



United States Department of the Interior

FISH AND WILDLIFE SERVICE
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ACTION MEMORANDUM

To: Regional Director, U.S. Fish and Wildlife Service, DOI Region 10
Sacramento, California

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Site: San Diego Bay National Wildlife Refuge – Sweetwater Marsh Unit Site
F&G Street Marsh (Operable Unit 3)
Chula Vista, California

Subject: Approval of CERCLA Non-time-critical Removal Action

I. Purpose

The purpose of this Action Memorandum is to request and document approval of the proposed non-time-critical removal action (removal action) for the F&G Street Marsh, Operable Unit 3 (OU3), of the San Diego Bay National Wildlife Refuge (Refuge) – Sweetwater Marsh Unit, in accordance with the U.S. Fish and Wildlife Service’s (FWS) delegated response authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),¹ as implemented by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).²

The removal action is necessary to protect the public health, welfare, and the environment from releases of hazardous substances in contaminated fill material placed into native tidal marshland in the 1960s and 1970s. The fill material is contaminated with hazardous substances, including arsenic, cadmium, copper, chromium, lead, molybdenum, nickel, selenium, zinc, chlordane, dieldrin, PCBs, polycyclic aromatic hydrocarbons (PAHs) and DDXs,³ at concentrations that pose

¹ 42 U.S.C. §§ 9601-9675.

² 40 C.F.R. Part 300.

³ DDXs are the combination of dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethylene (DDE), and dichlorodiphenyldichloroethane (DDD).

unacceptable risks to human health and the environment.⁴ The proposed removal action involves excavation and off-site disposal of approximately 17,900 cubic yards of contaminated fill material with concentrations of hazardous substances that exceed the cleanup goals described below.

This Action Memorandum outlines and documents the need for the proposed removal action, the scope of the proposed work, and the anticipated costs. The decision to select the response action described below is based on the administrative record for OU3.

II. Site Conditions and Background

The following section discusses OU3's history and current characteristics, the nature and extent of contamination, and previous environmental evaluations and other activities.

A. Site Description, Characteristics, and Location⁵

1. The Sweetwater Marsh Unit of the Refuge

The Refuge comprises the 316-acre Sweetwater Marsh Unit and the 2,300-acre South San Diego Bay Unit and is located at the south end of San Diego Bay. It was established to protect endangered and threatened species and migratory birds and encompasses approximately 2,616 acres of land and water in and around south San Diego Bay. Most of what remains of San Diego Bay's historical coastal salt marsh and intertidal mudflat habitat is preserved within the Refuge. The urban communities of National City, Chula Vista, San Diego, Imperial Beach, and Coronado border the Refuge.

The Refuge protects a rich diversity of endangered, threatened, migratory, and native species and their habitats in the midst of a highly urbanized coastal environment. Nesting, foraging, and resting sites are managed for a diverse assembly of birds. Waterfowl and shorebirds over-winter or stop here to feed and rest as they migrate along the Pacific Flyway. Undisturbed expanses of cordgrass-dominated salt marsh support sustainable populations of the endangered light-footed Ridgway's rail. Enhanced and restored wetlands provide new, high-quality habitat for fish, birds, and coastal salt marsh plants, such as the endangered salt marsh bird's beak. Quiet nesting areas, buffered from adjacent urbanization, ensure the reproductive success of the threatened snowy plover, endangered California least tern, and an array of ground-nesting seabirds and shorebirds.

State- and federally listed endangered and threatened species include the California least tern (*Sternula antillarum browni*) and light-footed Ridgway's rail (*Rallus longirostris levipes*); one federally threatened species of bird, the western snowy plover (*Charadrius alexandrinus nivosus*); and one federally endangered plant species, the salt marsh bird's beak (*Chloropyron maritimum*

⁴ As discussed in more detail below, the list of hazardous substances that pose unacceptable risks to human health and the environment varies depending on whether the analysis assumes current (upland) or future (submerged) conditions. Under either scenario, the cumulative risks associated with these hazardous substances are unacceptable.

⁵ Unless otherwise indicated, the facts in this section are drawn from the Comprehensive Conservation Plan (CCP) for the Refuge. See FWS, *San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, Comprehensive Conservation Plan and Environmental Impact Statement* (Aug. 2006), OU3 0272.

maritimum). In addition to these federally listed species, the Refuge also provides habitat for the Belding's Savannah sparrow (*Passerculus sandwichensis beldengi*), a bird species that is listed by the State of California as endangered. The Refuge is also home to an array of wildlife native to the tidal salt marsh habitat.

The United States acquired the land now contained within the Sweetwater Marsh Unit of the Refuge in 1988 under a consent decree resolving the parties' claims in a citizen suit against various federal agencies under the Endangered Species Act. The citizen suit was related to a combined state-federal highway and flood control project that was expected to result in a significant loss of important wetland habitat for three federally endangered species. Under the consent decree, the California Department of Transportation and the Santa Fe Land Improvement Company conveyed approximately 300 acres of land (including the F&G Street Marsh) to the United States to mitigate the impacts of the highway and flood control project. FWS has managed the land since that time.

2. F&G Street Marsh

F&G Street Marsh is located on Lagoon Drive at the west end of F Street in Chula Vista, California (Figure 1). It is bounded on the north by Lagoon Drive, on the west by Marina Parkway, and on both the east and south by Collins Aerospace facilities (formerly UTC Aerospace Systems). The F&G Street Marsh provides approximately 17.5 acres of salt marsh habitat for several federal and State of California endangered bird species and provides foraging habitat for migratory birds (especially shorebirds), wading birds, and waterfowl. The F&G Street Marsh is predominantly low-lying salt marsh vegetation coastal wetland habitat, consisting of tidal flats and interconnected brackish channels. The northern and western portions of the marsh are bounded by roads, and the eastern and southern portions of the marsh consist of a vegetated intertidal zone that continues to the Collins Aerospace property located to the east and south of OU3.

Within the F&G Street Marsh, OU3 consists primarily of a flat upland fill area approximately three to four feet above the southern native tidal marshland (Figure 2). This upland fill area is covered by minimal vegetation. An abrupt shelf marks the boundary between the upland fill area and the salt marsh. OU3 is crossed by an unlined drainage feature originating from the vacant land north of Lagoon Drive and draining to the south via a culvert beneath Lagoon Drive. The tidal marsh is generally flat, with a small tidal channel crossing broadly through this lower plain. OU3 is located on the Nestor Terrace, a west-sloping geologic formation described as a wave-cut terrace that was created during the Pleistocene glacial period. The marsh deposits are defined as undifferentiated alluvium and slope wash brought down by the Sweetwater River. Soil in the marsh is predominantly tidal flats consisting of a mixture of micaceous sands, silts, and clayey sands.⁶

Based on aerial photographs and data included in historical reports, undocumented fill was placed at F&G Street Marsh between 1964 and 1975, corresponding with the development of roads and nearby industrial operations.⁷ The fill material includes soil, rubble, and construction debris, and

⁶ Final Environmental Impact Statement, Sweetwater River Flood Control Channel, State Highway Route 54, Interstate Highway Route 5, Recreation Facilities, and Conservation of Marshlands (1977) at 11, OU3 0022.

⁷ Compare 1964 Aerial Photograph of OU3, OU3 0001, with 1975 Aerial Photograph of OU3, OU3 0002.

ranges in depth from an inch to four feet (or potentially deeper in areas where drilling refusal was encountered). The volume of fill is sufficient to have raised the surface elevation and created upland habitat out of historical salt marsh habitat.

The soil encountered in the upland parts of OU3 is characterized by a continuous layer of fill at the surface composed primarily of silty sand with gravel. The subsurface fill encountered below was largely similar, but also contained black soil. In contrast to Operable Unit 1 (OU1), there is no evidence of burn debris (*e.g.*, ash, fused glass, and ceramics) at OU3. The fill is underlain at depths of approximately three to four feet below ground surface (bgs) by a continuous layer of clay interpreted to be native soil. The clay is black in color near the top of the contact and dark brown to yellowish brown deeper below the fill-native contact.

According to the Regional Water Quality Control Board (RWQCB) Water Quality Control Plan for the San Diego Basin (Region 9), OU3 is located within the La Nacion Hydrologic Sub-Area of the Lower Sweetwater Hydrologic Area of the Sweetwater Hydrologic Unit.⁸ Groundwater within the Lower Sweetwater Hydrologic Area is designated as having existing beneficial uses for municipal, agricultural, and domestic supply.

Tidal fluctuation is thought to be the major hydrologic influence at F&G Street Marsh. The diurnal fluctuation from mean higher high water (MHHW) to mean lower low water (MLLW) in the San Diego Bay is 5.6 feet. Stagnant water is occasionally observed in the drainage channel running across OU3. Surface water communication with tidal water has not been observed through a series of normal tides that occurred during previous fieldwork at OU3, which suggests that this water only exchanges during high rainfall, flooding, or extreme tides. Groundwater was generally encountered at approximately five to six feet bgs, and the depth was consistent across OU3.

F&G Street Marsh, like the rest of the Refuge, is located in a highly urbanized area that is easily accessible by trespassers and cannot be fenced due to the risk of wildlife entrapment.

