, Volume III: Mammals*. State of California, the Resources Agency, Department of Fish and Game, Sacramento, California.

# ATTACHMENT 1.

## Figures

<b>ATTACHMENT 1.</b>	<b>Figures</b>
Figure 1.	Location of the Foster City Levee Protection Planning and Improvements Project
Figure 2.	Foster City Levee Protection Planning and Improvement Project Levee Improvement Type for the 2050 Sea Level Rise Scenario
Figure 3.	Foster City Levee Protection Planning and Improvement Project Levee Improvement Type for the 2100 Sea Level Rise Scenario
Figure 4.	Typical Sheet Pile Floodwall Improvement
Figure 5.	Typical Double Sheet Pile Floodwall Improvement
Figure 6.	Typical Earthen Levee Improvement
Figure 7.	Typical Conventional Floodwall Improvement
Figure 8.	Staging Areas to the North
Figure 9.	Staging Areas to the East
Figure 10.	Staging Areas to the South
Figure 11.	Levee Segment Overview
Figure 11a.	Segment 1 Levee Overview
Figure 11b.	Segment 2 Levee Overview
Figure 11c.	Segment 3 Levee Overview
Figure 11d.	Segment 4 Levee Overview
Figure 11e.	Segment 5 Levee Overview
Figure 11f.	Segment 6 Levee Overview
Figure 11g.	Segment 7 Levee Overview
Figure 11h.	Segment 8 Levee Overview
Figure 12	Soils Map of the Project Area
Figure 13	2004 Foster City Dredge Disposal Mitigation Site
Figure 14	Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction
Figure 14a.	Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 1 of 27
Figure 14b.	Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 2 of 27
Figure 14c.	Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 3 of 27
Figure 14d.	Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 4 of 27
Figure 14e.	Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 5 of 27
Figure 14f.	Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 6 of 27
Figure 14g.	Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 7 of 27

Figure 14h. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 8 of 27  
Figure 14i. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 9 of 27  
Figure 14j. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 10 of 27  
Figure 14k. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 11 of 27  
Figure 14l. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 12 of 27  
Figure 14m. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 13 of 27  
Figure 14n. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 14 of 27  
Figure 14o. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 15 of 27  
Figure 14p. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 16 of 27  
Figure 14q. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 17 of 27  
Figure 14r. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 18 of 27  
Figure 14s. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 19 of 27  
Figure 14t. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 20 of 27  
Figure 14u. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 21 of 27  
Figure 14v. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 22 of 27  
Figure 14w. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 23 of 27  
Figure 14x. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 24 of 27  
Figure 14y. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 25 of 27  
Figure 14z. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 26 of 27  
Figure 14aa. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 27 of 27

- Figure 15      Ridgway's Rail and California Black Rail Habitat in the Project Area  
Figure 15a.      Ridgway's Rail and California Black Rail Habitat Map, NW Sheet  
Figure 15b.      Ridgway's Rail and California Black Rail Habitat Map, NE Sheet  
Figure 15c.      Ridgway's Rail and California Black Rail Habitat Map, SE Sheet  
Figure 15d.      Ridgway's Rail and California Black Rail Habitat Map, SW Sheet
- Figure 16      Location of Impacts to Wetlands and Waters of the U.S. (2050 Sea Level Rise Scenario)
- Figure 17      Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)





**Figure 1. Location of the Foster City Levee Protection Planning and Improvements Project**





**Figure 2. Foster City Levee Protection Planning and Improvement Project  
Levee Improvement Type for the 2050 Sea Level Rise Scenario**





**Figure 3. Foster City Levee Protection Planning and Improvement Project  
Levee Improvement Type for the 2100 Sea Level Rise Scenario**



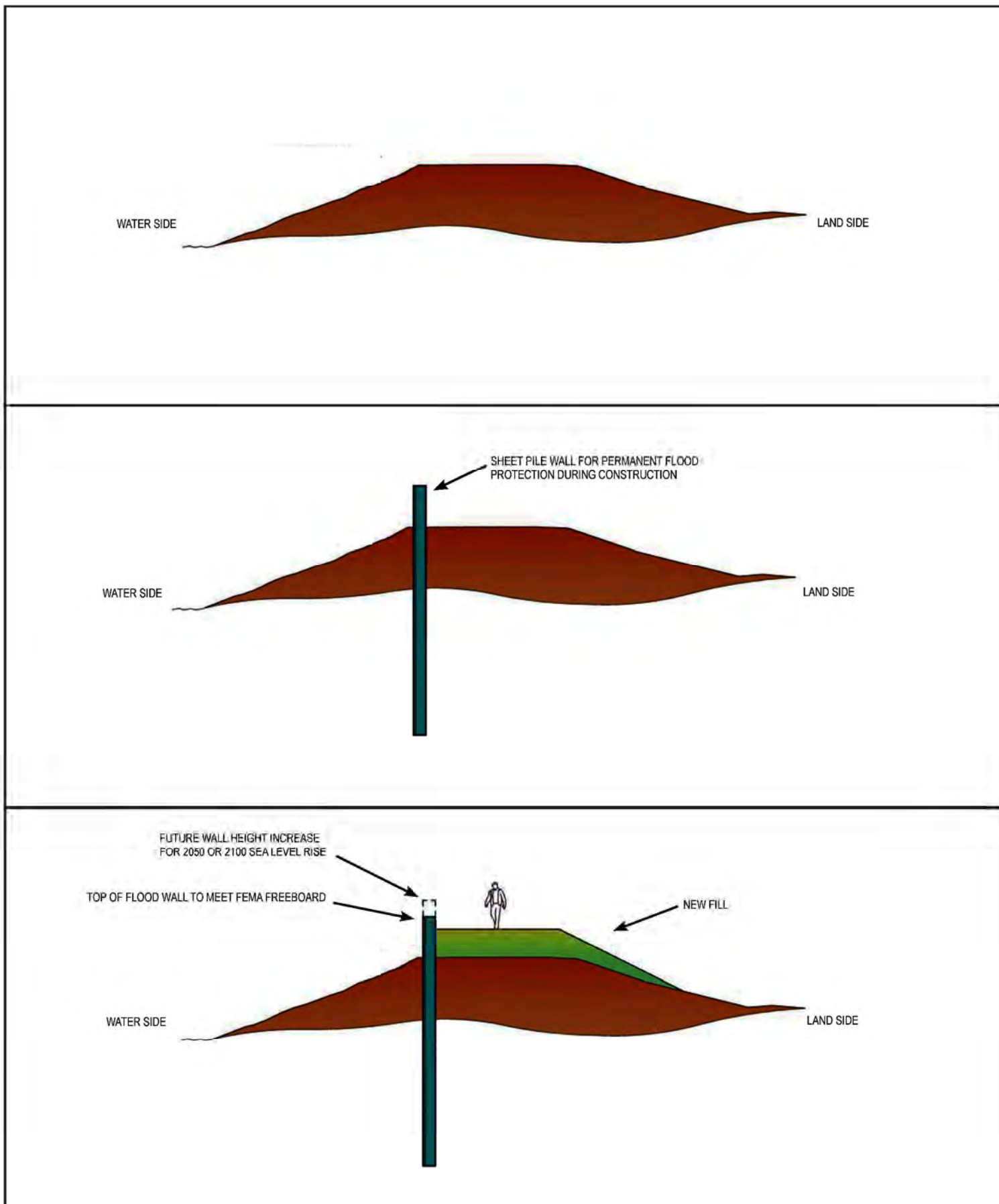


Figure 4. Typical Sheet Pile Floodwall Improvement

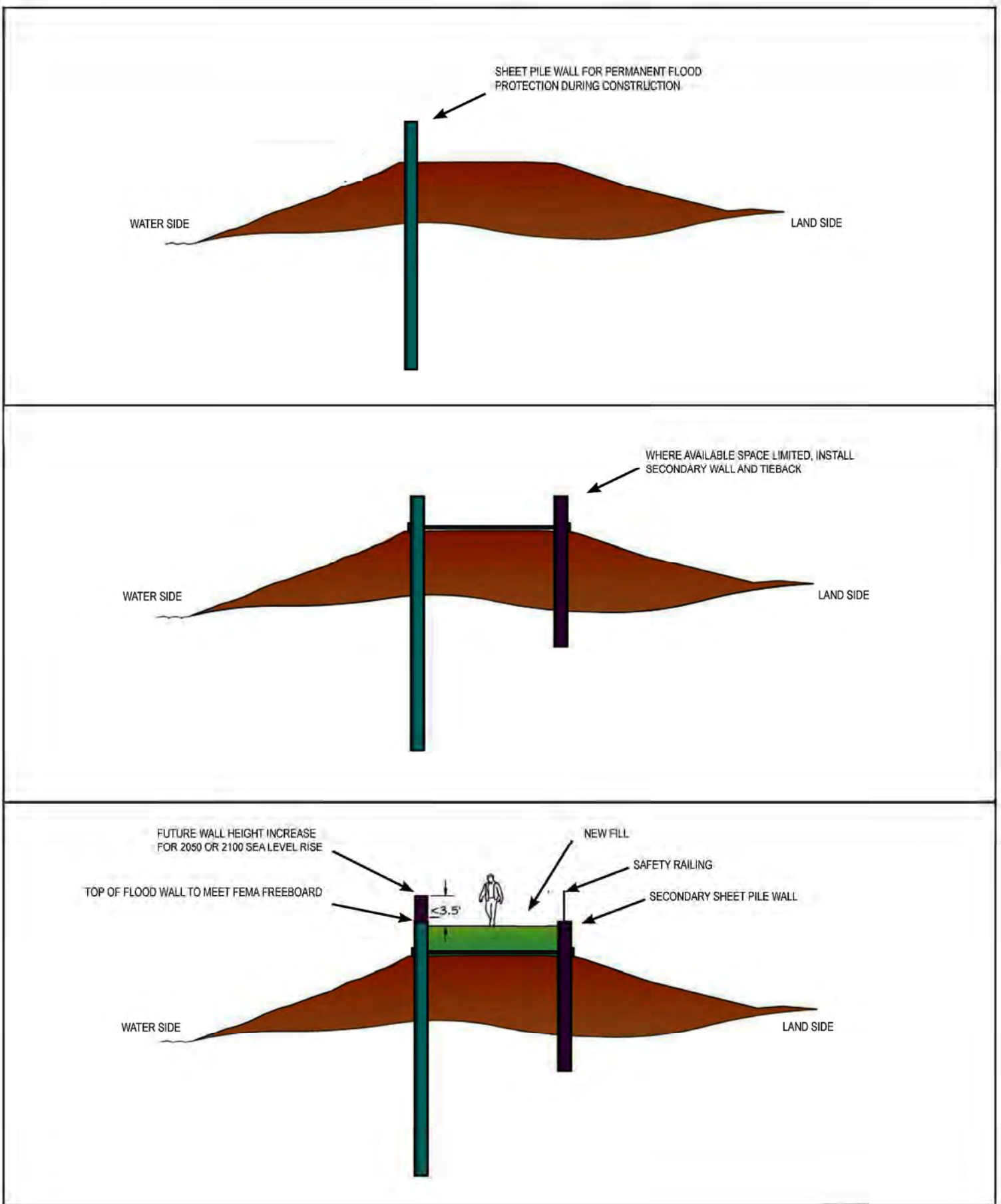


Figure 5. Typical Double Sheet Pile Floodwall Improvement

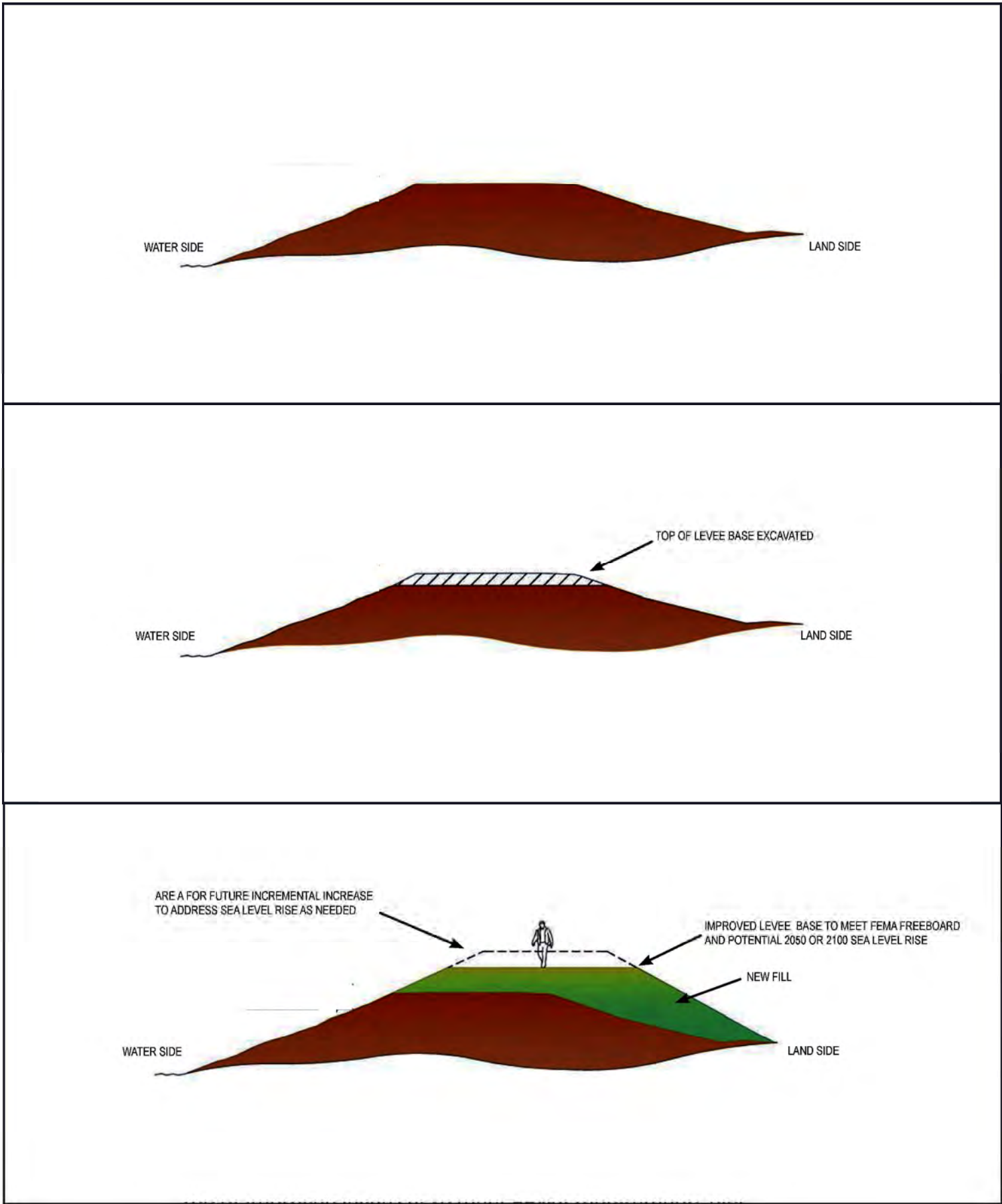


Figure 6. Typical Earthen Levee Improvement

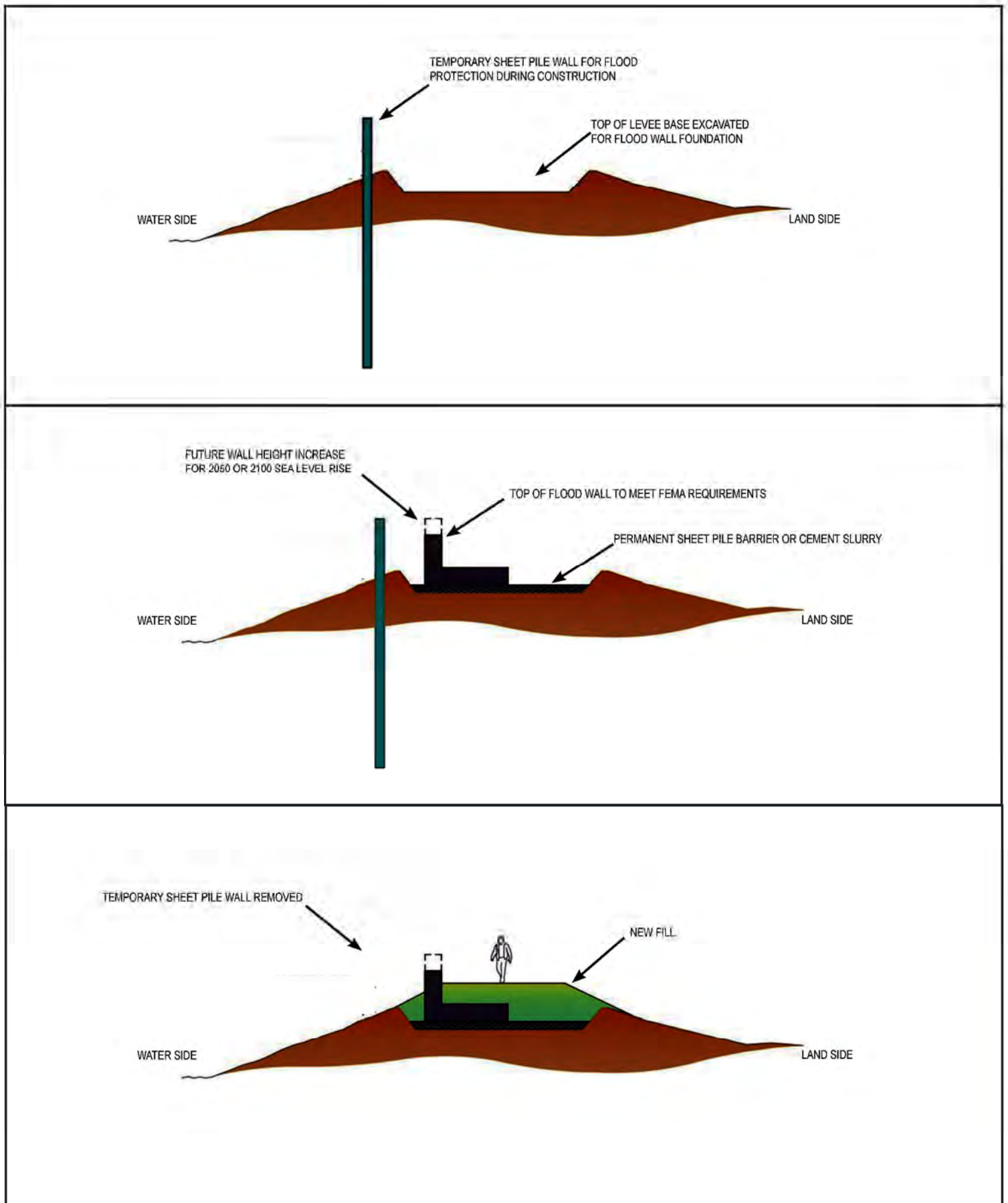


Figure 7. Typical Conventional Floodwall Levee Improvement



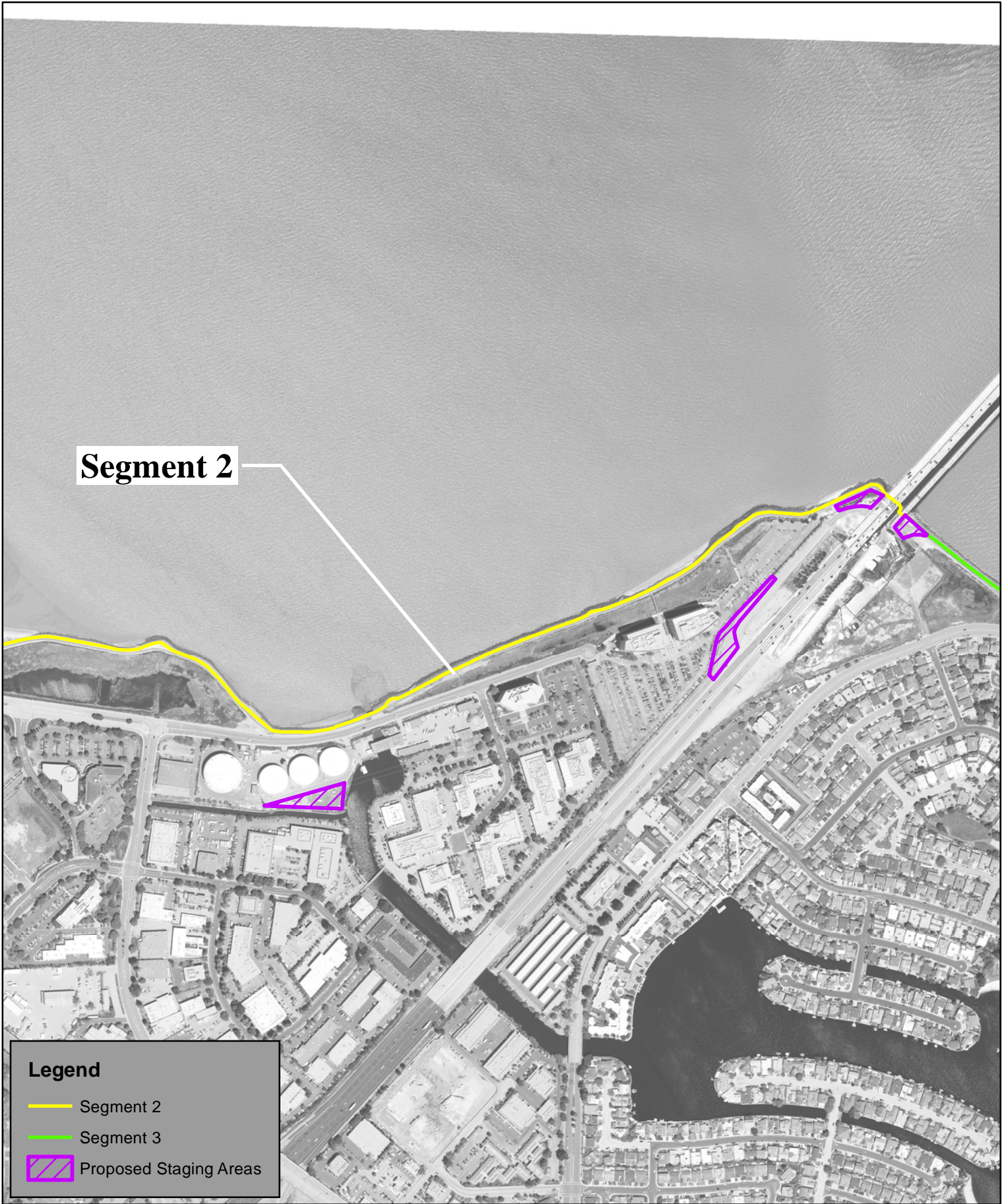


Figure 8. Staging Areas to the North





Figure 9. Staging Areas to the East



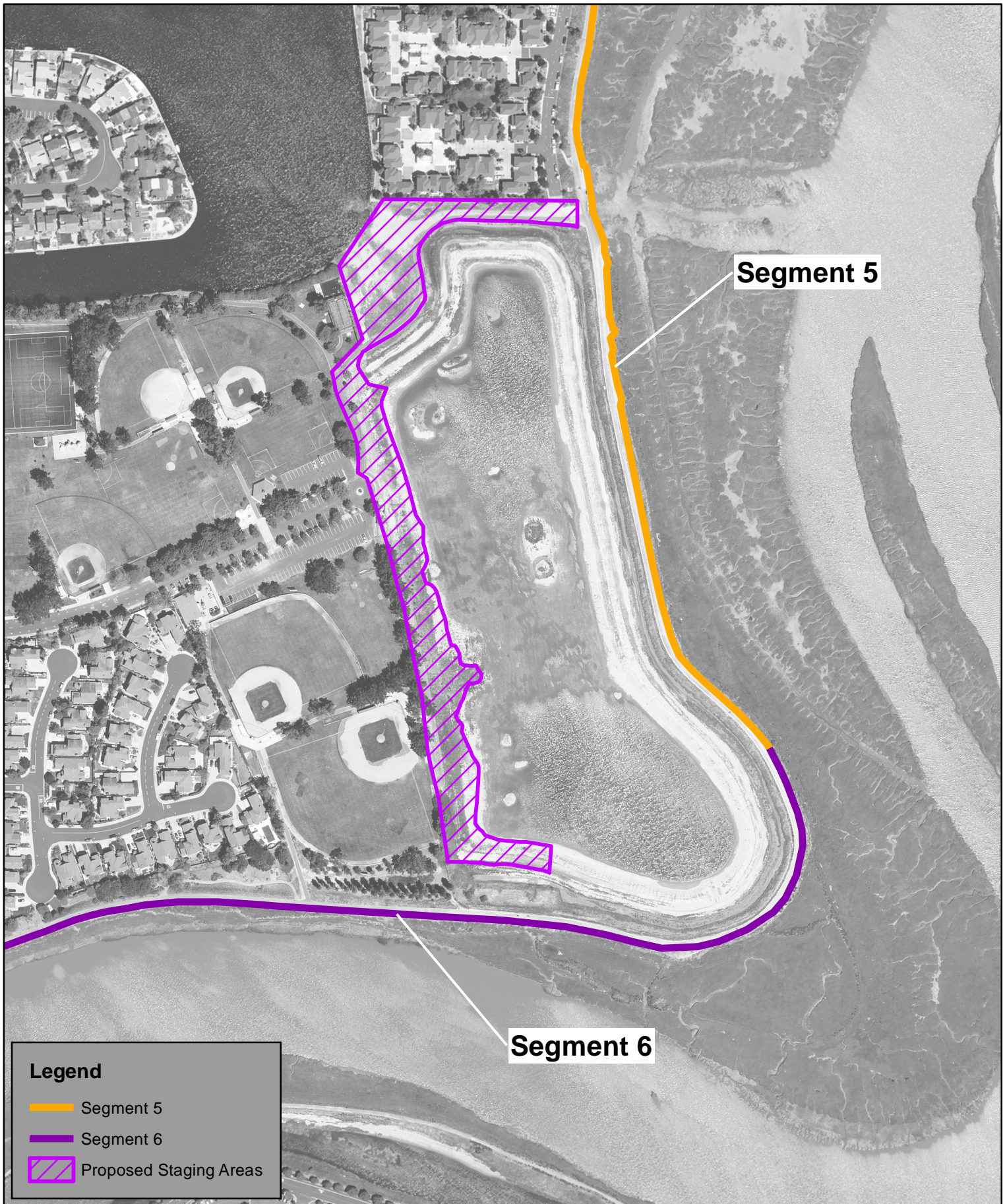


Figure 10. Staging Area to the South





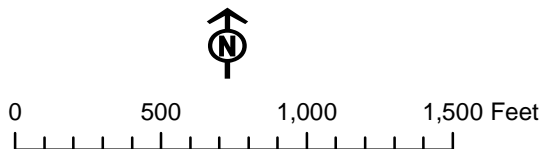
**Figure 11. Levee Segment Overview**

Foster City Proposed Levee Improvements  
 Foster City, San Mateo County, California

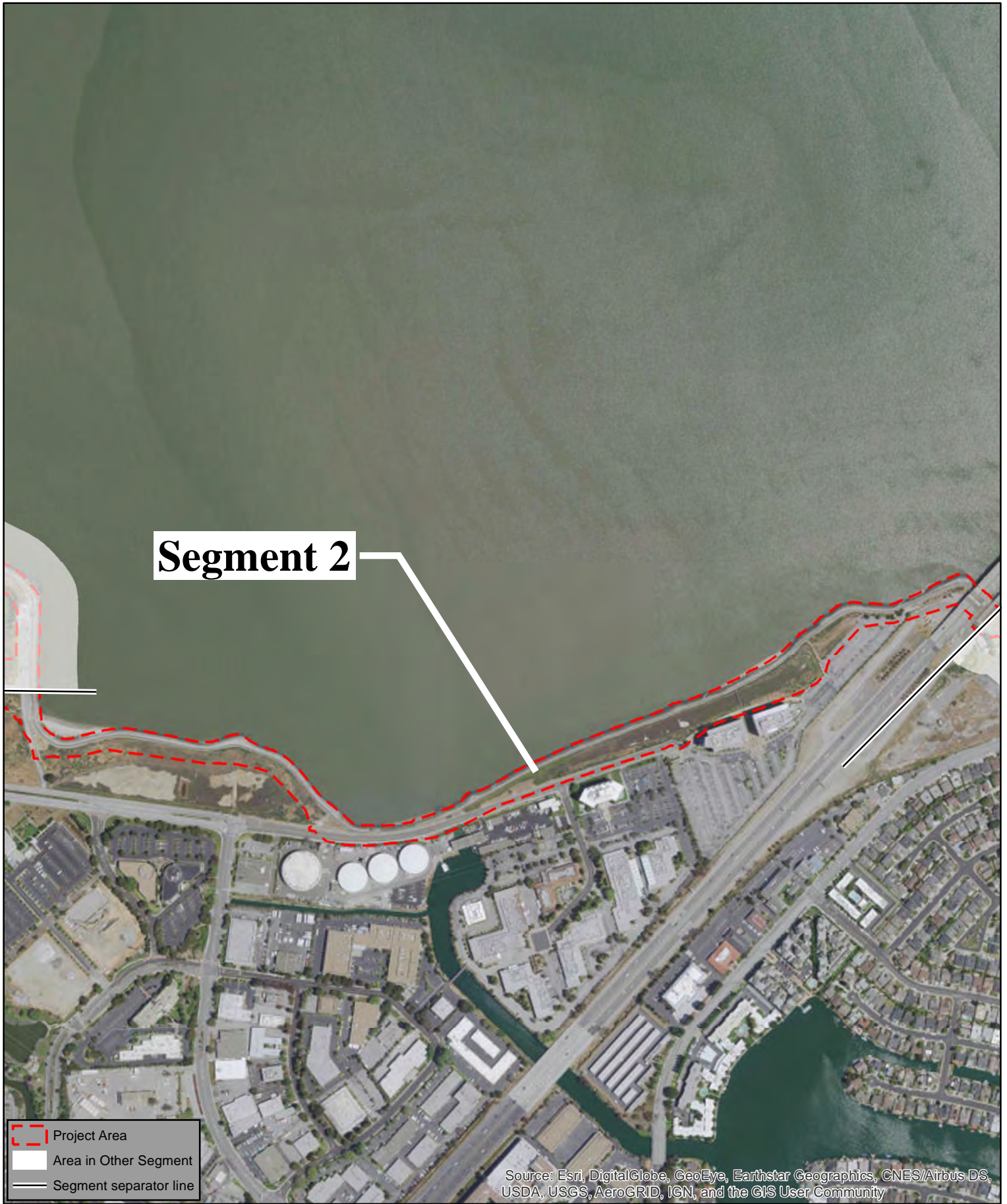




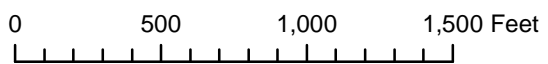
**Figure 11a. Segment 1  
Levee Overview**










