

**FINAL**

**ACTION MEMORANDUM**

**TIME-CRITICAL REMOVAL ACTION AT  
INSTALLATION RESTORATION SITE 33,  
TRANSFER PARCEL FED-1A, EBS PARCEL 23**

**ALAMEDA POINT  
ALAMEDA, CALIFORNIA**

**Contract Number N62473-07-D-3217  
Contract Task Order 0009**

**DCN: OTIE-3217-0009-0007**

**Prepared for:**



**Base Realignment and Closure  
Program Management Office West  
1455 Frazee Road, Suite 900  
San Diego, California 92108-4310**

**Prepared by:**



**1777 N. California Blvd., Suite 310  
Walnut Creek, California 94596**

**September 2012**

---

**FINAL**

**ACTION MEMORANDUM**

**TIME-CRITICAL REMOVAL ACTION AT  
INSTALLATION RESTORATION SITE 33,  
TRANSFER PARCEL FED-1A, EBS PARCEL 23**

**ALAMEDA POINT  
ALAMEDA, CALIFORNIA**

**Contract Number N62473-07-D-3217  
Contract Task Order 0009**

**DCN: OTIE-3217-0009-0007**

**Prepared for:**



**Base Realignment and Closure  
Program Management Office West  
1455 Frazee Road, Suite 900  
San Diego, California 92108-4310**

**REVIEW AND APPROVAL:**

OTIE Project Manager:

*Suman Sharma*

Date: 9/12/2012

Suman Sharma, M.Sc., M.Phil.

OTIE Senior Manager:

*Michael E. Quillin*

Date: 9/12/2012

Michael E. Quillin, PG #5315



**1777 N. California Blvd., Suite 310  
Walnut Creek, California 94596**

## TABLE OF CONTENTS

<b>1.0</b>	<b>PURPOSE</b> .....	<b>1</b>
<b>2.0</b>	<b>SITE CONDITIONS AND BACKGROUND</b> .....	<b>1</b>
2.1	Site Description and History .....	1
2.2	State And Local Actions .....	2
<b>3.0</b>	<b>THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT</b> .....	<b>2</b>
3.1	Threats to Public Health or Welfare .....	2
3.2	Threats to the Environment.....	3
<b>4.0</b>	<b>ENDANGERMENT DETERMINATION</b> .....	<b>3</b>
<b>5.0</b>	<b>PROPOSED ACTION AND ESTIMATED COSTS</b> .....	<b>3</b>
5.1	Removal Action Objective and Removal Action Level .....	3
5.2	Proposed Action Description.....	3
5.2.1	Removal Action Work Elements.....	4
5.2.2	Estimated Costs.....	5
<b>6.0</b>	<b>EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN</b> .....	<b>5</b>
<b>7.0</b>	<b>PUBLIC INVOLVEMENT</b> .....	<b>5</b>
<b>8.0</b>	<b>OUTSTANDING POLICY ISSUES</b> .....	<b>5</b>
<b>9.0</b>	<b>ENFORCEMENT</b> .....	<b>6</b>
<b>10.0</b>	<b>RECOMMENDATIONS</b> .....	<b>6</b>
<b>11.0</b>	<b>REFERENCES</b> .....	<b>6</b>

## **LIST OF FIGURES**

- Figure 1 Alameda Regional Map
- Figure 2 Site Features and Locations in Transfer Parcels FED-1A, FED-2B, and FED-2C
- Figure 3 Historical Sampling Locations Exceeding Screening Criterion within IR Site 33
- Figure 4 Proposed Excavation Areas within IR Site 33

## ABBREVIATIONS AND ACRONYMS

µg/Kg	micrograms per kilogram
§	Section
§§	Sections
AM	Action Memorandum
B(a)P	benzo(a)pyrene
bcy	bank cubic yards
BEI	Bechtel Environmental, Inc.
BRAC	Defense Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	constituents of concern
DTSC	Department of Toxic Substances Control
EA	Excavation Area
EBS	Environmental Baseline Survey
ELCR	Excess lifetime cancer risk
EPC	exposure point concentration
ERA	Environmental Risk Assessment
FED	Federal Agency
IR	Installation Restoration
NAS	Naval Air Station
Navy	U.S. Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
NPL	National Priorities List
PAHs	polycyclic aromatic hydrocarbons
PRG	preliminary remediation goal
RAB	Restoration Advisory Board
RWQCB	San Francisco Regional Water Quality Control Board
SI	Site Inspection
TCRA	Time-critical removal action
U.S.	United States
U.S.C.	United States Code
VA	Veterans Administration

## 1.0 PURPOSE

This Action Memorandum (AM) documents the decision by the United States (U.S.) Department of the Navy (Navy) to conduct a time-critical removal action (TCRA) to remove polycyclic aromatic hydrocarbons (PAHs) in soil from Installation Restoration (IR) Site 33, Transfer Parcel Federal Agency (FED)-1A, Environmental Baseline Survey (EBS) Parcel 23, at former Naval Air Station (NAS) Alameda, now referred to as Alameda Point, in Alameda, California. This TCRA will be conducted under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 40 Code of Federal Regulations (CFR), Section (§) 300.415.

This TCRA is being conducted to reduce potential risks to public health, welfare, and the environment posed by contaminants in soil possibly resulting from historical use of sediments containing PAHs dredged to form fill material for Alameda Point (CH2M HILL, 2011). The Navy has the authority to undertake CERCLA response actions, including removal actions, under Title 42 of the United States Code (U.S.C.) § 9604, Title 10, U.S.C. § 2705, and federal Executive Orders 12580 and 13016. There are no nationally significant or precedent-setting issues for this site.