B. Release or Threatened Release of Hazardous Substances at OU3

The results of past investigations and the streamlined risk evaluation (SRE) presented in the engineering evaluation and cost analysis (EE/CA) have documented the release of multiple hazardous substances, including several that present unacceptable risks to human health or the environment under current or future conditions (arsenic, cadmium, copper, chromium, lead, molybdenum, nickel, selenium, zinc, chlordane, dieldrin, PCBs, PAHs, and DDXs), from the fill material at OU3. The EE/CA report explained that “[t]he primary transport mechanism for the existing contamination is through upland and sediment erosion and surface water runoff,” and it

⁸ See San Diego Regional Water Quality Control Board, Water Quality Control Plan for the San Diego Basin (2016) at Table 2-5, available at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/docs/R9_Basin_Plan.pdf.

further concluded that “[e]rosion of contaminated refuse and soil and/or sediment is the likely source of [contaminants of potential concern (COPCs)] to groundwater and surface water.”⁹

C. Statutory and Regulatory Framework for CERCLA Response Action

Under CERCLA, the president is authorized to respond to releases and threatened releases of hazardous substances to protect public health or welfare or the environment.¹⁰ The president has delegated that response authority to the Secretary of the Interior with respect to releases on or solely from facilities under the jurisdiction, custody, or control of the Department of the Interior.¹¹ The Secretary, in turn, has re-delegated that authority to FWS for releases on land under the jurisdiction, custody, or control of FWS.¹² In determining whether a removal action is appropriate in a particular situation, FWS’s discretion is guided by the NCP.

Section 300.415(b)(1) establishes the foundation on which such a determination must be made:

[W]here the lead agency makes the determination, based on the factors in paragraph (b)(2) of this section, that there is a threat to public health or welfare of the United States or the environment, the lead agency may take any appropriate removal action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or the threat of release.¹³

⁹ Geosyntec Consultants, Inc., *Engineering Evaluation/Cost Analysis, Operable Unit 3 (F and G Street Marsh), Sweetwater Marsh Unit Site, San Diego Bay National Wildlife Refuge, Chula Vista, California* (Oct. 16, 2017) (“EE/CA Report”) at 14, OU3 2580.

¹⁰ 42 U.S.C. § 9604(a).

¹¹ Executive Order 12580, 52 Fed. Reg. 2923 (1987), as amended.

¹² U.S. Department of the Interior, Departmental Manual Part 207, Chapter 7.

¹³ 40 C.F.R. § 300.415(b)(1). Section 300.415(b)(2) of the NCP, in turn, provides that:

The following factors shall be considered in determining the appropriateness of a removal action pursuant to this section:

- (i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances;
- (ii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;
- (iii) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;
- (iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;
- (v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;
- (vi) Threat of fire or explosion;
- (vii) The availability of other appropriate federal or state response mechanisms to respond to the release; and
- (viii) Other situations or factors that may pose threats to public health or welfare of the United States or the environment.

40 C.F.R. § 300.415(b)(2).

In deciding whether to move forward with a removal action, FWS is required under the NCP to complete a removal site evaluation (RSE), which includes a removal preliminary assessment and, if warranted, a removal site inspection.¹⁴

The NCP describes additional steps to be taken when a planning period of at least six months exists before on-site activities need to be initiated.¹⁵ This “non-time-critical” removal action path requires the preparation of an engineering evaluation and cost analysis (EE/CA), which is an investigation of the nature and extent of hazardous substances at a site, an assessment of the associated risks, and an evaluation of various removal alternatives.

D. National Priorities List

The San Diego Bay National Wildlife Refuge – Sweetwater Marsh Site (the Site), which includes OU3, is not listed on the National Priorities List (NPL). Pursuant to section 120(c) of CERCLA, the Site was added to the Federal Agency Hazardous Waste Compliance Docket on July 19, 2004.¹⁶ OU3 has not been proposed for placement on the NPL and is not expected to be added to the NPL.

E. Removal Site Evaluation

FWS met the requirement for an RSE by completing a preliminary assessment and site inspection (PA/SI) report for OU3 in July 2015.¹⁷ Based on the results of the PA/SI, FWS determined that it was appropriate to proceed to an EE/CA.¹⁸ The PA/SI is discussed in detail in section II.F.4 below.

F. Past Site Activity

This decision document is the culmination of extensive investigations of hazardous substances at OU3 over many years. Those investigations are described below.

¹⁴ 40 C.F.R. § 300.410(a).

¹⁵ 40 C.F.R. § 300.415(b)(4).

¹⁶ See U.S. EPA, Notice of Nineteenth Update of the Federal Agency Hazardous Waste Compliance Docket, pursuant to CERCLA Section 120(c), 69 Fed. Reg. 42989, 42993 (July 19, 2004).

¹⁷ Geosyntec Consultants, Inc., *Preliminary Assessment/Site Inspection, F and G Street Marsh, San Diego Bay National Wildlife Refuge, Sweetwater Marsh Unit, Chula Vista, CA* (July 6, 2015) (“PA/SI”), OU3 1108.

¹⁸ Memorandum to FWS Regional Director, Region 8, from Assistant Regional Director, Budget and Administration, Region 1, *Approval Memorandum for Undertaking an Engineering Evaluation/Cost Analysis to Characterize Site Contamination and Identify Removal Action Alternatives at Operable Unit 3 (the F&G Street Marsh) in the Sweetwater Marsh Unit of the San Diego Bay National Wildlife Refuge* (June 29, 2016) (“EE/CA Approval Memo”), OU3 2214.

1. 2003 Investigation of Fill Material

In 2003, a study was conducted to determine the depth of the fill at OU3 and to assess whether contaminants were present at concentrations that presented concerns for waste management or potential risks to human health.¹⁹ A total of six borings were completed, and both surface and subsurface samples were analyzed for a suite of compounds including metals, volatile organic compounds (VOCs), PCBs, total petroleum hydrocarbons (TPH), polychlorinated dibenzodioxins (PCDDs), and polychlorinated dibenzofurans (PCDFs). The results of the investigation indicated, *inter alia*, that:

- concentrations of lead, mercury, cadmium, and PCDDs/PCDFs in select soil samples exceeded human health risk-based screening levels for soil under residential use scenarios;
- zinc levels detected in groundwater samples exceeded human health risk-based screening levels (however, the soil analytical data did not indicate that metals in the soils were being transported at appreciable concentrations into groundwater); and
- the lead concentration in one soil sample exceeded the State's threshold for characterizing material as hazardous waste based on its Total Threshold Limit Concentration (TTLIC).

The report concluded that the removal of the fill material to facilitate future restoration projects would require a remediation effort due to the hazardous levels of some contaminants.

2. 2003 Investigation of UTC Outfall and Marsh Sediments

In 2003, FWS conducted an investigation to determine if wastes entering the Main Branch of the tidal creek from an outfall located on the Collins Aerospace (formerly UTC Aerospace Systems) property were moving into the North Branch creek and adversely affecting the marsh. The findings of that investigation were presented in a 2008 report.²⁰ The report concluded that:

- the majority of impacted locations within OU3 were located farthest from the outfall;
- contaminants entering the Main Branch from the outfall continued downstream into the San Diego Bay without moving into OU3; and
- the marsh sediments and biota had a low to low-moderate risk of conditions causing acute toxicity to benthic organisms.

Due to its focus on the potential contamination of sediments by discharges from the Collins Aerospace outfall, the report did not recommend any further studies or sediment remediation in the marsh. But the study did appear to rule out the outfall as a source of the sediment contamination in proximity to the fill material.

¹⁹ P&D Environmental, *Preliminary Investigation of Soil and Groundwater Contaminants, F&G Street Marsh, Sweetwater National Wildlife Refuge, Chula Vista, California* (Apr. 14, 2003), OU3 03189.

²⁰ Catherine Zeeman, Ph.D., et al., *F&G Street Marsh Contaminants Investigation* (Oct. 20, 2008), OU3 0791.

3. 2004 Investigation of Fill Material

In 2004, FWS collected surface and subsurface samples for laboratory analysis of metals, PCBs, PAHs, PCDDs, PCDFs, organochlorine pesticides (OCPs) such as chlordane, dieldrin, and DDXs, as well as physical attributes.²¹ Based on the results of those samples, FWS concluded that:

- there were several zones of contamination (hot spots) in the upland fill area of OU3;
- one hot spot was approximately 0.14 acres and contained lead, chromium (VI), and chromium (total) at levels high enough to be classified as hazardous waste based on their TTLC concentrations;
- one area contained soil with PCB concentrations “sufficient to warrant cleanup based on risks to ecological receptors”;
- one shallow subsurface deposit of waste oil was found with elevated total PAH concentrations; and
- two areas were identified where concentrations of inorganics, OCPs, and PAHs were elevated when compared to human-health or ecological screening levels.

The report recommended further studies and remediation of contaminant hot spots in the fill.

4. 2015 Preliminary Assessment and Site Inspection (PA/SI)

In 2015, FWS conducted a PA/SI to characterize the nature and extent of hazardous substance contamination in soil, sediment, and groundwater.²² The PA/SI included a geophysical survey and collection of soil, sediment, and groundwater data. The PA/SI found that:

- the fill was between one and three feet thick;
- elevated concentrations of metals exist throughout the upland portion of OU3;
- among metals, lead was the primary risk driver;
- concentrations of metals generally decrease with depth and did not appear to impact native material below the fill;
- arsenic, chromium (VI), and lead were present in soil at concentrations exceeding human health risk-based regional screening levels for the industrial use scenario;
- TPH concentrations in soil exceeded the 2013 California EPA Environmental Screening Level for TPH-d in one sample, and TPH-motor oil in five samples;
- lead concentrations exceeded the TTLC in two soil samples and one sediment sample located adjacent to the upland fill area;

²¹ Catherine Zeeman, Ph.D. and Carol A. Roberts, *Pre-Cleanup Characterization of Contaminants in Fill on the F&G Street Marsh, Sweetwater Marsh Unit of the San Diego Bay National Wildlife Refuge, San Diego, California* (Dec. 19, 2013), OU3 0897.