**Figure 11b. Segment 2  
 Levee Overview**





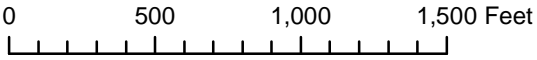


**Segment 3**

-  Project Area
-  Area in Other Segment
-  Segment separator line

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 11c. Segment 3  
Levee Overview**

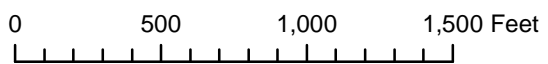


**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS





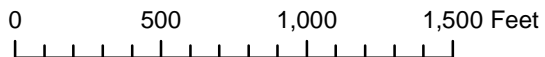
**Figure 11d. Segment 4  
Levee Overview**







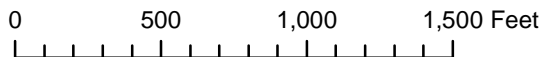
**Figure 11e. Segment 5  
 Levee Overview**







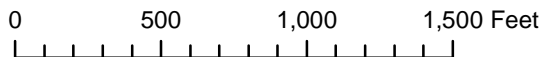
**Figure 11f. Segment 6  
Levee Overview**







**Figure 11g. Segment 7  
 Levee Overview**







**Segment 8**

- Project Area
- Area in Other Segment
- Segment separator line

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 11h Segment 8  
Levee Overview**



0      500      1,000      1,500 Feet

**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS



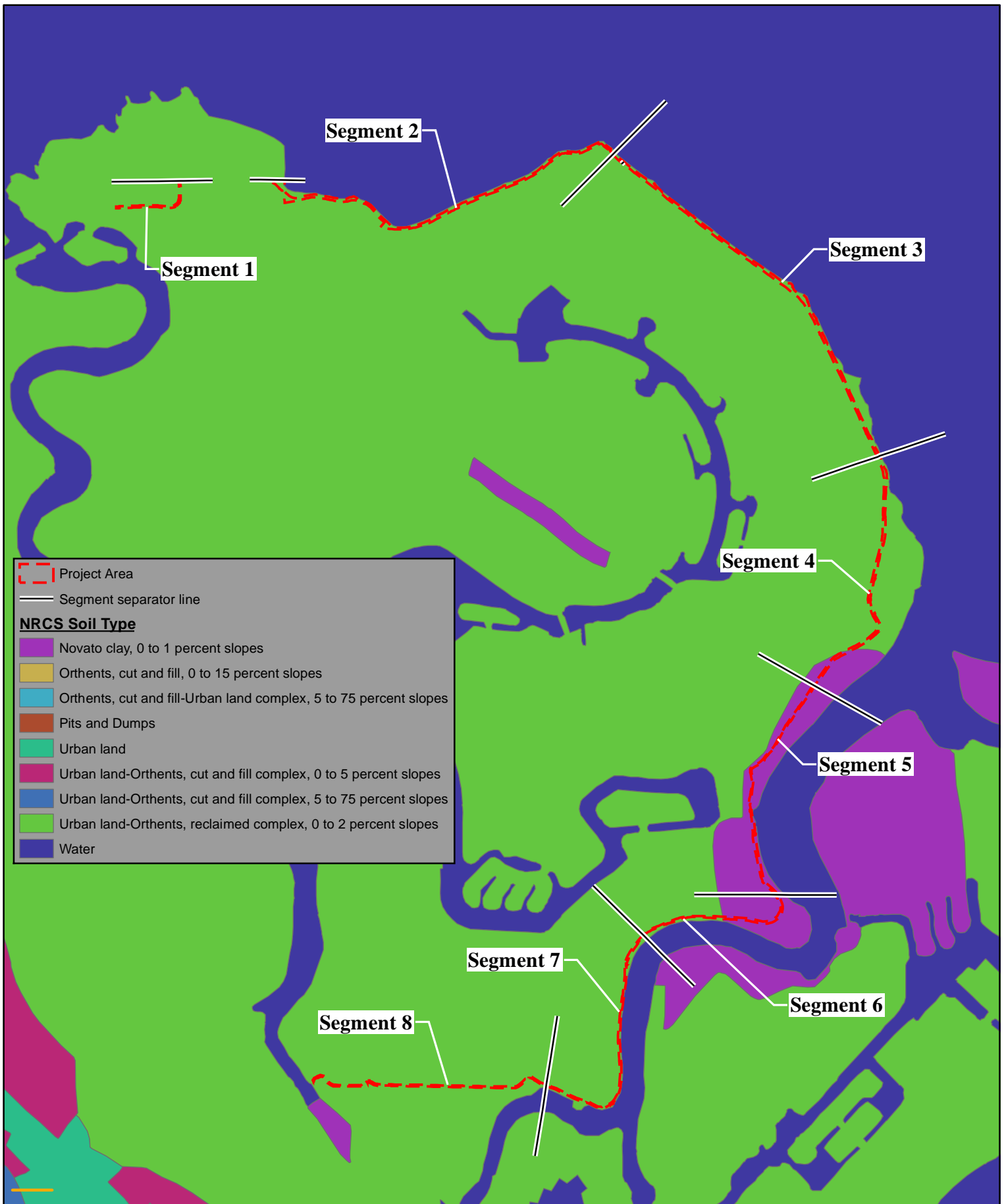
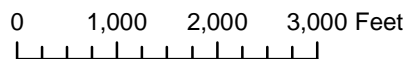
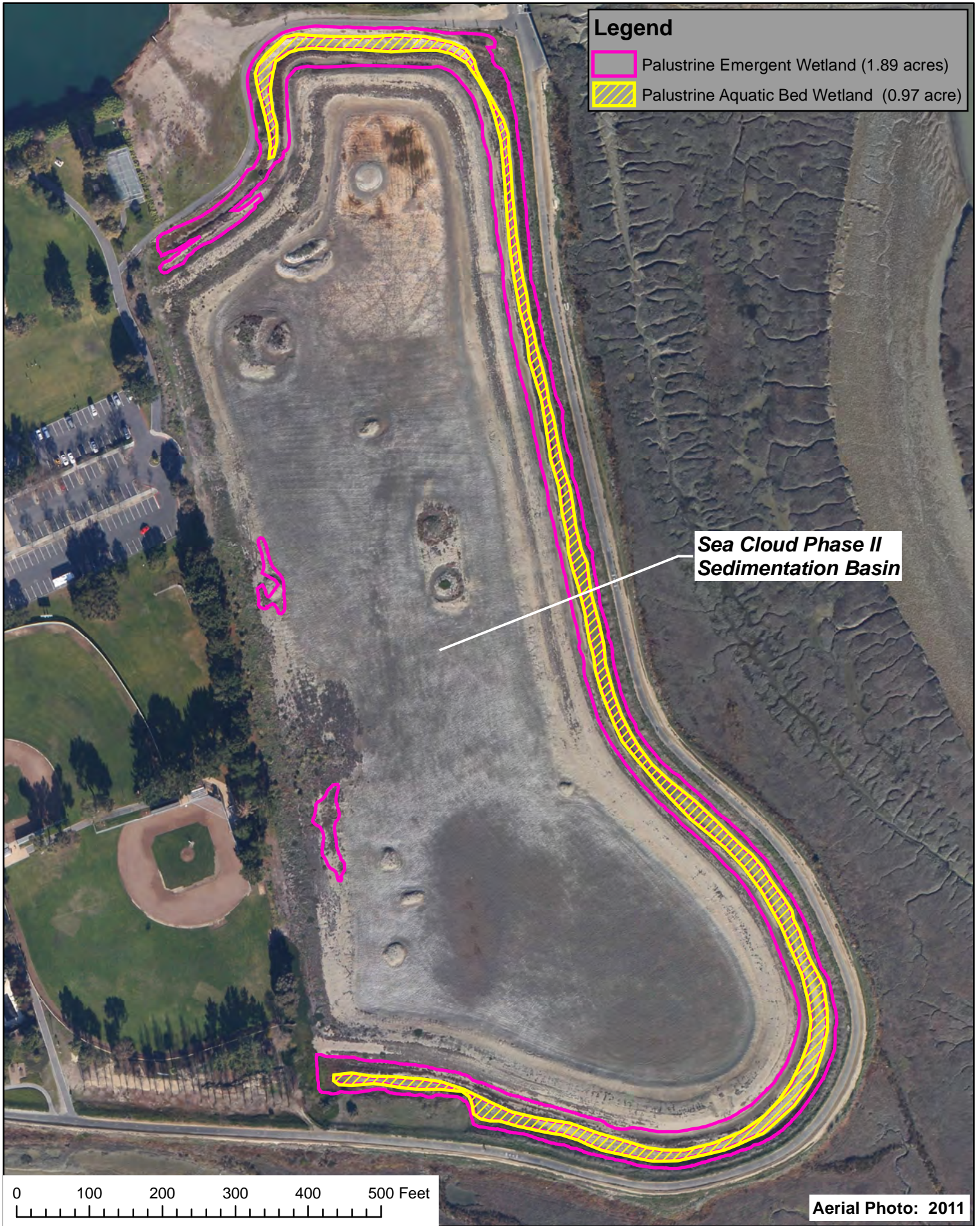


Figure 12. Soils Map of the Project Area

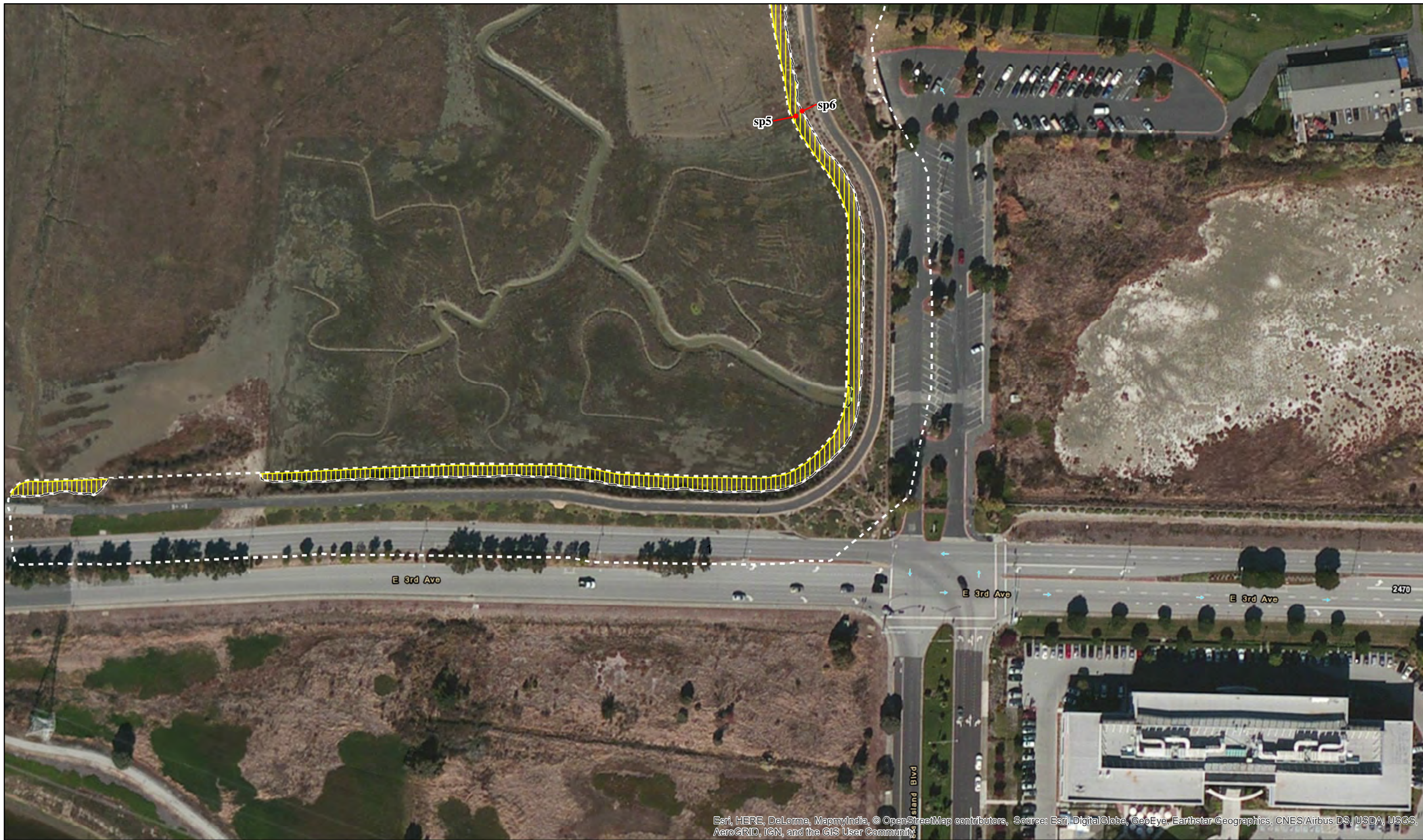






**Figure 13. 2004 Foster City Dredge Disposal Mitigation Site**

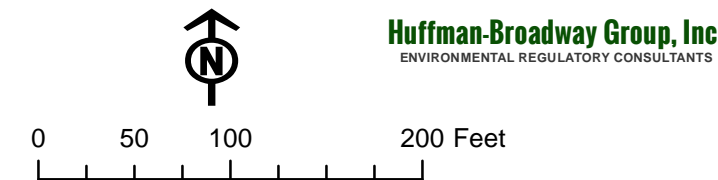
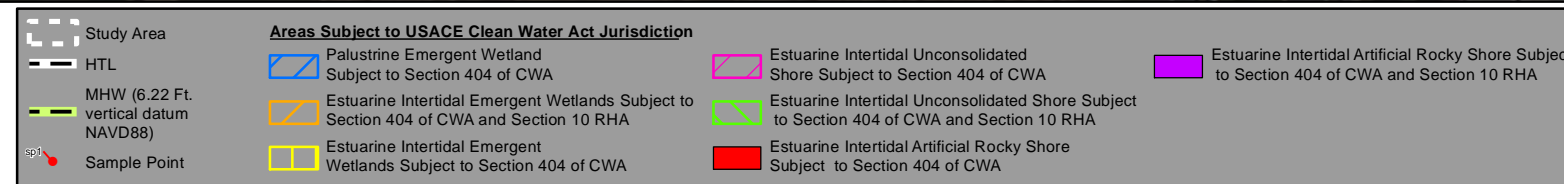




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14a. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 1 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



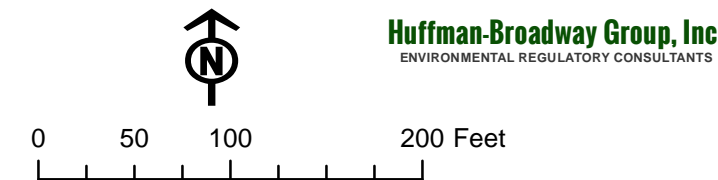
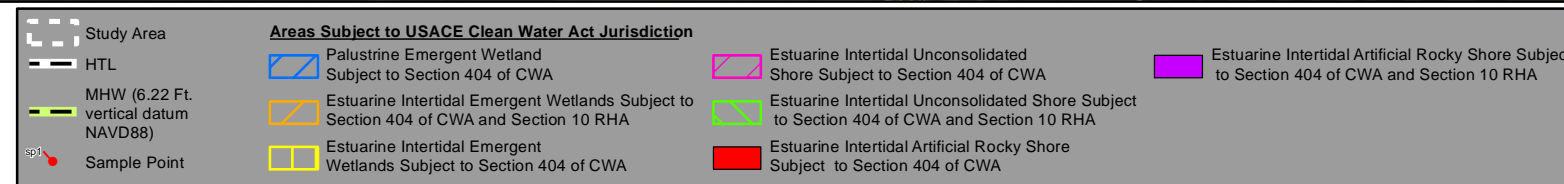




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14b. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 2 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



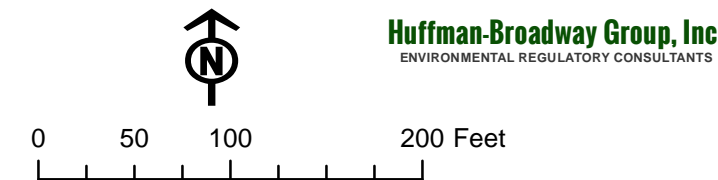
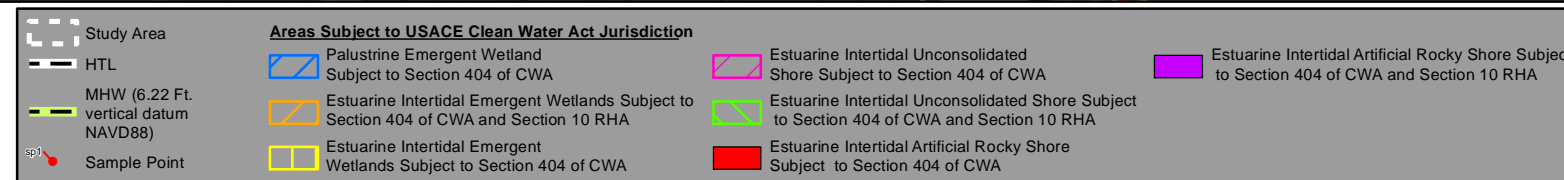




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14c. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 3 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



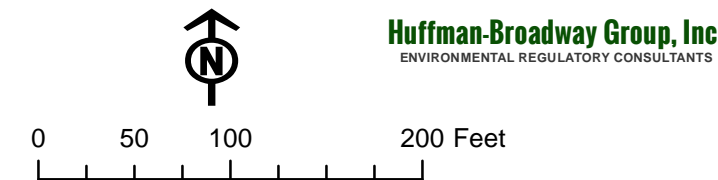
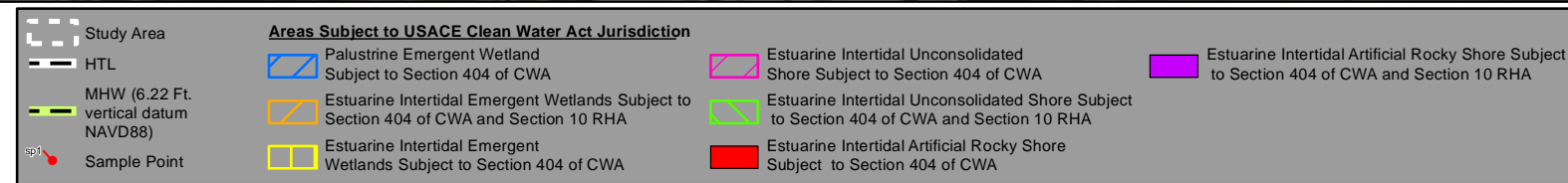




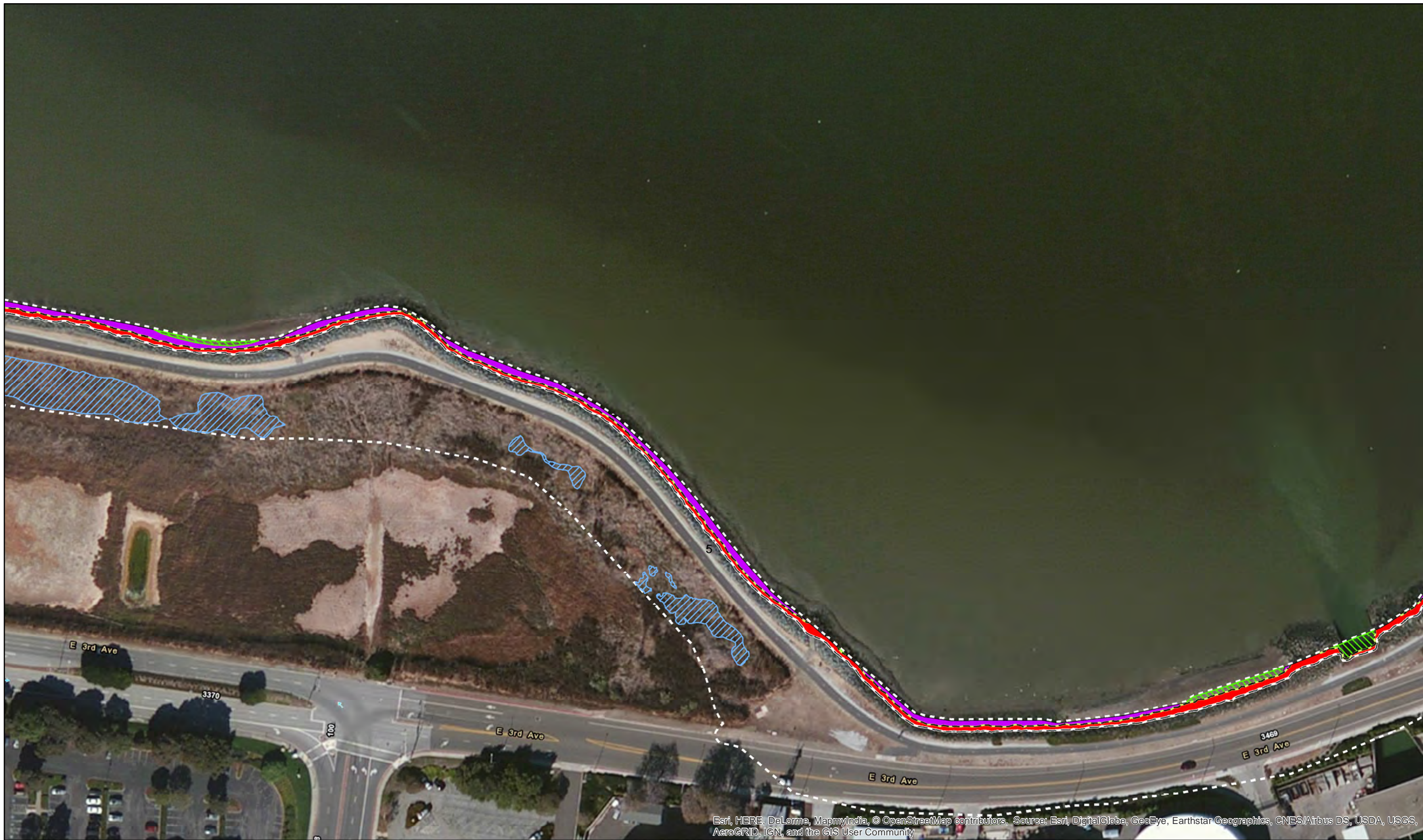
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14d. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 4 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California







**Figure 14e. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 5 of 27**

Foster City Proposed Levee Improvements  
 Foster City, San Mateo County, California

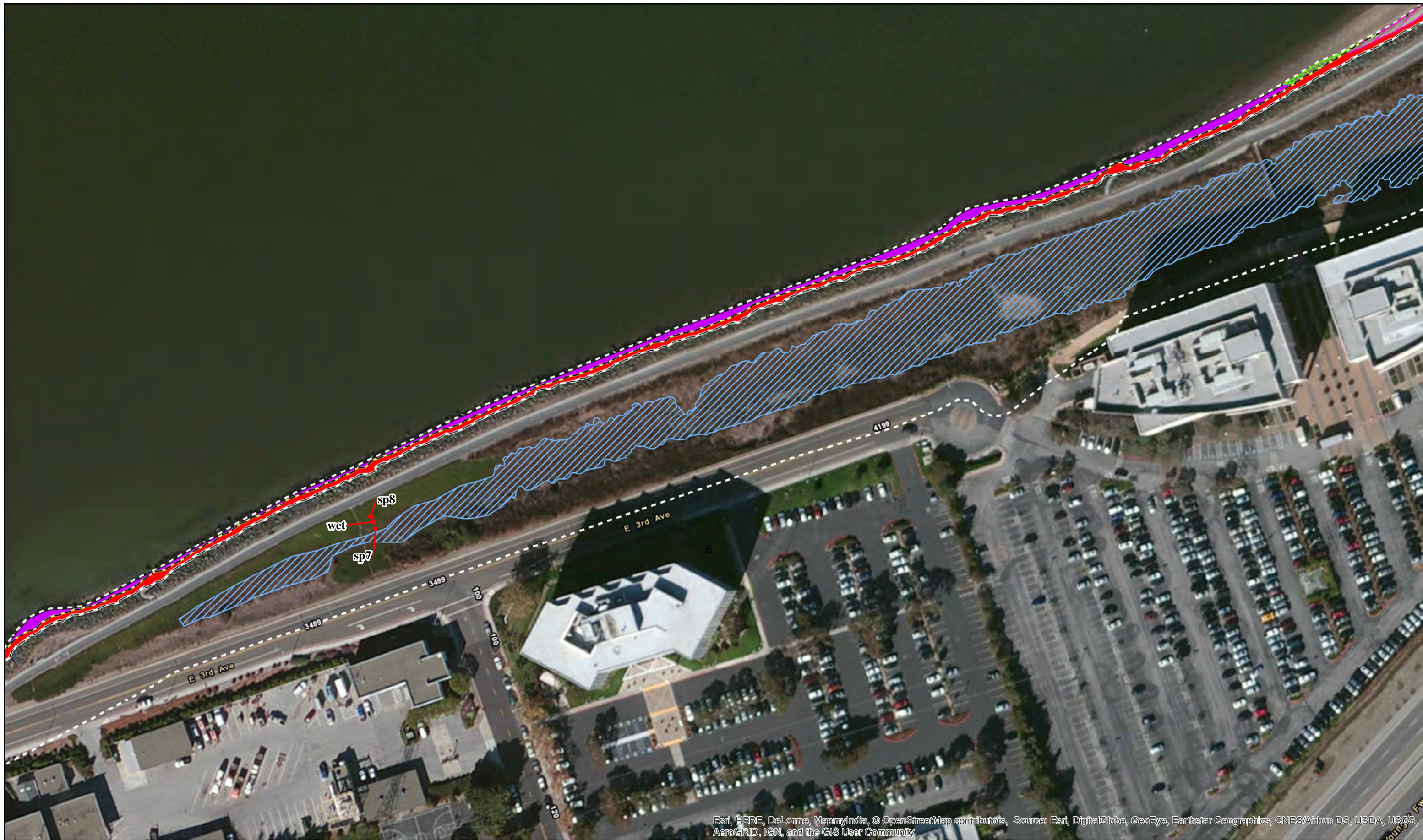
Areas Subject to USACE Clean Water Act Jurisdiction			
Study Area	Palustrine Emergent Wetland Subject to Section 404 of CWA	Estuarine Intertidal Unconsolidated Shore Subject to Section 404 of CWA	Estuarine Intertidal Artificial Rocky Shore Subject to Section 404 of CWA and Section 10 RHA
HTL	Estuarine Intertidal Emergent Wetlands Subject to Section 404 of CWA and Section 10 RHA	Estuarine Intertidal Unconsolidated Shore Subject to Section 404 of CWA and Section 10 RHA	
MHW (6.22 Ft. vertical datum NAVD88)	Estuarine Intertidal Emergent Wetlands Subject to Section 404 of CWA	Estuarine Intertidal Artificial Rocky Shore Subject to Section 404 of CWA	
Sample Point			

**Huffman-Broadway Group, Inc.**  
 ENVIRONMENTAL REGULATORY CONSULTANTS

0 50 100 200 Feet

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

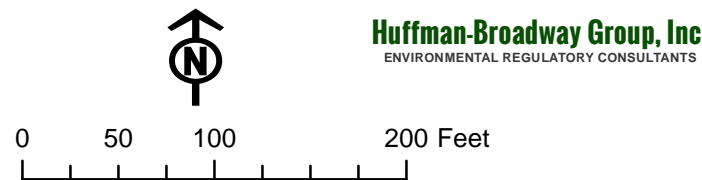
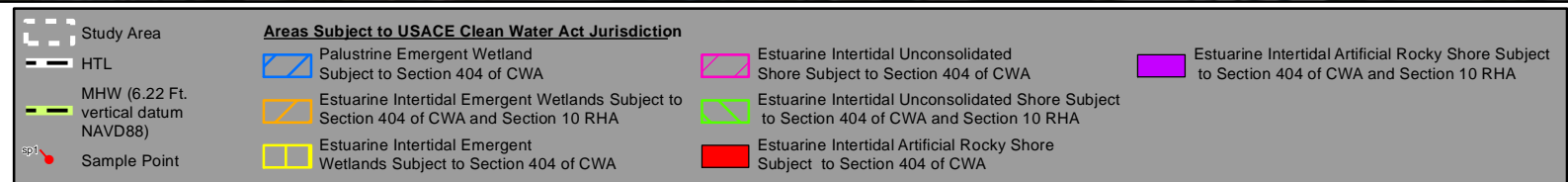




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14f. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 6 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California







Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14g. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 7 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California

Study Area		Areas Subject to USACE Clean Water Act Jurisdiction			
	Study Area		Palustrine Emergent Wetland Subject to Section 404 of CWA		Estuarine Intertidal Unconsolidated Shore Subject to Section 404 of CWA
	HTL		Estuarine Intertidal Emergent Wetlands Subject to Section 404 of CWA and Section 10 RHA		Estuarine Intertidal Unconsolidated Shore Subject to Section 404 of CWA and Section 10 RHA
	MHW (6.22 Ft. vertical datum NAVD88)		Estuarine Intertidal Emergent Wetlands Subject to Section 404 of CWA		Estuarine Intertidal Artificial Rocky Shore Subject to Section 404 of CWA
	Sample Point				Estuarine Intertidal Artificial Rocky Shore Subject to Section 404 of CWA and Section 10 RHA

**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS

0 50 100 200 Feet

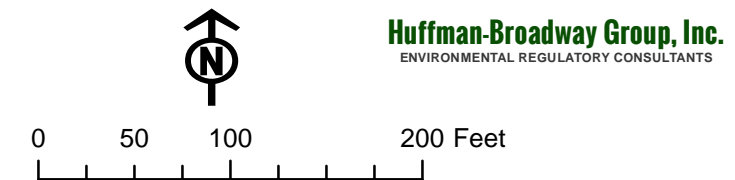
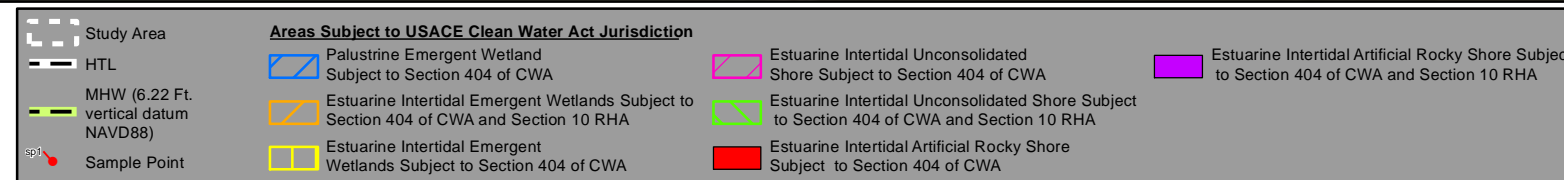




