# Wetland Delineation Report

## 14 Mile Fence Replacement
## U.S. Customs and Border Protection, San Diego Sector
## San Diego County, California

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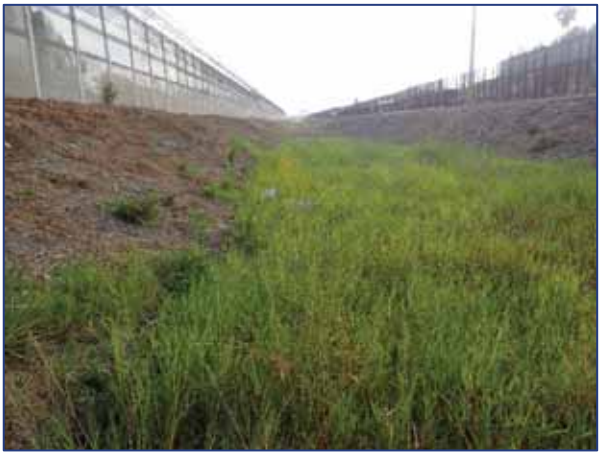
**Contract Number: GS10F0070W**
**Task Order: HSBP1017F00229**

**Date:**
January 2018



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## LIST OF ACRONYMS

| | |
|---|---|
| CBP | Customs and Border Protection |
| CDFW | California Department of Fish and Wildlife |
| CFGC | California Fish and Game Code |
| CFR | Code of Federal Regulations |
| Corps | United States Army Corps of Engineers |
| CWA | Clean Water Act |
| CZMA | Coastal Zone Management Act |
| EPA | Environmental Protection Agency |
| FAC | Facultative plant species |
| FACU | Facultative upland plant species |
| FACW | Facultative wetland plant species |
| NL | Not Listed |
| NRCS | National Resources Conservation Service |
| NWI | National Wetland Inventory |
| OBL | Obligate plant species |
| OHWM | Ordinary High Water Mark |
| PI | Prevalence Index |
| POE | Port of Entry |
| RWQCB | Regional Water Quality Control Board |
| UPL | Upland plant species |
| U.S. | United States |
| USGS | U.S. Geological Survey |
| WETS | Wetlands climate data |

# 1.0 INTRODUCTION

## 1.1 Study Background

This report presents the results of a delineation of wetlands and waters of the United States (U.S.; "waters") under Section 404 of the Clean Water Act (CWA). The delineation was conducted along an approximately 14-mile long section, between the primary and secondary fences of the U.S.-Mexico border, from the eastern end of Border Field State Park to the southwestern base of Otay Mountain (referred to as the Study Area throughout this report). The delineation was conducted on land owned by the U.S. Customs and Border Protection (CBP) in southern San Diego County, California (Figure 1). CBP will replace approximately 14 miles of legacy fencing within the 60-foot Roosevelt Reservation. The Study Area varies in width.

## 1.2 Regulatory Background

### *1.2.1 Environmental Law Waiver*

The principal mission requirements of the DHS include border security and the detection and prevention of illegal entry into the United States. Congress has provided the Secretary of Homeland Security with a number of authorities necessary to carry out DHS's border security mission. One of these authorities is found at section 102 of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA). In section 102(a) of IIRIRA, Congress provided that the Secretary of Homeland Security shall take such actions as may be necessary to install additional physical barriers and roads (including the removal of obstacles to detection of illegal entrants) in the vicinity of the United States border to deter illegal crossings in areas of high illegal entry into the United States. In section 102(b) of IIRIRA, Congress has called for the installation of additional fencing, barriers, roads, lighting, cameras, and sensors on the southwest border. Finally, in section 102(c) of IIRIRA, Congress granted to the Secretary of Homeland Security (the Secretary) the authority to waive all legal requirements that the Secretary determines necessary to ensure the expeditious construction of barriers and roads authorized by section 102 of IIRIRA.

In August of 2017, the Secretary issued a waiver covering, among other things, the replacement of approximately 14 miles of primary pedestrian barrier in the United States Border Patrol (USBP) San Diego Sector. Although the Secretary's waiver means that CBP no longer has any specific legal obligations under the laws that were included in the waiver, DHS and CBP, as was the case with past projects covered by a waiver, are committed to responsible environmental stewardship of our valuable natural and cultural resources. In order to uphold this commitment to responsible environmental stewardship, CBP has completed environmental resource surveys and prepared associated survey reports, including this Wetland Delineation.

### *1.2.2 Clean Water Act Section 404*

Section 404 of the CWA gives the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) regulatory and permitting authority regarding discharge of dredged or fill material into "navigable waters of the United States". Section 502(7) of the CWA defines navigable waters as "waters of the United States, including territorial seas." Section 328 of Chapter 33 in the Code of Federal Regulations (CFR) defines the term "waters of the United States" as it applies to the jurisdictional limits of the authority of the Corps under the CWA. A summary of this definition of "waters of the U.S." in 33 CFR 328.3 includes (1) waters used for commerce; (2) interstate waters and wetlands; (3) "other waters" such as intrastate lakes, rivers, streams, and wetlands; (4) impoundments of waters; (5) tributaries to the above waters; (6) territorial seas; and (7) wetlands adjacent to waters.

The limits of Corps jurisdiction under Section 404 of the CWA, as given in 33 CFR Section 328.4, are as follows: (a) *Territorial seas:* 3 nautical miles in a seaward direction from the baseline; (b) *Tidal waters of the U.S.:* high tide line or to the limit of adjacent non-tidal waters; (c) *Non-tidal waters of the U.S.:* ordinary high water mark (OHWM) or to the limit of adjacent wetlands; (d) *Wetlands:* to the limit of the wetland. A discussion of the methodology used to delineate wetlands and waters is presented in Section 3.1.