## 2.0 SITE CONDITIONS AND BACKGROUND

The following section provides an overview of the site, including its physical location, characteristics, and history. The section also provides an assessment of the current environmental conditions at the site and establishes why a TCRA is necessary to mitigate site conditions.

### 2.1 SITE DESCRIPTION AND HISTORY

Alameda Point is located on the western tip of Alameda Island, which is on the eastern side of San Francisco Bay (Figure 1). The U.S. Army acquired Alameda Point from the City of Alameda in 1930. The Navy later acquired the land from the U.S. Army in 1936, and built NAS Alameda to support the Navy's operations in Europe prior to World War II. The Base was operated as an active naval facility from 1940 to 1997 (CH2M HILL, 2011). NAS Alameda closed in April 1997, under the Defense Base Realignment and Closure (BRAC) Act, and was designated as a National Priorities List (NPL) site in July 1999 (U.S. Environmental Protection Agency [EPA] 1999).

The Navy is currently in the process of transferring the land to the City of Alameda and to other federal entities. As part of the closure process, an EBS was conducted in 1994. During the EBS, the former base was divided into 209 EBS parcels. Transfer Parcels FED-1A, FED-2B, and FED-2C contain seven of these EBS parcels, including EBS Parcel 23, located in Transfer Parcel FED-1A (Figure 2).

Transfer Parcels FED-1A, FED-2B, and FED-2C occupy approximately 400, 27, and 12 acres, respectively, in the western portion of Alameda Point (Figure 2). The Navy formerly used the land at Transfer Parcel FED-1A as aircraft runways, taxiways, and support service facilities (e.g., aircraft-arresting devices, compass pads, and lighting vaults) and as magazines. Currently, a 10-acre portion of Transfer Parcel FED-1A is identified as part of a California least tern sanctuary, which provides protective habitat for the endangered avian species (Figure 2). Transfer Parcel FED-2B is entirely unpaved open space that includes coastal scrub and wetlands habitat. Transfer Parcel FED-2C is entirely paved open space and serves as a buffer zone between Transfer Parcel FED-1A and IR Site 26.

IR Site 33 is located entirely within the boundaries of Transfer Parcels FED-1A and FED-2B (Figure 2). The portion of IR Site 33 extending north from the southern boundary of Transfer Parcel FED-1A was associated with EBS Parcel 23 and was identified to address PAHs detected in soil. Transfer Parcel FED-2B was included in IR Site 33 to address potentially outstanding ecological issues in the wetlands portion of the transfer parcel. However, it was determined that no significant human health or ecological risks exist for Transfer Parcel FED-2B (CH2M HILL, 2011). Therefore, the Navy recommended that IR Site 33 be revised to exclude the FED-2B portion of its boundaries.

## **2.2 STATE AND LOCAL ACTIONS**

The Navy is the lead federal agency at the site pursuant to the Defense Environmental Restoration Act, or Title 10, U.S.C Sections (§§) 2701 through 2710 and CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and the delegation of Presidential authority under federal Executive Orders 12580 and 13016. Pursuant to Title 10, U.S.C. § 2705, the Navy is required to ensure that state and local officials are given timely opportunity to review and comment on the Navy's proposed response actions. State and local authorities have not undertaken any removal actions at the site; however, EPA Region 9, the California Department of Toxic Substances Control (DTSC), and the San Francisco Regional Water Quality Control Board (RWQCB) provide oversight of studies and actions conducted by the Navy.

## **3.0 THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT**

Potential threats to public health, welfare, or the environment posed by site contaminants are discussed in this section.

### **3.1 THREATS TO PUBLIC HEALTH OR WELFARE**

The Draft Transfer Parcels FED-1A, FED-2B, and FED-2C Site Inspection (SI) Report (Bechtel Environmental, Inc. [BEI], 2008) recommended further evaluation of soils which are part of IR Site 33. In order to perform this further evaluation, the Navy collected additional data in Spring 2010 which was presented in the Final Expanded SI Report for Transfer Parcels FED-1A, FED-2B, and FED-2C (CH2M HILL, 2011). Elevated PAH concentrations with benzo(a)pyrene (B(a)P) equivalent concentrations above the Alameda Point-specific screening criterion for residential use (620 micrograms per kilogram [ $\mu\text{g}/\text{Kg}$ ]), were reported in soil in the central and southern portion of EBS Parcel 23; areas included within the boundary of IR Site 33.

A screening-level human health risk evaluation was conducted to assess whether these PAH concentrations might pose potential human health concerns. The human health risk screening evaluation was based on the planned future land use of the site, which includes residential areas (Veterans Administration [VA] medical facilities), commercial/industrial areas (national columbarium), wetlands/open space, and the California least tern sanctuary (EDAW, 2008). The evaluation used maximum reported analytical results from the 2010 site inspection (CH2M HILL, 2011) and previous environmental studies (BEI, 2008), conducted for Transfer Parcels FED-1A.

Human health target risk levels were exceeded at Transfer Parcel FED-1A, including EBS Parcel 23. The incremental risk for EBS Parcel 23 is above the target risk levels using industrial risk-based guidelines; however, this is due to the elevated levels of PAH concentrations from soil samples located in the IR Site 33 portion of this parcel.