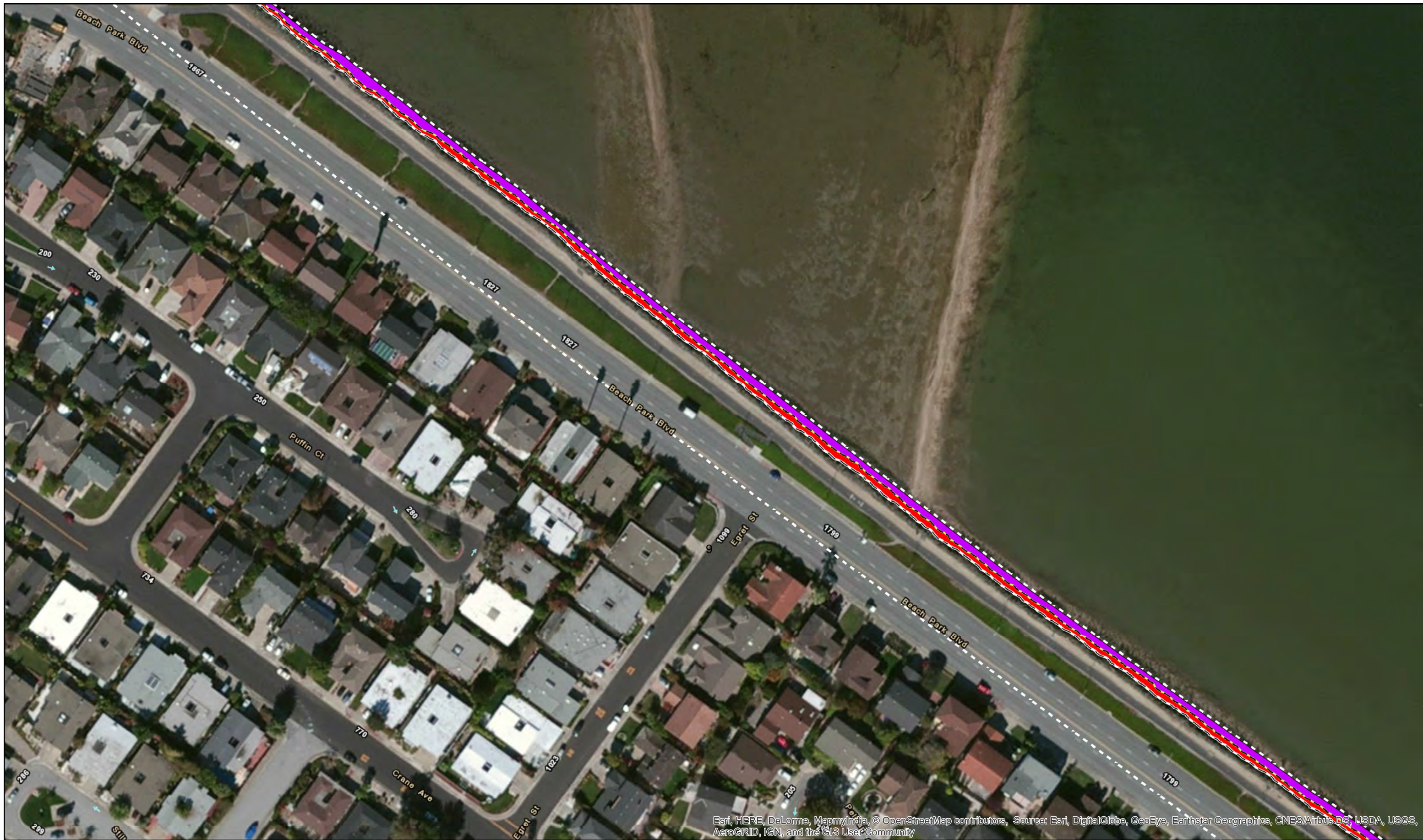
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14h. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 8 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



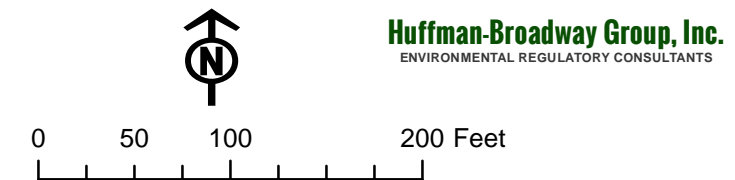
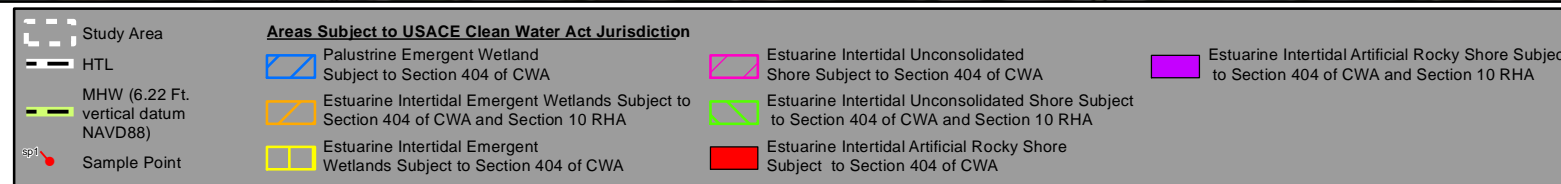




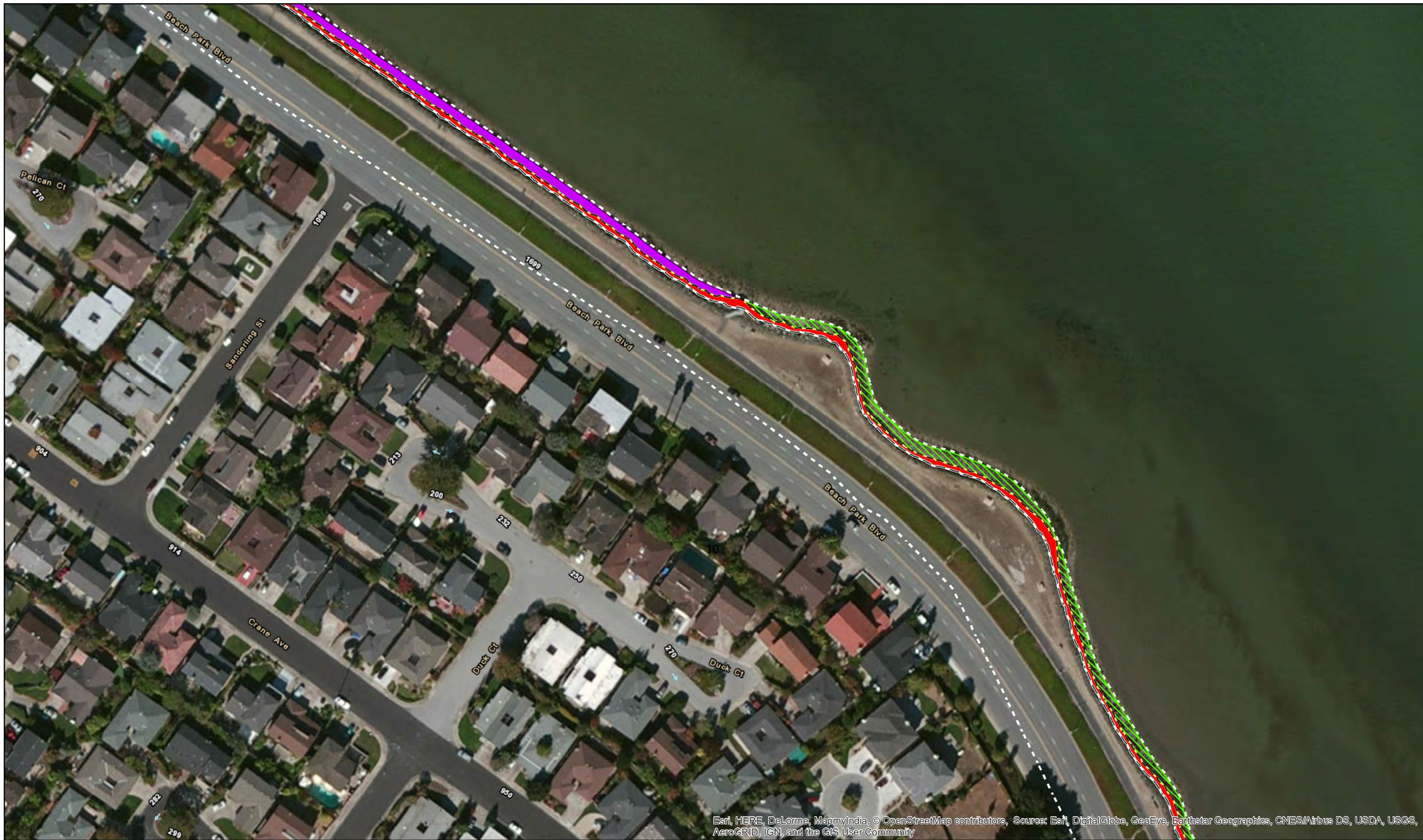
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14i. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 9 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



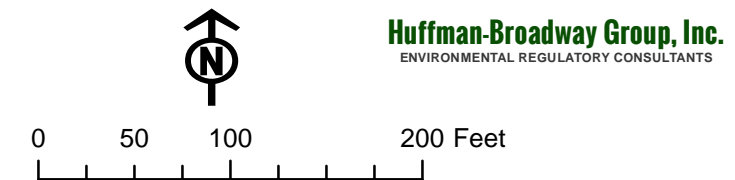
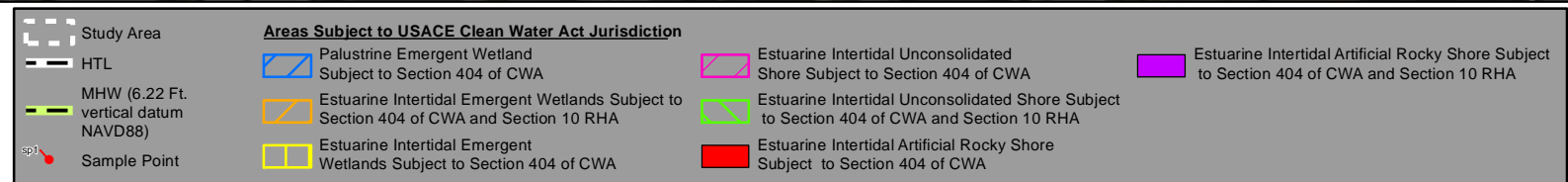




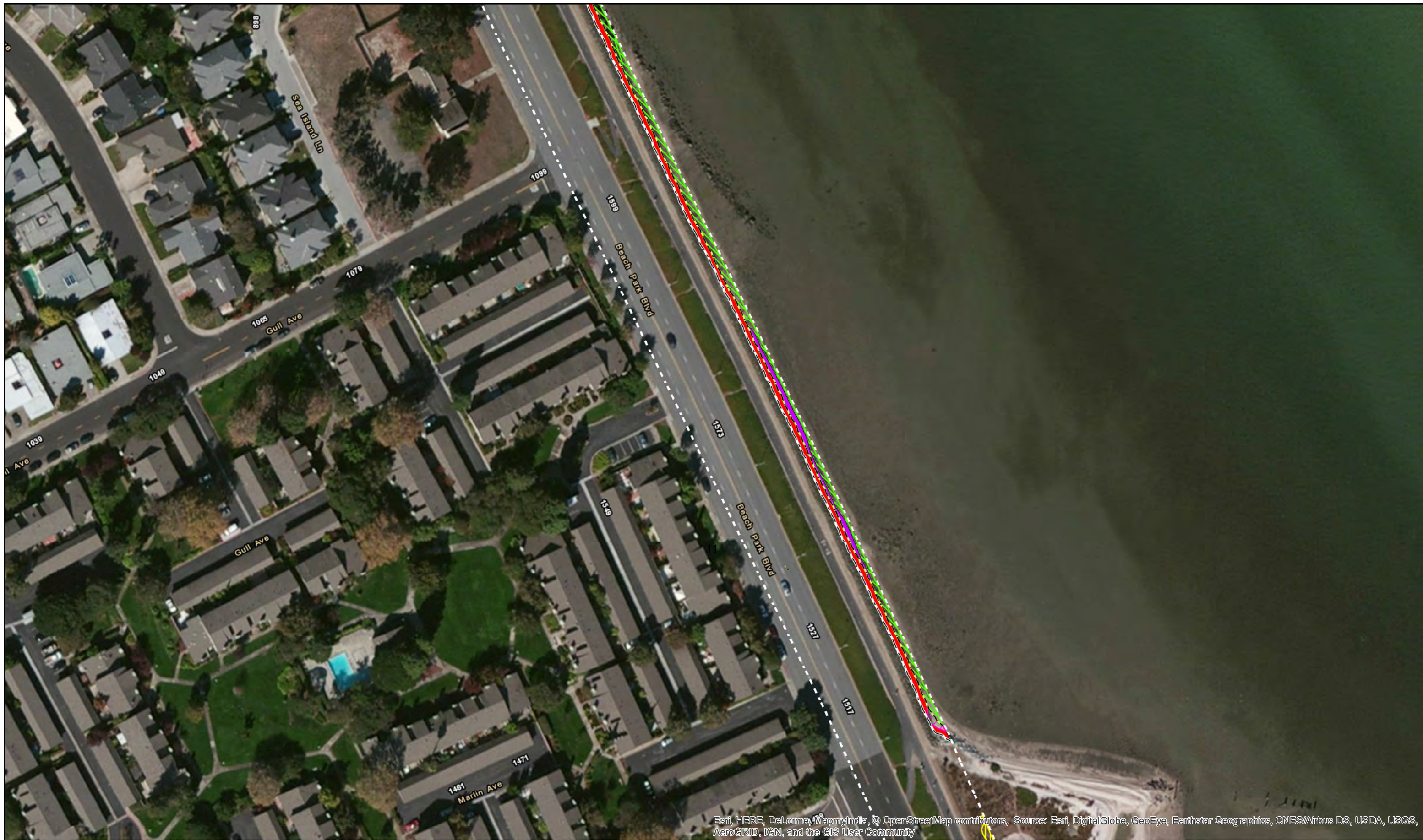
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14j. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 10 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



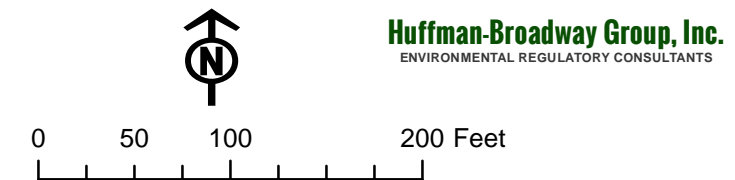
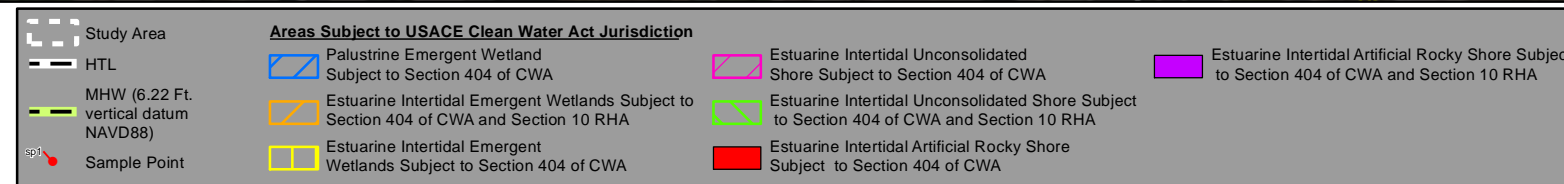




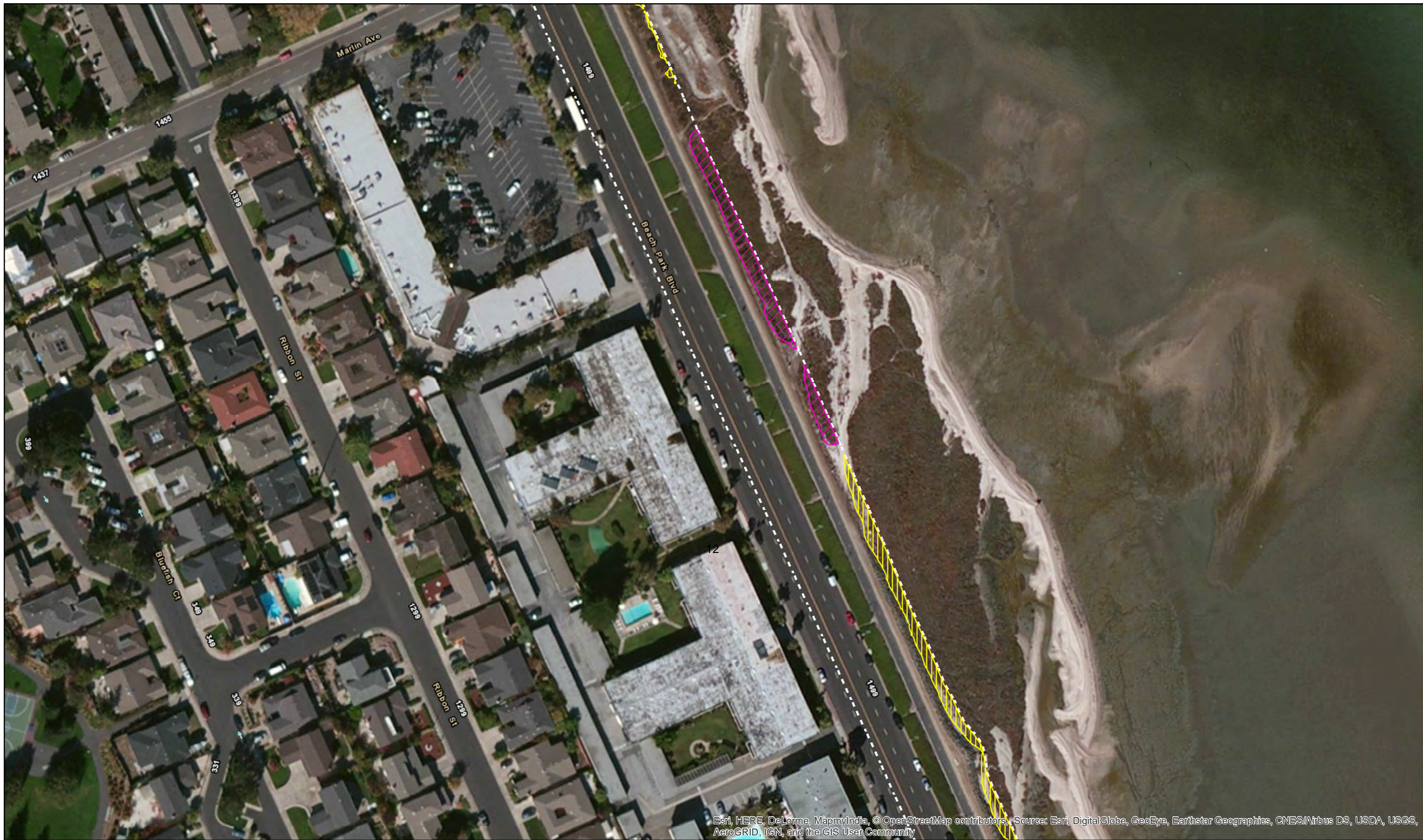
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14k. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 11 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



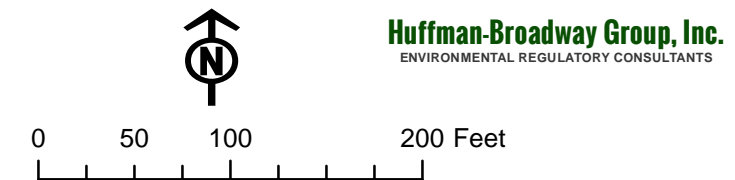
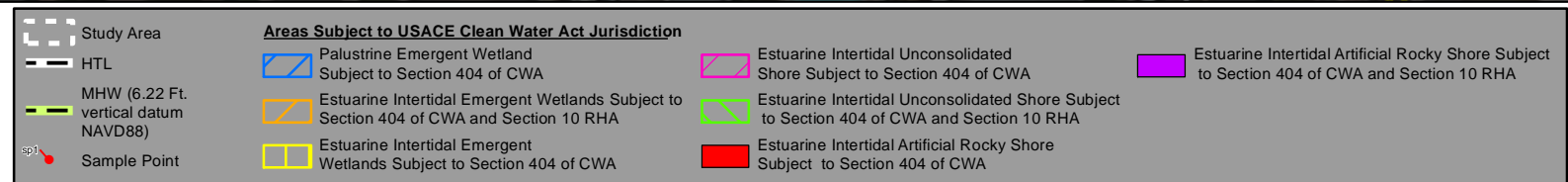




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14I. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 12 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



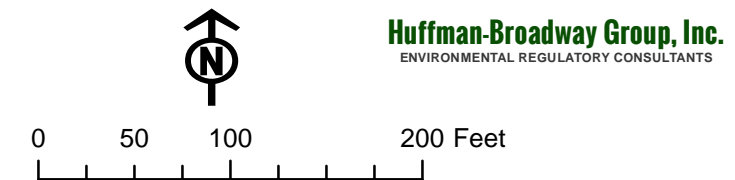
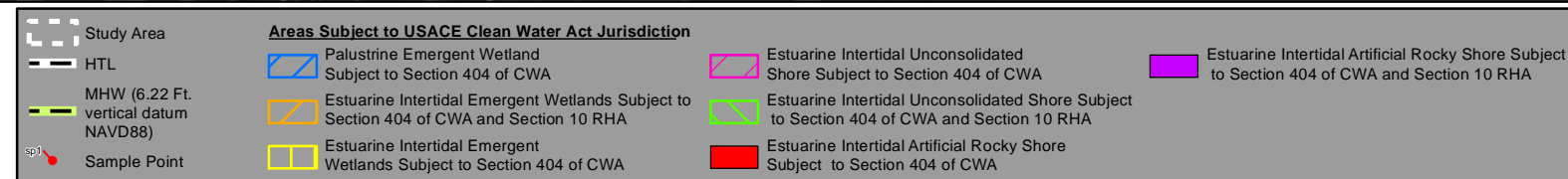




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14m. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 13 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



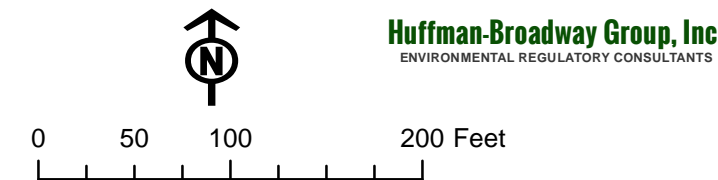
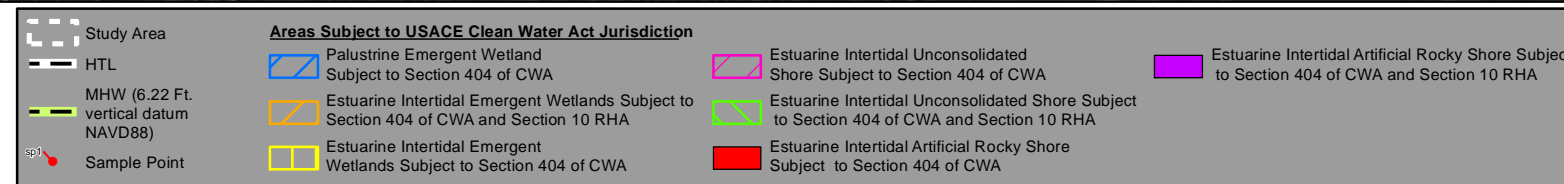




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14n. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 14 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



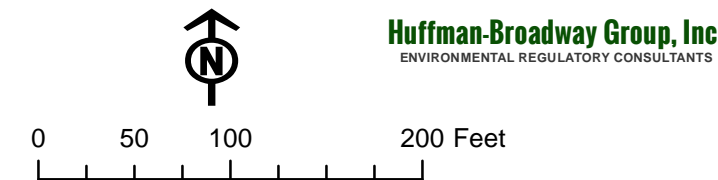
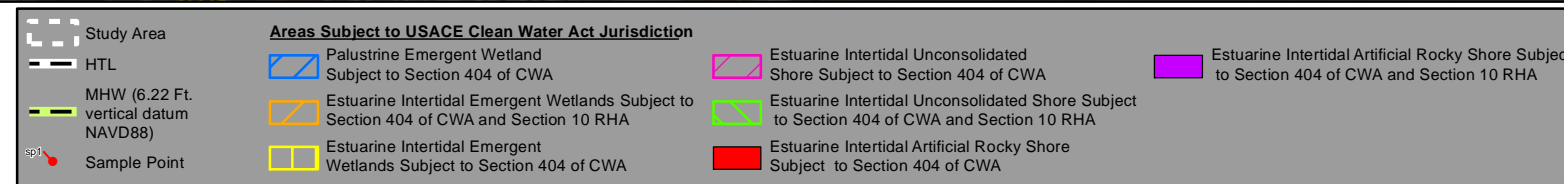




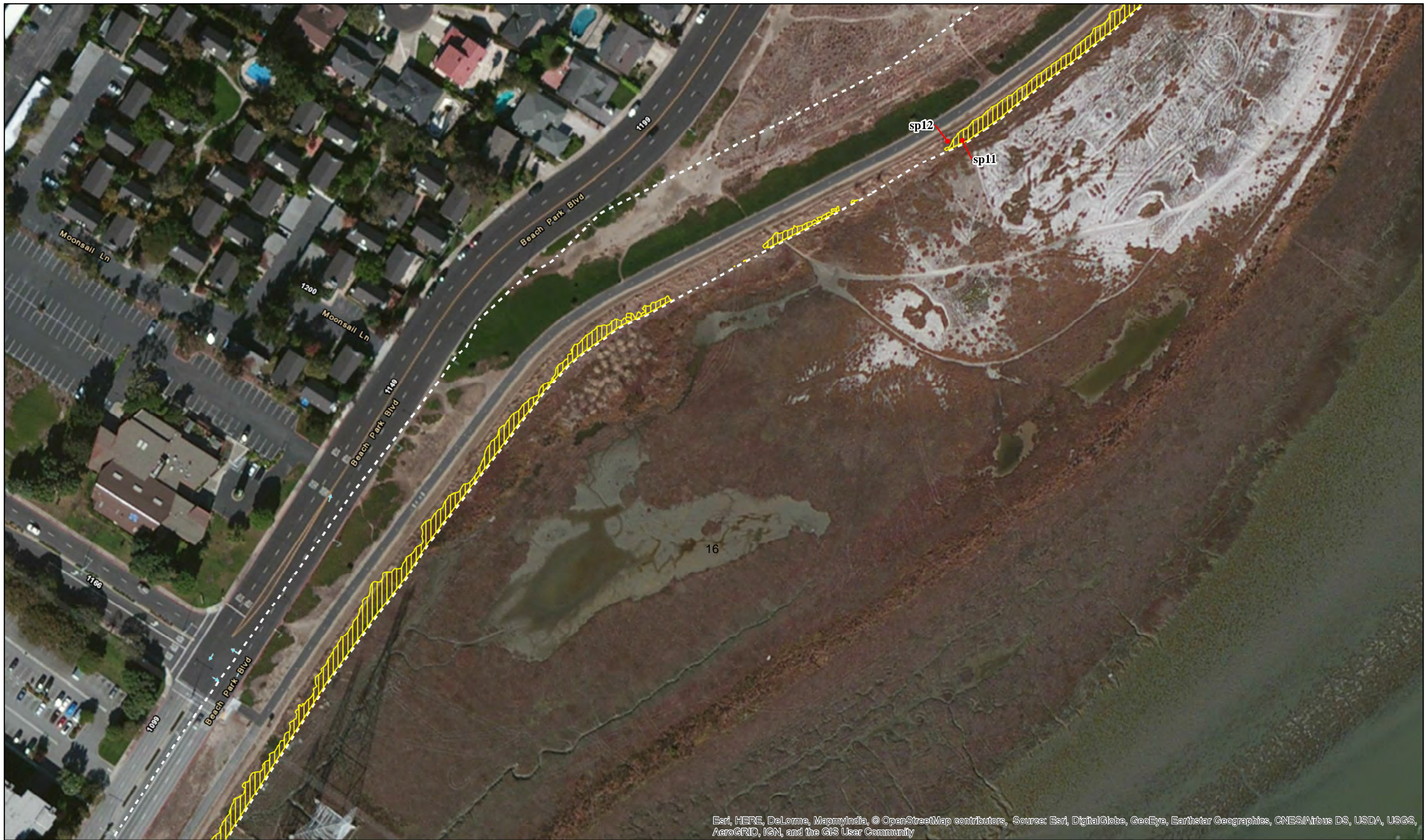
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14o. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 15 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



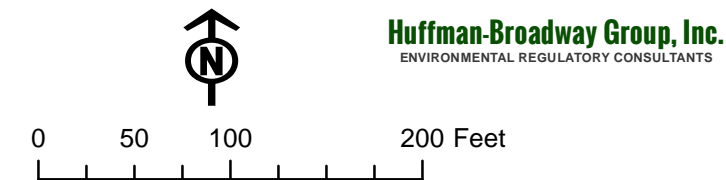
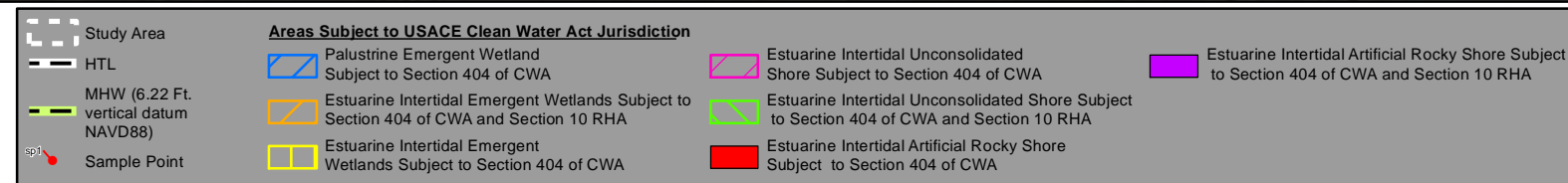




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14p. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 16 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



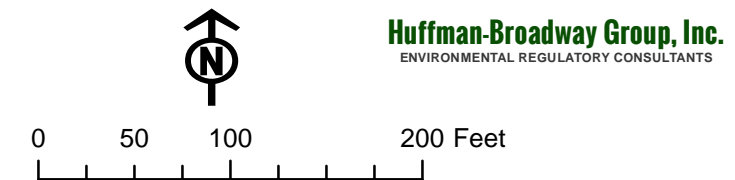
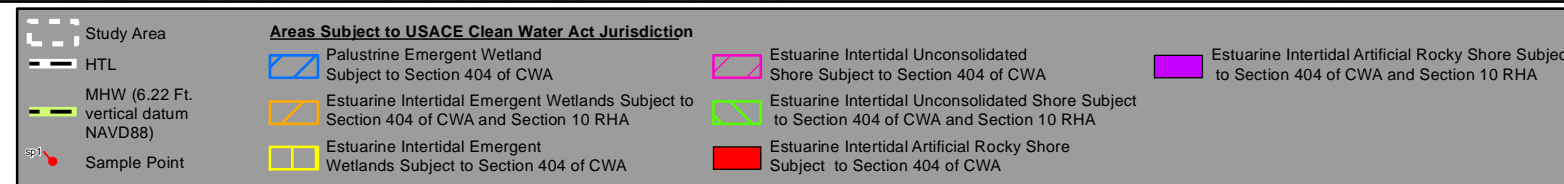