### *1.2.3 Clean Water Act Section 401 and the Porter-Cologne Water Quality Control Act*

Waters of the State are regulated by the Regional Water Quality Control Board (RWQCB) districts under the State Water Quality Certification Program, which regulates discharges of fill and dredged material under Section 401 of the CWA and under the Porter-Cologne Act. The term "waters of the State" is defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The RWQCBs protect all waters in their regulatory scope and have special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and may not be systematically protected by other programs. Regional Water Quality Control Board jurisdiction includes "isolated" wetlands and waters that may not be regulated by the Corps under Section 404 of the CWA. Projects that require a permit from the Corps, or that fall under other federal jurisdiction, and have the potential to impact waters of the State, are required to comply with the terms of the RWQCB Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

### *1.2.4 Coastal Zone Management Act*

The Coastal Zone Management Act defines coastal zone as:

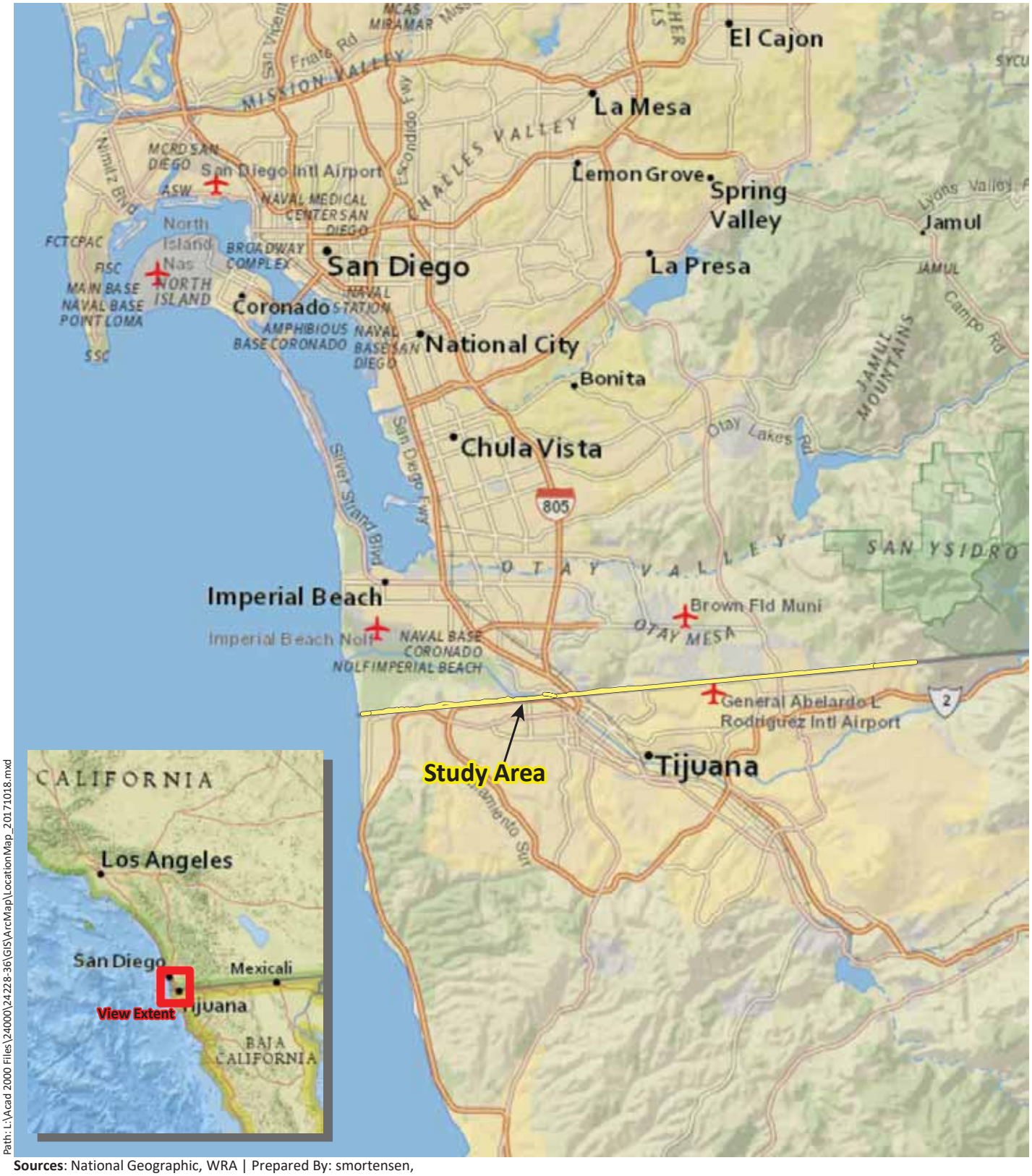
> *The coastal waters (including the lands therein and thereunder) and the adjacent shorelands (including the waters therein and thereunder), strongly influenced by each other and in proximity to the shorelines of the several coastal states, and includes islands, transitional and intertidal areas, salt marshes, wetlands, and beaches.*
>
> 16 U.S.C. § 1453. Definitions (Section 304)

The CZMA (Coastal Zone Management Act) regulatory exclusion:

> *Excluded from the coastal zone are lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government, its officers or agents.*

### *1.2.5 California Fish and Game Code Section 1602*

The Study Area is located on Federal Lands managed by CBP. Projects undertaken on land managed by federal agencies are not required to follow California Fish and Game Code (CFGC) Section 1602 jurisdiction; however, some agencies elect to follow CFGC Section 1602 regulations.

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**Sources**: National Geographic, WRA | Prepared By: smortensen, 10/18/2017

## Figure 1. Study Area Location Map

Northland Research, Inc.
CBP Fence Replacement
San Diego County, California

0 1 2 Miles

N

wra
ENVIRONMENTAL CONSULTANTS

## 2.0 SUMMARY OF POTENTIAL JURISDICTIONAL AREAS

Areas determined to be jurisdictional under Section 404 of the CWA were delineated based on field surveys conducted by biologists on October 9 through 13, 2017, as well as November 17, 2017. The results of the delineation are summarized below.

### 2.1 Waters of the U.S.

Appendix A depicts the extent of Corps jurisdiction within the Study Area based on the wetland delineations described above. The acreage and length of potential Section 404 jurisdictional areas are summarized in Table 1.