²² Geosyntec Consultants, Inc., *Preliminary Assessment/Site Inspection, F and G Street Marsh, San Diego Bay National Wildlife Refuge, Sweetwater Marsh Unit, Chula Vista, CA* (July 6, 2015), OU3 1108.

- fourteen soil samples exceeded the Soluble Threshold Limit Concentration (STLC) for lead, thereby classifying that soil as hazardous waste that would require special handling and disposal if transported off-site in California; and
- areas where lead levels exceed the leachability criterion were present across the upland area, but generally restricted to the upper 1.5 feet of soil.

Based on the results of the PA/SI, FWS elected to proceed to an EE/CA for OU3.²³

5. 2016 Supplemental Site Investigation

In 2016, FWS conducted a Supplemental Site Investigation (SSI) to eliminate or reduce remaining data gaps and to support the development of the human health and ecological risk assessments.²⁴ The results of the SSI provided additional vertical and horizontal delineation of the contamination and confirmed elevated concentrations of metals in soil and sediment.

6. Engineering Evaluation and Cost Analysis

FWS completed an EE/CA for OU3 in 2017.²⁵ The EE/CA report includes an evaluation of the nature and extent of contamination, an assessment of risk to human and ecological receptors, an evaluation of clean-up alternatives, and a recommendation for further action to address the release and substantial threat of a release of hazardous substances related to the undocumented fill material at OU3. The portions of the EE/CA addressing the nature and extent of contamination at OU3 and the associated risks are discussed in this section; the portions of the EE/CA identifying, screening, and evaluating removal alternatives are discussed in section V.A. below.

The EE/CA report concluded that hazardous substances at OU3 posed threats to public health, welfare, and the environment, and that a non-time-critical removal action was warranted pursuant to section 300.415(b) of the NCP.

The removal action objectives (RAOs) for OU3, as described in the EE/CA report, are to:

1. prevent potential exposure of ecological and human receptors to contaminants of potential concern (COPCs); and
2. attain all applicable or relevant and appropriate requirements (ARARs).

The SRE found that DDXs, chlordane, dieldrin, PCBs, cadmium, chromium, copper, lead, molybdenum, nickel, selenium, and zinc posed unacceptable risks to ecological receptors, and that lead posed unacceptable non-cancer risks to human health (in particular, FWS restoration workers) from exposure to site soils.²⁶ In the risk-based footprint evaluation, FWS assumed a future-flooded

²³ See EE/CA Approval Memo, OU3 2214.

²⁴ See EE/CA Report Appendix A – Supplemental Site Investigation, OU3 2642.

²⁵ EE/CA Report, OU3 2554.

²⁶ EE/CA Report, Appendix B: Streamlined Risk Evaluation at 56-57, OU3 3004 to OU3 3005.

scenario for OU3 and added arsenic and PAHs to the list of COPCs, and removed copper, molybdenum, and selenium, based on that assumption.²⁷

The future-flooded scenario, as contemplated by the Comprehensive Conservation Plan (CCP), is the reasonably anticipated future use of OU3 and assumes that the site will be inundated with surface water in the future, resulting in new tidal marsh habitat dominated by aquatic receptors and aquatic exposure pathways.

For reasons of cost-effectiveness, technical practicability, and the potential for recontamination, FWS does not generally establish cleanup goals that are lower than anthropogenic background (or ambient) concentrations present in the environment.²⁸ Accordingly, FWS used the *higher* of protective risk-based concentrations or background (or ambient) values to establish cleanup goals (also referred to as preliminary remediation goals or “PRGs”). The cleanup goal for each COPC and its basis (*i.e.*, risk-based or ambient) is shown in Table 1 below.

Table 1 – Preliminary Remediation Goals for Contaminants of Potential Concern²⁹

Contaminant of Potential Concern	Selected PRG (mg/kg dry weight)	Basis of PRG
arsenic	8.8	background
cadmium	2.3	aquatic life
chromium	81.0	aquatic life
lead	36.0	aquatic life
nickel	29.0	aquatic life
zinc	187.0	background
low molecular weight PAHs	0.55	aquatic life
high molecular weight PAHs	1.8	background
total PCBs	0.047	background
chlordane	0.0058	background
dieldrin	0.000357	background
total DDXs	0.016	background

FWS did not establish human health cleanup goals because human exposure to COPCs will be considerably reduced under the future-flooded scenario. In addition, the risk-based concentrations developed for ecological receptors are more conservative than human-health-based cleanup goals would be in these circumstances.

²⁷ EE/CA Report, Appendix C: Risk-based Footprint Evaluation at OU3 3174.

²⁸ See U.S. EPA, *Role of Background in the CERCLA Cleanup Program*, OSWER 9285.6-07P (Apr. 26, 2002) at 7.

²⁹ For a more comprehensive table showing the basis for the PRG established for each COPC, see Table 1-1 in the Risk-Based Footprint Evaluation, EE/CA Appendix C, OU3 3180.

FWS used these numeric cleanup goals to delineate the removal action areas (RAAs) that would be addressed by the non-time-critical removal action. The initial RAAs, which will be further refined based on a pre-design investigation, are shown on the attached Figure 3 and are also presented on Figure 11 of the EE/CA report.³⁰

G. State and Federal Authorities' Roles

In February 2017, San Diego County, in its capacity as the Solid Waste Local Enforcement Agency (or LEA) added the F&G Street Marsh to its Solid Waste Information System as a disposal site. Since that time, the LEA has conducted quarterly inspections of OU3. FWS has been coordinating with the LEA throughout the course of this investigation. FWS also solicited state ARARs from multiple state agencies and considered their proposed ARARs in evaluating removal alternatives.³¹

III. Threats to Public Health or Welfare or the Environment

Documented conditions at OU3 and their associated risks, along with the evaluation of relevant factors described in the NCP, demonstrate that the release of hazardous substances at OU3 poses imminent and substantial threats to public health, welfare, and the environment, and that the initiation of a removal action is therefore appropriate.

The SRE found potentially unacceptable non-cancer risks from lead for FWS restoration workers exposed to soils at OU3. It also found unacceptable exposure risks to ecological receptors, primarily to insectivorous and omnivorous birds and mammals, from hazardous substances, including cadmium, chromium, copper, molybdenum, nickel, selenium, zinc, chlordane, dieldrin, total PCBs, and total DDXs, in soil. The risk assessment also identified potentially unacceptable risks to ecological receptors based on exposure to copper and zinc in sediment. Finally, FWS concluded, in the risk-based footprint evaluation, that arsenic and PAHs would pose potentially unacceptable risks to ecological receptors under a future-flooded scenario, but removed copper, molybdenum, and selenium from the list of hazardous substances presenting unacceptable risks.

In determining that a non-time-critical removal action is appropriate in these circumstances, FWS has considered each of the factors described in section 300.415(b)(2) of the NCP.

- (i) *Actual or Potential Exposure to Nearby Human Populations, Animals, or the Food Chain from Hazardous Substances or Pollutants and Contaminants*

The primary exposure pathways for both human and ecological receptors are direct contact with contaminated upland fill soils at OU3. Elevated concentrations of lead pose potentially unacceptable risks to human health (in particular, FWS restoration workers) from exposure to site soils. Though OU3 is located in a National Wildlife Refuge, it is adjacent to a roadway and the recently constructed Sweetwater Bicycle and Pedestrian Path and easily accessible by trespassers. With the opening of the Costa Vista RV Resort, expanded public use of the Sweetwater Bicycle

³⁰ EE/CA Report, Figure 11, OU3 2640.

³¹ See generally OU3 2238 to OU3 2286.

and Pedestrian Path, and increased homeless activity in proximity to OU3, FWS now faces an increased probability that people will come into contact with the contaminated material.

The potential for ecological risk due to contaminated fill is primarily to insectivorous/omnivorous birds and mammals with small home ranges. Under current conditions, potential ecological risks to individual wildlife receptors were noted for cadmium, chromium, copper, molybdenum, nickel, selenium, zinc, total PCBs, chlordane, dieldrin and total DDXs. These compounds showed model-predicted no observed adverse effect level (NOAEL)-based hazard quotients (HQs) greater than 1. Lowest observed adverse effect level (LOAEL)-based HQs only marginally exceeded 1 for total PCB exposure to the California gnatcatcher and ornate shrew.

Finally, copper and zinc currently pose potential ecological risks to individual wildlife receptors for sediment. These compounds showed model-predicted NOAEL-based HQs greater than 1, which were later deemed to be of minimal concern. Note that under projected future-flooded conditions, arsenic and PAHs will present unacceptable risks to ecological receptors, but copper, molybdenum, and selenium will no longer pose unacceptable risks to those receptors.