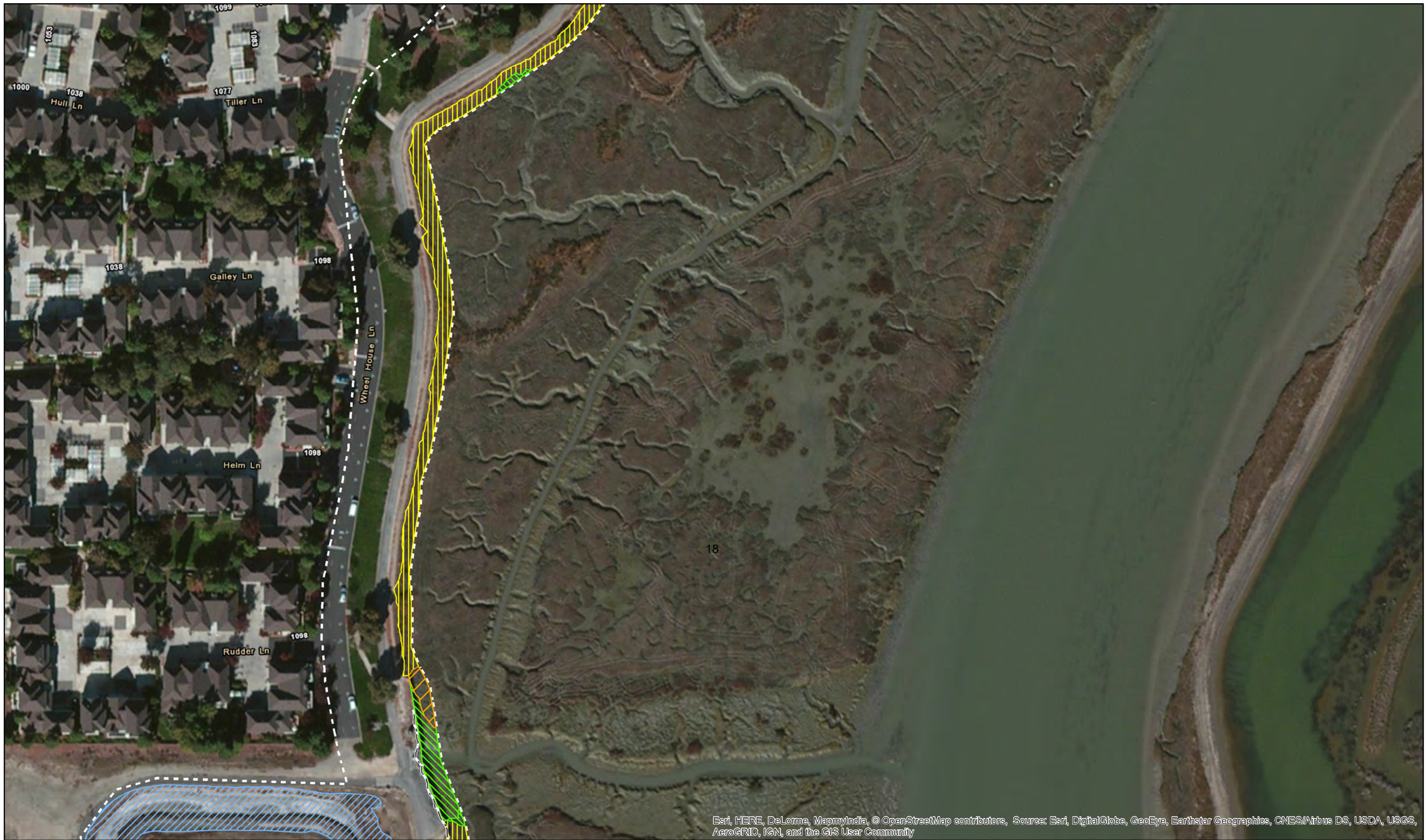
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14q. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 17 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



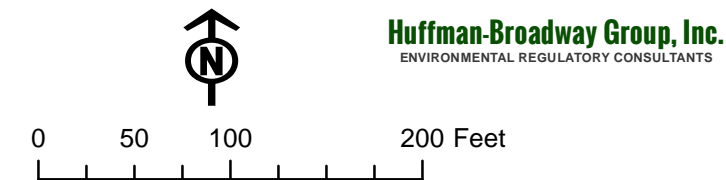
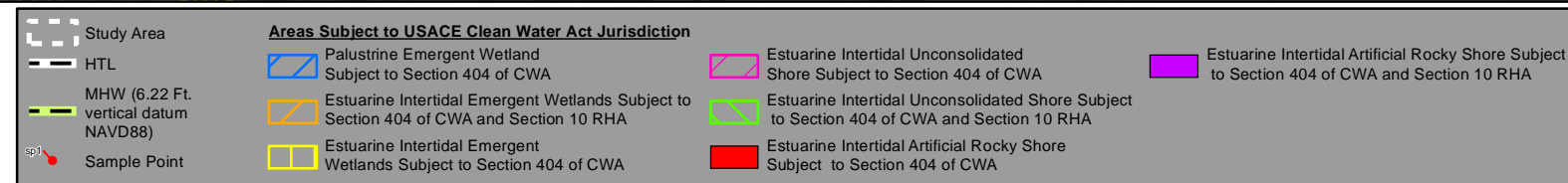




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14r. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 18 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California

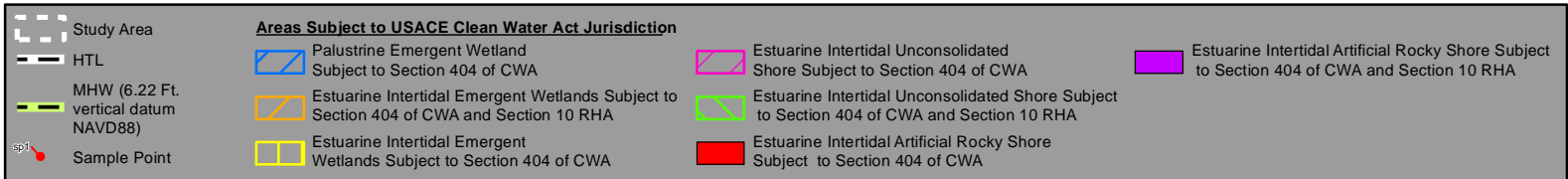






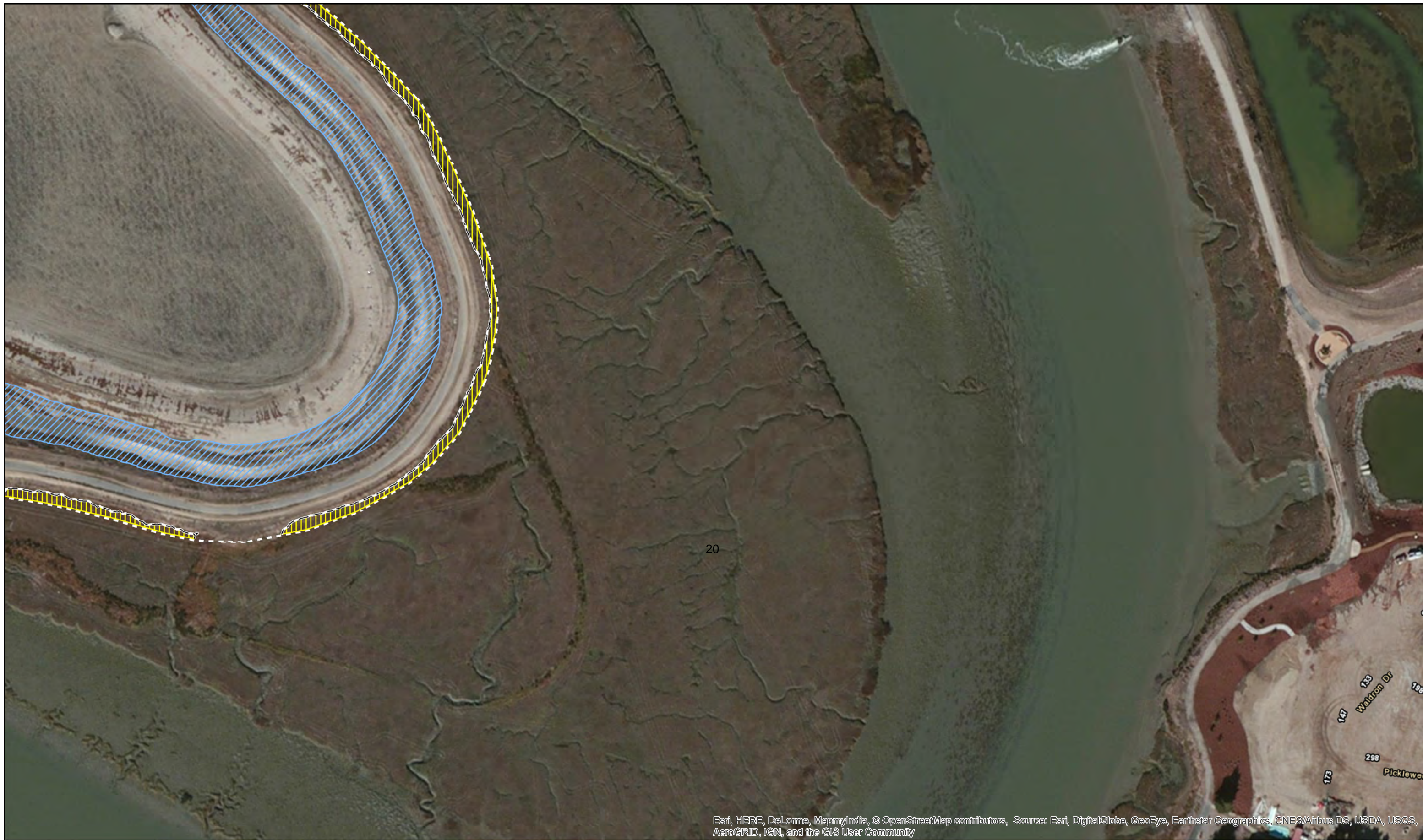
**Figure 14s. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 19 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

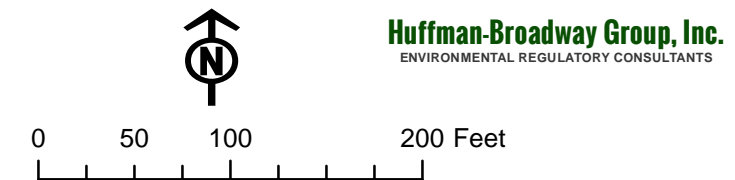
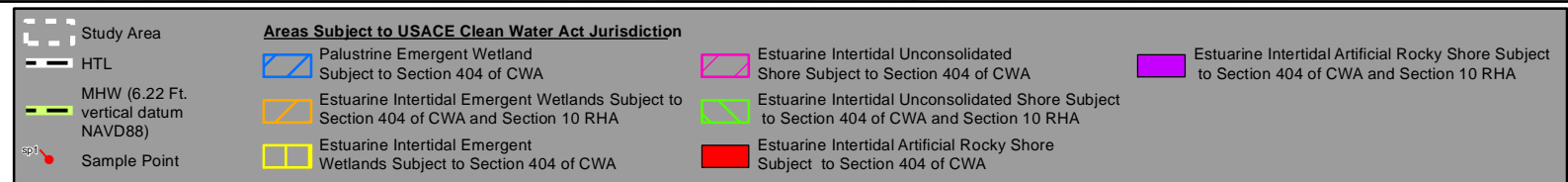




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14t. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 20 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS

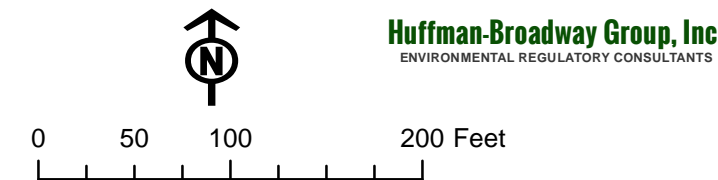
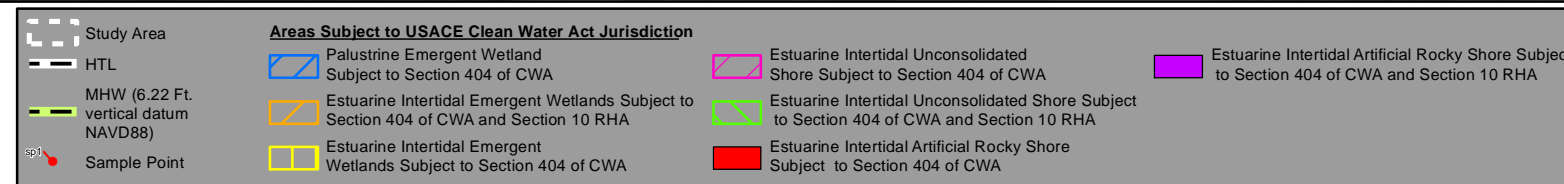




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14u. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 21 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS

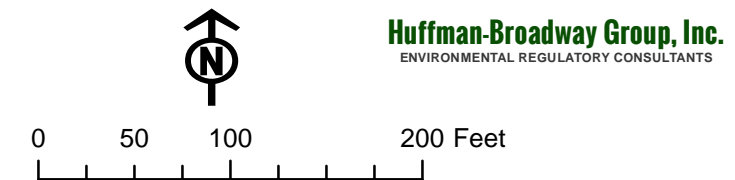
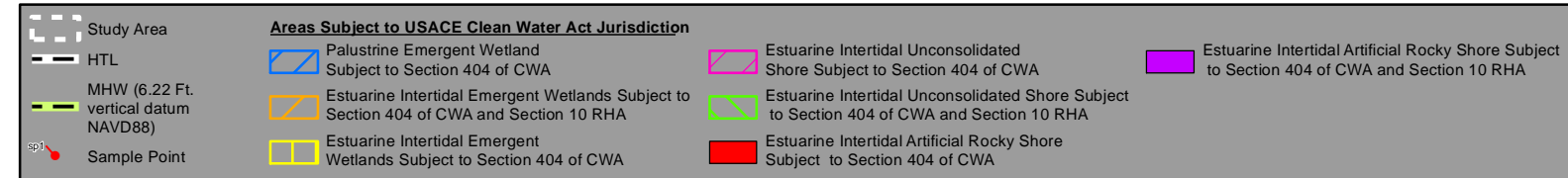




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14v. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 22 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS

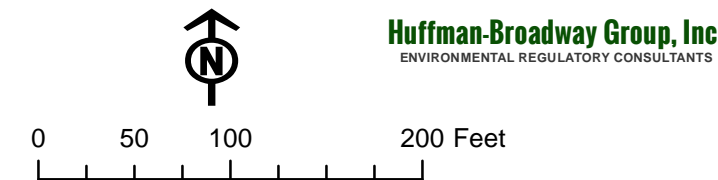
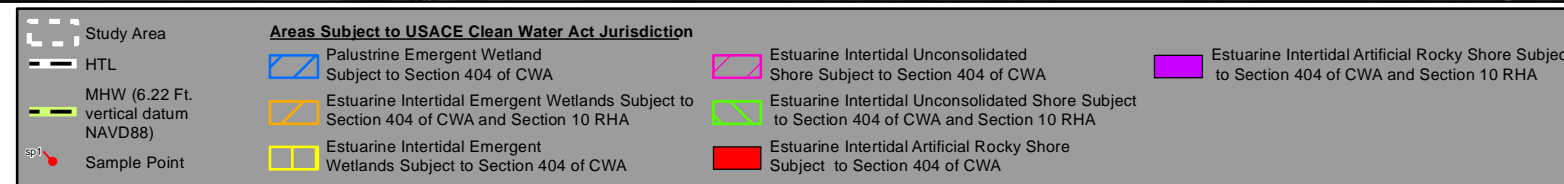




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14w. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 23 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS

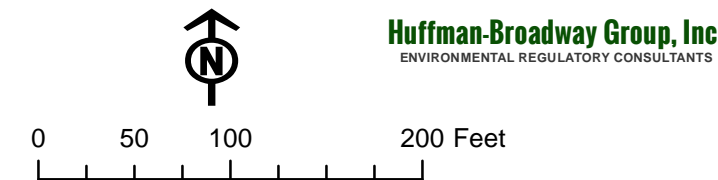
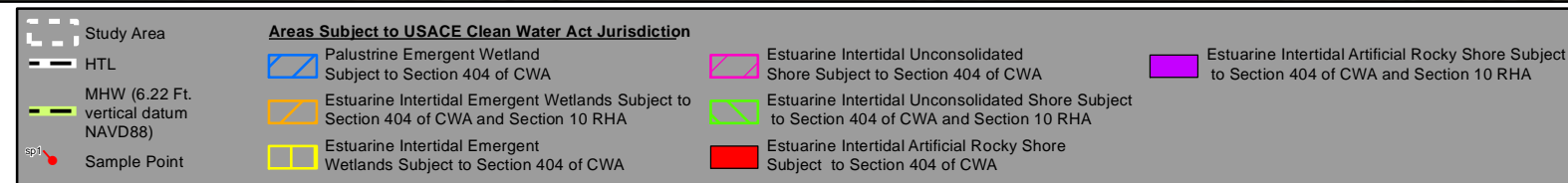




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

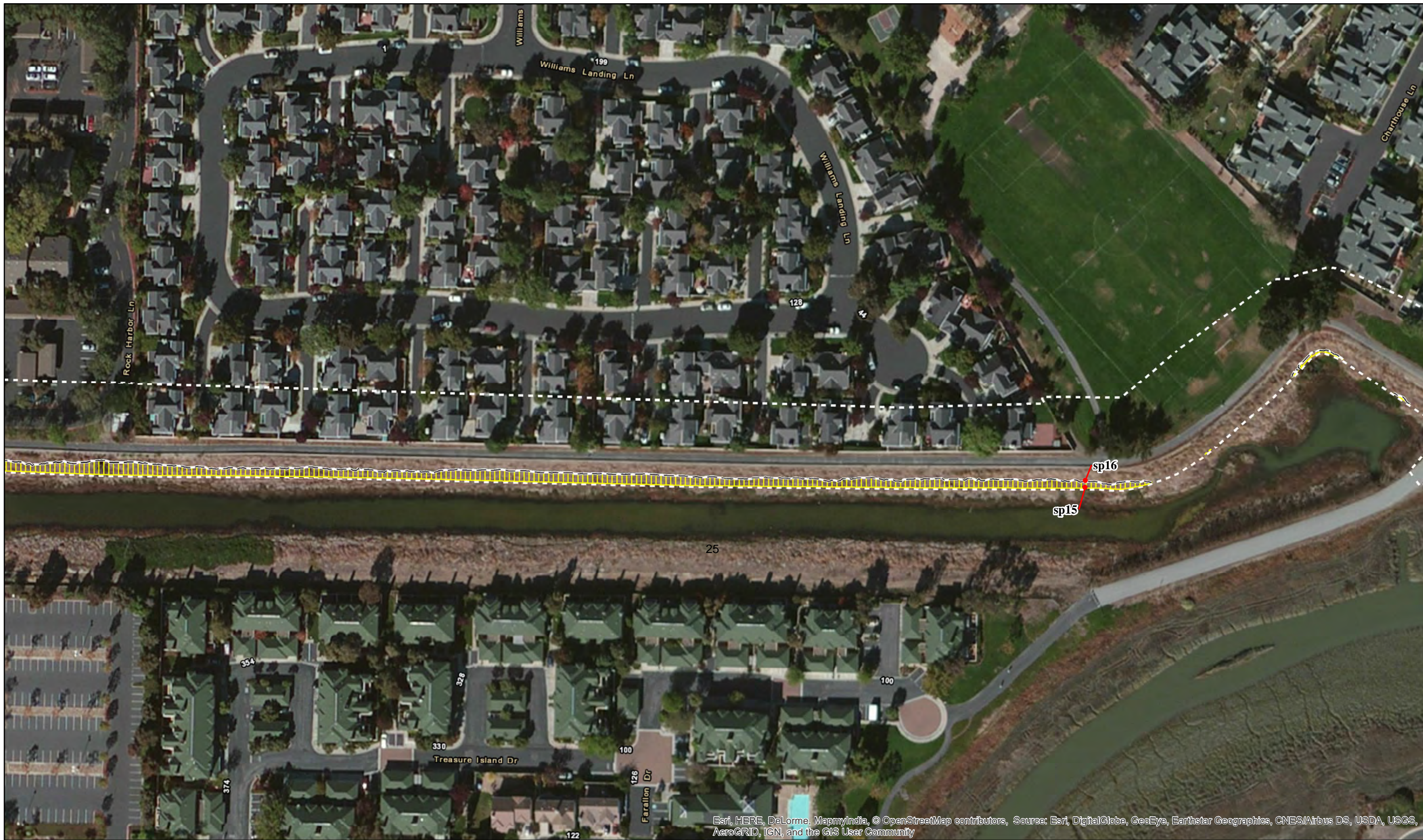
**Figure 14x. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 24 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS

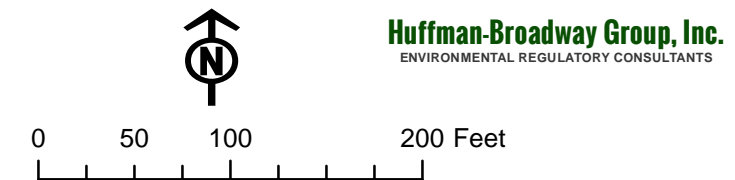
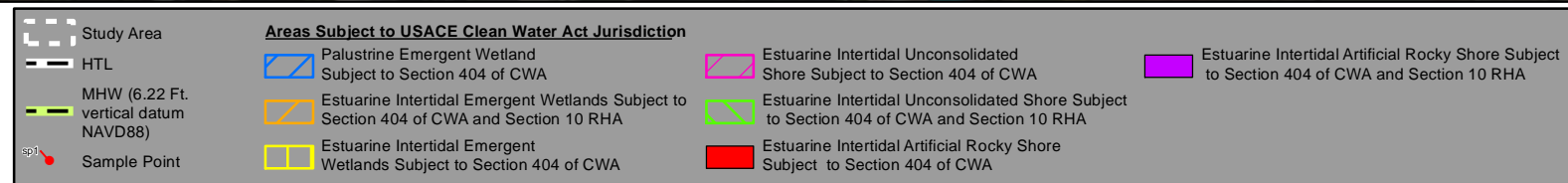




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

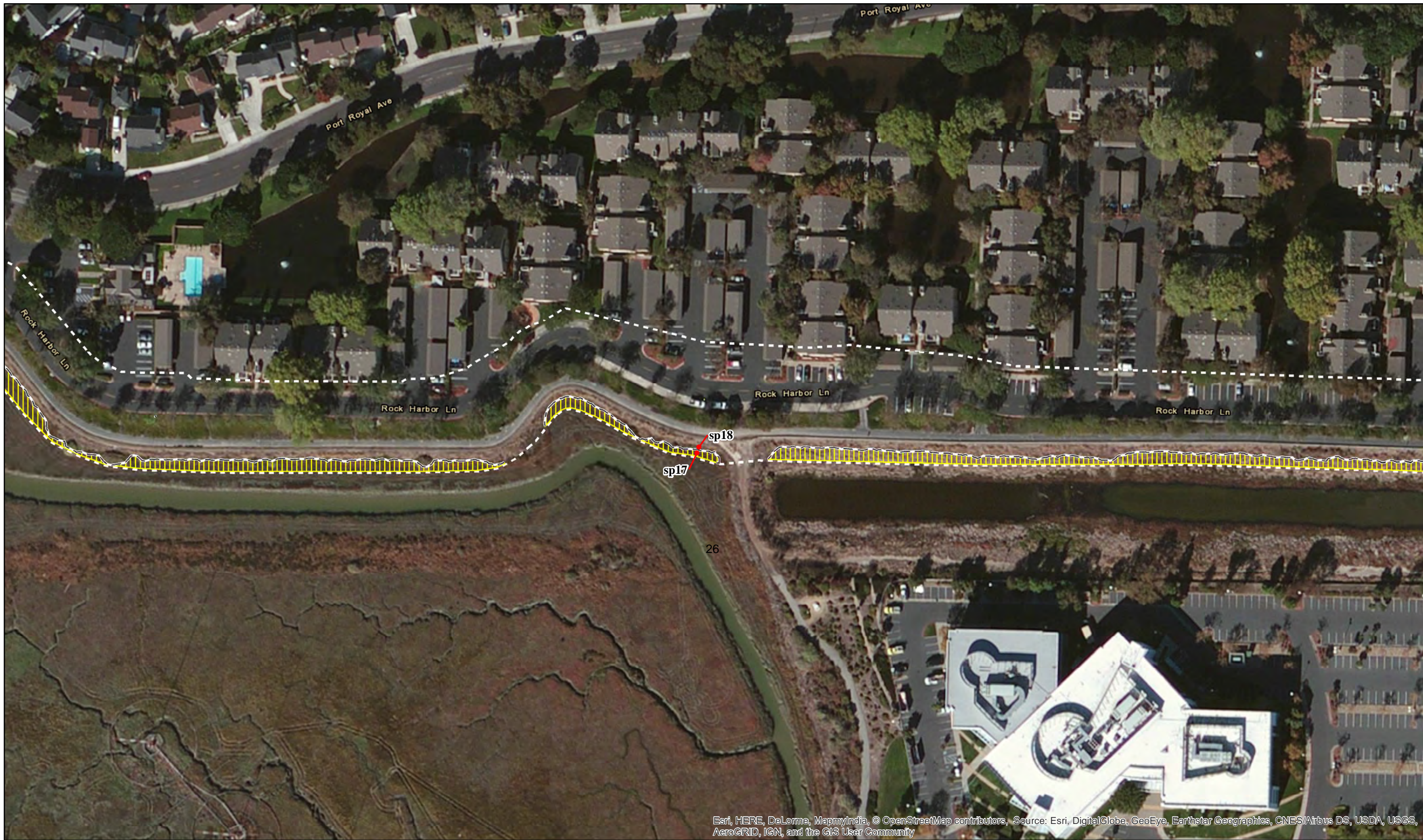
**Figure 14y. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 25 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS

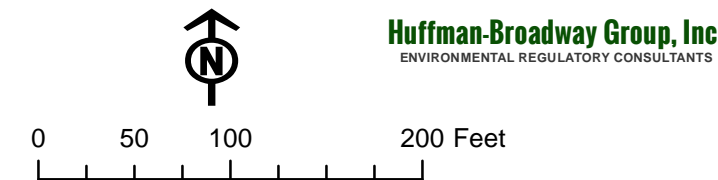
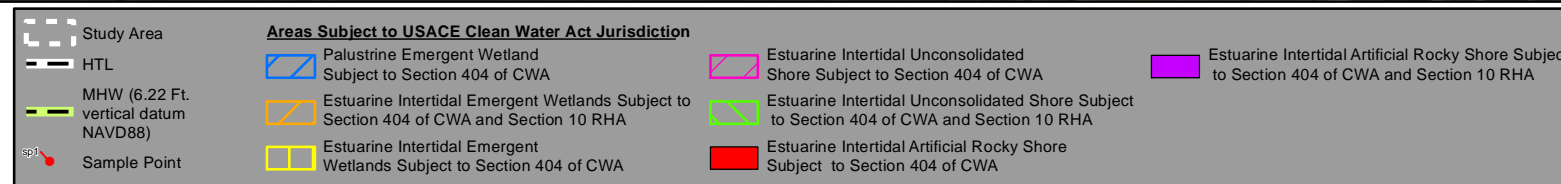




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

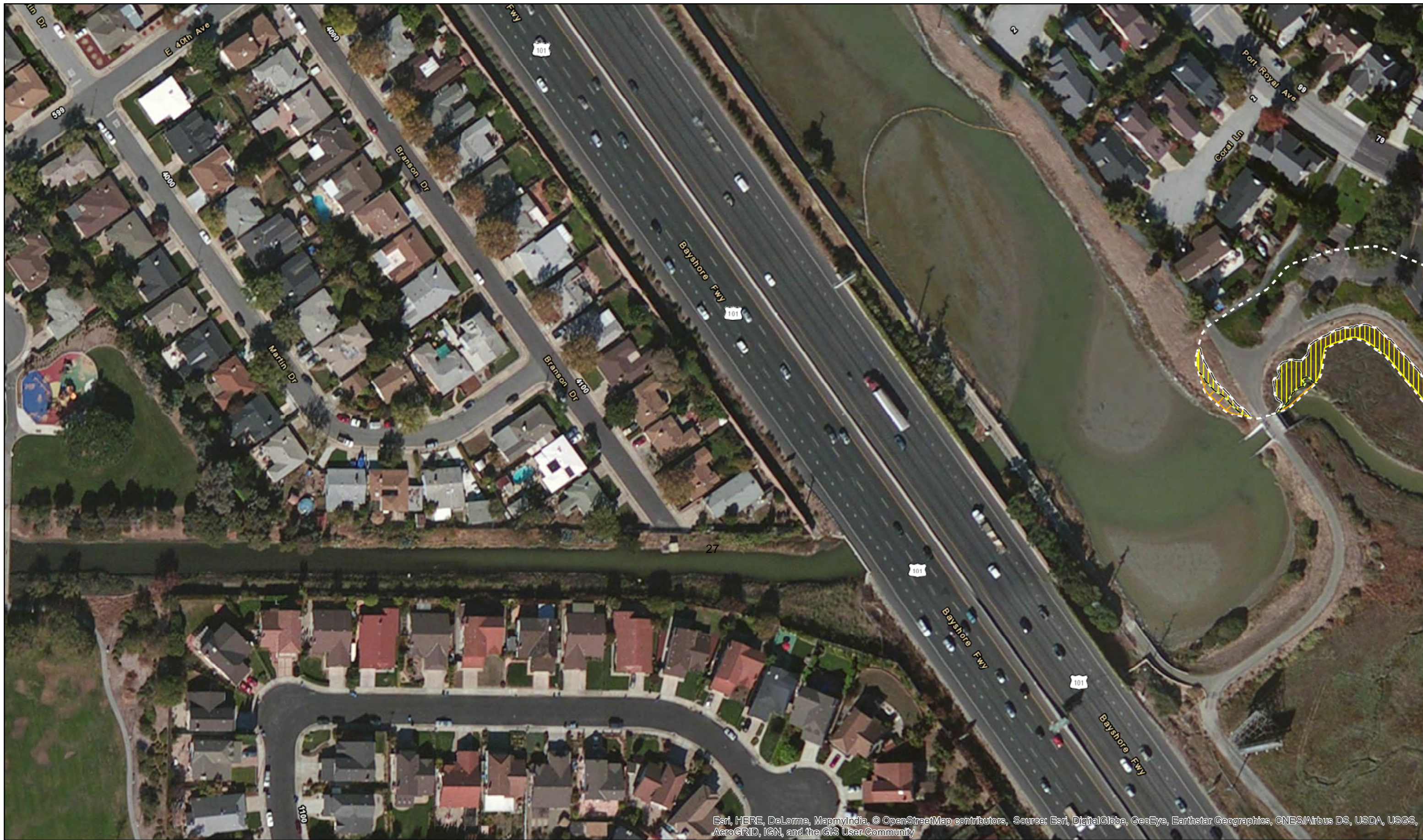
**Figure 14z. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 26 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS

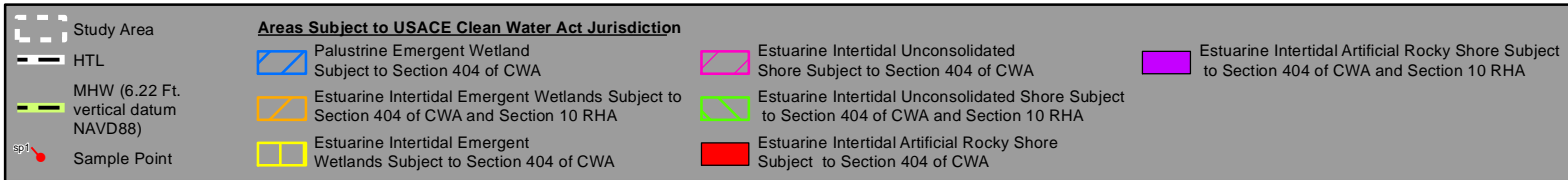




Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 14aa. Areas Subject to USACE Clean Water Act Jurisdiction, Sheet 27 of 27**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California

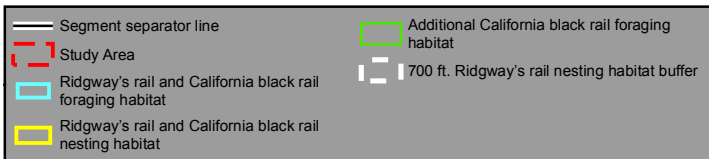




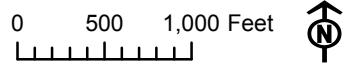


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

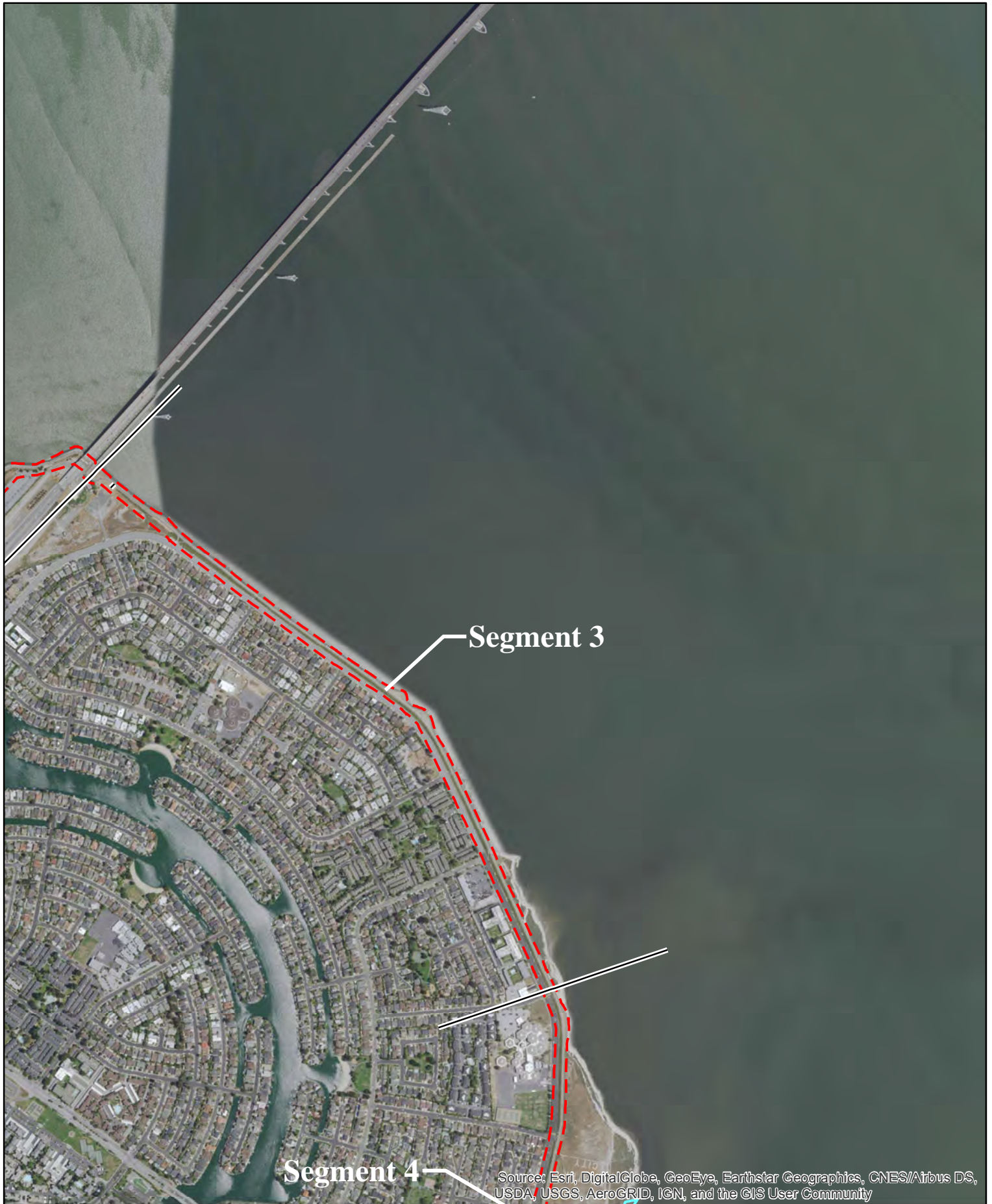
**Figure 15a. Ridgway's Rail and California Black Rail Habitat Map, NW Sheet**



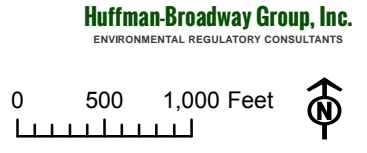
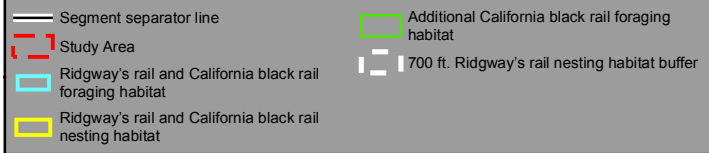
**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS







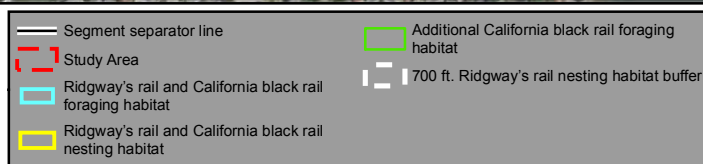
**Figure 15b. Ridgway's Rail and California Black Rail Habitat Map, NE Sheet**



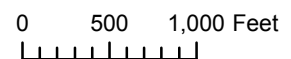




**Figure 15c. Ridgway's Rail and California Black Rail Habitat Map, SE Sheet**



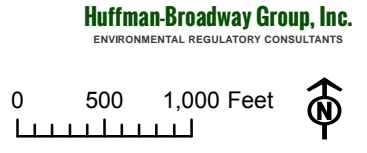
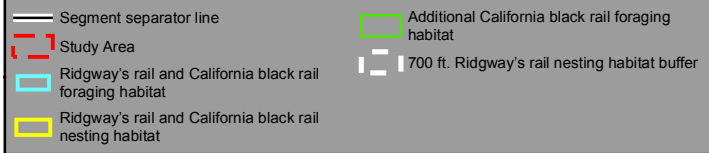
**Huffman-Broadway Group, Inc.**  
ENVIRONMENTAL REGULATORY CONSULTANTS







**Figure 15d. Ridgway's Rail and California Black Rail Habitat Map, SW Sheet**

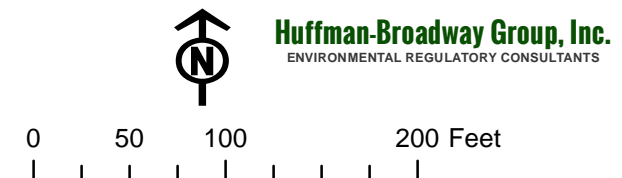
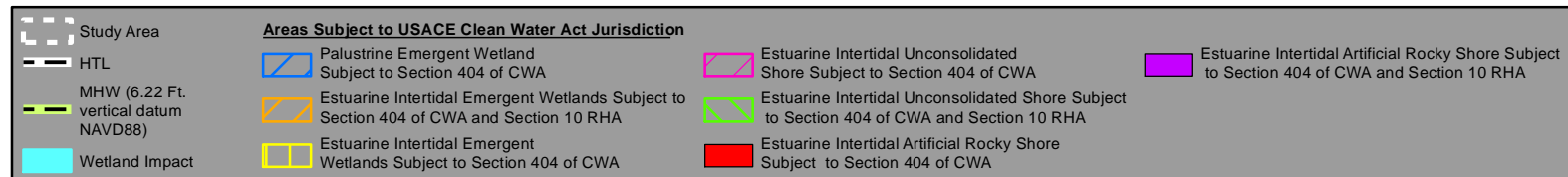






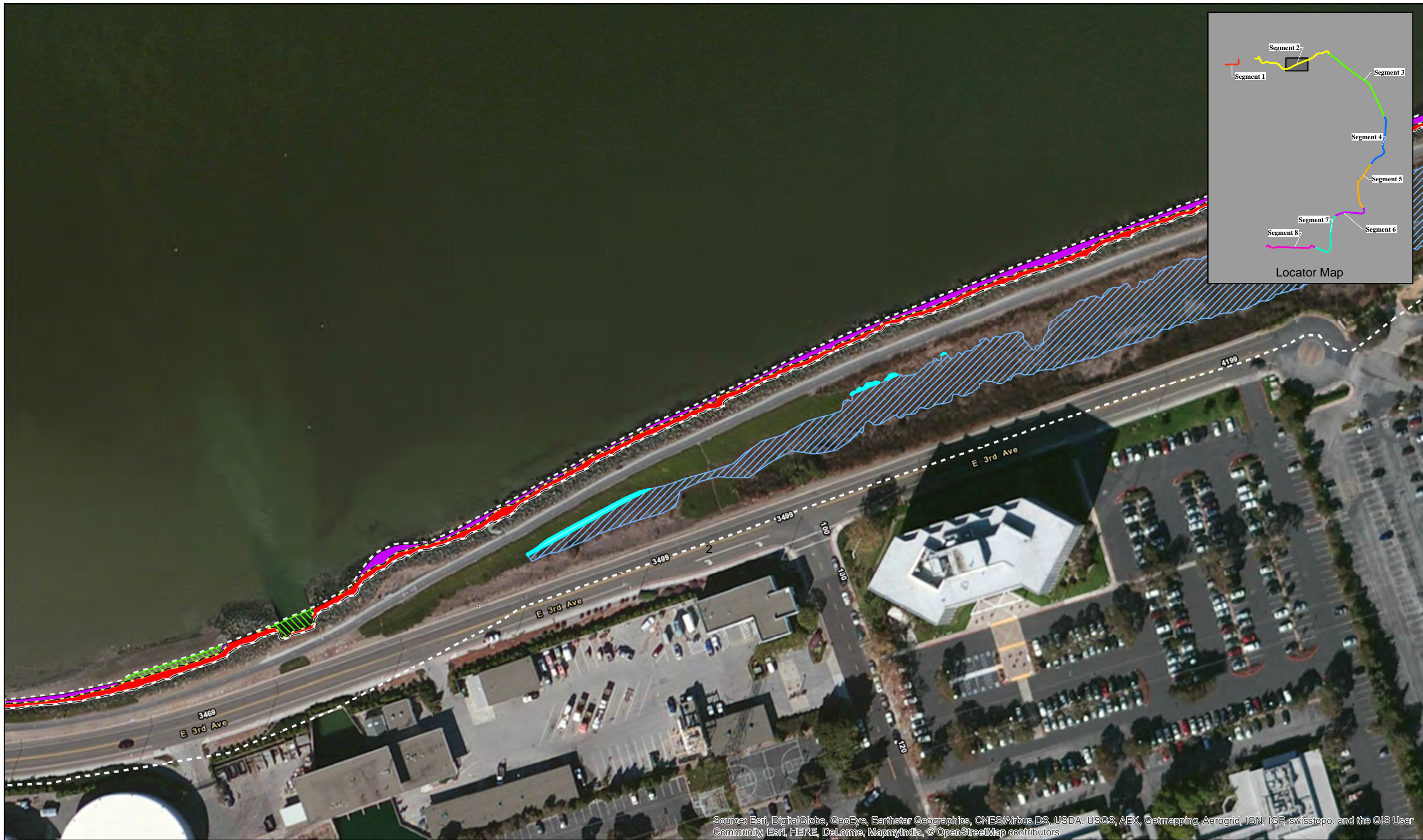
**Figure 16a. Location of Impacts to Wetlands and Waters of the U.S.(2050 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
 Foster City, San Mateo County, California



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors






**Figure 16b. Location of Impacts to Wetlands and Waters of the U.S.(2050 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California

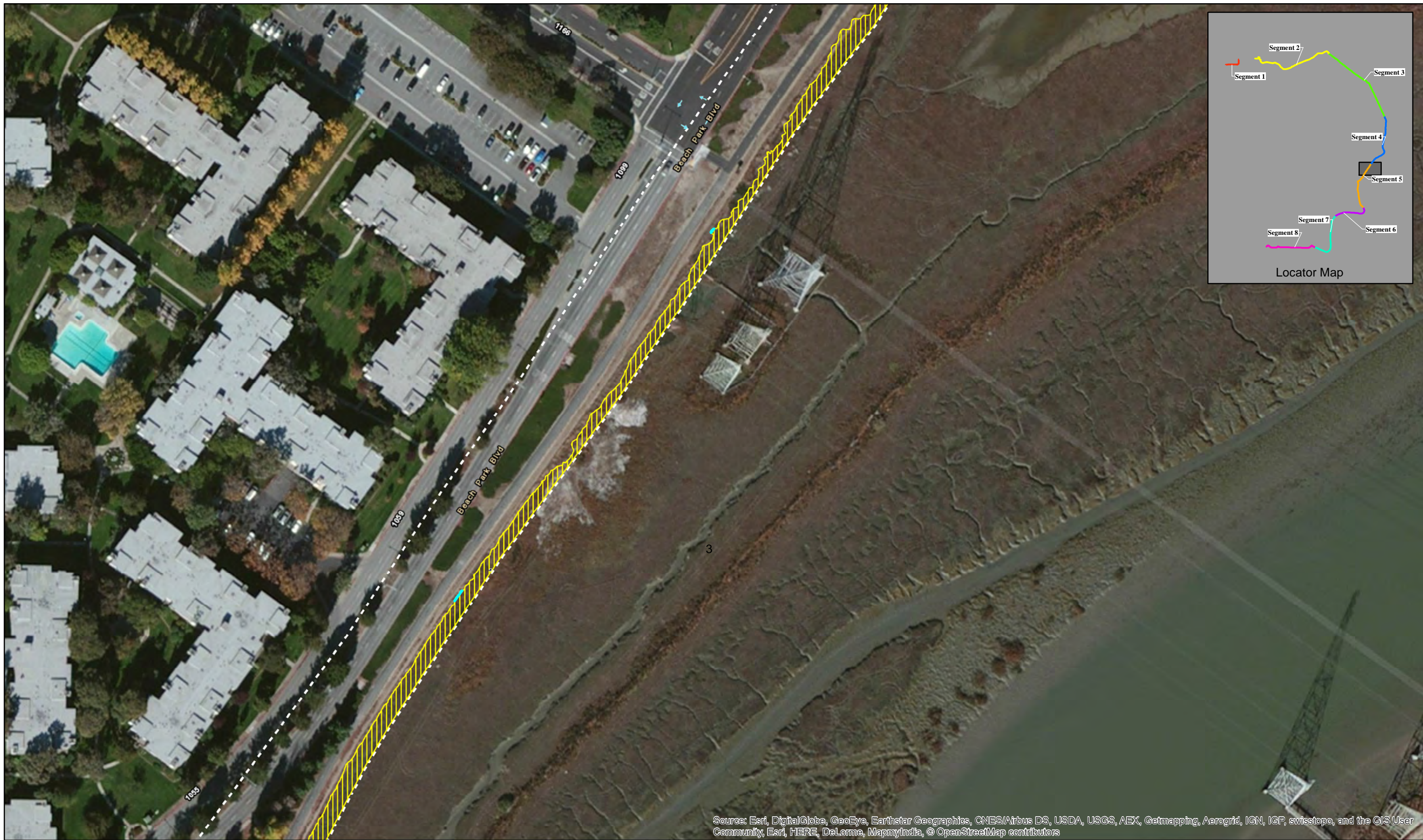
Study Area		Areas Subject to USACE Clean Water Act Jurisdiction			
	Study Area		Palustrine Emergent Wetland Subject to Section 404 of CWA		Estuarine Intertidal Unconsolidated Shore Subject to Section 404 of CWA
	HTL		Estuarine Intertidal Emergent Wetlands Subject to Section 404 of CWA and Section 10 RHA		Estuarine Intertidal Unconsolidated Shore Subject to Section 404 of CWA and Section 10 RHA
	MHW (6.22 Ft. vertical datum NAVD88)		Estuarine Intertidal Emergent Wetlands Subject to Section 404 of CWA		Estuarine Intertidal Artificial Rocky Shore Subject to Section 404 of CWA
	Wetland Impact				Estuarine Intertidal Artificial Rocky Shore Subject to Section 404 of CWA and Section 10 RHA


**Huffman-Broadway Group, Inc.**  
 ENVIRONMENTAL REGULATORY CONSULTANTS

0    50    100    200 Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, ICP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

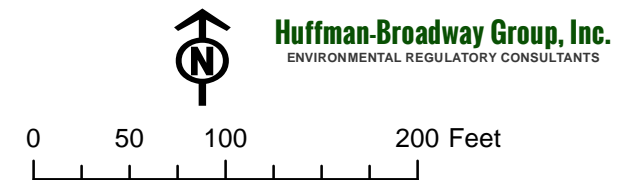
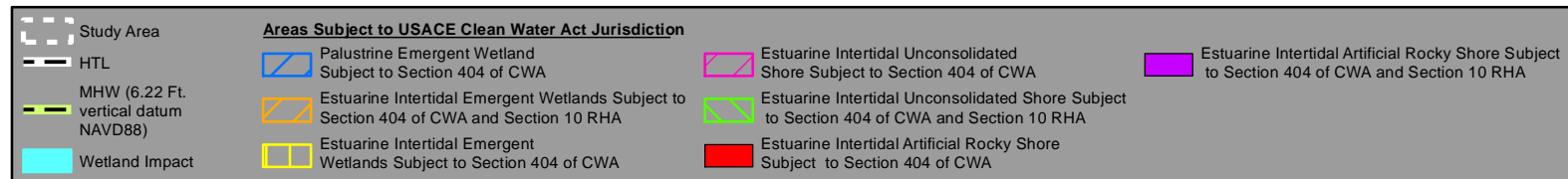




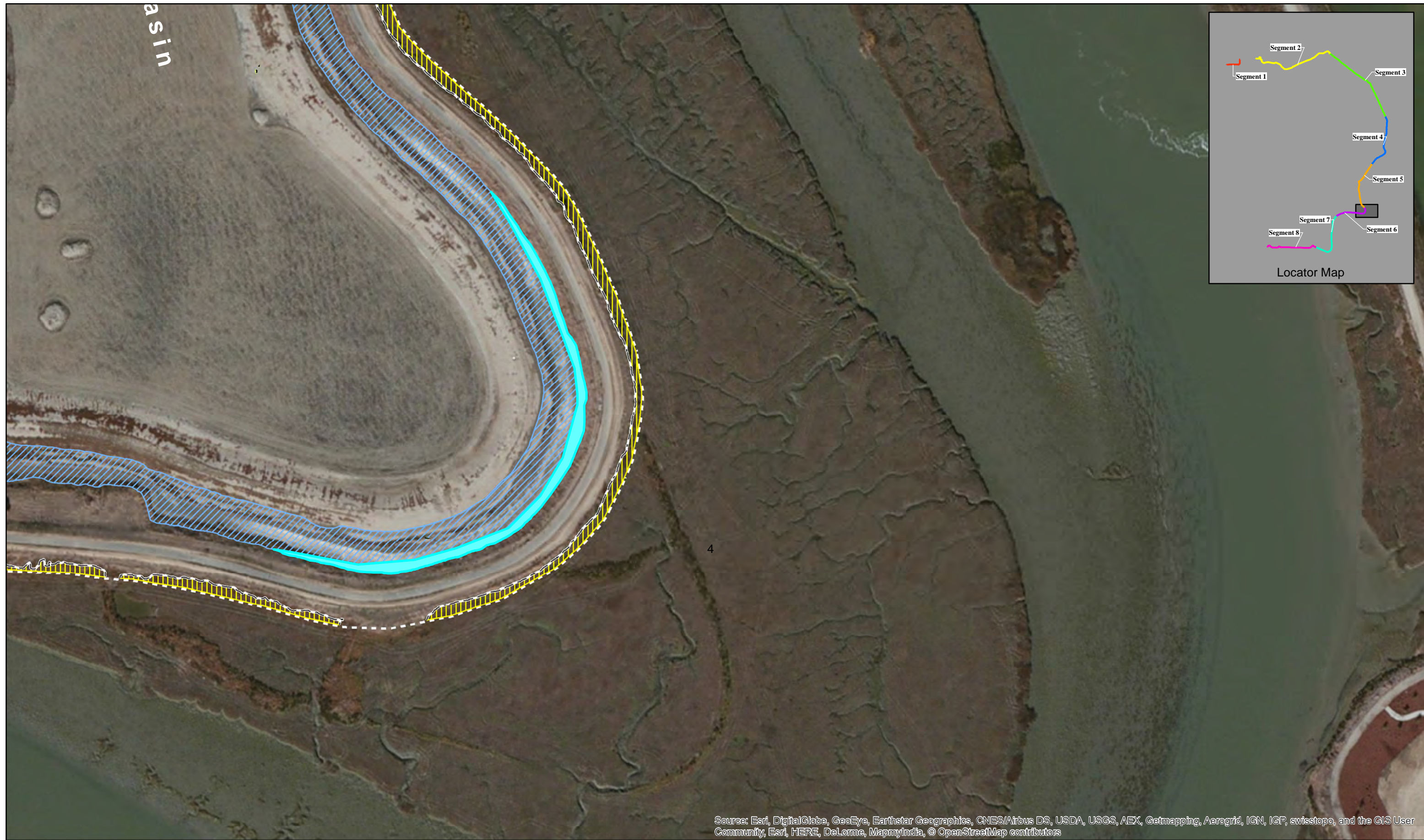
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

**Figure 16c. Location of Impacts to Wetlands and Waters of the U.S.(2050 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California

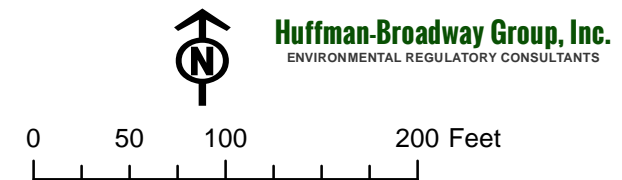
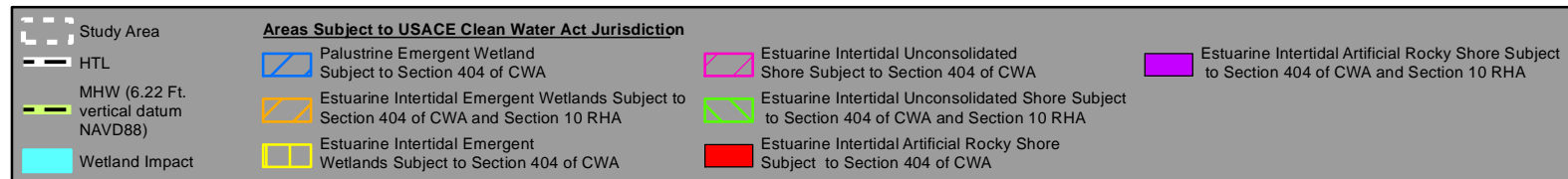






**Figure 16d. Location of Impacts to Wetlands and Waters of the U.S.(2050 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
 Foster City, San Mateo County, California



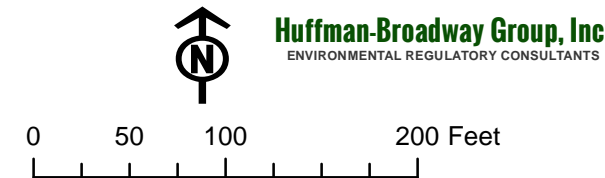
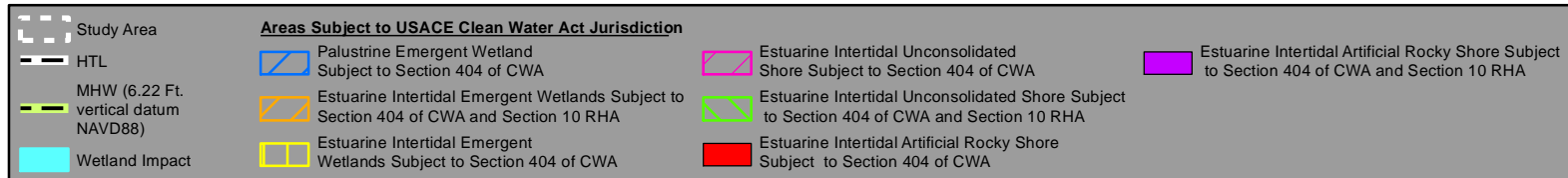
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors





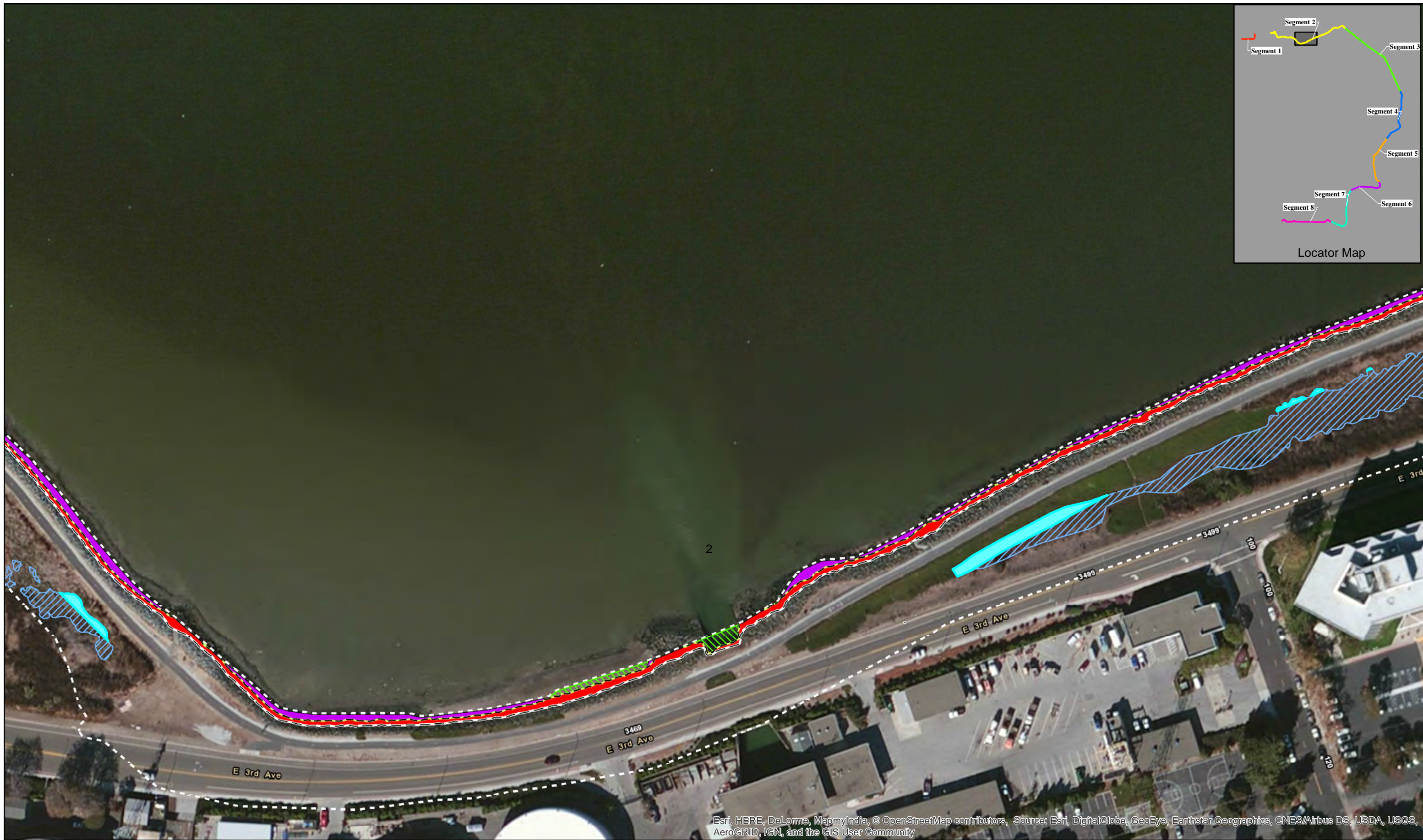
**Figure 17a. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



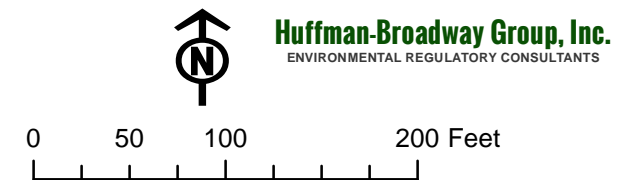
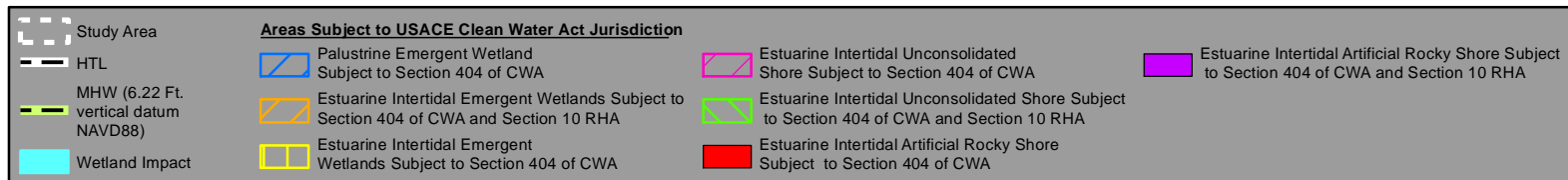
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