**Table 1. Summary of Potential CWA Section 404 Jurisdictional Areas within the Study Area.**

| Potentially Jurisdictional Features | Acres (Linear Feet [l.f.]) |
|---|---|
| *Wetlands* | |
| Detention basin wetland | 3.23 |
| Emergent marsh | 2.99 |
| Seasonal wetland depression | 0.53 |
| Wetland ditch | 0.25 |
| **TOTAL** | **7.00** |
| *Non-Wetlands* | |
| Ephemeral stream | 1.88 (4,112 l.f.) |
| Perennial stream | 0.71 (146 l.f.) |
| **TOTAL** | **2.59 (4,258 l.f)** |

## 3.0 METHODS

Prior to conducting field surveys, reference materials were reviewed, including the Soil Survey of San Diego County (USDA 1973), online soil data (CSRL 2017), the Imperial Beach and Otay Mesa U.S. Geological Survey (USGS) 7.5-minute quadrangles (USGS 2015a-b), National Wetland Inventory (NWI) data (USFWS 2017), as well as current and historic aerial photographs of the site (Google Earth 2017).

A focused evaluation of indicators of wetlands and waters within the Study Area was performed on October 9-13, 2017, as well as November 17, 2017.

### 3.1 Potential Section 404 Waters of the U.S.

#### *3.1.1 Wetlands*

The methods used in this study to delineate wetlands and non-wetland waters are based on the three-parameter approach of the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Supplement; Corps 2008), and the *U.S. Army Corps of Engineers Regulatory Guidance Letter No. 05-05* ("RGL 05-05", Corps 2005).

Under the existing regulation, Section 328.3 of the Federal Code of Regulations defines wetlands as:

> *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*
>
> 33 CFR 328.3 (b)

If an area was determined to be a wetland using the three parameter approach (vegetation, soil, and hydrology), its boundary was mapped using sub-meter accuracy global positioning system equipment and mapped on a topographic map. The areas of on-site water features were measured digitally using ArcGIS software. Indicators described in the Arid West Supplement were used to make decisions of wetland or non-wetland at each sample point in the Study Area and are summarized below.

<u>Vegetation</u>

Plant species observed in the Study Area were identified using the Jepson eFlora (Jepson Flora Project 2017). Plants were assigned a wetland indicator status according to the National Wetland Plant List (NWPL; Lichvar et al. 2016). Where differences in nomenclature occur between the Jepson eFlora and the NWPL, the species name as it occurs in the Jepson eFlora is used.

Wetland indicator statuses listed in the NWPL are based on the expected frequency of occurrence in wetlands as follows:

| | | | |
|---|---|---|---|
| OBL | Obligate species | Always found in wetlands | >99% |
| FACW | Facultative Wetland species | Usually found in wetlands | 67-99% |
| FAC | Facultative species | Equal in wetland or non-wetlands | 34-66% |

| | | | |
|---|---|---|---|
| FACU | Facultative Upland species | Usually found in non-wetlands | 1-33% |
| UPL/NL | Upland/Not listed species | Always found in uplands | <1% |

The presence of hydrophytic vegetation was then determined based on indicator tests described in the Arid West Supplement. The Arid West Supplement requires that a three-step process be conducted to determine if hydrophytic vegetation is present. The procedure first requires the delineator to apply the "50/20 rule" (Indicator 1; Dominance Test) described in the manual. To apply the 50/20 rule, dominant species are chosen independently from each stratum of the community. Dominant species are determined for each vegetation stratum from a sampling plot of an appropriate size surrounding the sample point. Dominants are the most abundant species that individually or collectively account for more than 50 percent of the total vegetative cover in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total vegetative cover. If greater than 50 percent of the dominant species has an OBL, FACW, or FAC status, the sample point meets the hydrophytic vegetation criterion.

If the sample point fails Indicator 1 and both hydric soils and wetland hydrology are not present, then the sample point does not meet the hydrophytic vegetation criterion, unless the site is a problematic wetland situation. However, if the sample point fails Indicator 1 but hydric soils and wetland hydrology are both present, the delineator must apply Indicator 2.

Indicator 2 is known as the Prevalence Index (PI). The prevalence index is a weighted average of the wetland indicator status for all plant species within the sampling plot. Each indicator status is given a numeric code (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5). Indicator 2 requires the delineator to estimate the percent cover of each species in every stratum of the community and sum the cover estimates for any species that is present in more than one stratum. The delineator must then organize all species into groups according to their wetland indicator status and calculate the PI using the following formula, where A equals total percent cover:

$$PI = \frac{A_{OBL} + 2A_{FACW} + 3A_{FAC} + 4A_{FACU} + 5A_{UPL}}{A_{OBL} + A_{FACW} + A_{FAC} + A_{FACU} + A_{UPL}}$$

The PI will yield a number between 1 and 5. If the PI is equal to or less than 3, the sample point meets the hydrophytic vegetation criterion. However, if the community fails Indicator 2, the delineator must proceed to Indicator 3.

Indicator 3 is known as Morphological Adaptations. If more than 50 percent of the individuals of a FACU species have morphological adaptations for life in wetlands, that species is considered to be a hydrophyte and its indicator status should be reassigned to FAC. If such observations are made, the delineator must recalculate Indicators 1 and 2 using a FAC indicator status for this species. The sample point meets the hydrophytic vegetation criterion if either test is satisfied.

Soils

The Natural Resource Conservation Service (NRCS) defines a hydric soil as "…a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (Federal Register 1994).

Soils formed over long periods of time under wetland (anaerobic) conditions often possess characteristics that indicate they meet the definition of hydric soils. Hydric soils can have a hydrogen sulfide (rotten egg) odor, low chroma matrix color, presence of redox concentrations, gleyed or depleted matrix, or high organic matter content. These indicators may be present singly or in combination.

Specific indicators that can be used to determine whether a soil is hydric for the purposes of wetland delineation are provided in the NRCS *Field Indicators of Hydric Soils in the U.S.* (USDA 2017a). The Arid West Supplement provides a list of 23 of these hydric soil indicators, which are known to occur in the Arid West region. Soil samples were collected and described according to the methodology provided in the Arid West Supplement. Soil chroma and values were determined by utilizing a standard Munsell soil color chart (Munsell Color 2009).

Hydric soils were determined to be present if any of the soil samples met one or more of the 23 hydric soil indicators described in the Arid West Supplement.

Hydrology

The Corps jurisdictional wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (a minimum of 14 consecutive days in the Arid West region). Evidence of wetland hydrology can include primary indicators, such as visible inundation or saturation, drift deposits, oxidized root channels, and salt crusts, or secondary indicators such as the FAC-Neutral test, presence of a shallow aquitard, or crayfish burrows. The Arid West Supplement contains 16 primary hydrology indicators and 10 secondary hydrology indicators. Only one primary indicator is required to meet the wetland hydrology criterion; however, if secondary indicators are used, at least two secondary indicators must be present to conclude that an area has wetland hydrology.