### **3.2 THREATS TO THE ENVIRONMENT**

EBS Parcel 23 was evaluated as a part of the 2010 SI (CH2M HILL, 2011) with a screening level environmental risk assessment (ERA) that assessed potential risk for representative receptors in the grassland and coastal scrub habitats. Results of the screening-level ERA indicated that the potential risk estimates were not greater than risk estimates for background conditions. Additionally, the potential risk is expected to be lower than originally estimated for ecological receptors in the grasslands and coastal scrub habitats due to the generally poor habitat quality and small size of these areas. The California least tern nesting colony is not exposed to soil chemicals of potential ecological concern due to the paved surfaces at its nesting area. The results of the screening-level ERA for EBS Parcel 23 infer, by association, no unacceptable risks were identified for ecological receptors at IR Site 33.

### **4.0 ENDANGERMENT DETERMINATION**

Section 300.415 (b)(2) of the NCP outlines the factors to be considered in determining the appropriateness of a removal action. In accordance with §300.415 (b)(2), IR Site 33 meets the following conditions for a removal action: “Actual or potential exposures to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.”

### **5.0 PROPOSED ACTION AND ESTIMATED COSTS**

This section describes the proposed removal action to mitigate the conditions cited in [Section 3.1](#), above. This section also discusses the removal action objective and removal action level, and presents the estimated costs for the TCRA.

#### **5.1 REMOVAL ACTION OBJECTIVE AND REMOVAL ACTION LEVEL**

The objective of the TCRA presented in this AM is to obtain No Further Action (NFA) concurrence from regulatory agencies for IR Site 33. To achieve this objective the Navy will remove PAH contaminated soil from in and around the hot spot locations presented in the 2010 SI (CH2M HILL, 2011; [Figure 3](#)). Soil removal will continue until the remaining soils are below the Alameda Point-specific cleanup criterion for residential use, defined as 620 µg/kg for the calculated benzo(a)pyrene (B(a)P) equivalent concentration, or the exposure point concentration (EPC) for each excavation area EA ([Figure 4](#)) is below this criterion. The cleanup criterion was agreed upon by the Navy and regulatory agencies during the PAH technical meeting held in May 2001 (Navy, 2001) and corresponds to an excess lifetime cancer risk (ELCR) value of  $10^{-5}$  (one additional cancer case in a population of 100,000), which was derived from the EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil (EPA, 2004). The regional screening level for benzo(a)pyrene (B(a)P) in residential soil has been revised. Based on the current toxicity values for PAHs; benzo(a)pyrene (B(a)P) equivalent concentration 620 µg/kg represents a  $4 \times 10^{-5}$  ELCR, which is within the CERCLA risk range. Upon achieving 620 µg/kg cleanup criterion, as detailed in the Work Plan (OTIE 2012), the removal action report will provide basis for a NFA determination for IR Site 33.

#### **5.2 PROPOSED ACTION DESCRIPTION**

The proposed soil removal action consists of the excavation, transportation, and disposal of an estimated 9,689 bank cubic yards (bcy) of PAH-contaminated soil at IR Site 33. Following excavation, the removal areas will be backfilled with clean fill, graded to the pre-existing base grade elevation, and compacted.

### 5.2.1 Removal Action Work Elements

The major work elements of the proposed removal action at IR Site 33 and the investigation activities to support this action are provided below. Details of the actions and methods to perform the soil removal action will be described in the TCRA Work Plan, which will be placed in the local Information Repository (see [Section 7.0](#)) and be available to the public and the regulators for review and comment. The major components of this proposed action are as follows:

- TCRA Work Plan – A Draft TCRA Work Plan will be prepared and submitted to the regulatory parties (EPA, DTSC, and RWQCB) for review and to solicit and address their comments regarding the execution of the removal action. A Final TCRA Work Plan, providing the definitive plan for project execution, will also be prepared and distributed. The TCRA Work Plan will describe the details of the removal, schedule, remedial goals, sampling to be conducted, proposed excavation limits, and site restoration plan.
- Staging Area Setup – Prior to the start of site activities, staging areas, decontamination areas, and site access controls will be set up, and any buried utilities will be located and marked accordingly. Fences will be opened as necessary for bringing equipment to the site and will then be re-secured. Staging areas will be sized to accommodate the expected volume of excavated soil.
- Erosion Control – Erosion control measures will be set up to prevent runoff or erosion of soil from the site and staging areas during excavation activities. This will be completed before any clearing activities begin as described in the TCRA Work Plan.
- Clearing – Vegetation will be cleared from the work area as necessary to make it accessible to personnel and equipment for the removal activities.
- Pre-excavation Sampling – Pre-excavation samples will be collected around and between the PAH hot spot areas reported in the 2010 SI (CH2M HILL, 2011; [Figure 3](#)). These samples will assist in determining the lateral and vertical extent of PAH contamination, and further assist in the delineation of the necessary excavation limits. The TCRA Work Plan will specify the frequency of sampling.
- Hardscape Removal – Asphalt and concrete will be removed and stockpiled appropriately prior to excavation.
- Excavation – The excavation will begin in the identified soil removal area and will proceed based on pre-excavation sampling analytical results. The proposed excavation areas are presented in [Figure 4](#).
- Confirmation Sampling – Confirmation samples will be collected from the bottom and sidewalls of the excavation areas and will be analyzed for PAHs by EPA Test Method 8270-SIM. The analytical results will be converted to B(a)P equivalent concentrations and compared to the cleanup criterion (620 µg/Kg) to determine if the excavation is complete or further excavation is necessary. The TCRA Work Plan will specify the frequency of sampling.