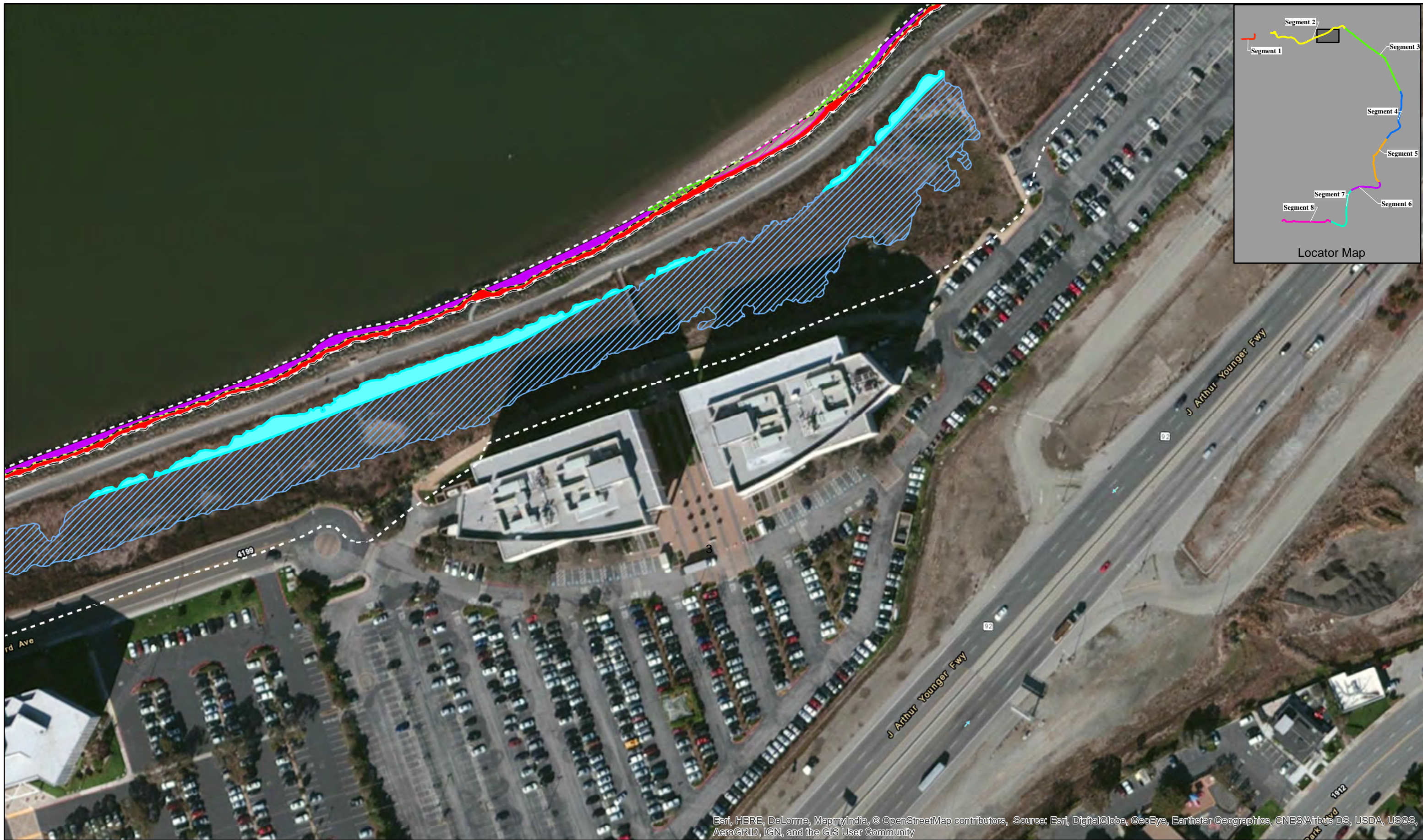
**Figure 17b. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community






**Figure 17c. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
 Foster City, San Mateo County, California

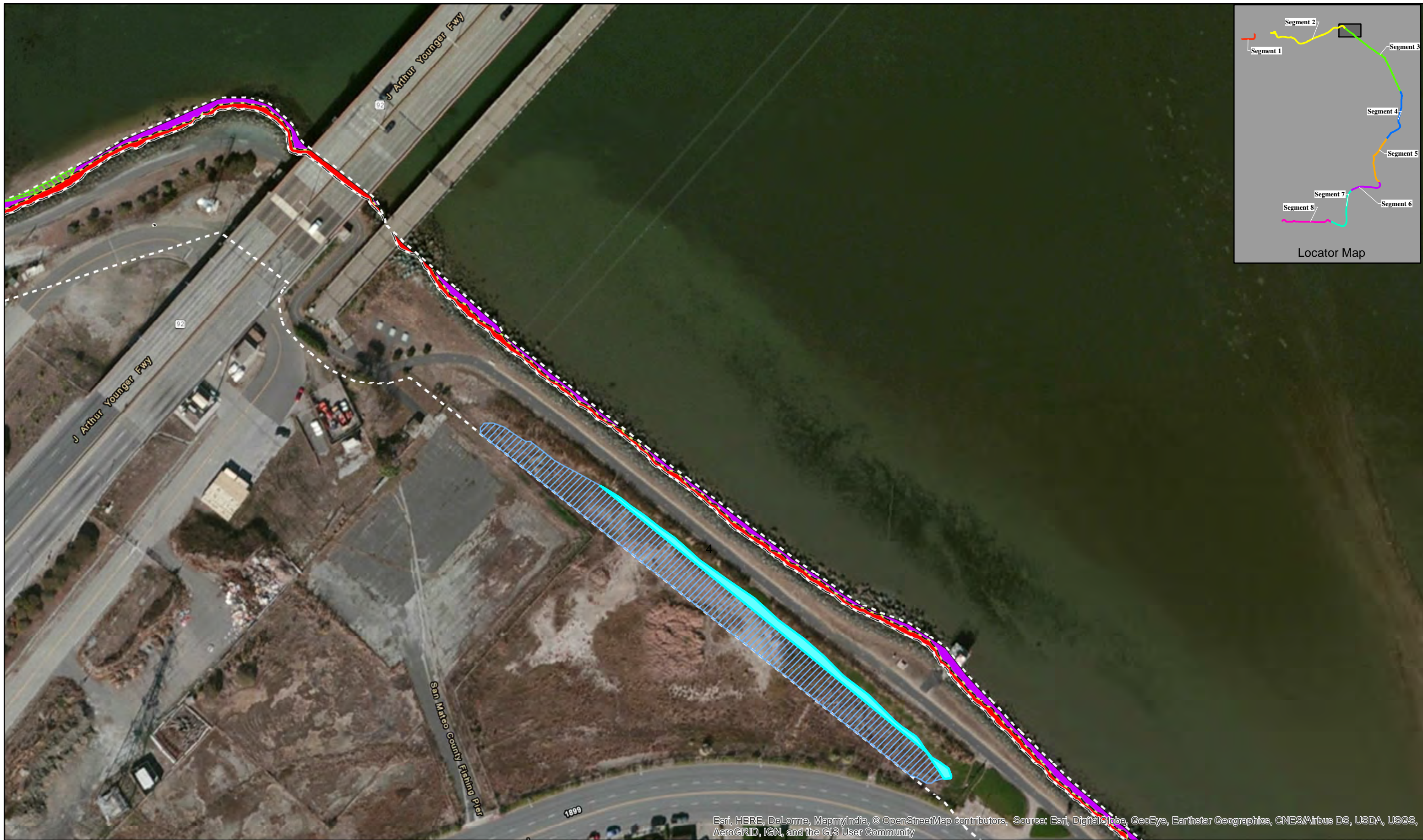
Study Area		Areas Subject to USACE Clean Water Act Jurisdiction			
	Study Area		Palustrine Emergent Wetland Subject to Section 404 of CWA		Estuarine Intertidal Unconsolidated Shore Subject to Section 404 of CWA
	HTL		Estuarine Intertidal Emergent Wetlands Subject to Section 404 of CWA and Section 10 RHA		Estuarine Intertidal Unconsolidated Shore Subject to Section 404 of CWA and Section 10 RHA
	MHW (6.22 Ft. vertical datum NAVD88)		Estuarine Intertidal Emergent Wetlands Subject to Section 404 of CWA		Estuarine Intertidal Artificial Rocky Shore Subject to Section 404 of CWA
	Wetland Impact				Estuarine Intertidal Artificial Rocky Shore Subject to Section 404 of CWA and Section 10 RHA


**Huffman-Broadway Group, Inc.**  
 ENVIRONMENTAL REGULATORY CONSULTANTS

0    50    100    200 Feet

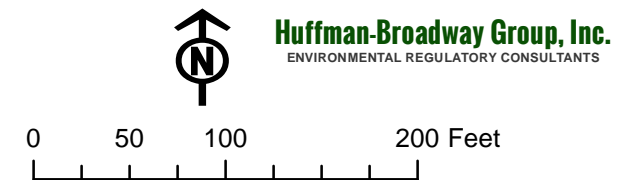
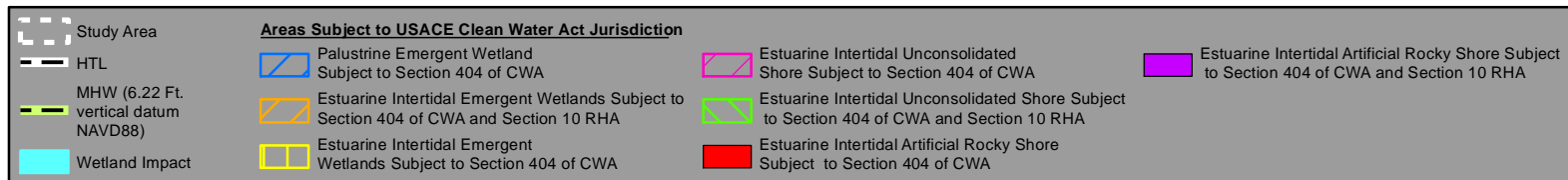
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





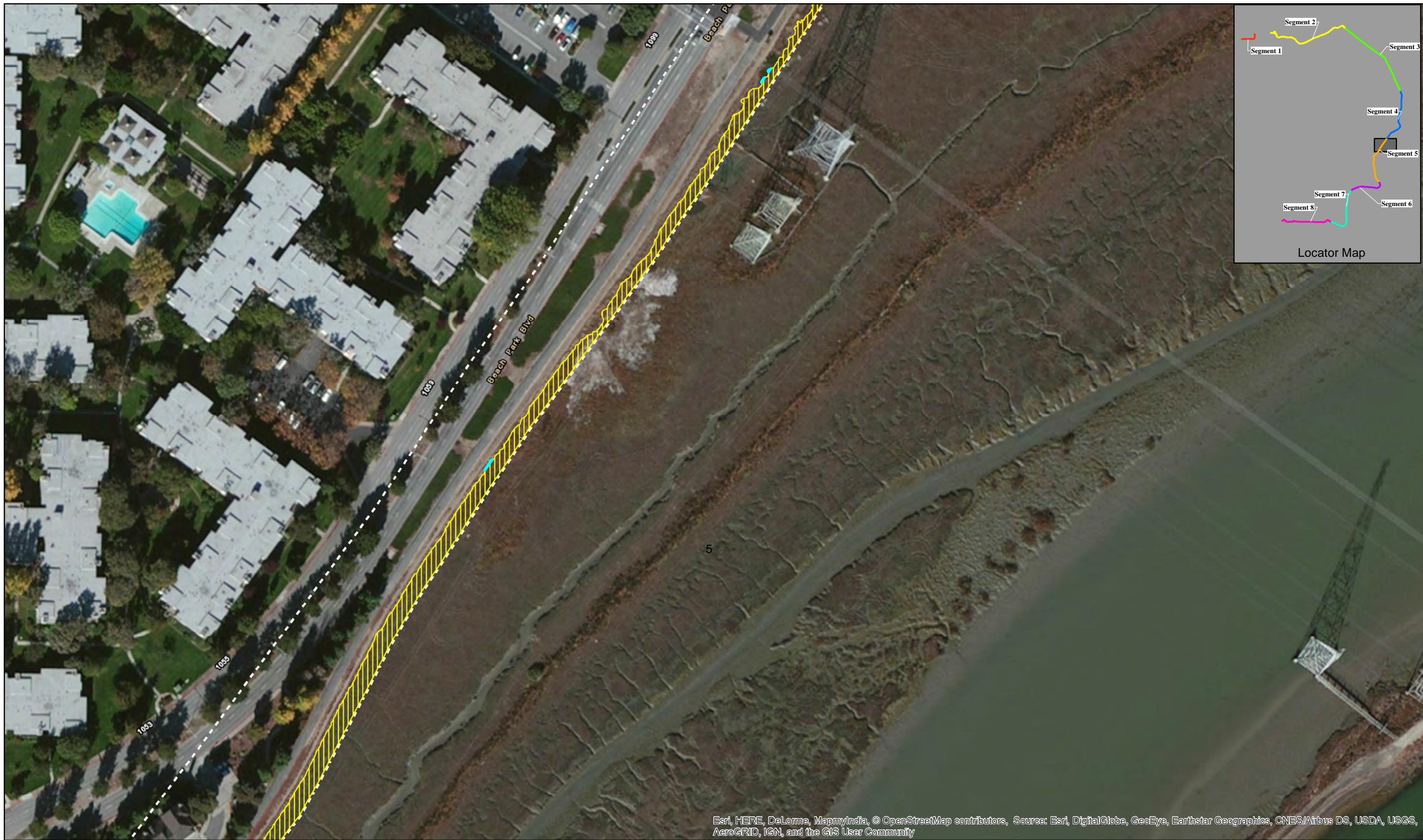
**Figure 17d. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



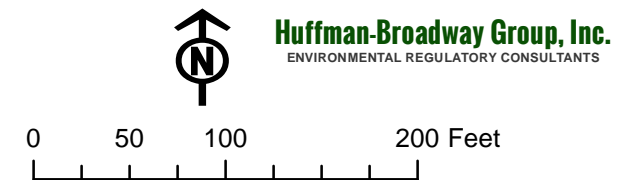
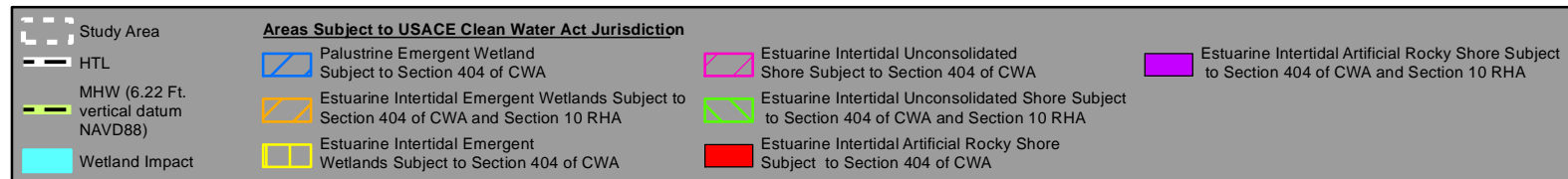
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





**Figure 17e. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California

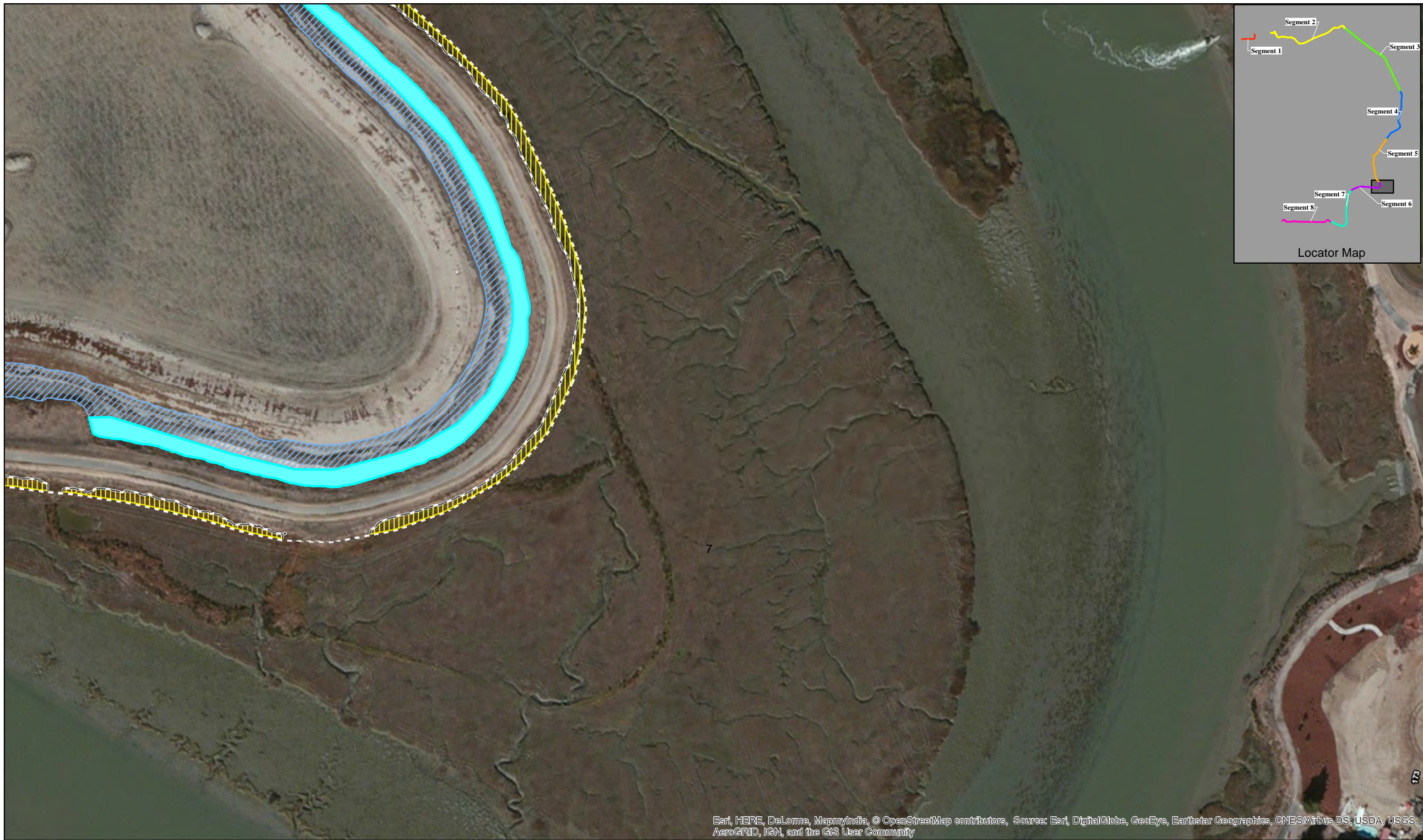


Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



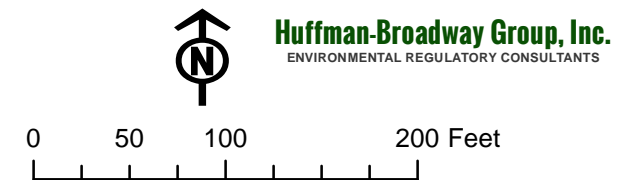
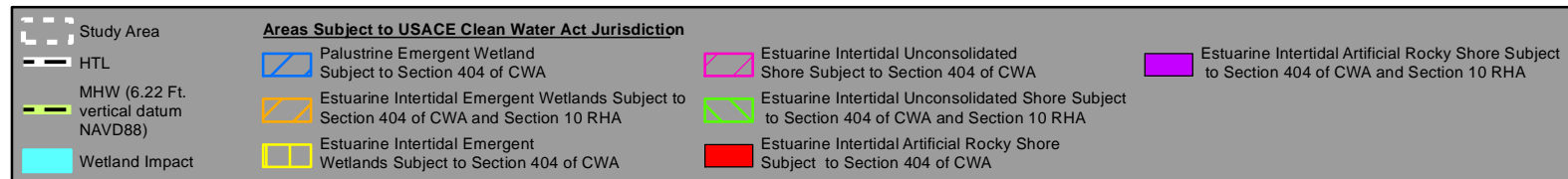






**Figure 17g. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



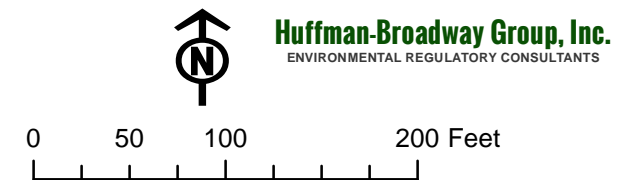
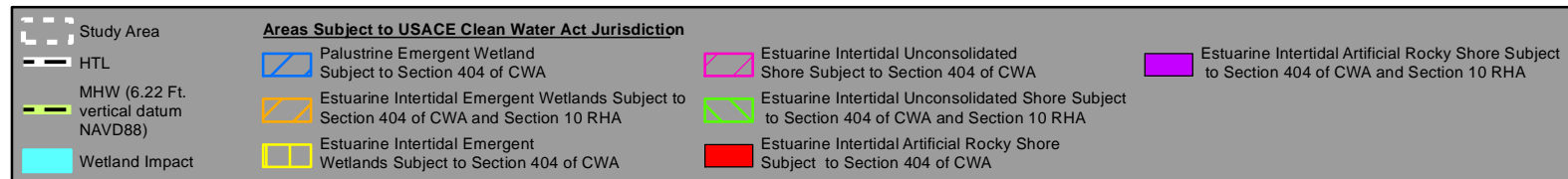
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





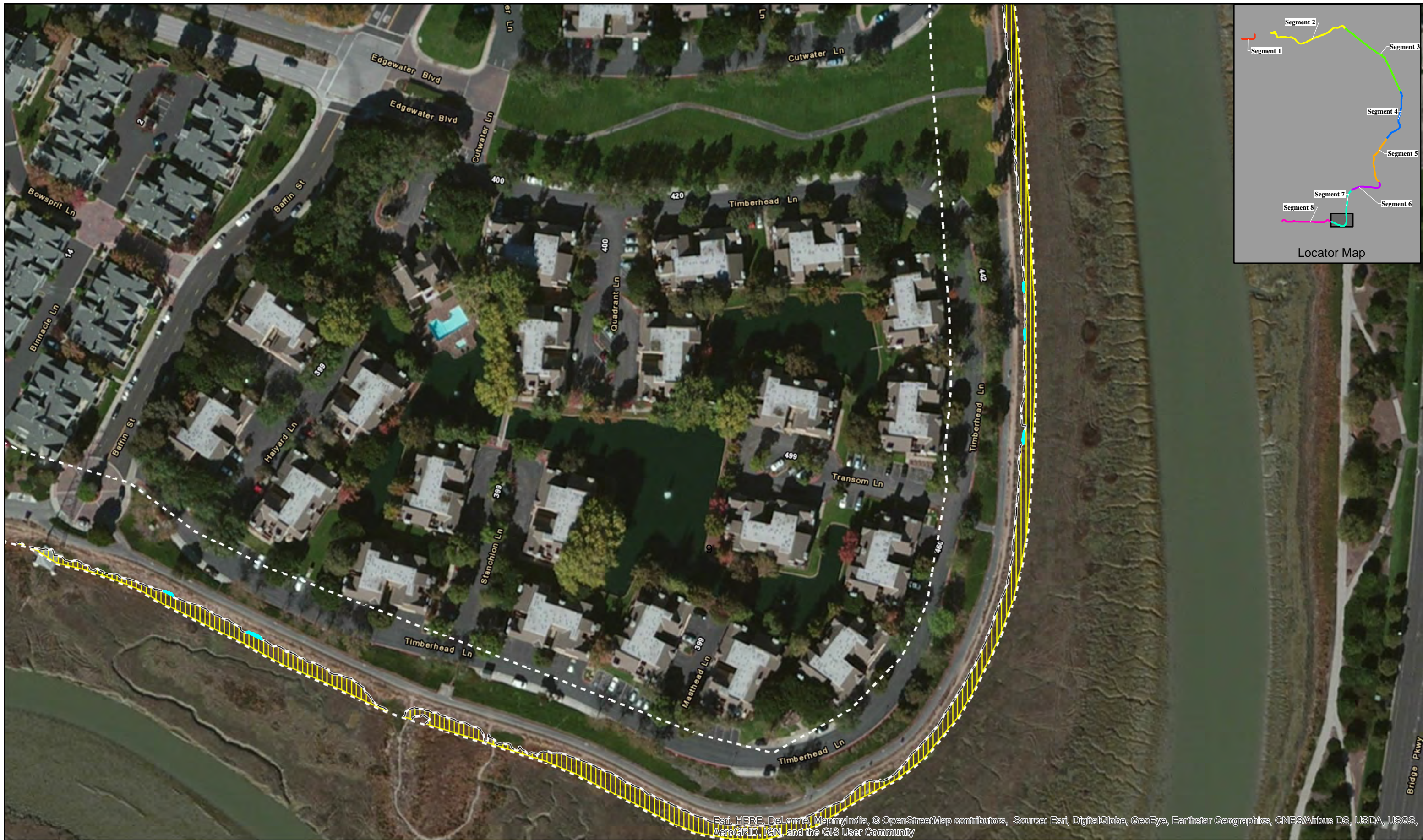
**Figure 17h. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



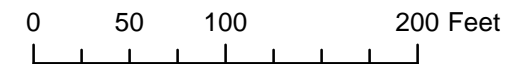
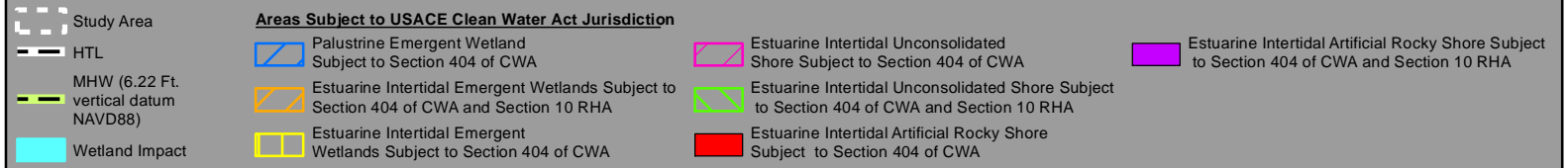
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





**Figure 17i. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



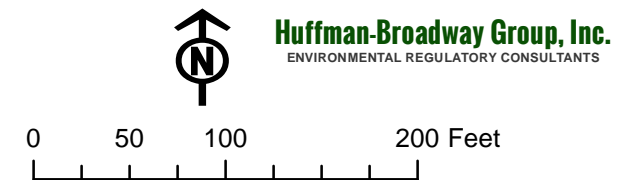
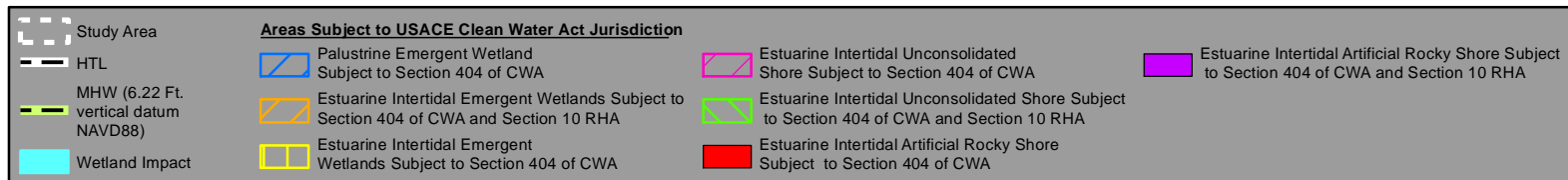
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





**Figure 17j. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



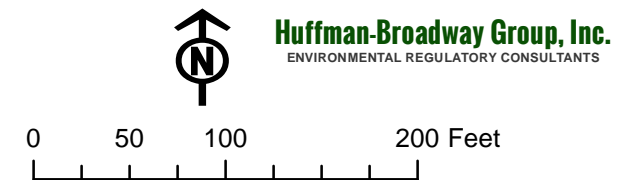
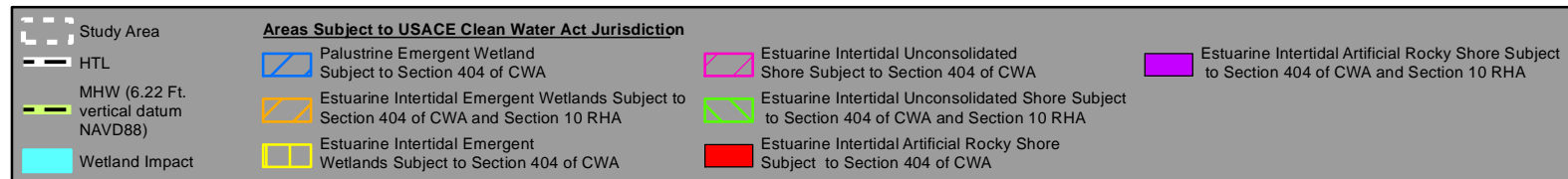
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





**Figure 17k. Location of Impacts to Wetlands and Waters of the U.S. (2100 Sea Level Rise Scenario)**

Foster City Proposed Levee Improvements  
Foster City, San Mateo County, California



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



## **ATTACHMENT 2**

### **Tables**

- Table 1. Wildlife Species Known to Occur in the Project Area
- Table 2. Special Status Plants with Potential to Occur in the Vicinity of the Project Site, Foster City, California
- Table 3. Special Status Animal Species that Have Been Reported in the Vicinity of the Project Site, Foster City, California