The presence or absence of the primary or secondary indicators described in the Arid West Supplement was utilized to determine if sample points within the Study Area met the wetland hydrology criterion.

### *3.1.2 Non-wetland Waters*

This study also evaluated the presence of "Waters of the U.S." other than wetlands potentially subject to Corps jurisdiction under Section 404 of the CWA. Other areas, besides wetlands, subject to Corps jurisdiction include lakes, rivers, and streams (including intermittent and ephemeral streams), in addition to all areas below the high tide line in areas subject to tidal influence. Jurisdiction in non-tidal areas extends to the OHWM defined as under existing regulations:

> *that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*
>
> 33 CFR 328.3(e)

The methods used in this study to delineate the OHWM in variable, ephemeral, intermittent, or perennial non-wetland waters (e.g. 'washes' or 'dry washes') followed guidance described in the publication *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (Lichvar and McColley 2008) and the *Updated Datasheet for the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* ("Updated Datasheet", Curtis and Lichvar 2010). The Corps has issued specific guidance and data sheets for delineation of streams in the Arid West region (Lichvar and McColley 2008, Curtis and Lichvar 2010). This guidance applies to "low-gradient, alluvial, ephemeral/intermittent channel forms" that may have a broad lateral extent and are often referred to as "washes" or "dry washes."

### 3.2 Potential RWQCB Jurisdiction

The RWQCB maintains jurisdiction over all waters of the State; however, the RWQCB has not formalized the methodology for documenting jurisdictional boundaries. As such, the methods used to determine federal jurisdiction (Section 3.1) were also used to determine the extent of RWQCB jurisdiction within the Study Area. However, only features that are potentially jurisdictional by the Corps under Section 404 of the CWA are presented in this report. Issues related to RWQCB Section 401 jurisdiction are not discussed again in this report.

### 3.3 Potential California Coastal Commission Jurisdiction

Since the Study Area is located on land that is owned by a federal agency, it is excluded from CZMA regulations, and potential wetlands and non-wetland waters within the Study Area were not assessed in reference to the coastal commission methodology.

### 3.4 Potential CDFW Jurisdiction

Since the Study Area is located on land that is owned by a federal agency, the CBP is not required to follow CFGC Section 1602 regulations. However, because some agencies elect to follow California Department of Fish and Wildlife (CDFW) Section 1602 regulations, potential Section 1602 jurisdictional areas were identified in the field using standard top-of-bank indicators. However, only features that are potentially jurisdictional under the CWA are presented in this report. Issues related to CDFW Section 1602 are not discussed again in this report.

# 4.0 SITE DESCRIPTION

## 4.1 Location

The Study Area is located in San Diego County, along the international border between the U.S. and Mexico. It lies within the Imperial Beach and Otay Mesa USGS quadrangles (USGS 2015a-b), in Sections 1-2 and 7-11, Township 19S, Range 2W; Sections 1-6, Township 19S, Range 1W; Sections 5-6, Township 19S, Range 1E; and Section 32, Township 18S, Range 1E.

The Study Area is bordered to the south by the US-Mexico border (primary fence) and in most areas, the secondary fence. Where the secondary fence was absent, the access road running to the north of the primary fence was used as the survey boundary. The Study Area falls within the Tijuana River Watershed. The Tijuana River Watershed drains 1,750 square miles, three quarters of which lies in Mexico. The watershed is bounded on the north by the Laguna Mountains in the U.S. and to the southwest by the Sierra Juárez in Mexico. Major tributaries are Cottonwood Creek (U.S.), Pine Creek (U.S.), and the Río Las Palmas system (Mexico). The watershed is characterized by steep, hilly terrain. Vegetation within the watershed ranges from chaparral to coastal sage scrub, with riparian zones, vernal pools, wetlands in the estuary, and conifer forests in the mountains. The rapidly expanding population in the watershed, particularly in the city of Tijuana, is covering the upland terrain with unplanned housing developments. Storms moving through both deforested and unvegetated hillsides send sediment down eroding gullies, bringing metals, PCBs, nutrients, pesticides, and trash into the mouth of the river. Water quality is also compromised, and beach advisories are often posted during the wet weather season. The high flows generated by the additional stormwater input brings large amounts of trash, detritus, silt, and sand into the Study Area from Mexico.

## 4.2 Vegetation

Most of the Study Area is characterized by varying levels of disturbance. Some areas are relatively unimpacted native habitats; other areas, such as Smuggler's Gulch, include areas of native plant revegetation; and some areas are highly disturbed, with heavy non-native cover or bare ground. Much of the native or revegetated areas are characterized by coastal sage scrub species, including California sagebrush (*Artemisia californica*; NL), California brittlebush (*Encelia farinosa*; NL), laurel sumac (*Malosma laurina*; NL), and California buckwheat (*Eriogonum fasciculatum*; NL). Common non-native species observed include purple fountain grass (*Pennisetum setaceum*; NL), small-flowered ice plant (*Mesembryanthemum nodiflorum*; FAC), fennel (*Foeniculum vulgare*; NL), and Russian thistle (*Salsola australis*; NL).

The NWI (Appendix D) details seven distinct types of wetlands within the Study Area: Freshwater Emergent Wetland (PEMA), Freshwater Forested/Shrub Wetland (PSS/EMAh), Freshwater Pond (PUBHx), and Riverine (R4SBA, R4SBAx, R4SBC, and R4SBCx). The mapping conventions utilized in developing the NWI are not always completely accurate; NWI relies on aerial photography and vegetative cover to identify wetlands, but additional investigation is required to confirm the findings from the NWI mapping. Field investigation of the Study Area was not able to confirm the presence of most of the wetland types; wetland distribution and location differ from what was mapped on the NWI. Frequent mowing and disturbance of the floodplain as well as surface alteration activities by CBP contractors reduces the aerial vegetation signature, which accounts for much of the discrepancy between NWI mapped wetlands and current on-site wetland communities within the Study Area (Appendix A).