- Handling of Excavated Soil – Excavated soils will be stockpiled onsite in accordance with the TCRA Work Plan. Precautions will be taken not to excavate below the water table.
- Excavation Dewatering – If dewatering is required, water pumped from the excavation will be stored in temporary tanks at the site for proper disposal at an appropriately licensed disposal facility, as required.
- Waste Disposal – Stockpiled soil and stored water (if any) will be sampled and analyzed for characterization purposes and to facilitate disposal. After profiling and manifesting, material that is determined to be hazardous will be transported offsite to an appropriately licensed treatment, storage and disposal facility (TSDF). Material determined to be non-hazardous and deemed useful by the Navy, may be utilized for onsite use (away from IR Site 33).
- Site Restoration – Excavated areas will be backfilled with Navy approved clean fill as described in the TCRA Work Plan. The excavated areas and other areas disturbed during the removal action will be restored to the original elevation and compacted.
- SI Report Addendum – Following completion of the TCRA excavation described above, the Navy will prepare and submit a SI Report Addendum documenting site closeout.

### **5.2.2 Estimated Costs**

The estimated cost for the TCRA, borne by the Navy, is estimated at \$1,500,000 including planning documents, field work, and reporting. There are no long-term operations, maintenance, or monitoring costs associated with this removal action.

## **6.0 EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

If the removal action is not conducted, or if the action is delayed, COC concentrations in the soil at IR Site 33 will remain and continue to pose potential risk to human receptors. Contaminant concentrations are not expected to significantly decrease over time. Delay or no action at the site may also result in increased future cleanup costs. In addition, if contamination remained at the site, as a practical matter, transfer of the property by the Navy and future reuse of the property would be encumbered by the presence of high levels of PAH contaminants.

## **7.0 PUBLIC INVOLVEMENT**

The planning of this TCRA has been coordinated with the Alameda Point Restoration Advisory Board (RAB), which is composed of concerned citizens and is supported by the Alameda Point Technical Team. Bimonthly RAB meetings (second Thursday of every other month) are held to notify the public of significant milestones in the environmental cleanup program at the base. In accordance with 40 CFR 300.415(n), a notice of availability of the Administrative Record File will be published in the local newspaper within 60 days of signing of the AM. The notice will also inform the public of the 30-day public comment period.

## **8.0 OUTSTANDING POLICY ISSUES**

There are no outstanding policy issues.

## **9.0 ENFORCEMENT**

The Navy has taken responsibility for development and implementation of the TCRA. The TCRA meets the substantive requirements of applicable requirements and governing regulations.

## **10.0 RECOMMENDATIONS**

This AM was developed in accordance with current EPA and Navy guidance documents for removal actions under CERCLA (EPA, September 2009; Navy, August 2006). This AM documents, for the Administrative Record, the Navy's decision to undertake a TCRA at IR Site 33, at Alameda Point, in Alameda, California. The removal of PAH-contaminated soil will reduce the estimated human health risks associated with exposure to contaminants at IR Site 33. The Navy therefore recommends the implementation of the proposed removal action.

## **11.0 REFERENCES**

Bechtel Environmental, Inc. (BEI). 2008. Draft Site Inspection Report, Transfer Parcels FED-2C, Alameda Point, Alameda, California. May.

CH2M HILL. 2011. Final Site Inspection Report Transfer Parcels FED 1A, FED-2B, and FED-2C, Alameda Point, Alameda, California. January 31.

EDAW Natural Resources Studio. 2008. Wetland Delineation and Preliminary Jurisdictional Determination for the Proposed Department of Veterans' Affairs Facilities at the Former NAS Alameda, Alameda County, California. August 13.

Oneida Total Integrated Enterprises (OTIE). 2012. Final Time-Critical Removal Action Work Plan, Installation Restoration Site 33, Transfer Parcel FED-1A, EBS Parcel 23, Alameda Point, Alameda, California. September 10.

U.S. Department of the Navy (Navy). 2001. Polynuclear Aromatic Hydrocarbon Technical Meeting, Meeting Minutes. Draft. May 31.