**Table 1. Wildlife Species Known to Occur in the Project Area**

<u>Common Name</u>	<u>Scientific Name</u>
<b>Amphibians and Reptiles</b>	
Pacific Tree Frog	<i>Hyla regilla</i>
Western Fence Lizard	<i>Sceloporus occidentalis</i>
Gopher Snake	<i>Pituophis melanoleucus</i>
Common Garter Snake	<i>Thamnophis sirtalis</i>
<b>Birds</b>	
Cackling Goose	<i>Branta hutchinsii</i>
Canada Goose	<i>Branta canadensis</i>
Gadwall	<i>Anas strepera</i>
Eurasian Wigeon	<i>Anas penelope</i>
American Wigeon	<i>Anas americana</i>
Mallard	<i>Anas platyrhynchos</i>
Blue-winged Teal	<i>Anas discors</i>
Cinnamon Teal	<i>Anas cyanoptera</i>
Northern Shoveler	<i>Anas clypeata</i>
Northern Pintail	<i>Anas acuta</i>
Green-winged Teal	<i>Anas crecca</i>
Canvasback	<i>Aythya valisineria</i>
Redhead	<i>Aythya americana</i>
Ring-necked Duck	<i>Aythya collaris</i>
Tufted Duck	<i>Aythya fuligula</i>
Greater Scaup	<i>Aythya marila</i>
Lesser Scaup	<i>Aythya affinis</i>
Harlequin Duck	<i>Histrionicus histrionicus</i>
Surf Scoter	<i>Melanitta perspicillata</i>
White-winged Scoter	<i>Melanitta fusca</i>
Long-tailed Duck	<i>Clangula hyemalis</i>
Bufflehead	<i>Bucephala albeola</i>
Common Goldeneye	<i>Bucephala clangula</i>
Barrow's Goldeneye	<i>Bucephala islandica</i>
Hooded Merganser	<i>Lophodytes cucullatus</i>
Common Merganser	<i>Mergus merganser</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>
California Quail	<i>Callipepla californica</i>
Red-throated Loon	<i>Gavia stellata</i>

Common Loon	<i>Gavia immer</i>
Pied-billed Grebe	<i>Podilymbus podiceps</i>
Horned Grebe	<i>Podiceps auritus</i>
Eared Grebe	<i>Podiceps nigricollis</i>
Western Grebe	<i>Aechmophorus occidentalis</i>
Clark's Grebe	<i>Aechmophorus clarkii</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
American White Pelican	<i>Pelecanus erythrorhynchos</i>
Brown Pelican	<i>Pelecanus occidentalis</i>
Great Blue Heron	<i>Ardea herodias</i>
Great Egret	<i>Ardea alba</i>
Snowy Egret	<i>Egretta thula</i>
Green Heron	<i>Butorides virescens</i>
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>
Turkey Vulture	<i>Cathartes aura</i>
Osprey	<i>Pandion haliaetus</i>
White-tailed Kite	<i>Elanus leucurus</i>
Northern Harrier	<i>Circus cyaneus</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Ridgway's Rail	<i>Rallus obsoletus</i>
Virginia Rail	<i>Rallus limicola</i>
Sora	<i>Porzana carolina</i>
American Coot	<i>Fulica americana</i>
Black-necked Stilt	<i>Himantopus mexicanus</i>
American Avocet	<i>Recurvirostra americana</i>
Black-bellied Plover	<i>Pluvialis squatarola</i>
Snowy Plover	<i>Charadrius nivosus</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>
Killdeer	<i>Charadrius vociferus</i>
Spotted Sandpiper	<i>Actitis macularius</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Willet	<i>Tringa semipalmata</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>
Whimbrel	<i>Numenius phaeopus</i>
Long-billed Curlew	<i>Numenius americanus</i>
Marbled Godwit	<i>Limosa fedoa</i>
Ruddy Turnstone	<i>Arenaria interpres</i>
Black Turnstone	<i>Arenaria melanocephala</i>
Red Knot	<i>Calidris canutus</i>



Surfbird	<i>Calidris virgata</i>
Sanderling	<i>Calidris alba</i>
Dunlin	<i>Calidris alpina</i>
Least Sandpiper	<i>Calidris minutilla</i>
Western Sandpiper	<i>Calidris mauri</i>
Short-billed Dowitcher	<i>Limnodromus griseus</i>
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
Wilson's Snipe	<i>Gallinago delicata</i>
Red-necked Phalarope	<i>Phalaropus lobatus</i>
Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>
Mew Gull	<i>Larus canus</i>
Ring-billed Gull	<i>Larus delawarensis</i>
Western Gull	<i>Larus occidentalis</i>
California Gull	<i>Larus californicus</i>
Herring Gull	<i>Larus argentatus</i>
Thayer's Gull	<i>Larus thayeri</i>
Glaucous-winged Gull	<i>Larus glaucescens</i>
Least Tern	<i>Sternula antillarum</i>
Elegant Tern	<i>Thalasseus elegans</i>
Caspian Tern	<i>Hydroprogne caspia</i>
Forster's Tern	<i>Sterna forsteri</i>
Black Skimmer	<i>Rynchops niger</i>
Rock Pigeon	<i>Columba livia</i>
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>
Mourning Dove	<i>Zenaida macroura</i>
Barn Owl	<i>Tyto alba</i>
Great Horned Owl	<i>Bubo virginianus</i>
Vaux's Swift	<i>Chaetura vauxi</i>
White-throated Swift	<i>Aeronautes saxatalis</i>
Anna's Hummingbird	<i>Calypte anna</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
Allen's Hummingbird	<i>Selasphorus sasin</i>
Belted Kingfisher	<i>Megaceryle alcyon</i>
Nuttall's Woodpecker	<i>Picoides nuttallii</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Northern Flicker	<i>Colaptes auratus</i>
American Kestrel	<i>Falco sparverius</i>
Merlin	<i>Falco columbarius</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Black Phoebe	<i>Sayornis nigricans</i>
Say's Phoebe	<i>Sayornis saya</i>
Loggerhead Shrike	<i>Lanius ludovicianus</i>

Western Scrub-Jay	<i>Aphelocoma californica</i>
American Crow	<i>Corvus brachyrhynchos</i>
Common Raven	<i>Corvus corax</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Violet-green Swallow	<i>Tachycineta thalassina</i>
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>
Barn Swallow	<i>Hirundo rustica</i>
Chestnut-backed Chickadee	<i>Poecile rufescens</i>
Oak Titmouse	<i>Baeolophus inornatus</i>
Bushtit	<i>Psaltriparus minimus</i>
Marsh Wren	<i>Cistothorus palustris</i>
Bewick's Wren	<i>Thryomanes bewickii</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
Hermit Thrush	<i>Catharus guttatus</i>
American Robin	<i>Turdus migratorius</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
European Starling	<i>Sturnus vulgaris</i>
American Pipit	<i>Anthus rubescens</i>
Cedar Waxwing	<i>Bombcilla cedrorum</i>
Orange-crowned Warbler	<i>Oreothlypis celata</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Yellow Warbler	<i>Setophaga petechia</i>
Yellow-rumped Warbler	<i>Setophaga coronata</i>
Townsend's Warbler	<i>Setophaga townsendi</i>
California Towhee	<i>Melospiza crissalis</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Fox Sparrow	<i>Passerella iliaca</i>
Song Sparrow	<i>Melospiza melodia</i>
Lincoln's Sparrow	<i>Melospiza lincolnii</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Western Tanager	<i>Piranga ludoviciana</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Tricolored Blackbird	<i>Agelaius tricolor</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Hooded Oriole	<i>Icterus cucullatus</i>
House Finch	<i>Haemorhous mexicanus</i>
Purple Finch	<i>Haemorhous purpureus</i>



Pine Siskin  
Lesser Goldfinch  
American Goldfinch  
House Sparrow

*Spinus pinus*  
*Spinus psaltria*  
*Spinus tristis*  
*Passer domesticus*

## **Mammals**

Opossum  
California Ground Squirrel  
Botta's Pocket Gopher  
Norway Rat  
House Mouse  
Deer Mouse  
Black-tailed Jackrabbit  
Raccoon  
Striped Skunk

*Didelphis virginiana*  
*Spermophilus beecheyi*  
*Thomomys bottae*  
*Rattus norvegicus*  
*Mus musculus*  
*Peromyscus maniculatus*  
*Lepus californicus*  
*Procyon lotor*  
*Mephitis mephitis*

---

Mayer and Laudenslayer (1988)  
National Geographic Society (2011)  
Reid (2006)  
Sibley (2014)  
Stebbins (2003)  
Zeiner et al. (1990a, 1990b, 1990c)

**Table 2. Special-Status Plants with Potential to Occur in the Vicinity of the Project Site, Foster City, California**

SPECIES	STATUS FED/STATE/CNPS <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
<b>PLANTS</b>			
San Mateo thorn-mint ( <i>Acanthomintha duttonii</i> )	FE/CE/1B.1	Chaparral, valley and foothill coastal scrub, vernal pools. Endemic from very uncommon San Mateo serpentine vertisol clays. 50-200m. Known sites are in the hills near I-280, Edgewood Park and Pulgas Ridge.	Not present. Appropriate habitat not present on site.
Franciscan onion ( <i>Allium peninsulare franciscanum</i> )	-/-/1B.2	Found in cismontane woodland and valley and foothill grassland in clay soils and serpentine on dry hillsides. 100-300m. Most recent documentation from area of Crystal Springs Road/Polhemus Road in 1963.	Not present. Appropriate habitat not present on site.
Bent-flowered fiddleneck ( <i>Amsinckia lunaris</i> )	-/-/1B.2	Cismontane woodland and valley and foothill grassland. 50-500m. Known from the area of Crystal Springs Road in Hillsborough.	Not present. Appropriate habitat not present on site.
Anderson's manzanita ( <i>Arctostaphylos andersonii</i> )	-/-/1B.2	Broadleaved upland forest, chaparral, North Coast coniferous forest, open sites, redwood forest. 180-800m. Occurs in the area of Kings Mountain Road.	Not present. Appropriate habitat not present on site.
Kings Mountain manzanita ( <i>Arctostaphylos regismontana</i> )	-/-/1B.2	Broadleaved upland forest, chaparral, North Coast coniferous forest, on granitic or sandstone outcrops. 305-730m. Occurs near Kings Mountain Road at Skyline Blvd.	Not present. Appropriate habitat not present on site.
Montara manzanita ( <i>Arctostaphylos montaraensis</i> )	-/-/1B.2	Slopes and ridges in chaparral and Coastal scrub. 150-500m. Nearest location is on Montara Mountain.	Not present. Appropriate habitat not present on site.
Coastal marsh milk-vetch ( <i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i> )	-/-/1B.2	Found in mesic sites in dunes or along streams in coastal dunes and coastal salt marshes. 0-30m. Known from the area of Crystal Springs Reservoir.	Not present. Appropriate habitat not present on site.
San Francisco Bay spineflower ( <i>Chorizanthe cuspidata cuspidata</i> )	-/-/1B.1	Found on sandy soil on terraces and slopes within coastal bluff scrub, coastal dunes, coastal prairie and coastal scrub. 5-550m. Known from area around I-280/Highway 92 interchange.	Not present. Appropriate habitat not present on site.



SPECIES	STATUS FED/STATE/CNPS <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
Fountain thistle ( <i>Cirsium fontinale fontinale</i> )	-/-/1B.2	Endemic to serpentine seeps in valley and foothill grassland and chaparral in San Mateo County. 90-180m. Known from area of Emerald Lake, Pulgas Ridge and Edgewood County Park.	Not present. Appropriate habitat not present on site.
Lost thistle ( <i>Cirsium praeoteriens</i> )	-/-/1B.2	Habitat little known. Collected in Palo Alto in 1897 and 1901. Thought to be extinct.	Not present. Plant is thought to be extinct.
San Francisco collinsia ( <i>Collinsia multicolor</i> )	FE/CE/1B.1	Found in closed-cone coniferous forest and coastal scrub. Usually on decomposed mudstone shale mixed with humus. 30-250m. Found along San Mateo Creek below Crystal Springs Dam.	Not present. Appropriate habitat not present on site.
Points Reyes bird's beak ( <i>Cordylanthus maritimus palustris</i> )	-/-/1A	Usually in coastal salt marsh with <i>Salicornia</i> , <i>Distichlis</i> , <i>Jaumea</i> , <i>Spartina</i> , etc. 0-15m. Known from a 1908 collection at the mouth of Redwood Creek and 1893 collection at Belmont Slough.	Not present. Occurrence at Belmont Slough has been extirpated for some time.
Western leatherwood ( <i>Dirca occidentalis</i> )	-/-/1B.2	On brushy slopes and mesic sites mostly in mixed evergreen and foothill woodland communities. 30-550m. Known from areas west of Palo Alto (e.g. Searsville Lake) and at Edgewood County Park.	Not present. Appropriate habitat not present on site.
San Mateo woolly sunflower ( <i>Eriophyllum latilobum</i> )	-/-/1B.2	Endemic to cismontane woodland in San Mateo County, often on roadcuts and serpentine. 45-150m. Found near Crystal Springs Road.	Not present. Appropriate habitat not present on site.
Hillsborough chocolate lily ( <i>Fritillaria biflora ineziana</i> )	FE/CE/1B.1	Endemic to serpentine cismontane woodland, valley and foothill grassland of San Mateo County. Known from Hillsborough.	Not present. Appropriate habitat not present on site.
Fragrant fritillary ( <i>Fritillaria liliacea</i> )	-/-/1B.1	Coastal scrub, valley and foothill grassland, coastal prairie, often on ultramafic soils. 3-410m. Has occurred at Edgewood County Park, Pulgas Ridge, Crystal Springs Reservoir and in the hills near Stanford University.	Not present. Appropriate habitat not present on site.
Congdon's tarplant ( <i>Centromedia parryi congdonii</i> )	-/-/1B.2	Alkaline soils in valley and foothills grassland. Known site at Cooley Landing converted to salt evaporators in early 1900s.	Not present. Appropriate habitat not present on site.

SPECIES	STATUS FED/STATE/CNPS <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
Short-leaved evax ( <i>Hesperovax sparsiflora</i> var. <i>brevifolia</i> )	-/-/1B.2	Sandy bluffs and flats in Coastal bluff scrub, coastal dunes. 0-200M. Known from near Skyline Blvd. near Black Mountain.	Not present. Appropriate habitat not present on site.
Marin western flax ( <i>Hesperolinon congestum</i> )	FT/CT/1B.1	Chaparral, valley and foothill grassland. Found in serpentine barrens and serpentine grassland and chaparral. 31-365m. Known sites in Woodside Glens, Edgewood County Park, Pulgas Ridge and other sites near I-280.	Not present. Appropriate habitat not present on site.
Point Reyes horkelia ( <i>Horkelia marinensis</i> )	-/-/1B.2	Coastal dunes, coastal prairie and coastal scrub; in sandy flats and dunes of grassland or scrub habitats near the coast. 5-30m. Documented in 1903 near the Point Reyes Post Office.	Not present. Appropriate habitat not present on site.
Kellogg's horkelia ( <i>Horkelia cuneata</i> ssp. <i>sericea</i> )	-/-/1B.1	Closed-cone coniferous forest, coastal scrub. Old dunes, coastal sandhills; generally under 200 m.	Not present. Appropriate habitat not present on site.
Contra Costa Goldfields ( <i>Lasthenia conjugens</i> )	FE--/1B.1	Valley and foothill grassland, vernal pools, cismontane woodland. Grows in vernal pools, swales, and low depressions in open grassy areas. Extirpated from most of its range 1-445m.	Not present. Appropriate habitat not present on site.
Crystal Springs lessingia ( <i>Lessingia arachnoidea</i> )	-/-/1B.2	Grassy slopes, roadsides in serpentine soils of coastal sage scrub, valley and foothill grassland and cismontane woodland. 60-200m. Known from Pulgas Ridge and San Mateo Canyon.	Not present. Appropriate habitat not present on site.
Indian Valley Bush Mallow ( <i>Malacothamnus aboriginum</i> )	-/-/1B.2	Granitic outcrops and sandy bare soil in cismontane woodland, chaparral. Often in disturbed soils. 150-1700m. Known from a specimen collected in 1897.	Not present. Appropriate habitat not present on site.
Arcuate bush mallow ( <i>Malacothamnus arcuatus</i> )	-/-/1B.2	Found in gravelly alluvium in chaparral. 80-355m. Nearest location was at a site mapped in 1935 near the San Mateo Bridge which has long been developed and extirpated.	Not present. Appropriate habitat not present on site.
Davidson's bush mallow ( <i>Malacothamnus davidsonii</i> )	-/-/1B.2	Sandy washes in coastal scrub, riparian woodland and chaparral. 180-855m. Known from specimen in Belmont in 1897.	Not present. Appropriate habitat not present on site.
Hall's bush mallow ( <i>Malacothamnus hallii</i> )	-/-/1B.2	Found in chaparral, sometimes in serpentine. 10-550m. Known from specimen in Belmont in 1891.	Not present. Appropriate habitat not present on site.



SPECIES	STATUS FED/STATE/CNPS <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
Woodland woollythreads ( <i>Monolopiagracilens</i> )	-/-/1B.2	Chaparral, valley and foothill grasslands (serpentine), cismontane woodland, broadleaved upland forests, North Coast coniferous forest. Found in grassy sites in openings in sandy to rocky soils. Often seen on serpentine after burns but may have only weak affinity to serpentine. 100-1200m. Nearest location is near Pilarcitos Lake.	Not present. Appropriate habitat not present on site.
White-rayed pentachaeta ( <i>Pentachaeta bellidiflora</i> )	FE/CE/1B.1	Mostly on soils derived from serpentine bedrock or open, dry rocky slopes and grassy areas of valley and foothill grassland. Known from Edgewood County Park.	Not present. Appropriate habitat not present on site.
Choris's popcornflower ( <i>Plagiobothrys chorisianus</i> )	None/None/1B.2	Grassy and moist places, coastal scrub, chaparral; < 100m.	Not present. Appropriate habitat not present on site.
Oregon Polemonium ( <i>Polemonium carneum</i> )	-/-/2B.2	Found in Coastal prairie, coastal scrub and lower montane coniferous forest. 0-1830m. Last observed near Pilarcitos Dam in 1916.	Not present. Appropriate habitat not present on site.
Slender-leaved pondweed ( <i>Potamogeton filiformis</i> )	-/-/2B.2	Occurs in clear, shallow water of marshes, lakes, drainage channels.	Not present. Appropriate habitat not present on site.
Chaparral ragwort ( <i>Senecio aphanactis</i> )	B/B/1B.2	Known from foothill woodland and chaparral habitats.	Not present. Appropriate habitat not present on site.
San Francisco campion ( <i>Silene verecunda veracunda</i> )	-/-/2B.2	Often on mudstone or shale in coastal scrub, valley and foothill grassland, coastal bluff scrub, chaparral and coastal prairie. Found at Edgewood County Park.	Not present. Appropriate habitat not present on site.
Saline clover ( <i>Trifolium depauperatum</i> var. <i>hydrophilum</i> )	-/-/1B.2	Found in mesic alkaline sites in marshes and swamps, valley and foothill grassland and vernal pools. 0-300m. Known from an 1886 specimen in Belmont.	Not present. Appropriate habitat not present on site.
San Francisco owl's clover ( <i>Triphysaria floribunda</i> )	-/-/1B.2	Coastal prairie, valley and foothill grassland, on both serpentine and non-serpentine. 10-160m.	Not present. Appropriate habitat not present on site.
Long-beard lichen ( <i>Usnea longissima</i> )	-/-/4.3	North Coast coniferous forest, broadleaved upland forest. Grows in the "redwood zone" on a variety of trees including big leaf maple, oaks, ash, Douglas fir and bay. 0-700 m in California. Known from Purisima Creek east of Half Moon Bay.	Not present. Appropriate habitat not present on site.

1. Source: California Natural Diversity Data Base, Natural Heritage Division, California Department of Fish and Wildlife for the San Mateo 7.5 Minute Quadrangle Map and surrounding areas, information dated May 2016.

2. Status Codes:

FE	Federal-listed Endangered
FT	Federal-listed Threatened
FPE	Federal Proposed Endangered
FPT	Federal Proposed Threatened
CE	California State-listed Endangered
CT	California State-listed Threatened
CR	California Rare
FP	California Fully Protected
CSC	California Species of Special Concern

California Rare Plant Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere.

California Rare Plant Rank 1B: Plants rare, threatened, or endangered in California and elsewhere.

California Rare Plant Rank 2A: Plants presumed extirpated in California, but more common elsewhere.

California Rare Plant Rank 2B: Plants rare, threatened, or endangered in California, but more numerous elsewhere.

California Rare Plant Rank 3: Plants about which more information is needed – a review list.

California Rare Plant Rank 4: Plants of limited distribution – a watch list.

CNPS Threat Ranks

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

0.3-Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)



**Table 3. Special Status Animal Species that Have Been Reported in the Vicinity of the Project Area, Foster City, California**

SPECIES <sup>1</sup>	STATUS FED/STATE <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
<b>ANIMALS</b>			
Edgewood blind harvestman ( <i>Calicina minor</i> )	-/--	Found in open grassland in areas of serpentine bedrock; found on the underside of moist serpentine rocks near permanent springs. Nearest population is at Edgewood County Park.	Not present. Appropriate habitat not present on site.
Ricksecker's water scavenger beetle ( <i>Hydrochara rickseckeri</i> )	-/--	Known from aquatic habitats in the San Francisco Bay Area. Found at the Pulgas Water Temple at Upper Crystal Springs Reservoir in 1954.	Not present. Appropriate habitat not present on site.
San Francisco Fork-tailed damselfly ( <i>Ischnura gemina</i> )	--/--	Inhabits small, marshy ponds and ditches with emergent and floating aquatic vegetation. Endemic to the San Francisco Bay Area.	Not present. Appropriate habitat not present on site.
Callippe Silverspot Butterfly ( <i>Speyeria callippe callippe</i> )	FE/--	Coastal grassland; host plant is <i>Viola pedunculata</i> . Known from the area around San Bruno Mountain.	Not present. Appropriate habitat not present on site.
Myrtle's silverspot ( <i>Speyeria zerene myrtleae</i> )	FE/--	Restricted to foggy, coastal dunes and hills of Point Reyes Peninsula. Larval food plant is <i>Viola adunca</i> . Thought to be extirpated from San Mateo County.	Not present. Appropriate habitat not present on site. Extirpated from San Mateo County.
San Bruno elfin butterfly ( <i>Callophrys mossii bayensis</i> )	FE/--	Inhabits rocky outcrops and cliffs in coastal scrub on the San Francisco Peninsula. Distribution matches that of the host plant, broadleaf stonecrop ( <i>Sedum spathulifolium</i> ). Known from the area around San Bruno Mountain.	Not present. Appropriate habitat not present on site.
Mission blue butterfly ( <i>Plebejus icarioides missionensis</i> )	FE/--	Inhabits grasslands of the San Francisco Peninsula. Larval host plants include <i>Lupinus albifrons</i> , <i>L. variicolor</i> , and <i>L. formosus</i> , favors <i>L. albifrons</i> . Known from San Bruno Mountain area, also McLaren Park.	Not present. Appropriate habitat not present on site.

SPECIES <sup>1</sup>	STATUS FED/STATE <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
<b>ANIMALS</b>			
Bay checkerspot butterfly ( <i>Euphydryas editha bayensis</i> )	FT/-	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. <i>Plantago erecta</i> is the primary host plant; <i>Orthocorpus densiflorus</i> and <i>O. purpurscens</i> are the secondary host plants. Nearest populations are at Pulgas Ridge near Hillsborough, near Crystal Springs Reservoir, Edgewood County Park and Jasper Ridge west of the Stanford Campus.	Not present. Appropriate habitat not present on site.
Green Sturgeon ( <i>Acipenser medirostris</i> )	FT/CSC	Green Sturgeon rely on streams, rivers, and estuarine habitat as well as marine waters during their lifecycle. They prefer to spawn in lower reaches of large rivers with swift currents and large cobble. They are found spawning in the Sacramento, Klamath and Rogue Rivers.	Possible. May pass by the project area during migration through the Bay. No significant impacts are anticipated.
Coho Salmon-Central California Coast ESU ( <i>Oncorhynchus kisutch</i> )	FE/CE	Coho Salmon spawn in streams that are narrow, shallow, clear, and cold with a strong upwelling of water through the gravel. This ESU includes tributaries to San Francisco Bay, but not the Sacramento-San Joaquin river system.	Not present. Appropriate habitat not present on site. Species may pass through San Francisco Bay. No significant impacts are anticipated.
Steelhead - Central CA Coast ESU ( <i>Oncorhynchus mykiss</i> )	FT/--	Well-oxygenated streams with riffles; loose, silt-free gravel substrate. ESU encompasses drainages in San Francisco and San Pablo Bays east to the Napa River.	Possible. Nearest spawning run is San Mateo Creek. May pass by the project area during migration through the Bay. No significant impacts are anticipated.
Steelhead-Central Valley ESU ( <i>Oncorhynchus mykiss</i> ).	FT/--	Steelhead spawn in streams that are shallow, clear, and cold with a strong upwelling of water through the gravel. The ESU encompasses the Suisun Bay/Sacramento River Delta watersheds.	Not present. Appropriate habitat not present on site. Species may pass through San Francisco Bay. No significant impacts are anticipated.
Chinook Salmon Central Valley spring-run ( <i>Oncorhynchus tshawytscha</i> ).	FT/CT	Chinook salmon choose to spawn in streams that are shallow, clear, and cold with a strong upwelling of water through the gravel. The ESU encompasses the Sacramento River and its tributaries.	Not present. Appropriate habitat not present on site. Species may pass through San Francisco Bay. No significant impacts are anticipated.



SPECIES <sup>1</sup>	STATUS FED/STATE <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
<b>ANIMALS</b>			
Chinook Salmon Winter-Run Sacramento River ( <i>Oncorhynchus tshawytscha</i> )	FE/CE	Chinook Salmon spawn in streams that are shallow, clear, and cold with a strong upwelling of water through the gravel. The ESU includes populations of winter-run Chinook Salmon in the Sacramento River and its tributaries.	Not present. Appropriate habitat not present on site. Species may pass through San Francisco Bay. No significant impacts are anticipated.
Longfin Smelt ( <i>Spirinchus thaleichthys</i> )	FC/CT, CSC	In California, Longfin Smelt have been commonly collected from San Francisco Bay, Eel River, Humboldt Bay and Klamath River. As they mature in the fall, adults found throughout San Francisco Bay migrate to brackish or freshwater in Suisun Bay, Montezuma Slough, and the lower reaches of the Sacramento and San Joaquin Rivers. Spawning probably takes place in freshwater.	Possible. May pass by the project area during migration through the Bay. No significant impacts are anticipated.
California tiger salamander ( <i>Ambystoma californiense</i> )	FT/CT,CSC	Found in annual grasslands and grassy understory of valley-foothill hardwood habitats in central and northern California. Needs underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water source for breeding. Nearest populations are at Lake Lagunita and San Francisquito Creek.	Not present. Not known to occur in the project area.
California red-legged frog ( <i>Rana draytonii</i> )	FT/CSC	Mostly in lowlands and foothills in/near permanent sources of deep water but will disperse far during and after rain. Prefers shorelines with extensive vegetation. Nearby populations are at Crystal Springs Reservoir and in Matadero and San Francisquito Creeks.	Not present. Not known to occur in the project area. Appropriate wetland and surrounding upland habitats are not present.
Western pond turtle ( <i>Clemmys marmorata marmorata</i> )	-/CSC	Aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Needs basking sites and suitable upland habitat for egg-laying (sandy banks or grassy open fields). Known in the area from San Francisquito Creek and Lake Lagunita.	Not present. Not known to occur in the project area. Appropriate wetland and surrounding upland habitats are not present.

SPECIES <sup>1</sup>	STATUS FED/STATE <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
<b>ANIMALS</b>			
San Francisco garter snake ( <i>Thamnophis sirtalis tetrataenia</i> )	FE/CE,FP	Found in vicinity of freshwater marshes, ponds and slow moving streams in San Mateo County and extreme northern Santa Cruz County. Prefers dense cover and water depths of at least one foot. Also requires uplands near aquatic habitats. Nearest population is at Upper Crystal Springs Reservoir.	Not present. Not known to occur in the project area. Appropriate wetland and surrounding upland habitats are not present.
Double-crested cormorant ( <i>Phalacrocorax auritus</i> ) [rookery site]	-/WL	Colonial nester on coastal cliffs and offshore islands and along lake margins in the interior of the state. Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins. Nearest nesting colony is on utility poles next to San Mateo-Hayward Bridge.	Rookery not present. Appropriate nesting habitat not present on site.
Great blue heron ( <i>Ardea herodias</i> ) [Nesting]	-/-	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites are in close proximity to foraging areas such as marshes, lake margins, tide-flats, rivers and streams, wet meadows. Known to nest on the east side of Steinberger Slough on the northwest edge of Bair Island.	Rookery not present. Appropriate nesting habitat not present on the site.
Northern harrier ( <i>Circus cyaneus</i> ) [Nesting]	-/CSC	Coastal salt marsh and freshwater marsh; nests and forages in grasslands; nests on ground in shrubby vegetation, usually at marsh edge. Has nested at Bair Island.	Not present. Appropriate nesting habitat not present on site.
White-tailed kite ( <i>Elanus caeruleus</i> ) [nesting]	-/FP	Open grassland and agricultural areas throughout Central California. Nests in the northeast part of Bair Island.	Not present. Appropriate nesting habitat not present on site. May forage in the project area.
Cooper's hawk ( <i>Accipiter cooperii</i> ) [nesting]	-/WL	Nests primarily in deciduous riparian forests; forages in open woodlands.	Not present. Appropriate nesting habitat not present on site. May forage in the project area.



SPECIES <sup>1</sup>	STATUS FED/STATE <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
<b>ANIMALS</b>			
Sharp-shinned Hawk ( <i>Accipiter striatus</i> ) [nesting]	-/WL	Breeds in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats. Prefers, but not restricted to, riparian habitats. North facing slopes, with plucking perches are critical requirements. All habitats except alpine, open prairie, and bare desert used in winter.	Not present. Appropriate nesting habitat not present on site. May forage in the project area.
American peregrine falcon ( <i>Falco peregrinus</i> ) [nesting]	Delisted, BCC/Delisted	Inhabits open wetlands near cliffs, also occurs in some cities where nests on buildings and bridges.	Not present. Appropriate nest sites not present. May forage in the project area.
Merlin ( <i>Falco columbarius</i> ) [wintering]	-/WL	Breeds in Canada, winters in a variety of California habitats, including grasslands, savannahs, wetlands, etc.	Not present. Appropriate wintering sites not present.
Ridgway's (California clapper) rail ( <i>Rallus obsoletus obsoletus</i> )	FE/CE,FP	Found in saltwater marshes traversed by tidal sloughs in the vicinity of San Francisco Bay; associated with abundant growths of pickleweed; feeds on mollusks obtained from mud bottomed sloughs. Documented in the area in marshes bordering Belmont Slough, Seal Slough, Bair Island, Corkscrew Slough, Steinberger Slough and others.	Likely. Nesting habitat for Ridgway's Rail can be found in the salt marsh habitats immediately adjacent to the levee in segments 5 (southern portion), 6, and 7 along Belmont Slough, and adjacent to the levee in segment 8 (western portion) along O'Neil Slough. Suitable foraging habitats for Ridgway's Rail can be found adjacent to the levee in segment 1 and also along O'Neil Slough in the eastern portion of segment 8. Mitigation including work windows, protocol surveys as warranted, and minimization measures including biological construction monitoring is recommended.