(ii) *Actual or Potential Contamination of Drinking Water Supplies or Sensitive Ecosystems*

OU3 is located within the La Nacion Hydrologic Sub-Area of the Lower Sweetwater Hydrologic Area of the Sweetwater Hydrologic Unit.³² Though not currently used as such, groundwater within the Lower Sweetwater Hydrologic Area is designated as having existing beneficial uses for municipal, agricultural, and domestic supply. Metals including arsenic, barium, beryllium, cadmium, chromium VI, chromium, copper, lead, nickel, selenium, thallium, and vanadium exceed California maximum contaminant levels for drinking water.

Because OU3 is within a National Wildlife Refuge, it is a sensitive ecosystem for purposes of determining the appropriateness of a removal action.³³ OU3 is in a tidally influenced wetland area that includes the small tidal creek by which tidal waters from the San Diego Bay reach the marsh. F&G Street Marsh is characterized by coastal salt marsh habitat and marsh/upland transition habitat and is home to an array of wildlife native to that habitat. The coastal wetlands provide habitat for several state and federally listed endangered and threatened species, as well as represent a vital link in the Pacific Flyway.

(iii) *Hazardous Substances or Pollutants or Contaminants in Drums, Barrels, Tanks, or Other Bulk Storage Containers, that May Pose a Threat of Release.*

FWS is unaware of the presence of hazardous substances or pollutants or contaminants contained in drums, barrels, tanks, or other bulk storage containers buried in the fill material. Accordingly,

³² See San Diego Regional Water Quality Control Board, Water Quality Control Plan for the San Diego Basin (2016) at Table 2-5, available at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/docs/R9_Basin_Plan.pdf.

³³ See Final Rule: Hazard Ranking System, 55 Fed. Reg. 51532-01, 51624 Table 4-23 (Dec. 14, 1990).

this factor is inapplicable to FWS's determination under section 300.415(b). In the event that containerized hazardous substances are encountered during excavation, however, they will be removed from the site and disposed of at a properly licensed off-site facility.

- (iv) *High Levels of Hazardous Substances or Pollutants or Contaminants in Soils Largely at or near the Surface, that May Migrate.*

Concentrations of lead (5,138 mg/kg), total chromium (5,404 mg/kg), chromium VI (5,374 mg/kg), and zinc (16,329 mg/kg) at OU3 are high enough for soils to be classified as hazardous waste in California, based on comparison to TTLC. The highest detected concentrations of lead, total chromium, and chromium VI are present in surface soils. The hazardous substances are the result of the historical placement of undocumented fill onto the F&G Street Marsh. The contaminated fill is at an elevation three to four feet above the surrounding marsh and therefore has potential to erode into the marsh and potentially reach San Diego Bay.

- (v) *Weather Conditions that May Cause Hazardous Substances or Pollutants or Contaminants to Migrate or Be Released.*

Contaminants in the upland fill soil at OU3 could migrate into the surrounding tidal marsh during periods of high tidal ranges (spring tides) and flooding due to high rainfall events. Future sea level rise poses an additional increased risk for migration of contaminants into the surrounding marsh lands and San Diego Bay.

- (vi) *Threat of Fire or Explosion.*

FWS is unaware of a threat of fire or explosion associated with the hazardous substances contained within the fill material at OU3. Accordingly, this factor is inapplicable to FWS's determination under section 300.415(b).

- (vii) *The Availability of Other Appropriate Federal or State Response Mechanisms to Respond to the Release.*

Although FWS could have addressed OU3 through a remedial investigation/feasibility study (RI/FS) and subsequent remedial action, it determined that the use of removal authority was the most appropriate response mechanism in this case. In addition to the section 300.415(b)(2) factors described above, EPA guidance describes four additional considerations that may be relevant in deciding whether to address a contaminated site using remedial authority or removal authority:

1. the time-sensitivity of the response;
2. the complexity of both the problems to be addressed and the action to be taken;
3. the comprehensiveness of the proposed action; and
4. the likely cost of the action.³⁴

³⁴ Memorandum from Stephen Luftig, Director, Office of Emergency and Remedial Response, U.S. EPA, and Barry Breen, Director, Office of Site Remediation Enforcement, U.S. EPA, to Program and Legal Division Directors, Regions I-X, *Use of Non-Time Critical Removal Authority in Superfund Response Actions* (Feb. 14, 2000) at 2-3.

FWS has considered these factors and concludes that they support the use of removal authority in this case. Because hazardous substances at OU3 pose ongoing threats to public health, welfare, and the environment and may migrate from their current location into the surrounding marsh, the fill material needs to be addressed in a timely manner. In addition, the proposed removal action is not overly complex and is not comprehensive in the sense that it is focused on only one medium (soil). Indeed, the general type of removal action proposed for OU3 is expressly listed in the NCP as an appropriate response to the circumstances at the site: “[e]xcavation, consolidation, or removal of highly contaminated soils from drainage or other areas – where such actions will reduce the spread of, or direct contact with, the contamination.”³⁵ The cost of the proposed removal action is also in line with other non-time-critical removal actions, particularly those that are intended to be the final response action at the site.³⁶

Finally, no state agencies are willing or able to address the contamination at OU3 under state law. Accordingly, there appear to be no readily available federal or state response mechanisms to respond to the releases at OU3.

(viii) Other situations or factors that may pose threats to public health or welfare of the United States or the environment.

The hazardous substances now present at OU3 pose unacceptable risks to the public health, welfare, and the environment, and failure to address those risks in a timely manner could result in the migration of hazardous substances from their current location, the permanent loss of functional habitat, and an associated increase in response costs. In contrast to many other wildlife refuges, OU3 is located in an easily accessible, urbanized area that cannot be effectively fenced due to the risk of wildlife entrapment and ongoing problems with fences being cut. These factors greatly reduce the effectiveness of access restrictions and increase the need for active measures to remove the hazardous substances from the site.

IV. Endangerment Determination

The risk assessments for OU3 (discussed in Section II.F.6 above) concluded that hazardous substances at OU3 pose unacceptable risks and hazards to human health and the environment. Similarly, the factors described in section 300.415(b)(2) indicate that there is a threat to public health or welfare or the environment. FWS concludes that actual or threatened releases of hazardous substances at or from OU3 may present an imminent and substantial endangerment to public health, welfare, or the environment.

³⁵ 40 C.F.R. § 300.415(e)(6). Note that the filled area is bisected by a drainage channel that flows into the marsh.

³⁶ The \$2 million limitation on Superfund-financed removal actions does not apply here. *See* 42 U.S.C. § 9604(c)(1).

V. Proposed Removal Action and Estimated Cost

A. Description of Proposed Action

FWS considered a range of removal technologies in the EE/CA report, including:

- geosynthetics;
- in-situ treatment;
- ex-situ treatment;
- capping;
- excavation with on-site consolidation; and
- excavation with off-site disposal.

Most of these technologies were eliminated from further consideration based on ineffectiveness, inconsistency with the reasonably anticipated future use of the site, excessive cost, expected impact to existing habitat, and the requirements of the CCP and other ARARs.³⁷

Consistent with EPA guidance on conducting non-time-critical removal actions, FWS evaluated the remaining alternatives (no action and excavation with off-site disposal) based on effectiveness, implementability, and cost. These three broad categories also incorporate the evaluation criteria normally applicable to remedial alternatives in section 300.430(e)(9)(iii) of the NCP.³⁸

The proposed removal action involves the mechanical excavation and off-site disposal of contaminated fill material that exceeds the PRGs established for the contaminants of concern identified in the EE/CA. The volume of contaminated material to be excavated at OU3 is approximately 17,900 cubic yards (25,000 tons). Slopes and sidewalls created by the excavation will be graded and replanted with native vegetation to prevent erosion.

1. Effectiveness

FWS determined in the EE/CA report that the proposed removal action would be effective, as viewed through the evaluation criteria of overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, and short-term effectiveness.

³⁷ EE/CA Report at 23-24, OU3 2589 to OU3 2590.

³⁸ See U.S. EPA, Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA, OSWER 9360.0-32 (Aug. 1993) at 55 (grouping the nine NCP criteria under the umbrella categories of effectiveness, implementability, and cost); EE/CA Report at 26-31, OU3 2592 to OU3 2597. Because the proposed removal action will be the final response action for OU3, FWS has endeavored to comply to the greatest extent practicable with the substantive and procedural requirements normally applicable only to remedial actions.

a. Overall Protection of Human Health and the Environment

Because the proposed removal action involves the removal of contaminated material from OU3 and the disposal of the excavated material at a properly licensed, off-site facility, it will eliminate the associated risks to human health and the environment, including the potential future migration of hazardous substances to surface water, groundwater, and nearby sediments.

b. Compliance with ARARs

The proposed removal action complies, and its implementation will comply, with all identified location-specific, chemical-specific, and action-specific ARARs shown on Attachment 2.³⁹

c. Long-term Effectiveness and Permanence

The proposed removal action is a permanent solution to the hazardous substances contained in the fill material at OU3. In contrast to other technologies that would have allowed the contaminated material to remain in place (*e.g.*, geosynthetics, capping, or excavation with on-site consolidation), there is no risk that hazardous substances at OU3 will become exposed to human or ecological receptors in the future due to erosion or rising sea levels.⁴⁰

d. Reduction of Toxicity, Mobility, or Volume through Treatment

Because the proposed removal action will not reduce the toxicity, mobility, or volume of the hazardous substances at OU3 through the use of treatment technologies, this criterion has no relevance to the selection decision.⁴¹

³⁹ The ARARs table attached to the EE/CA report identified all potential ARARs that might be either applicable or relevant and appropriate to any of the removal alternatives under consideration. The ARARs shown on Attachment 2 are the final ARARs that must be attained by the proposed removal action.