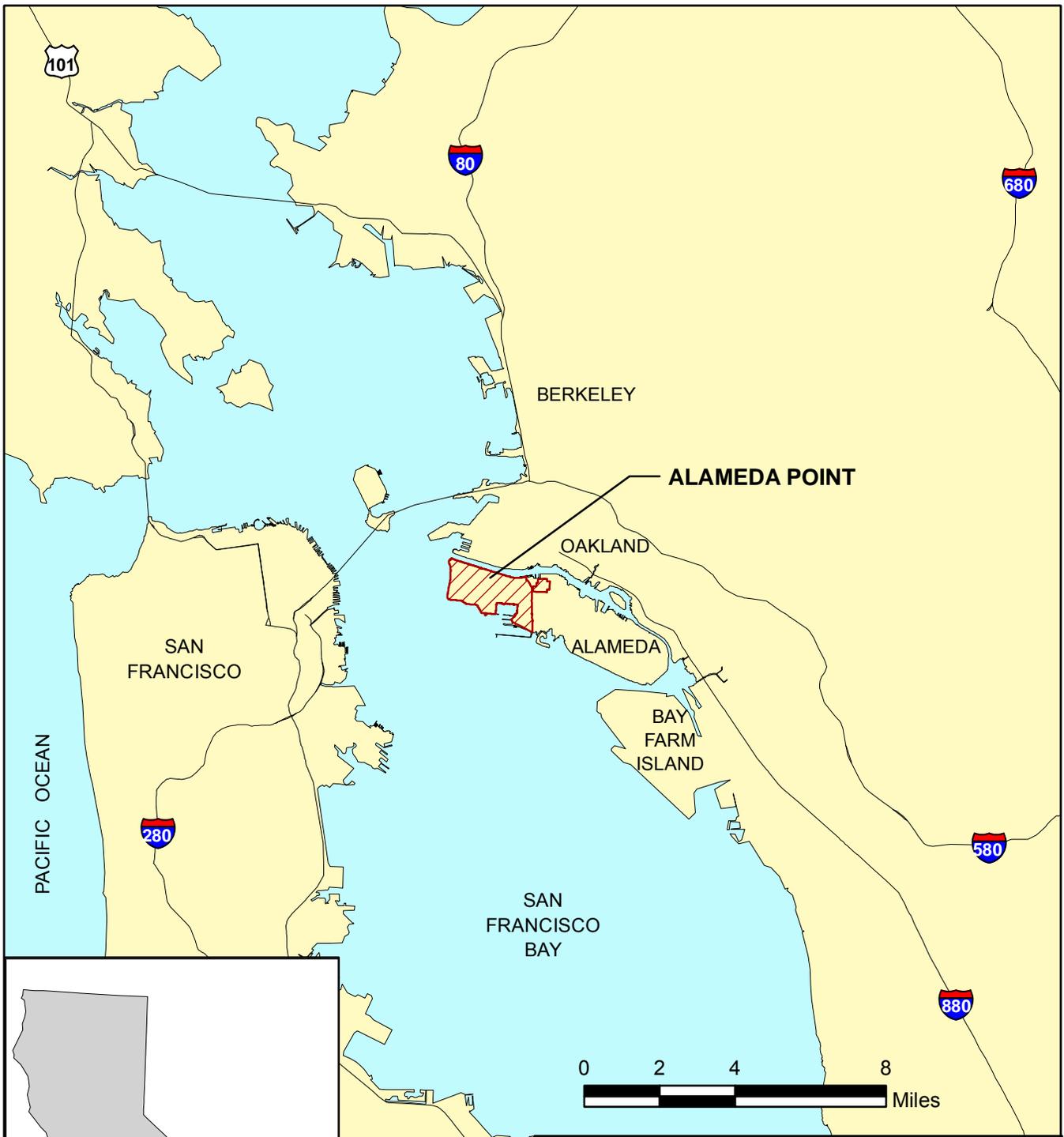
\_\_\_\_\_. 2006. Navy Environmental Restoration Program (NERP) Manual. August.

U.S. Environmental Protection Agency (EPA). 1999. Federal Register, Volume 64, No. 140, pages 39,878 through 39,885. July 22.

\_\_\_\_\_. 2004. Region 9 Preliminary Remediation Goals. October.

\_\_\_\_\_. 2009. Superfund Removal Guidance for Preparing Action Memoranda, Office of Emergency Management, Office of Solid Waste and Emergency Response, Washington, D.C. September.