## 4.3 Soils

Soil mapping resources indicate there are eleven major soil types mapped within the Study Area (CSRL 2017, USDA 1973). These are listed below, shown in Appendix E, and described in the following section. Soil maps are an effective tool for determining landscape position and normal soil conditions. The maps utilize topographical information and historical field observations to classify soil types. Soils within the Study Area can be broken up into two distinct sections. The first section is from Imperial Beach to San Ysidro, and the second section is from Roberto's Gate to Tin Can Gate.

The soils from Imperial Beach to San Ysidro consist primarily of loams, ranging from finer particulate composition of fine sandy loams to large particulate composition of cobbly loams, with a range of infiltration rates from low to high. Soil types include:

- Carlsbad gravelly, loamy sand, 2 to 5 percent slopes (CbB);
- Chesterton fine, sandy loam, 2 to 5 percent slopes (CfB);
- Chino fine, sandy loam, saline, with 0 to 2 percent slopes (ChA);
- Chino silt loam, saline, 0 to 2 percent slopes (CkA);
- Huerhuero loam, 5 to 9 percent slopes, eroded (HrC2);
- Marine, loamy, coarse sand with 2 to 9 percent slopes (MIC);
- Olivenhain cobbly loam, 9 to 30 percent slope (OhE);
- Riverwash (Rm);
- Terrace escarpments (TeF);
- Tujunga sand, 0 to 5 percent slopes (TuB); and
- Visalia gravelly sandy loam with 2 to 5 percent slopes (VbB).

The soils from Roberto's Gate to Tin Can Gate consist of nine described soil series, several of which occurred in multiple distinct locations. These soils are moderately to well-drained, with the exception of the Huerhuero series, which has very high runoff. Soil types include:

- Diablo clay, 30 to 50 percent slope (DaF);
- Huerhuero loam, 2 to 9 percent slope (HrC);
- Huerhuero loam, 5 to 9 percent slope, eroded (HrC2);
- Huerhuero loam, 9 to 15 percent slopes (HrD);
- Huerhuero loam, 9 to 15 percent slopes, eroded (HrD2);
- Olivenhain cobbly loam, 9 to 30 percent slope (OhE);
- Olivenhain cobbly loam, 30 to 50 percent slope (OhF);
- Salinas clay, 0 to 2 percent slope (ScA);
- Stockpen gravelly clay loam, 0 to 2 percent slope (SuA);
- Stockpen gravelly clay loam, 2 to 5 percent slope (SuB); and
- Terrace escarpments (TeF).

Carlsbad Series

The Carlsbad series is a member of the sandy, mixed, thermic Entic Durixerepts. Soil is generally brown to very pale brown and slightly acidic to strongly acidic. At depths of 12 to 35 inches, the soil is usually continuously moist from December to May. The average soil temperature at 20 inches is 65 degrees Fahrenheit.

The Carlsbad series is moderately well-drained with medium to rapid runoff. There is moderately rapid permeability to the duripan, and the duripan is slowly to very slowly permeable. This soil is used to grow large-scale crops and flowers. Vegetation typically includes chaparral species and annual grasses.

This series is gently to moderately sloped and occur at elevations between 30 and 300 feet. They typically occur on marine terraces that mostly parallel coastal areas and the climate is subhumid mesothermal with dry, foggy summers and cool, moist winters. The average temperature is 62 degrees Fahrenheit and precipitation is 10 to 16 inches, with the frost-free season lasting 330 to 350 days (CSRL 2017, USDA 1973).

Chesterton Series

The Chesterton series is a member of the fine, kaolinitic, thermic Abruptic Durixeralfs class. Typically, soil is moist between 5 and 15 inches between December and May. The mean soil temperature at 20 inches is 62 degrees Fahrenheit.

The Chesterton series is moderately well-drained with slow to medium to rapid runoff and there is very slow permeability. This soil is used to grow large-scale crops, flowers, and winter vegetables. Vegetation typically includes chaparral species and annual grasses.

This series is gently to moderately sloped and occur at elevations between 50 and 600 feet. They typically occur on uplifted marine sediment and old terraces and the climate is dry, foggy summers and short mild winters. The average temperature is 60 to 62 degrees Fahrenheit and precipitation is 10 to 14 inches, with the frost-free season lasting 300 to 350 days (CSRL 2017, USDA 1973).

Chino Series

The Chino series is a member of the fine-loamy, mixed, superactive, thermic Aquic Haploxerolls. The soil is generally grey or light grey and slightly acidic to moderately alkaline. Typically, the soil is moist at a depth of about 4 to 12 inches from November to May, and is dry the rest of the year. From February to May, the soils at 40 to 60 inches in depth are usually saturated, except where drained. The mean annual soil temperature at a depth of 20 inches is 59 to 65 degrees Fahrenheit.

The Chino series are poorly to somewhat poorly drained. Runoff is slow to very slow. Permeability is moderately slow. The series is commonly used for grazing, or used for growing irrigated crops where drained. Vegetation typically includes annual grasses, weeds, and shrubs.

This series is found in basins and flood plains at elevations of near sea level to 3,100 feet. They are distributed across coastal valleys and intermountain valleys of southern California and southern Joaquin Valley of California. They were formed in alluvium from granitic rock. The Chino series occurs in dry subhumid mesothermal climates with hot, dry summers and cool, moist winters. The annual rainfall in these areas is 8 to 20 inches. Mean annual temperatures range from 60 to 65 degrees Fahrenheit, with the frost-free season lasting 230 to 340 days. The average temperature in January is about 51 degrees Fahrenheit, and average July temperature is 76 degrees (CSRL 2017, USDA 1973).

Diablo Series

The Diablo series is part of the fine, smectitic, thermic Aridic Haploxererts taxonomic class. They are typically dark gray in color and neutral to mildly alkaline. The average soil temperature is 60

to 64 degrees Fahrenheit. Dry soil typically have 0.5- to 2-inch cracks from 20 to 40 inches deep. These cracks will close from late October to late November when soils become wet and remain closed until they dry in April to early June.

This series is well-drained, has slow runoff during dry conditions and medium to rapid runoff when soils are moist, and have slow permeability. Land uses include grazing and farming of dry grains. Annual grasses and forbs are common in uncultivated areas.