⁴⁰ FWS considered geosynthetics, capping, and excavation with on-site consolidation in the EE/CA report, but those alternatives were not carried forward into the comparative evaluation of alternatives because they were inconsistent with the reasonably anticipated future use of the site. *See* EE/CA Report at 23-24, OU3 2589 to OU3 2590. However, those alternatives – had they been carried forward in the evaluation – would have scored lower on the criterion of long-term effectiveness and permanence due to ongoing long-term maintenance requirements and the potential for the response action to be compromised in the future due to erosion or rising sea levels.

⁴¹ The EE/CA report did consider *in situ* and *ex situ* treatment alternatives, but they were screened out of the evaluation for reasons of cost, anticipated damage to existing habitat, concerns about effectiveness, and inconsistency with the reasonably anticipated future use of OU3. *See* EE/CA Report at 23-24, OU3 2589 to OU3 2590.

e. Short-term Effectiveness

This criterion requires FWS to consider the short-term impacts to the surrounding community, remediation workers, and the environment during implementation of the proposed response action. Potential risks to site workers from exposure to hazardous substances and operational hazards, such as noise and air emissions, will be mitigated by the use of personal protective equipment (PPE) as specified in a site-specific health and safety plan (HASP), as well as through the use of appropriate equipment and material handling procedures to be specified in design documents and work plans. FWS will effectively mitigate impacts to the community and the environment through various safeguards, best management practices, and other measures that will be adopted in the statement of work and related work plans.⁴²

2. Implementability

Based on the factors discussed below, FWS concluded that the proposed removal action furthers the evaluation criterion of implementability.

a. Technical Feasibility

The proposed alternative is technically feasible using existing and proven technologies, but will require various levels of coordination, planning, and management. Excavation and off-site disposal are widely used remedial technologies that can be readily completed using standard construction procedures and conventional earthmoving equipment. Commercial disposal facilities for the type of waste that will be encountered are readily available.

b. Administrative Feasibility

The proposed removal action is exempt from permitting and other administrative requirements for activities conducted entirely on-site.⁴³ FWS does not anticipate any issues related to any necessary off-site activities because the proposed removal technology – excavation and off-site disposal – is a common approach to addressing hazardous substances that is well understood by state and local permitting authorities. FWS will continue to communicate and coordinate with the community and local governments during implementation. Accordingly, the proposed removal action is administratively feasible.

⁴² For a preliminary list of best management practices, see Letter to Penny Ruvelas, National Oceanic and Atmospheric Administration (NOAA) Fisheries, from Andy Yuen, Project Leader, San Diego National Wildlife Refuge Complex (Mar. 24, 2021), OU3 04837.

⁴³ See 42 U.S.C. § 9621(e)(1); 40 C.F.R. § 300.400(e).

c. Availability of Services and Materials

The proposed removal action requires such resources as field personnel, heavy equipment, disposal facilities, and an analytical laboratory. These resources are readily available from multiple vendors, and FWS can procure them through competitive bidding.

There are sufficient trucking contractors available in the project area; however, at times the demand for trucking may be high such that procuring trucks may be a challenge at certain times of the year. FWS has the scheduling flexibility to address this possibility.

d. State Acceptance

In its comments on the EE/CA report for OU3, the County of San Diego, acting in its capacity as the Solid Waste Local Enforcement Agency (LEA) and for its Hazardous Materials Division, concurred in the preferred removal action described in the report.⁴⁴ In a letter dated June 30, 2022, the San Diego Regional Water Quality Control Board concurred in the proposed removal action for OU3.⁴⁵ Finally, in a letter dated July 22, 2022, the Department of Toxic Substances Control expressed its support for the proposed removal action.⁴⁶ Based on the foregoing, FWS concludes that state acceptance of the proposed removal action further supports its selection.

e. Community Acceptance

With the exception of comments submitted by potentially responsible parties, FWS did not receive any public comments expressing community support for, or opposition to, the removal action proposed in the EE/CA report. Accordingly, this criterion does not affect the alternatives evaluation conducted in that report.

3. Cost

The estimated costs used in the EE/CA report were based on contractor and vendor estimates, engineering judgment, and experience on other similar projects and include both direct and indirect capital costs and operation and maintenance (O&M). The costs are not detailed estimates but are instead used to compare the relative costs of various alternatives under consideration.

⁴⁴ Letter from Ricardo M. Serrano, Supervising EHS, Solid Waste Local Enforcement Agency, and John Misleh, Program Coordinator, Hazardous Materials Division, San Diego County Department of Environmental Health, to MaryAnn Amann, CERCLA Project Manager, FWS (Jan. 9, 2018), OU3 04465, OU3 04466 (explaining that the County concurs in the recommended removal actions and the areas of excavation shown in the EE/CA report).

⁴⁵ Letter from Wayne Chiu, Senior Water Resource Engineer, San Diego Regional Water Quality Control Board, to Andy Yuen, Project Leader, San Diego National Wildlife Refuge Complex (June 30, 2022), OU3 05161, OU3 05162 (noting that the “San Diego Water Board supports and concurs with the proposed removal action selected by USFWS for OU3”).

⁴⁶ Letter from Eileen Mananian, Unit Chief, Site Mitigation and Restoration Program, Department of Toxic Substances Control, to Andy Yuen, Project Leader, San Diego National Wildlife Refuge Complex (July 22, 2022), OU3 05164, OU3 05165 (describing the selected removal action as a “practical mechanism to [re]mediate existing and future risk to the environment in, and near to San Diego Bay associated with the presence of the contaminants identified”).

The estimated cost of the proposed removal action is \$3,450,000, which is the net present value of direct and indirect capital and O&M costs using 2017 dollars and a performance period of 30 years. Using a conservative cost inflation factor of 4 percent (%), the estimated cost in 2022 dollars is approximately \$4,200,000.

4. Summary

Based on the evaluation criteria, the EE/CA report concluded that excavation with off-site disposal was the preferred removal alternative.⁴⁷ The criteria of state acceptance and community acceptance do not affect that initial evaluation.

B. Contribution to Remedial Performance

The proposed removal action is intended to be the final action for OU3, and further response action at OU3 is not anticipated.

C. Applicable or Relevant and Appropriate Requirements

The NCP provides that Fund-financed removal actions “shall, to the extent practicable considering the exigencies of the situation” attain ARARs.⁴⁸ In determining whether compliance with ARARs is practicable, FWS may consider the urgency of the situation and the scope of the removal action. The proposed removal action will not be funded by the Superfund. Nonetheless, when a non-time-critical removal action is expected to be the first and final action at a site, FWS attains ARARs as a matter of policy.⁴⁹ Final ARARs for the selected removal action are presented in the table attached as Attachment 2. The proposed removal action will attain all identified ARARs.

D. Estimated Cost

The cost of the selected removal action for OU3 was estimated to be approximately \$3,450,000 at the time the EE/CA report was prepared. Using a conservative cost-inflation factor of 4 percent, the estimated cost in 2022 dollars is approximately \$4,200,000.

E. Project Schedule

Following approval of this Action Memorandum, FWS will conduct a pre-design investigation to better delineate the RAAs. FWS will then develop a work plan that will include a detailed schedule for implementation of the response action. FWS anticipates that implementation of the selected removal action can be completed in approximately three months. The removal action at OU3 will

⁴⁷ EE/CA Report at 26-32, OU3 2592 to OU3 2598.

⁴⁸ 40 C.F.R. § 300.415(j).

⁴⁹ U.S. Department of the Interior, Office of Environmental Policy and Compliance, Environmental Compliance Memorandum (ECM) 10-1, *Central Hazardous Materials Fund (CHF) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Process for CHF Projects* (Sept. 18, 2018) at 6.

be implemented, to the greatest extent practicable, outside of the nesting season, which is generally from February 15th through September 15th of each year. Based on the five-month construction window, there is sufficient time to complete the removal action in a single season.

F. Administrative Record, Public Comment Period, and Community Relations

The EE/CA report for OU3 was made available for public review on November 15, 2017, and the administrative record was posted online at the same time.⁵⁰ FWS accepted public comments on the EE/CA report and other documents in the administrative record from November 15, 2017, until January 31, 2018. FWS also held a public meeting on December 5, 2017. In November 2020, FWS granted a request from Chula Vista and National City to reopen the administrative record to accept comments on the EE/CA report from the municipalities. The municipalities submitted comments on December 18, 2020.

FWS has provided written responses to all significant comments received on the EE/CA report.⁵¹ FWS has considered all public comments received and the information in the administrative record in reaching its selection decision.

VI. Expected Change in the Situation Should Action Be Delayed or Not Taken

If the proposed removal action were to be delayed or not taken, hazardous substances would remain at OU3 and would continue to pose unacceptable risks to human health and ecological receptors. Hazardous substances could migrate from the contaminated fill material to the surrounding marsh, to underlying groundwater (which has been designated for beneficial use), and to San Diego Bay. Over the long term, these processes will be accelerated by the projected rise in sea level.

VII. Outstanding Policy Issues

There are no outstanding policy issues related to OU3.