## **FIGURES**



**Alameda Regional Map**

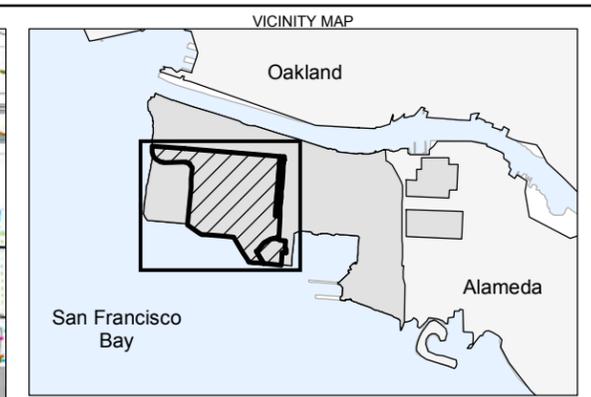
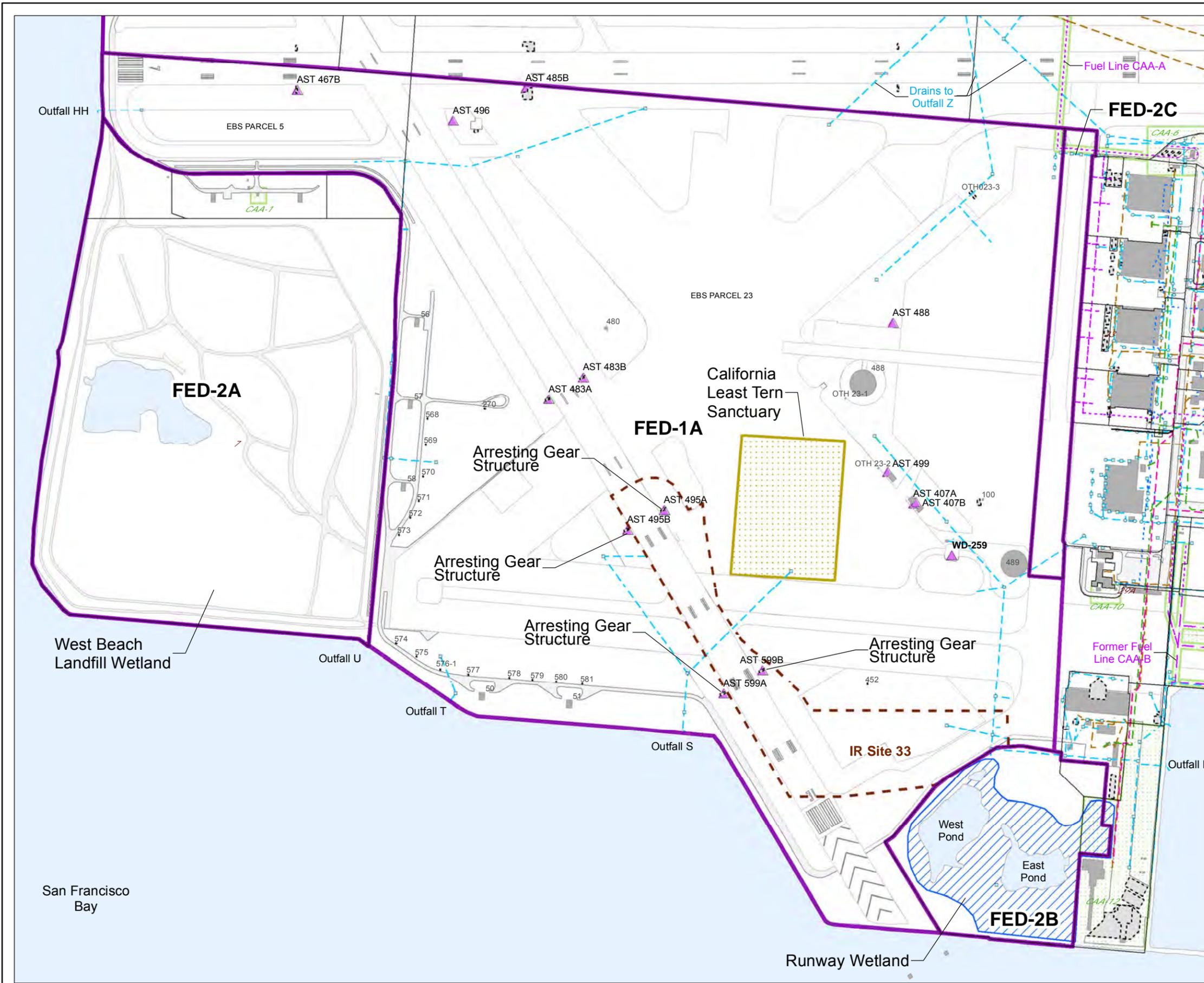
IR Site 33

Date: 10-11

Project No. 2011096

Figure 1





**LEGEND**

- Transfer Parcels FED-1A, 2B, and 2C
- IR Site 33
- EBS Parcel Included in Transfer Parcels FED-1A, 2B, 2C
- Water
- Wetland
- Least Tern Sanctuary
- Building or Structure (Present)
- Building or Structure (Removed)
- CAA
- ▲ SWMU
- Catch Basin
- Manhole
- Storm Drain
- Steam Line
- Sanitary Sewer Line
- Industrial Wastewater Line
- Gas Line
- Fuel Line
- Fuel Line (abandoned-in-place)
- Fuel Line (Removed)