Diablo series soils are common in areas with rolling to steep uplands. Slopes range from 5 to 50 percent and elevations from 25 to 3,000 feet. Subhumid mesothermal with warm, dry summers and cool, moist winters. The mean temperature is 65 to 76 degrees Fahrenheit and precipitation is 10 to 35 inches. The frost-free season lasts 220 to 320 days (CSRL 2017, USDA 1973).

Huerhuero Series

The Huerhuero series fine, smectitic, thermic Typic Natrixeralfs class. The soil is usually light brown gray to yellow brown and are moderately acidic and alkaline. Coarse san makes up less than 5 percent of the composition. The soil moist between 4 and 12 inches and remains moist from November to late May or early June. The average soil temperature is 50 to 64 degrees Fahrenheit.

This soil is moderately well to poorly drained, has slow to medium runoff, and very slow permeability. Common uses include dry farmed grain, irrigated row crops, and annual pasture. In uncultivated areas, annual grasses, weeds, and scattered oaks are present.

Huerhuero soils can be level to alluvial fans and terraces that generally have slopes less than 3 percent. Elevations are less than 1,000 feet. Climates are typified as subhumid mesothermal with warm to hot summers and cool, moist winters. Average temperature is 58 degrees Fahrenheit and precipitation is 12 to 20 inches. The frost-free season is about 260 days (CSRL 2017, USDA 1973).

Marina Series

The Marina series is a member of the mixed, thermic Lamellic Xeropsamments. They can range from a gray brown to light brown and pink in color. They are slightly to strongly acidic. Soil is generally moist between 12 and 35 inches from November to April. The average soil temperature is 59 to 62 degrees Fahrenheit, with the temperature rarely dropping below 47 degrees Fahrenheit.

This soil is somewhat excessively drained, has slow to rapid runoff, and moderate permeability. The series is usually used as a range but can be used for irrigated alfalfa and special crops. Vegetation typically includes chaparral species, annual grasses, and small live oaks.

The Marina series occur on short rolling dune-like slopes that have gentle to moderate slopes between 100 and 700 feet in elevation. The climate is subhumid mesothermal with dry, foggy summers and cool, moist winters. The average precipitation is 12 to 16 inches and the freeze-free season is 300 to 350 days (CSRL 2017, USDA 1973).

Olivenhain Series

The taxonomic class for the Olivenhain series is clayey-skeletal, kaolinitic, thermic Ultic Palexeralfs. Soils are typically brown to red and have medium to strong acidity and have cobbly

loam. At 20 inches, the average soil temperature is 62 to 64 degrees Fahrenheit. Soil depths from 6 to 15 inches are moist from December through May.

This soil is well-drained, has slow to medium runoff, and has very slow permeability. The major use for this soil series is grazing. Vegetation typically includes chaparral and cactus species. The Olivenhain series typically dissect marine terraces at elevations of 100 to 600 feet. The climate is subhumid mesothermal with dry, warm summers and cool, moist winters. The average temperature is 62 degrees Fahrenheit and precipitation is 12 to 16 inches. The frost-free season is 290 to 330 days (CSRL 2017, USDA 1973).

Riverwash

Riverwash is a mixture of sand, gravel, and cobblestones that contains little or no silt and clay. It is the loose mass of material that occupies stream channels and is exposed at low water. Riverwash is subject to movement in spring during periods of runoff and during stream flooding.

Salinas Series

The Salinas series is a member of fine-loamy, mixed, superactive, thermic Pachic Haploxerolls. Soil colors can range from a grey brown to black. Lime can be found between 22 and 36 inches. The soil is usually dry between 5 and 15 inches from May to early December and moist the rest of the year. The mean soil temperature is 60 to 64 degrees Fahrenheit but usually does not drop below 47 degrees Fahrenheit.

Soils are well-drained, have slow to medium runoff, and have moderately slow permeability. Soils in this series are used for irrigated farming and sometimes for small, dry grains. Vegetation includes annual grasses and scattered oaks and sycamores in uncultivated areas. These soils occur on alluvial fans, plains, and terraces with slopes of 0 to 9 percent and elevations between 50 and 2,000 feet. Typical climates are dry subhumid mesothermal cool to warm, dry summers and cool, moist winters. The average temperature is 62 to 73 degrees Fahrenheit and precipitation is 12 to 20 inches. The frost-free season is 233 to 300 days (CSRL 2017, USDA 1973).

Stockpen Series

Stockpen soils belong to the fine, smectitic, thermic Typic Natrixeralfs taxonomic class and are light to dark gray in color. At 20 inches, the average soil temperature is 59 to 65 degrees Fahrenheit. Soil is usually dry between 4 and 12 inches from May to October. This series generally occurs at elevations below 700 feet on level to gently sloping marine terraces. The climate is subhumid mesothermal with dry, warm to hot summers and cool, moist winters. The average temperature is 61 degrees Fahrenheit and precipitation is 10 to 12 inches.

This soil series is moderately well-drained, has medium runoff, and has very slow permeability. Common land uses include large-scale crops and non-irrigated grain. Annual grasses and forbs are common in uncultivated areas. The frost-free season is 320 to 340 days long (CSRL 2017, USDA 1973).

Terrace Escarpments

Terrace escarpments consist of steep to very steep escarpments and escarpment-like landscapes. This land type occurs on the nearly even fronts of terraces and alluvial fans between narrow floodplains and adjoining uplands and the sides of entrenched drainageways within

relatively level upland areas. It occurs mainly on the coastal plains and as small areas in the foothills and desert. Typically there are 4 to 10 inches of loamy or gravelly soil over varying types of sediment. The vegetation ranges from sparse to dense, depending on the aspect (USDA 1973).

Tujunga Series

The taxonomic class for the Tujunga series is mixed, thermic Typic Xeropsamments. The soils are generally light brown to dark grayish brown and are slightly alkaline. At about 30 inches, the soil is periodically moist from October to December and between 30 and 90 inches, soils will be moist in parts until April or May. Average soil temperature is usually between 60 and 68 degrees Fahrenheit but rarely drops below 46 degrees Fahrenheit.

This soil series can be excessively drained and has little to no runoff. Typical uses include grazing, growing various kinds of fruit, and urban development. In urban areas, ornamentals and turf-grass are common. Outside of developed areas, vegetation includes shrubs and annual grasses. The Tujunga soil series occurs on alluvial fans and floodplains. Slopes range from 0 to 9 percent, and elevation ranges from 0 to 2,000 feet. The average precipitation is 10 to 25 inches. The frost-free season is 225 days in inland areas and approaches 365 days in coastal areas (CSRL 2017, USDA 1973).