VIII. Enforcement

FWS has identified and notified several potentially responsible parties of their liability for response costs incurred at the Site, including OU3. Upon approval of this Action Memorandum, DOI (including FWS and the Office of the Solicitor) and the U.S. Department of Justice plan to conduct settlement negotiations with those parties for the implementation of the selected removal actions at the Site (including the removal action for OU3) and the recovery of past costs.

IX. Recommendation

This decision document represents the selected removal action for Operable Unit 3 (OU3) of the Sweetwater Marsh Unit Site at the San Diego Bay National Wildlife Refuge in Chula Vista,

⁵⁰ See https://www.fws.gov/refuge/san_diego_bay/resource_management/sweetwater_marsh_restoration/F_and_G_Street.aspx.

⁵¹ See Responses to Public Comments on the OU3 EE/CA Report (May 2022), OU3 05106.

California, developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for OU3. On the basis of the evaluations conducted and the factors outlined in the NCP, FWS has determined that the release of hazardous substances from the contaminated fill material at OU3 poses an imminent and substantial danger to public health, welfare, and the environment and that a non-time-critical removal action is necessary and appropriate to abate and contain the release, to mitigate the ongoing migration of hazardous substances off-site, and to address the associated risks to public health, welfare, and the environment.

X. Authorization

Because conditions at OU3 meet all applicable CERCLA and NCP requirements and criteria for undertaking a non-time-critical removal action (including 40 C.F.R. § 300.415(b)(2)), I approve the proposed removal action described herein.

**PAUL
SOUZA**

Digitally signed by PAUL
SOUZA
Date: 2022.08.19
15:03:58 -07'00'

Date: _____

Regional Director
U.S. Fish and Wildlife Service
DOI Region 10

Attachments

Attachment 1 – Figures


Attachment 2 – Table Showing Applicable or Relevant and Appropriate Requirements (ARARs)

Attachment 1



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Legend

 U.S. Fish and Wildlife Service
Refuge Boundary



San Diego Bay National Wildlife Refuge

San Diego, California

Geosyntec
consultants

Figure

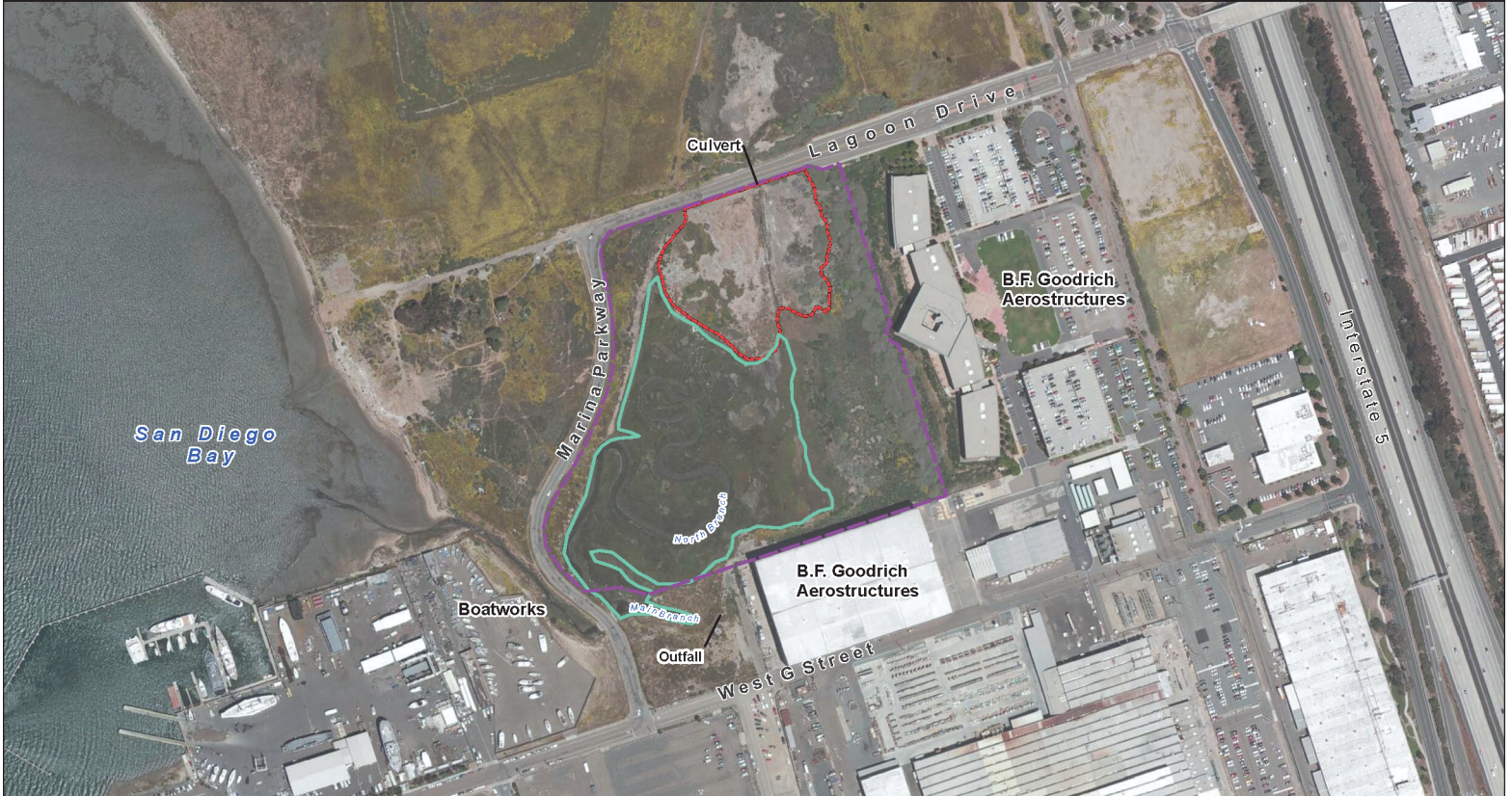
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics,

Santa Barbara

May 2016

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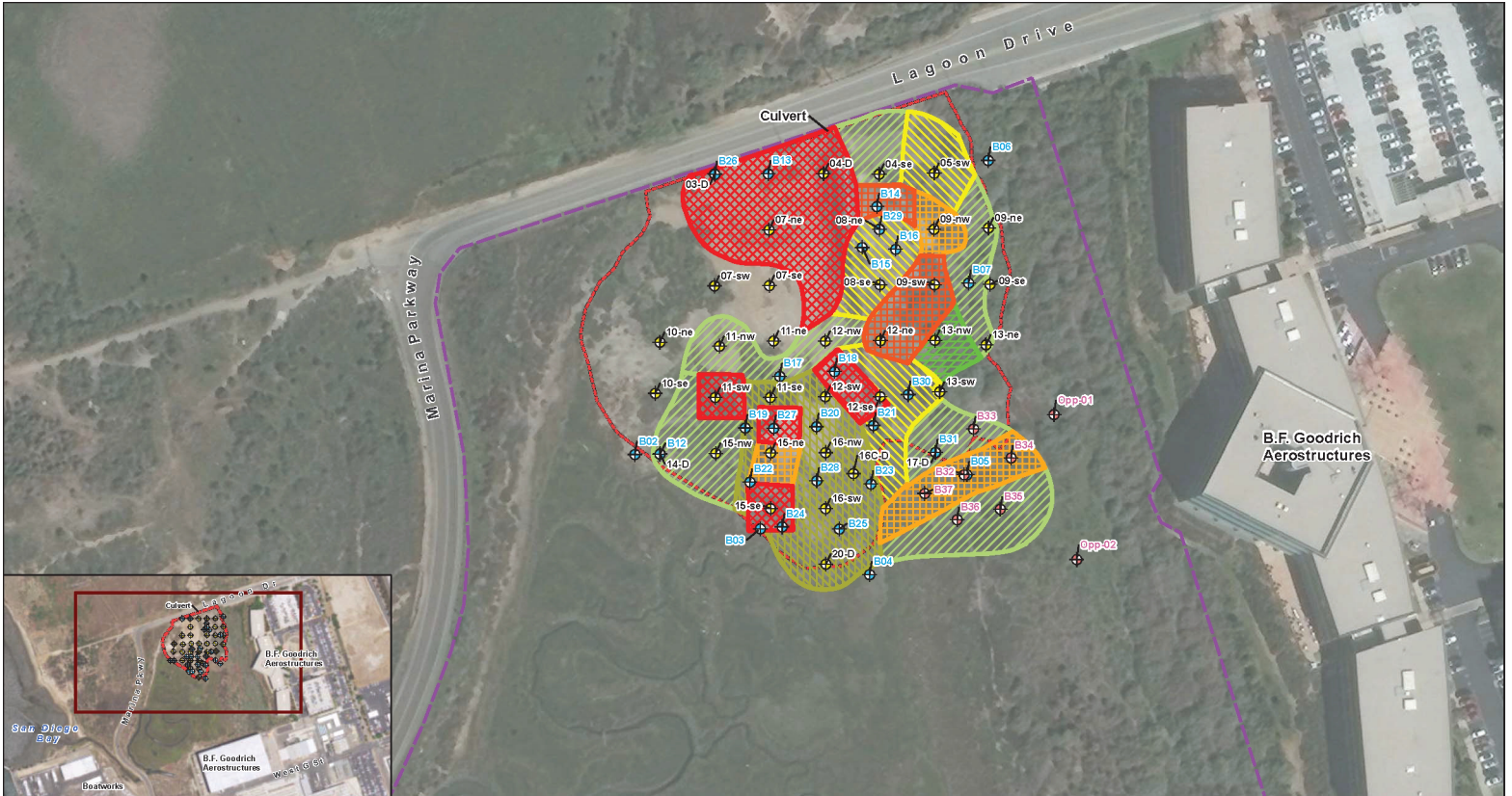