**Notes:**  
 All ASTs in transfer parcel FED-1A have been removed.

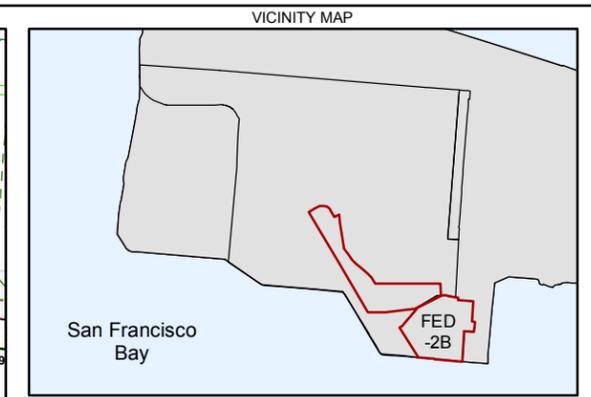
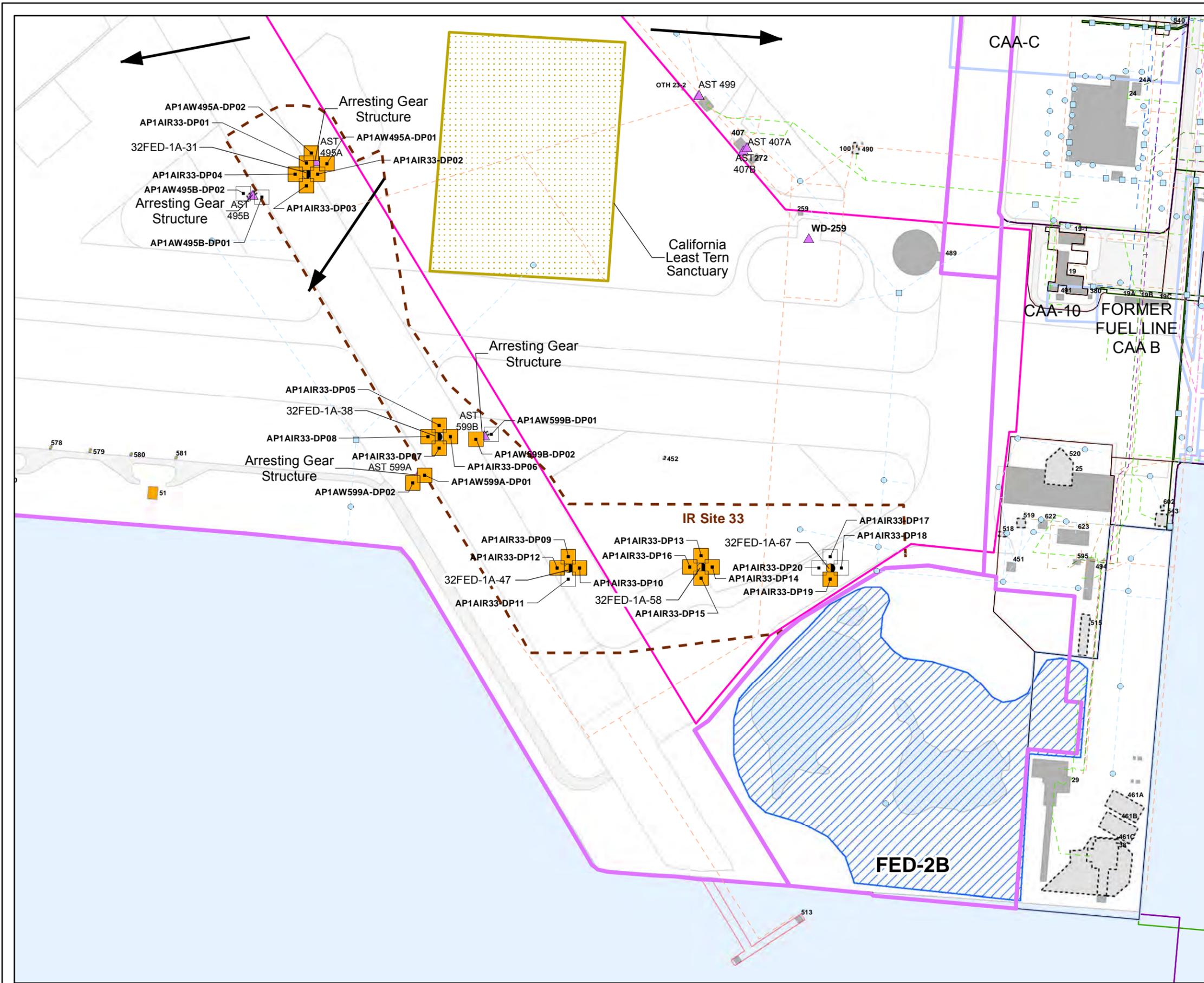
AST - Aboveground Storage Tank  
 EBS - Environmental Baseline Survey  
 FED - Federal Agency  
 IR - Installation Restoration (program)  
 SWMU - Solid Waste Management Unit  
 WD - Washdown



**Site Features and Locations in Transfer Parcels FED-1A, FED-2B, and FED-2C**

IR Site 33

Date: 10-11	Project No. 2011096	Figure 2
-------------	---------------------	----------



- LEGEND**
- PAH Soil Sampling Location(CH2MHill, 2011)
  - PAH Soil Sampling Location Exceeding Screening Levels(CH2MHill, 2011)
  - ▲ SWMU
  - Catch Basin
  - Manhole
  - ▭ Transfer Parcels FED-1A, 2B, and 2C
  - ▭ Other Transfer Parcels
  - ▭ Environmental Baseline Survey Parcel
  - ▭ Least Tern Sanctuary
  - ▭ Corrective Action Area
  - ▭ IR Site 33
  - ▭ Environmental Restoration Site
  - ▭ Wetland
  - ▭ Munitions Storage Areas (MSA)
  - ▭ Building or Structure (Present)
  - ▭ Building or Structure (Removed)
  - ▭ Storm Drain
  - ▭ Communications Line
  - ▭ Electric Line
  - ▭ Fuel Line
  - ▭ Gas Line
  - ▭ Industrial Wastewater Line
  - ▭ Storm Sewer Line
  - ▭ Steam Line
  - ➔ Approximate Groundwater Flow Direction