Visalia Series

The Visalia series is a member of the Cumulic Haploxerolls and consists of sandy loams derived from granitic alluvium. The soil color is dark grayish-brown, and in some areas, it is gravelly throughout. The soils are moderately well-drained with very low runoff. Typical uses include fruit and nut orchards, truck crops, irrigated pasture, field crops, tomatoes, flowers, and nursery stock. The soil occurs on alluvial fans and have slopes of 0 to 15 percent. The average temperature is between 60 and 62 degrees Fahrenheit, and the average precipitation is 14 to 18 inches. The frost-free season is 260 to 320 days.

## 4.4 Hydrology

The primary source of hydrology for the Study Area is surface water runoff from adjacent lands and direct precipitation. In addition, the Tijuana River and several unnamed ephemeral streams flow through the Study Area at various locations. Low to moderate volumes of water are present for short periods, in response to precipitation events. Hydrology within the Study Area has been modified by human activities in a number of ways. The unplanned development in Mexico sends large amounts of floodwater, silt, trash, and contaminants into the Tijuana River and other stormwater outlets across the Study Area. Although portions of the Study Area retain the natural topography of the landscape, much of it has been altered in several ways, affecting the drainage and infiltration patterns of the site. In the hilly western portion of the Study Area, grading, the installation of manmade drainage features, and the filling of valleys (e.g., Smugglers Gulch), related to fence construction and road building, have altered the landscape. In the eastern portion of the Study Area, where the landscape is flat to rolling in nature, the Study Area has been graded such that a series of shallow, linear swales drain to culverts.

Rainfall in the vicinity of the Study Area was analyzed to better understand the conditions at the time of the field surveys. The closest climate station with available Wetlands climate data (WETS) was located in Chula Vista, and ranges in distance from approximately 7 to 12.25 miles north of the Study Area. WETS and precipitation data from this station were used to approximate

conditions at the Study Area. Average annual rainfall at the Chula Vista station is 9.94 inches (USDA 2017b). Long-term averages and annual precipitation data are shown in Table 2.

**Table 2. Rainfall Data.**

| WETS Rainfall Data (inches) | | | Rainfall by Water Year (inches) | | | | | |
|---|---|---|---|---|---|---|---|---|
| Below Normal | Average | Above Normal | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| 7.74 | 9.94 | 11.45 | 8.07 | 5.53 | 7.29 | 7.15 | 10.11 | 8.55 |

*WETS Station: Chula Vista, CA Creation Date: 10/04/2017*
*Latitude: 32.64 Longitude: -117.0858 Elevation: 68*
*State FIPS/County (FIPS): 06073 County Name: San Diego*

A WETS analysis (USDA 1995) for the Chula Vista climate station was performed for the 3-month period preceding the site visit. In July, 0.00 inch of precipitation occurred (normal), 0.07 inch occurred in August (normal), and 0.02 inch occurred in September (normal) (USDA 2017b). The total of 0.09 inch of precipitation that occurred in the 3 months prior to the October and November 2017 site visit was normal.

In addition, precipitation data from weather stations located closer to the Study Area, and situated near the western and eastern sides of the Study Area, were also compared against the long-term averages from the Chula Vista climate station. During the 3-month period preceding the site visit, the Imperial Beach Ream Field NAS (NOAA 2017a) and Imperial Beach 3.3E (NOAA 2017b) weather stations, located 2.2 miles and 2.4 miles north of the Study Area, respectively, and situated longitudinally near the western portion of the Study Area, had normal precipitation amounts. The Otay Lake weather station (UCANR 2017), located 5.75 miles north of the Study Area, and situated longitudinally near the eastern portion of the Study Area, had normal precipitation amounts.

All stream and wetland features observed within the Study Area eventually drain into the Pacific Ocean and are likely to be considered jurisdictional waters of the U.S.

# 5.0 RESULTS

Potential Section 404 jurisdictional areas are described in the following sections and depicted in Appendix A. Vegetation, soils, and hydrology data collected during delineation site visits are reported on standard Corps Arid West Region data forms and are included in Appendix B. Photographs of representative portions of the Study Area and sample points are presented in Appendix C.

## 5.1 Potential Section 404 Waters of the U.S.

### *5.1.1 Wetlands*

The Study Area is composed of four wetland categories (Appendix A). These categories include detention basin wetland, emergent marsh, seasonal wetland depression, and wetland ditch. All mapped features are likely to be considered jurisdictional by the Corps. The majority of these features occur in areas that have been heavily altered by human activity.

Detention Basin Wetland

There were five wetlands located in manmade detention basins (W15, W16, W17, W18, and W19) in the Study Area. Two were immediately west and three were immediately east of the Otay Mesa Port of Entry (POE). These detention basins are connected by concrete culverts on the east and west ends, and there are periodic inlet culverts on the north banks. These basins were designed to capture stormwater and surface runoff, and based on aerial imagery (Google Earth 2017) and field observations, the basins are maintained periodically by mowing. The hydrology of the basins appears to be asynchronous with seasonal precipitation. Although seasonal precipitation is a clear influence, the wetland features were inundated or saturated over large areas during the October 2017 site visit, and it is assumed that these features receive urban runoff throughout the year. W15 and W16 were saturated throughout. Much of the vegetation in each of the detention basins had recently been mowed. No outlets were observed in these basins; as such, they do not appear to have a surface hydrologic connection to any other potential Waters of the U.S. located outside of the basins.

Paired sample points were taken at W16, W17, and W19. The wetland sample points in each of these detention basins had hydrophytic vegetation, hydric soils, and hydrology present. Dominant species included sprangletop (*Leptochloa fusca*; FACW), Vasey's grass (*Paspalum urvillei*; FAC), and tall cyperus (*Cyperus eragrostis*; FACW). Soils were typically brownish-black (10YR 2/1 to 5/1) and redox was dull brown (7.5YR 5/4), dark brown (7.5YR 3/3), and brown (5YR 3/4). Hydric soil indicators met included redox dark surface (SP16 and 21), redox depression (SP16 and 21), and depleted matrix (SP19). Wetland hydrology indicators met included high water table (SP16), saturation (SP16 and 19), hydrogen sulfide odor (SP16), and inundation visible on aerial imagery (SP21). Of the upland points, only one (SP20) met any of the wetland indicator: hydrophytic vegetation. All of the points were situated on gravelly clay, loamy clay, silty clay, gravelly clay loam, and sandy clay loam.