SPECIES <sup>1</sup>	STATUS FED/STATE <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
<b>ANIMALS</b>			
California black rail ( <i>Laterallus jamaicensis coturniculus</i> )	BCC/CT,FP	Mainly inhabits salt-marshes bordering larger bays. Occurs in tidal salt marsh with dense growths of pickleweed; also occurs in freshwater and brackish marshes. Documented in Belmont Slough in 1972.	Possible. Suitable nesting and foraging habitat occurs in salt marsh adjacent to portions of the levee and the species has occurred in the vicinity of the project. Mitigation applied to Ridgway's Rail will mitigate any potential impact to this species, with the addition of a requirement for a biological monitor in one additional marsh location in segment 2.
Western snowy plover ( <i>Charadrius alexandrinus nivosus</i> ) [nesting]	FT,BCC/CSC	Found on sandy beaches or marine and estuarine shores; also salt pond levees and shores of large alkali lakes; requires sandy, gravelly or friable soil substrate for nesting. Has been observed at Bair Island.	Not present. Appropriate nesting habitat not present on site. May occasionally forage in locations near segment 1 or within the City's Dredge Disposal Site near segments 5 and 6.
Long-billed curlew ( <i>Numenius americanus</i> ) [nesting]	BCC/WL	Breeds in wet meadows in northeastern California. Winters on the coast and in the Central Valley in coastal estuaries, upland herbaceous areas and croplands.	Not present. Appropriate nesting habitat not present on site. May forage on mudflats along the Bay shore.
California least tern ( <i>Sterna antillarum browni</i> ) [Nesting]	FE/CE,FP	Nests along the coast from San Francisco Bay south to northern Baja, California; a colonial breeder on bare or sparsely vegetated substrates; sandy beaches, alkali flats, landfills, or paved areas. Nearby nesting has occurred at Bair Island (most recently in 1982),	Unlikely. Appropriate nesting habitat not present on site. Foraging individuals have been recorded along the Foster City shoreline, including the Foster City Shell Bar in segment 3, especially during post-breeding dispersal.
Short-eared owl ( <i>Asio flammeus</i> ) [Nesting]	-/CSC	Found in marshes, both freshwater and salt; lowland meadows; irrigated alfalfa fields. Tule patches/full grass needed for nesting and daytime seclusion. Nests on dry ground in a depression concealed in vegetation. Has nested on Bair Island.	Not present. Appropriate habitat not present on site.



SPECIES <sup>1</sup>	STATUS FED/STATE <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
<b>ANIMALS</b>			
Burrowing owl ( <i>Athene cunicularia</i> )	BCC/CSC	Found in open dry annual or perennial grasslands, deserts and scrublands characterized by low growing vegetation. This species is a subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel. Last known nest site in San Mateo County off East Third Avenue is extirpated.	Not present. Appropriate habitat not present on site. Breeding individuals once occurred in the vicinity of segment 1, but that population has been extirpated.
Loggerhead shrike ( <i>Lanius ludovicianus</i> )	BCC/CSC	Habitat includes open areas such as desert, grasslands and savannah. Nests in thickly foliated trees or tall shrubs. Forages in open habitats, which contain trees, fence posts, utility poles, and other perches.	Not present. Species could occur on site as a transient.
Saltmarsh common yellowthroat ( <i>Geothlypis trichas sinuosa</i> )	BCC/CSC	Requires thick continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting. Closest breeding site is at Upper Crystal Springs Reservoir.	Not present. Appropriate nesting habitat not present on site. Foraging by the species is possible, especially in winter.
Alameda song sparrow ( <i>Melospiza melodia pusillula</i> )	BCC/CSC	Resident of salt marshes bordering south arm of San Francisco Bay. Known from Colma Creek in S. San Francisco in 1947.	Not present. Appropriate habitat not present on site.
Tri-colored blackbird ( <i>Agelaius tricolor</i> ) [nesting colony]	BCC/CE	Breeds near freshwater, usually in tall emergent vegetation. Colonies prefer heavy growth of cattails and tules. Uses grasslands and agricultural lands for foraging.	Not present. Appropriate habitat for a nesting colony not present on site. No nesting colonies are known in the area. Utilization of habitat on site for foraging in winter is possible.
Pallid bat ( <i>Antrozous pallidus</i> )	-/CSC	Roosts primarily in oak woodland and ponderosa pine habitats; forages in open areas. Known from specimens collected near Inverness between 1948 and 1951.	Not present. Appropriate habitat not present on site.
Hoary bat ( <i>Lasivurus cinereus</i> )	-/-	Prefers open habitats with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Known from a specimen collected near Inverness in 1949.	Not present. Appropriate habitat not present on site.

SPECIES <sup>1</sup>	STATUS FED/STATE <sup>2</sup>	HABITAT	OCCURRENCE ON THE PROJECT SITE
<b>ANIMALS</b>			
Salt marsh harvest mouse ( <i>Reithrodontomys raviventris</i> )	FE/CE,FP	Inhabits saline emergent wetlands in the San Francisco Bay and its tributaries. Pickleweed is the primary habitat. Nearest known population is in the marsh between O'Neil Slough and Highway 101. Also known from Bair Island along Steinberger Slough, Corkscrew Slough and Redwood Creek.	Possible. Appropriate habitat occurs in salt marsh habitats adjacent to Belmont Slough from the southern portion of segment 4 (Shorebird Park) through O'Neil Slough in segment 8. Mitigation measures are recommended to reduce potential for impact to this species.
Salt-marsh wandering shrew ( <i>Sorex vagrans halicoetes</i> )	-/CSC	Found in salt marshes of the south arm of San Francisco Bay in medium high marsh 6-8 feet above sea level where abundant driftwood is scattered among <i>Salicornia</i> . Known to occur at Bair Island.	Not present. Appropriate habitat not present on site.
Santa Cruz kangaroo rat ( <i>Dipodomys venustus venustus</i> )	-/-	Found in silverleaf manzanita mixed chaparral in the Zayante Sand Hills of the Santa Cruz Mountains. One found near Redwood City in 1933.	Not present. Appropriate habitat not present on site.
San Francisco dusky-footed woodrat	-/CSC	Found in forested habitats of moderate canopy and moderate to dense understory.	Not present. Appropriate habitat not present on site.
American badger ( <i>Taxidea taxus</i> )	-/CSC	Drier open stages of most shrub, forest, and herbaceous habitats; needs sufficient food, friable soils and open, uncultivated ground. Documented about 2 miles west of the site.	Not present. Appropriate habitat not present on site.

1. Source: California Natural Diversity Data Base, Natural Heritage Division, California Department of Fish and Wildlife for the San Mateo 7.5 Minute Quadrangle Map and surrounding areas, information dated May 2016.

2. Status Codes:

FE Federal-listed Endangered

FT Federal-listed Threatened

FPE Federally Proposed Endangered

FPT Federally Proposed Threatened

BCC USFWS Bird Species of Conservation Concern

CE California State-listed Endangered

CT California State-listed Threatened

CR California Rare

FP California Fully Protected

CSC CDFW Species of Special Concern

WL CDFW Watch List Species



## **ATTACHMENT 3.**

### **U.S. Fish and Wildlife Service and California Native Plant Society Special Status Species Lists for the Project Area**



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office

FEDERAL BUILDING, 2800 COTTAGE WAY, ROOM W-2605

SACRAMENTO, CA 95825

PHONE: (916)414-6600 FAX: (916)414-6713

Consultation Code: 08ESMF00-2016-SLI-1861

July 19, 2016

Event Code: 08ESMF00-2016-E-04076

Project Name: Foster City Levee Protection Planning and Improvements Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

[http://www.nwr.noaa.gov/protected\\_species/species\\_list/species\\_lists.html](http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html)

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2)



of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment



United States Department of Interior  
Fish and Wildlife Service

Project name: Foster City Levee Protection Planning and Improvements Project

## Official Species List

### Provided by:

Sacramento Fish and Wildlife Office  
FEDERAL BUILDING  
2800 COTTAGE WAY, ROOM W-2605  
SACRAMENTO, CA 95825  
(916) 414-6600

### Expect additional Species list documents from the following office(s):

Ventura Fish and Wildlife Office  
2493 PORTOLA ROAD, SUITE B  
VENTURA, CA 93003  
(805) 644-1766  
San Francisco Bay-Delta Fish and Wildlife  
650 CAPITOL MALL  
SUITE 8-300  
SACRAMENTO, CA 95814  
(916) 930-5603  
[http://kim\\_squires@fws.gov](mailto:kim_squires@fws.gov)

**Consultation Code:** 08ESMF00-2016-SLI-1861

**Event Code:** 08ESMF00-2016-E-04076

**Project Type:** STREAM / WATERBODY / CANALS / LEVEES / DIKES

**Project Name:** Foster City Levee Protection Planning and Improvements Project

**Project Description:** Improvements to eight miles of levees along the Foster City shoreline

**Please Note:** The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

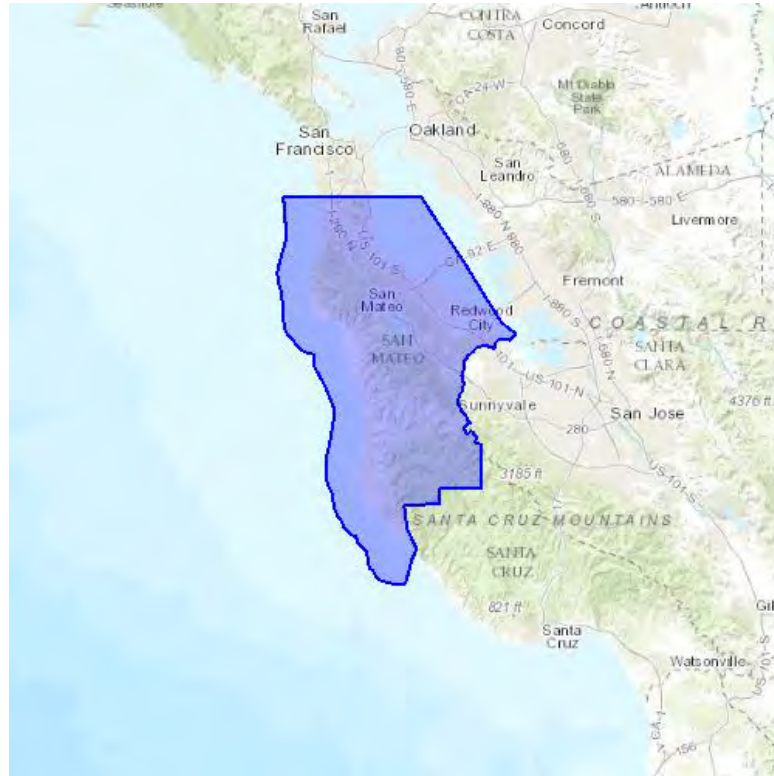




United States Department of Interior  
Fish and Wildlife Service

Project name: Foster City Levee Protection Planning and Improvements Project

### Project Location Map:



**Project Coordinates:** The coordinates are too numerous to display here.

**Project Counties:** San Mateo, CA



United States Department of Interior  
Fish and Wildlife Service

Project name: Foster City Levee Protection Planning and Improvements Project

## Endangered Species Act Species List

There are a total of 35 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Amphibians	Status	Has Critical Habitat	Condition(s)
California red-legged frog ( <i>Rana draytonii</i> ) Population: Entire	Threatened	Final designated	
California tiger Salamander ( <i>Ambystoma californiense</i> ) Population: U.S.A. (Central CA DPS)	Threatened	Final designated	
<b>Birds</b>			
California Clapper rail ( <i>Rallus longirostris obsoletus</i> ) Population: Entire	Endangered		
California Least tern ( <i>Sterna antillarum browni</i> )	Endangered		
Marbled murrelet ( <i>Brachyramphus marmoratus</i> ) Population: CA, OR, WA	Threatened	Final designated	
Short-Tailed albatross ( <i>Phoebastria (=diomedea) albatrus</i> ) Population: Entire	Endangered		





United States Department of Interior  
Fish and Wildlife Service

Project name: Foster City Levee Protection Planning and Improvements Project

western snowy plover ( <i>Charadrius nivosus ssp. nivosus</i> ) Population: Pacific coastal pop.	Threatened	Final designated	
Yellow-Billed Cuckoo ( <i>Coccyzus americanus</i> ) Population: Western U.S. DPS	Threatened	Proposed	
<b>Conifers and Cycads</b>			
Santa Cruz cypress ( <i>Cupressus abramsiana</i> )	Threatened		
<b>Crustaceans</b>			
Vernal Pool fairy shrimp ( <i>Branchinecta lynchi</i> ) Population: Entire	Threatened	Final designated	
Vernal Pool tadpole shrimp ( <i>Lepidurus packardii</i> ) Population: Entire	Endangered	Final designated	
<b>Fishes</b>			
Delta smelt ( <i>Hypomesus transpacificus</i> ) Population: Entire	Threatened	Final designated	
steelhead ( <i>Oncorhynchus (=salmo) mykiss</i> ) Population: Northern California DPS	Threatened	Final designated	
Tidewater goby ( <i>Eucyclogobius newberryi</i> ) Population: Entire	Endangered	Final designated	
<b>Flowering Plants</b>			
California seablite ( <i>Suaeda</i> )	Endangered		



United States Department of Interior  
Fish and Wildlife Service

Project name: Foster City Levee Protection Planning and Improvements Project

<i>californica</i> )			
Fountain thistle ( <i>Cirsium fontinale</i> <i>var. fontinale</i> )	Endangered		
Franciscan manzanita ( <i>Arctostaphylos</i> <i>franciscana</i> )	Endangered	Final designated	
Hickman's potentilla ( <i>Potentilla</i> <i>hickmanii</i> )	Endangered		
Marin dwarf-flax ( <i>Hesperolinon</i> <i>congestum</i> )	Threatened		
Presidio Manzanita ( <i>Arctostaphylos</i> <i>hookeri var. ravenii</i> )	Endangered		
Robust spineflower ( <i>Chorizanthe</i> <i>robusta var. robusta</i> )	Endangered	Final designated	
San Francisco lessingia ( <i>Lessingia</i> <i>germanorum (=l.g. var.</i> <i>germanorum))</i> )	Endangered		
San Mateo Woolly sunflower ( <i>Eriophyllum latilobum</i> )	Endangered		
San Mateo thornmint ( <i>Acanthomintha</i> <i>obovata ssp. duttonii</i> )	Endangered		
Showy Indian clover ( <i>Trifolium</i> <i>amoenum</i> )	Endangered		
White-Rayed pentachaeta ( <i>Pentachaeta bellidiflora</i> )	Endangered		
<b>Insects</b>			
Bay Checkerspot butterfly ( <i>Euphydryas editha bayensis</i> )	Threatened	Final designated	





United States Department of Interior  
Fish and Wildlife Service

Project name: Foster City Levee Protection Planning and Improvements Project

Population: Entire			
Callippe Silverspot butterfly ( <i>Speyeria callippe callippe</i> ) Population: Entire	Endangered		
Mission Blue butterfly ( <i>Icaricia icarioides missionensis</i> ) Population: Entire	Endangered		
Myrtle's Silverspot butterfly ( <i>Speyeria zerene myrtleae</i> ) Population: Entire	Endangered		
San Bruno Elfin butterfly ( <i>Callophrys mossii bayensis</i> ) Population: Entire	Endangered		
<b>Mammals</b>			
Salt Marsh Harvest mouse ( <i>Reithrodontomys raviventris</i> ) Population: wherever found	Endangered		
Southern Sea otter ( <i>Enhydra lutris nereis</i> )	Threatened		
<b>Reptiles</b>			
Alameda whipsnake ( <i>Masticophis lateralis euryxanthus</i> ) Population: Entire	Threatened	Final designated	
San Francisco Garter snake ( <i>Thamnophis sirtalis tetrataenia</i> ) Population: Entire	Endangered		



United States Department of Interior  
Fish and Wildlife Service

Project name: Foster City Levee Protection Planning and Improvements Project

## Critical habitats that lie within your project area

The following critical habitats lie fully or partially within your project area.

Amphibians	Critical Habitat Type
California red-legged frog ( <i>Rana draytonii</i> ) Population: Entire	Final designated
<b>Birds</b>	
Marbled murrelet ( <i>Brachyramphus marmoratus</i> ) Population: CA, OR, WA	Final designated
western snowy plover ( <i>Charadrius nivosus ssp. nivosus</i> ) Population: Pacific coastal pop.	Final designated
<b>Fishes</b>	
Tidewater goby ( <i>Eucyclogobius newberryi</i> ) Population: Entire	Final designated
<b>Insects</b>	
Bay Checkerspot butterfly ( <i>Euphydryas editha bayensis</i> ) Population: Entire	Final designated



# CNPS *California Native Plant S* Rare and Endangered Plant Inventory

## Plant List

97 matches found. *Click on scientific name for details*

### Search Criteria

Found in San Mateo County

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
<a href="#">Acanthomintha duttonii</a>	San Mateo thorn-mint	Lamiaceae	annual herb	1B.1	S1	G1
<a href="#">Agrostis blasdalei</a>	Blasdale's bent grass	Poaceae	perennial rhizomatous herb	1B.2	S2	G2
<a href="#">Allium peninsulare var. franciscanum</a>	Franciscan onion	Alliaceae	perennial bulbiferous herb	1B.2	S1	G5T1
<a href="#">Amsinckia lunaris</a>	bent-flowered fiddleneck	Boraginaceae	annual herb	1B.2	S2?	G2?
<a href="#">Androsace elongata ssp. acuta</a>	California androsace	Primulaceae	annual herb	4.2	S3S4	G5?T3T4
<a href="#">Arabis blepharophylla</a>	coast rockcress	Brassicaceae	perennial herb	4.3	S4	G4
<a href="#">Arctostaphylos andersonii</a>	Anderson's manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2	G2
<a href="#">Arctostaphylos imbricata</a>	San Bruno Mountain manzanita	Ericaceae	perennial evergreen shrub	1B.1	S1	G1
<a href="#">Arctostaphylos montaraensis</a>	Montara manzanita	Ericaceae	perennial evergreen shrub	1B.2	S1	G1
<a href="#">Arctostaphylos pacifica</a>	Pacific manzanita	Ericaceae	evergreen shrub	1B.2	S1	G1
<a href="#">Arctostaphylos regismontana</a>	Kings Mountain manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2	G2
<a href="#">Astragalus nuttallii var. nuttallii</a>	ocean bluff milk-vetch	Fabaceae	perennial herb	4.2	S4	G4T4
<a href="#">Astragalus pycnostachyus var. pycnostachyus</a>	coastal marsh milk-vetch	Fabaceae	perennial herb	1B.2	S2	G2T2
<a href="#">Calandrinia breweri</a>	Brewer's calandrinia	Montiaceae	annual herb	4.2	S4	G4
<a href="#">California macrophylla</a>	round-leaved filaree	Geraniaceae	annual herb	1B.2	S3?	G3?
<a href="#">Calochortus umbellatus</a>	Oakland star-tulip	Liliaceae	perennial bulbiferous herb	4.2	S4	G4
<a href="#">Calochortus uniflorus</a>	pink star-tulip	Liliaceae	perennial bulbiferous herb	4.2	S4	G4
<a href="#">Castilleja ambigua var. ambigua</a>	johnny-nip	Orobanchaceae	annual herb (hemiparasitic)	4.2	S4	G4T5
<a href="#">Centromadia parryi ssp. congdonii</a>	Congdon's tarplant	Asteraceae	annual herb	1B.1	S2	G3T2

<a href="#">Centromadia parryi ssp. parryi</a>	pappose tarplant	Asteraceae	annual herb	1B.2	S2	G3T2
<a href="#">Chloropyron maritimum ssp. palustre</a>	Point Reyes bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	1B.2	S2	G4?T2
<a href="#">Chorizanthe cuspidata var. cuspidata</a>	San Francisco Bay spineflower	Polygonaceae	annual herb	1B.2	S1	G2T1
<a href="#">Chorizanthe robusta var. robusta</a>	robust spineflower	Polygonaceae	annual herb	1B.1	S1	G2T1
<a href="#">Cirsium andrewsii</a>	Franciscan thistle	Asteraceae	perennial herb	1B.2	S3	G3
<a href="#">Cirsium fontinale var. fontinale</a>	Crystal Springs fountain thistle	Asteraceae	perennial herb	1B.1	S1	G2T1
<a href="#">Collinsia multicolor</a>	San Francisco collinsia	Plantaginaceae	annual herb	1B.2	S2	G2
<a href="#">Corethrogyne leucophylla</a>	branching beach aster	Asteraceae	perennial herb	3.2	S3	G3Q
<a href="#">Cypripedium fasciculatum</a>	clustered lady's-slipper	Orchidaceae	perennial rhizomatous herb	4.2	S4	G4
<a href="#">Cypripedium montanum</a>	mountain lady's-slipper	Orchidaceae	perennial rhizomatous herb	4.2	S4	G4
<a href="#">Dirca occidentalis</a>	western leatherwood	Thymelaeaceae	perennial deciduous shrub	1B.2	S2	G2
<a href="#">Elymus californicus</a>	California bottle-brush grass	Poaceae	perennial herb	4.3	S4	G4
<a href="#">Equisetum palustre</a>	marsh horsetail	Equisetaceae	perennial rhizomatous herb	3	S1S3	G5
<a href="#">Eriophyllum latilobum</a>	San Mateo woolly sunflower	Asteraceae	perennial herb	1B.1	S1	G1
<a href="#">Erysimum ammophilum</a>	sand-loving wallflower	Brassicaceae	perennial herb	1B.2	S2	G2
<a href="#">Erysimum franciscanum</a>	San Francisco wallflower	Brassicaceae	perennial herb	4.2	S3	G3
<a href="#">Fissidens pauperculus</a>	minute pocket moss	Fissidentaceae	moss	1B.2	S2	G3?
<a href="#">Fritillaria agrestis</a>	stinkbells	Liliaceae	perennial bulbiferous herb	4.2	S3	G3
<a href="#">Fritillaria biflora var. ineziana</a>	Hillsborough chocolate lily	Liliaceae	perennial bulbiferous herb	1B.1	S1	G3G4T1
<a href="#">Fritillaria lanceolata var. tristulis</a>	Marin checker lily	Liliaceae	perennial bulbiferous herb	1B.1	S2	G5T2
<a href="#">Fritillaria liliacea</a>	fragrant fritillary	Liliaceae	perennial bulbiferous herb	1B.2	S2	G2
<a href="#">Grimmia torenii</a>	Toren's grimmia	Grimmiaceae	moss	1B.3	S2	G2
<a href="#">Grindelia hirsutula var. maritima</a>	San Francisco gumplant	Asteraceae	perennial herb	3.2	S1	G5T1Q
<a href="#">Helianthella castanea</a>	Diablo helianthella	Asteraceae	perennial herb	1B.2	S2	G2
<a href="#">Hemizonia congesta ssp. congesta</a>	congested-headed hayfield tarplant	Asteraceae	annual herb	1B.2	S1S2	G5T1T2
<a href="#">Hesperevax sparsiflora var. brevifolia</a>	short-leaved evax	Asteraceae	annual herb	1B.2	S2	G4T3
<a href="#">Hesperocypris abramsiana var. butanoensis</a>	Butano Ridge cypress	Cupressaceae	perennial evergreen tree	1B.2	S1	G1T1
<a href="#">Hesperolinon congestum</a>	Marin western flax	Linaceae	annual herb	1B.1	S1	G1



<a href="#">Heteranthera dubia</a>	water star-grass	Pontederiaceae	perennial herb	2B.2	S1	G5
<a href="#">Hordeum intercedens</a>	vernal barley	Poaceae	annual herb	3.2	S3S4	G3G4
<a href="#">Horkelia cuneata var. sericea</a>	Kellogg's horkelia	Rosaceae	perennial herb	1B.1	S2?	G4T2
<a href="#">Horkelia marinensis</a>	Point Reyes horkelia	Rosaceae	perennial herb	1B.2	S2	G2
<a href="#">Hosackia gracilis</a>	harlequin lotus	Fabaceae	perennial rhizomatous herb	4.2	S3	G4
<a href="#">Iris longipetala</a>	coast iris	Iridaceae	perennial rhizomatous herb	4.2	S3	G3
<a href="#">Lasthenia californica ssp. macrantha</a>	perennial goldfields	Asteraceae	perennial herb	1B.2	S2	G3T2
<a href="#">Legenere limosa</a>	legenere	Campanulaceae	annual herb	1B.1	S2	G2
<a href="#">Leptosiphon acicularis</a>	bristly leptosiphon	Polemoniaceae	annual herb	4.2	S3	G3
<a href="#">Leptosiphon ambiguus</a>	serpentine leptosiphon	Polemoniaceae	annual herb	4.2	S4	G4
<a href="#">Leptosiphon croceus</a>	coast yellow leptosiphon	Polemoniaceae	annual herb	1B.1	S1	G1
<a href="#">Leptosiphon grandiflorus</a>	large-flowered leptosiphon	Polemoniaceae	annual herb	4.2	S3	G3
<a href="#">Leptosiphon rosaceus</a>	rose leptosiphon	Polemoniaceae	annual herb	1B.1	S1	G1
<a href="#">Lessingia arachnoidea</a>	Crystal Springs lessingia	Asteraceae	annual herb	1B.2	S2	G2
<a href="#">Lessingia germanorum</a>	San Francisco lessingia	Asteraceae	annual herb	1B.1	S1	G1
<a href="#">Lessingia hololeuca</a>	woolly-headed lessingia	Asteraceae	annual herb	3	S3?	G3?
<a href="#">Lilium maritimum</a>	coast lily	Liliaceae	perennial bulbiferous herb	1B.1	S2	G2
<a href="#">Limnanthes douglasii ssp. ornduffii</a>	Ornduff's meadowfoam	Limnanthaceae	annual herb	1B.1	S1	G4T1
<a href="#">Limnanthes douglasii ssp. sulphurea</a>	Point Reyes meadowfoam	Limnanthaceae	annual herb	1B.2	S2	G4T2
<a href="#">Lupinus arboreus var. eximius</a>	San Mateo tree lupine	Fabaceae	perennial evergreen shrub	3.2	S2	G2Q
<a href="#">Malacothamnus aboriginum</a>	Indian Valley bush-mallow	Malvaceae	perennial deciduous shrub	1B.2	S3	G3
<a href="#">Malacothamnus arcuatus</a>	arcuate bush-mallow	Malvaceae	perennial evergreen shrub	1B.2	S2	G2Q
<a href="#">Malacothamnus davidsonii</a>	Davidson's bush-mallow	Malvaceae	perennial deciduous shrub	1B.2	S2	G2
<a href="#">Malacothamnus hallii</a>	Hall's bush-mallow	Malvaceae	perennial evergreen shrub	1B.2	S2	G2
<a href="#">Microsens paludosa</a>	marsh microsaris	Asteraceae	perennial herb	1B.2	S2	G2
<a href="#">Mielichhoferia elongata</a>	elongate copper moss	Mielichhoferiaceae	moss	4.3	S4	G5
<a href="#">Monotopia gracilens</a>	woodland woolythreads	Asteraceae	annual herb	1B.2	S3	G3
<a href="#">Orthotrichum kellmani</a>	Kellman's bristle moss	Orthotrichaceae	moss	1B.2	S2	G2
<a href="#">Pedicularis dudleyi</a>	Dudley's lousewort	Orobanchaceae	perennial herb	1B.2	S2	G2

<a href="#">Pentachaeta bellidiflora</a>	white-rayed pentachaeta	Asteraceae	annual herb	1B.1	S1	G1
<a href="#">Perideridia gairdneri ssp. gairdneri</a>	Gairdner's yampah	Apiaceae	perennial herb	4.2	S4	G5T4
<a href="#">Pinus radiata</a>	Monterey pine	Pinaceae	perennial evergreen tree	1B.1	S1	G1
<a href="#">Piperia candida</a>	white-flowered rein orchid	Orchidaceae	perennial herb	1B.2	S3	G3
<a href="#">Piperia michaelii</a>	Michael's rein orchid	Orchidaceae	perennial herb	4.2	S3	G3
<a href="#">Plagiobothrys chorisianus var. chorisianus</a>	Choris' popcornflower	Boraginaceae	annual herb	1B.2	S2	G3T2Q
<a href="#">Plagiobothrys chorisianus var. hickmanii</a>	Hickman's popcornflower	Boraginaceae	annual herb	4.2	S3	G3T3Q
<a href="#">Plagiobothrys diffusus</a>	San Francisco popcornflower	Boraginaceae	annual herb	1B.1	S1	G1Q
<a href="#">Polemonium carneum</a>	Oregon polemonium	Polemoniaceae	perennial herb	2B.2	S2	G3G4
<a href="#">Potentilla hickmanii</a>	Hickman's cinquefoil	Rosaceae	perennial herb	1B.1	S1	G1
<a href="#">Ranunculus lobbii</a>	Lobb's aquatic buttercup	Ranunculaceae	annual herb	4.2	S3	G4
<a href="#">Sanicula hoffmannii</a>	Hoffmann's sanicle	Apiaceae	perennial herb	4.3	S3	G3
<a href="#">Silene verecunda ssp. verecunda</a>	San Francisco campion	Caryophyllaceae	perennial herb	1B.2	S2	G5T2
<a href="#">Stebbinsoseris decipiens</a>	Santa Cruz microseris	Asteraceae	annual herb	1B.2	S2	G2
<a href="#">Stuckenia filiformis ssp. alpina</a>	slender-leaved pondweed	Potamogetonaceae	perennial rhizomatous herb	2B.2	S3	G5T5
<a href="#">Toxicoscordion fontanum</a>	marsh zigadenus	Melanthiaceae	perennial bulbiferous herb	4.2	S3	G3
<a href="#">Trifolium amoenum</a>	two-fork clover	Fabaceae	annual herb	1B.1	S1	G1
<a href="#">Trifolium hydrophilum</a>	saline clover	Fabaceae	annual herb	1B.2	S2	G2
<a href="#">Triphysaria floribunda</a>	San Francisco owl's-clover	Orobanchaceae	annual herb	1B.2	S2	G2
<a href="#">Triquetrella californica</a>	coastal triquetrella	Pottiaceae	moss	1B.2	S2	G2
<a href="#">Usnea longissima</a>	Methuselah's beard lichen	Parmeliaceae	fruticose lichen (epiphytic)	4.2	S4	G4

### Suggested Citation

CNPS, Rare Plant Program. 2016. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website <http://www.rareplants.cnps.org> [accessed 19 July 2016].

#### Search the Inventory

[Simple Search](#)

[Advanced Search](#)

[Glossary](#)

#### Information

[About the Inventory](#)

[About the Rare Plant Program](#)

[CNPS Home Page](#)

[About CNPS](#)

#### Contributors

[The Calflora Database](#)

[The California Lichen Society](#)



[Join CNPS](#)

© Copyright 2010-2014 California Native Plant Society. All rights reserved.