- Legend**
- Sediment / Lowland Area
 - Fill Area (Upland)
 - F and G Street Marsh Boundary



Site Details Engineering Evaluation/Cost Analysis Sweetwater Marsh Unit Site, Operable Unit 3 <small>San Diego Bay National Wildlife Refuge Chula Vista, California</small>	
	Figure 2
<small>San Diego</small>	<small>March 2017</small>

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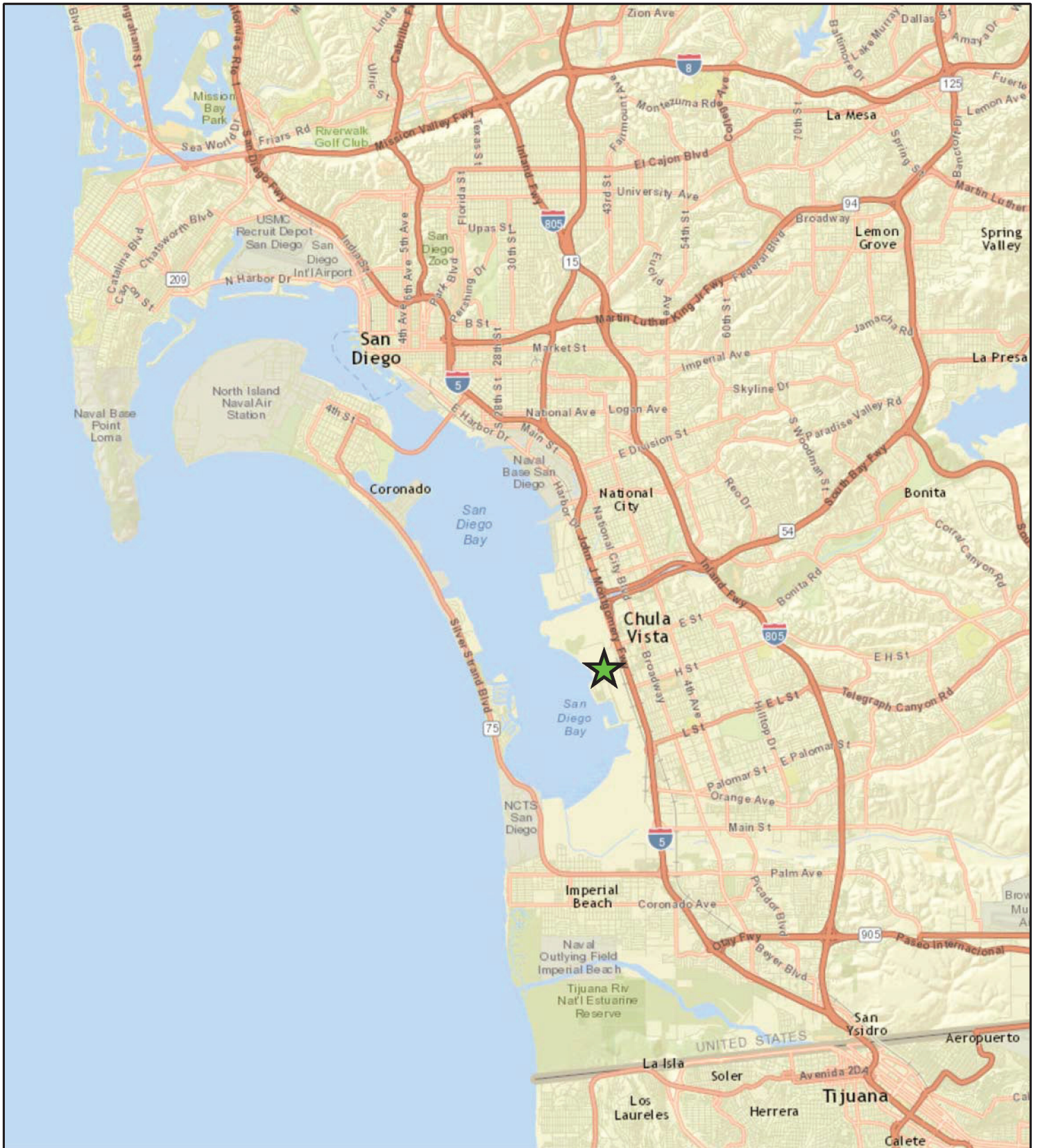


Legend		Excavation Depth	
	Soil Sample Location (Geosyntec, 2016)		2.0 ft
	Soil Sample Location (Ahtna, 2014)		2.5 ft
	Soil Sample Location (USFWS, 2003-2004)		3.0 ft
	Fill Area (Upland)		3.5 ft
	F and G Street Marsh Boundary		4.0 ft
			4.5 ft
			5.0 ft



Removal Action Areas Engineering Evaluation/Cost Analysis Sweetwater Marsh Unit Site, Operable Unit 3 San Diego Bay National Wildlife Refuge Chula Vista, California	
San Diego	September 2017
Figure 3	

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Legend

 Site Location



Sources: Esri, HERE, DeLorme, USGS, Intermap,



OU3 05192

Site Location
Engineering Evaluation/Cost Analysis
Sweetwater Marsh Unit Site, Operable Unit 3
 San Diego Bay National Wildlife Refuge
 Chula Vista, California

Geosyntec
 consultants

Figure
4

San Diego

March 2017

Attachment 2

Attachment 2A
Location-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) Criteria
Action Memorandum
San Diego Bay National Wildlife Refuge, Sweetwater Marsh Unit Site
Operable Unit 3 (F&G Street Marsh)

Standard, Requirement, Criteria, or Limitation	Citation	Requirement Description	Potentially Applicable, Relevant and Appropriate, or To Be Considered
Requirements for Activities Conducted within Units of the National Wildlife Refuge System	National Wildlife Refuge System Administration Act, as amended, 16 U.S.C. §§ 668dd 50 C.F.R. Part 27	The National Wildlife Refuge System Act, as amended, and its implementing regulations establish a number of substantive management requirements for all units within the National Wildlife Refuge System.	Applicable
FWS Policies for Activities Conducted within Units of the National Wildlife Refuge System	Policy on National Wildlife Refuge System Mission and Goals and Refuge Purposes, 601 FW 1 Policy on the Appropriateness of Refuge Uses, 603 FW 1 Policy on Compatibility, 603 FW 2 Policy on Maintaining Biological Integrity, Diversity, and Environmental Health, 601 FW 3	This policy provides guidance on the mission and goals of the National Wildlife Refuge System, as well as the purpose of the units of the System. This policy provides guidance on which uses are appropriate within units of the System. This policy provides guidance for evaluating proposed uses for compatibility with the purposes and mission of the System, as well as the purposes for which the unit was created. This policy provides guidance on the National Wildlife Refuge System's substantive requirement to maintain and, where appropriate, restore the biological integrity, diversity, and environmental health of System units for the benefit of present and future generations of Americans.	TBC
Activities Conducted within the San Diego Bay National Wildlife Refuge	Comprehensive Conservation Plan (CCP) for the San Diego Bay National Wildlife Refuge	The National Wildlife Refuge System requires FWS to adopt a Comprehensive Conservation Plan (CCP) for each unit or complex of units within the National Wildlife Refuge System. The Act also requires that each System unit be managed in accordance with its adopted CCP.	Applicable
Activities Affecting Endangered or Threatened Species and Their Critical Habitats	Endangered Species Act, 16 U.S.C. §§ 703-712 Endangered and Threatened Species, 50 C.F.R. Part 17	The Endangered Species Act protects endangered and threatened species and their habitats. The ESA prohibits the unauthorized take of endangered and threatened species and protects their habitats by prohibiting or restricting certain activities.	Applicable
Migratory Bird Treaty Act (MBTA)	16 U.S.C. § 703 50 C.F.R. § 10.13	The MBTA prohibits the unauthorized incidental take of migratory birds.	Applicable
Responsibilities of Federal Agencies to Protect Migratory Birds	Executive Order No. 13186	This order directs executive departments and agencies to take certain actions to further implement the MBTA, including supporting the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.	TBC

Attachment 2A
Location-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) Criteria
Action Memorandum
San Diego Bay National Wildlife Refuge, Sweetwater Marsh Unit Site
Operable Unit 3 (F&G Street Marsh)