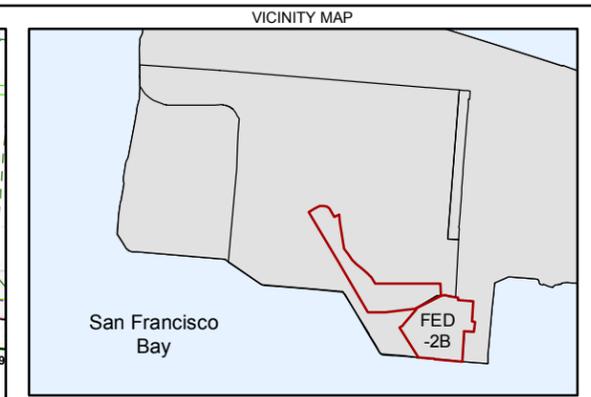
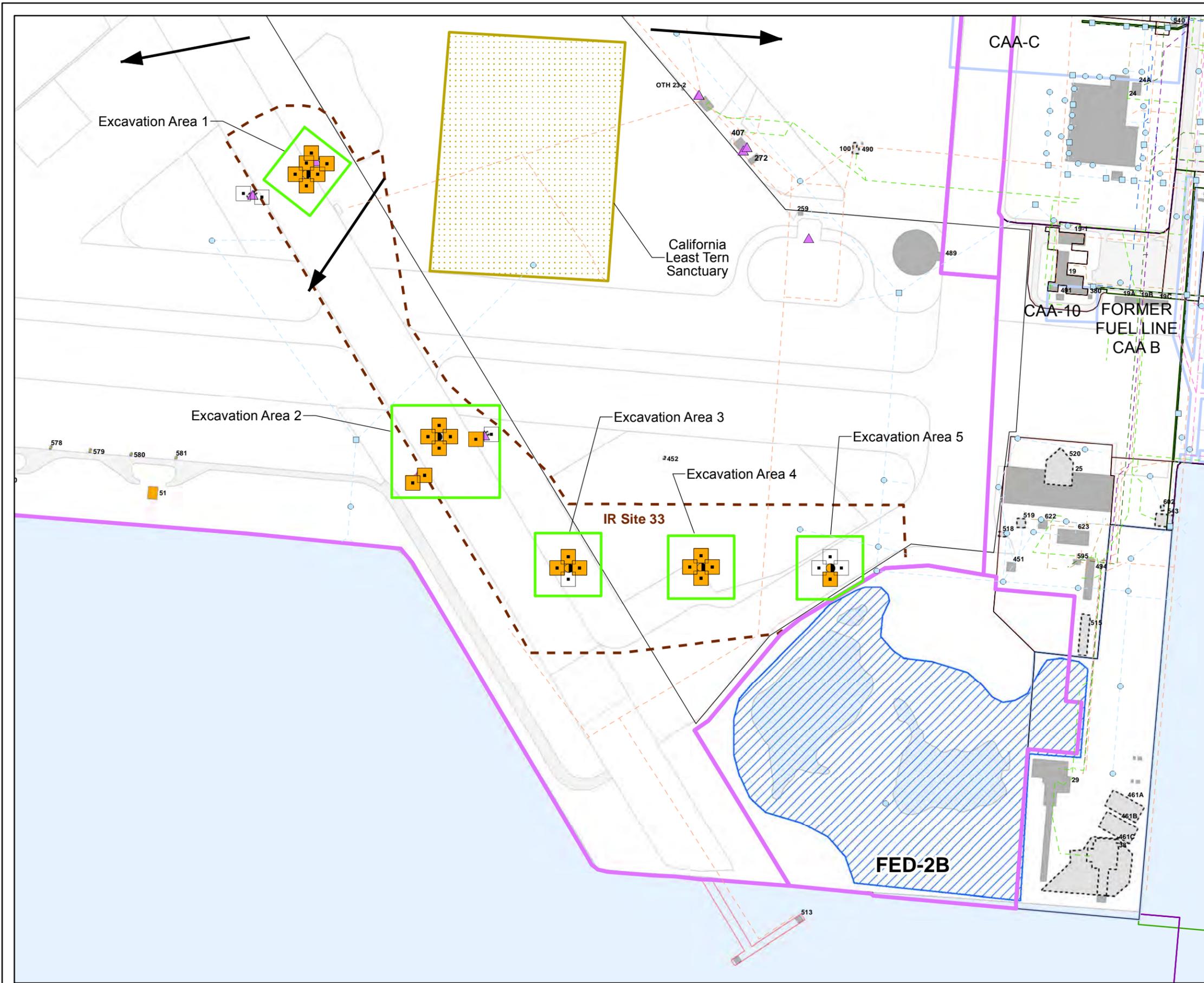
**Notes:**  
 SVOC = Semi-Volatile Organic Compounds  
 PAH = Polycyclic Aromatic Hydrocarbon  
 EDC = Economic Development Conveyance  
 FED = Federal Agency Parcel  
 CAA = Corrective Action Area  
 OU = Operable Unit  
 IR = Installation Restoration (Program)  
 SWMU = Solid Waste Management Unit



**Historical Sampling Locations Exceeding Screening Criterion Within IR Site 33**

IR Site 33  
 Date: 10-11 | Project No. 2011096 | Figure 3





- LEGEND**
- ◻ PAH Soil Sampling Location (CH2MHill, 2011)
  - ◼ PAH Soil Sampling Location Exceeding Screening Levels (CH2MHill, 2011)
  - Locations Exceeding Screening Levels (BEI, 2003)
  - ▲ SWMU
  - Catch Basin
  - Manhole
  - ▭ Transfer Parcels FED-1A, 2B, and 2C
  - ▭ Other Transfer Parcels
  - ▭ 23 Environmental Baseline Survey Parcel
  - ▭ Least Tern Sanctuary
  - ▭ Corrective Action Area
  - ▭ IR Site 33
  - ▭ Environmental Restoration Site
  - ▭ Wetland
  - ▭ Munitions Storage Areas (MSA)
  - ▭ Building or Structure (Present)
  - ▭ Building or Structure (Removed)
  - ▭ Storm Drain
  - ▭ Communications Line
  - ▭ Electric Line
  - ▭ Fuel Line
  - ▭ Gas Line
  - ▭ Industrial Wastewater Line
  - ▭ Storm Sewer Line
  - ▭ Steam Line
  - ➔ Approximate Groundwater Flow Direction

**Notes:**  
 SVOC = Semi-Volatile Organic Compounds  
 PAH = Polycyclic Aromatic Hydrocarbon  
 EDC = Economic Development Conveyance  
 FED = Federal Agency Parcel  
 CAA = Corrective Action Area  
 OU = Operable Unit  
 IR = Installation Restoration (Program)  
 SWMU = Solid Waste Management Unit



**Proposed Excavation Areas  
Within IR Site 33**

IR Site 33

Date: 10-11	Project No. 2011096	Figure 4
-------------	---------------------	----------