Standard, Requirement, Criteria, or Limitation	Citation	Requirement Description	Potentially Applicable, Relevant and Appropriate, or To Be Considered
Requirements within Wetlands	Executive Order 11990 Fish and Game Commission Wetlands Policy included in Fish and Game Code Addenda (amended August 18, 2005)	These TBCs discourage actions that result in the destruction, loss, or degradation of wetlands and seek to preserve and enhance the wetlands' natural and beneficial values. The agency should avoid construction in, or conversion of, wetlands unless there is no practicable alternative, and it should adopt any measures necessary to minimize harm to wetlands from such construction.	TBC
Requirements within Floodplains	Executive Order No. 11988 44 C.F.R. Part 9	These TBCs require consideration of impacts to areas within the 100-year floodplain in order to reduce flood loss risks, minimize flood impacts on human health, safety, and welfare, and preserve and/or restore floodplain values.	TBC
National Historic Preservation Act	54 U.S.C. §§ 306101 – 306131 36 C.F.R. Part 800	The statute and its implementing regulations require federal agencies to consider the effect of any federally assisted undertaking on any district, site building, structure, or object that is included in, or is eligible for, the National Register of Historic Places and to minimize or mitigate reasonably unavoidable effects. Indian cultural and historical resources must be evaluated, and effects avoided, minimized, or mitigated.	Potentially Applicable
Archaeological and Historic Preservation Act	54 U.S.C. §§ 312502 – 312503	This statute establishes requirements for the evaluation and preservation of historical and archaeological data, including Indian cultural and historic data, which may be destroyed through alteration of the terrain as a result of, <i>inter alia</i> , federal construction projects. If eligible scientific, pre-historical, or archaeological data are discovered during site activities, such data must be preserved in accordance with these requirements.	Potentially Applicable
Historic Sites, Buildings, and Antiquities Act	54 U.S.C. § 320102(g)	This statute requires federal agencies to consider the existence and location of historic or prehistoric sites, buildings, objects, or properties of national historical or archaeological significance when evaluating remedial alternatives.	Potentially Applicable
Archaeological Resources Protection Act	16 U.S.C. §§ 470ee(a) 43 C.F.R. §§ 7.4(a), 7.5, 7.8, 7.9, 7.33	This statute and its implementing regulations provide for the protection of archaeological resources located on public and tribal lands. If an activity involves soil disturbance, the land manager cannot approve the excavation or removal of archaeological resources unless specified criteria are met.	Potentially Applicable
Native American Graves Protection and Repatriation Act (NAGPRA)	25 U.S.C. § 3002(d) 43 C.F.R. §§ 10.3(b), 10.4 – 10.6	NAGPRA and its implementing regulations provide for the disposition of Native American remains and objects inadvertently discovered on federal or tribal lands after November 1990. If the response activities result in the discovery of Native American human remains or related objects, the activity must stop while the head of the federal land management agency (in this case, NPS) and appropriate Indian tribes are notified of the discovery. After the discovery, the response activity must cease and a reasonable effort must be made to protect Native American human remains or related objects. The response action can resume once these requirements have been met.	Potentially Applicable
Fish and Wildlife Coordination Act	16 U.S.C. §§ 661 et seq., as amended by Pub. L. No. 116-9, 133 Stat. 580 (2019)	This statute requires NPS to consider the impacts to wildlife resources resulting from the modification of waterways.	Applicable

Attachment 2A
 Location-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) Criteria
 Action Memorandum
 San Diego Bay National Wildlife Refuge, Sweetwater Marsh Unit Site
 Operable Unit 3 (F&G Street Marsh)

Standard, Requirement, Criteria, or Limitation	Citation	Requirement Description	Potentially Applicable, Relevant and Appropriate, or To Be Considered
Coastal Zone Management Act California Coastal Management Program	16 U.S.C. §§ 1456(c) 15 C.F.R. §§ 930.30-930.36, 930.39 Public Resources Code, Division 20, Chapter 3	The Coastal Zone Management Act requires federal agencies to make a determination that proposed federal actions affecting any coastal use or resource are undertaken in a manner consistent to the greatest extent practicable with the enforceable policies of the state's approved coastal management plan. FWS has determined that the selected removal action would have no adverse effects on coastal resources and is therefore consistent to the greatest extent practicable with the California Coastal Management Program. The California Coastal Commission has concurred with that determination.	Applicable

Attachment 2B
 Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) Criteria
 Action Memorandum
 San Diego Bay National Wildlife Refuge, Sweetwater Marsh Unit Site
 Operable Unit 3 (F&G Street Marsh)

Standard, Requirement, Criteria, or Limitation	Citation	Requirement Description	Potentially Applicable, Relevant and Appropriate, or To Be Considered
Toxic Substances Control Act (TSCA), PCB Remediation Waste Regulations	40 C.F.R. §§ 761.50-761.61	TSCA and its implementing regulations could be applicable to the removal action if PCBs are found at a concentration greater than 50 parts per million (ppm). FWS has not encountered PCBs in the fill material at those concentrations, but these requirements would apply if such concentrations were encountered during excavation.	Potentially Applicable

Attachment 2C
Action-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) Criteria
Action Memorandum
San Diego Bay National Wildlife Refuge, Sweetwater Marsh Unit Site
Operable Unit 3 (F&G Street Marsh)

Standard, Requirement, Criteria, or Limitation	Citation	Requirement Description	Potentially Applicable, Relevant and Appropriate, or To Be Considered
Clean Water Act Stormwater Program	33 U.S.C. § 1342(p) 40 C.F.R. § 122.26 Construction Stormwater General Permit, State Water Resources Control Board Order 2009-0009-DWQ, as amended	The Clean Water Act stormwater program regulates the discharge of stormwater from industrial and construction activities and require the implementation of best management practices such as the use of stormwater fencing and other measures to prevent the discharge of stormwater to surface waters. There is no requirement to obtain a permit for on-site response activities, but the substantive requirements of the general permit must be met.	Applicable
Resource Conservation and Recovery Act, Characterization of Hazardous Waste	40 C.F.R. § 262.11(a)-(e)	These regulations require the characterization of material excavated at the site to determine if it is hazardous waste for purposes of management and disposal.	Applicable
RCRA Hazardous Waste "Contained-in" Policy	Final Rule, 63 Fed. Reg. 28556, 28621-22 (May 26, 1998)	This policy provides that environmental media containing hazardous waste must be treated as hazardous waste until it no longer contains the hazardous waste.	Applicable
Requirements for Temporary On-site Staging of Excavated Material	40 C.F.R. § 264.54(d)-(k)	The identified subsections of this regulation establish requirements for temporary, on-site staging piles used for excavated material prior to being transported off-site.	Applicable
Identification and Listing of California Hazardous Waste	22 C.C.R. Division 4.5, Chapter 11	These regulations require the characterization of material excavated at the site to determine if it is hazardous waste for purposes of management and disposal.	Relevant and Appropriate
Standards Applicable to Generators of Hazardous Wastes	22 C.C.R. §§ 66262.10-66262.11	These requirements apply to the generation hazardous waste on-site (i.e., investigation-derived waste or materials excavated and temporarily stored on-site).	Relevant and Appropriate
Exemption from SWRCB-Adopted Requirements regarding Land Disposal of Solid Waste and Treatment, Storage, Processing, and Disposal of Hazardous Waste for Cleanup Actions	23 C.C.R. § 2511(d) 27 C.C.R. § 20090(d)	These provisions exempt public agencies conducting cleanup activities from the certain requirements of Title 23 and Title 27 adopted by the State Water Resources Control Board, provided that contaminated materials removed from the site are disposed in accordance with applicable state law.	Applicable
California Least Tern Recovery Plan	U.S. Fish and Wildlife Service (1985)	This recovery plan describes the activities necessary to promote the recovery of the California least tern and should be considered in designing and implementing the removal action.	TBC
Protection of Rare and Endangered Plants	California Fish and Game Code § 1908	Section 1908 of the California Fish and Game Code prohibits take of rare or endangered plants. The removal action will be implemented in a way that avoids any incidental take of rare or endangered plant species.	Relevant and Appropriate
State Protection of Wildlife Species	California Fish and Game Code § 3005	Section 3005 of the California Fish and Game Code provides that it is unlawful to take birds or mammals through a number of means, including "poisonous substances." The removal action will be implemented in a manner that avoids any incidental take of birds or mammals through the release of hazardous substances.	Relevant and Appropriate

Attachment 2C
 Action-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) Criteria
 Action Memorandum
 San Diego Bay National Wildlife Refuge, Sweetwater Marsh Unit Site
 Operable Unit 3 (F&G Street Marsh)

Standard, Requirement, Criteria, or Limitation	Citation	Requirement Description	Potentially Applicable, Relevant and Appropriate, or To Be Considered
Fully Protected Bird Species and Habitat	California Fish and Game Code § 3511	Section 3511 of the California Fish and Game Code provides that fully protected bird species may not be taken or possessed. The removal action must be conducted in a manner that avoids incidental take of any fully protected bird species present on the site.	Relevant and Appropriate
Protection of Bird Nests and Eggs	California Fish and Game Code § 3503	Section 3503 of the California Fish and Game Code provides that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. The removal action must be conducted in a manner that avoids the take or destruction of any bird nests or eggs.	Relevant and Appropriate
California Endangered Species Act	California Fish and Game Code § 2080 14 C.C.R. §§ 670.2, 670.5, 783.1	These statutory and regulatory provisions prohibit the unauthorized take of state endangered or threatened species. The removal action will be conducted in a manner that avoids the take of state threatened or endangered species.	Relevant and Appropriate
Protection of Migratory Birds	California Fish and Game Code § 3513	Section 3513 of the California Fish and Game Code prohibits the take of migratory birds identified under the MBTA or state law. The removal action will be conducted in a manner that avoids incidental take of migratory birds.	Relevant and Appropriate
Aquatic Species and Habitat	California Fish and Game Code § 5650(a)	Section 5650(a) of the California Fish and Game Code provides that it is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of the state any of a number of specified pollutants, including any substance or material deleterious to fish, plant life, mammals, or bird life. The selected removal action will be conducted in such a manner that avoids releasing covered materials into the adjacent marsh.	Relevant and Appropriate