Emergent Marsh

Emergent marsh was mapped in areas that met the three wetland criteria and were characterized by species typical of areas that experience prolonged inundation, such as pickleweed (*Salicornia pacifica*; OBL) and cattails (*Typha* spp.; OBL).

W01 is a very disturbed seasonal marsh that has numerous dirt roads throughout. Water is received from the U.S. at the northwest end of the feature and from the Mexico side from under the primary fence from an unknown source. Although a culvert drains the wetland at the northwest boundary of the feature, some the wetland appears to function as a closed basin. Paired sample points were taken in W10. SP03 met the three criteria to be considered a wetland. Dominant shrubs included pickleweed and big saltbush (*Atriplex lentiformis*; FAC). Soils were a dark reddish gray (2.5YR 3/1) and a dull reddish brown (2.5YR 5/3) and had a sandy texture. The wetland hydrology indicator met was salt crust. SP03 meets the problematic hydric soil criteria because it is located in a saline, closed, seasonally ponded depression, and hydrophytic vegetation and wetland hydrology indicators were met. The associated upland sample point (SP02) did not meet any of the three wetland criteria.

W02 is located directly south of a water treatment facility in a shallow depression at an inlet culvert. It is most likely formed by a blockage of the culvert. Paired sample points were taken in the feature. SP04 met all three wetland criteria. Common cattail (*Typha latifolia*; OBL) was the dominant species. The soil was a black (Gley 1.25/N) mucky loam that met the loamy mucky mineral and loamy gleyed matrix hydric soil indicators. The wetland hydrology indicators met were surface water, high water table, saturation, and hydrogen sulfide odor. Bermuda grass (*Cynodon dactylon*; FACU) dominated the area outside of the wetland, and the associated sample location (SP05) did not meet any of the wetland criteria.

W05 is located along the south side of the primary fence at the base of a steep slope in a remnant stream channel. The feature appears to have surface connection to the unnamed intermittent stream located in Spring Canyon in the U.S. Though water appears to flow through the feature, entering from the southeast and exiting to the southwest, the feature appears to also be in a location where water ponds for a duration sufficient for dense marsh vegetation to develop. The feature also likely receives surface runoff from the surrounding residential lands. The central portion of the features is dominated by cattails, and it transitions to giant reed (*Arundo donax*; FACW) and willows (*Salix* sp.; FACW) toward the edges of the feature. This feature was inaccessible during the October 2017 site visit as was assessed from a distance using binoculars and aerial imagery (Google Earth 2017) analysis.

Seasonal Wetland Depression

Seasonal wetland depressions were mapped in shallow, closed depressions that are seasonally ponded or saturated for a duration sufficient to allow the formation of wetland characteristics, but insufficient to support marsh vegetation. Seasonal wetland depressions were typically characterized by non-native annual species, though in W06, mulefat (*Baccharis salicifolia*; FAC) was a dominant species. Seasonal wetland depressions contained generalist wetland species; no species were observed that characteristic of vernal pools in the region, such as short woolly marbles (*Psilocarphus brevissimus* FACW) and slender woolly marbles (*P. tenellus*; OBL).

Seasonal wetland depression W06 is located about 0.75 miles east of the San Ysidro POE at the base of a hillslope in a shallow depression along the primary fence. This feature is likely the result of ponding water against the concrete base of the fence. A portion of the vegetation had been mowed. Paired sample points were taken in the features. The wetland sample point (SP06) met all three wetland criteria. The dominant species were mulefat and rough cocklebur (*Xanthium strumarium*; FAC). The wetland hydrology indicators met were surface soil cracks and biotic crust. Hydric soil was assumed based on landscape position (a closed depression at the base of a slope that ponds) and the fact that hydrophytic vegetation and wetland hydrology indicators were met. A soil pit was not dug because of visible soil contamination. The upland soil pit (SP07)

included a small portion of dirt road. The dominance test hydrophytic vegetation indicator was met, with the dominant species being Australian saltbush (*Atriplex semibaccata*; FAC), prickly lettuce (*Lactuca serriola*; FACU), and slenderleaf iceplant, but the other wetland indicators were absent.

Seasonal wetland depression W07 is located about 0.5 miles to the east of W06. It is a very shallow depression that collects runoff from a concrete drainage upslope. Paired sample points were taken in this feature. Hydrophytic vegetation at the wetland sample point (SP08) is met by approximately 50 percent cover of narrowleaf dock (*Rumex stenophyllus*; FAC). The wetland hydrology met was biotic crust. Problematic hydric soil indicators are met based on hydrophytic vegetation and wetland hydrology indicators being met and the fact that features is a shallow depression that ponds seasonally. Soil texture was gravelly loam. The upland sample point (SP09) was located between the concrete drainage outfall and the depression. No wetland indicators were met.

W08 through W11 are a series of linear, shallow, seasonal wetland depressions that are located in nearly flat, manmade swales. Paired sample points were taken at W08 (SP10 and 11) and W10 (SP13 and 14). For both locations, the upland points did not meet any wetland indicators. In the wetland sample points, dominant hydrophytic vegetation included prostrate knotweed (*Polygonum aviculare*; FAC), Italian rye grass (*Festuca perennis*; FAC), and eastern annual saltmarsh aster (*Symphyotrichum subulatum*; OBL). Soil texture was gravelly clay loam with gravelly clay appearing at W11 between 8 and 12 inches. Soil colors were a grayish yellow brown to a brownish gray (10YR 4/2 to 5/3). Both W08 and W10 met the biotic crust wetland hydrology indicator. W10 also met the water-stained leaves wetland hydrology indicator. SP10 and 13 met the problematic hydric soil indicator because hydrophytic vegetation and wetland hydrology indicators were met, and the features is a shallow depression that ponds seasonally.

Seasonal wetland depressions W12 and W13 are located immediately adjacent to a small concrete channel. W12 had water marks on the adjacent concrete wall, and the dominant species was prostrate knotweed. W13 had biotic crust and soil cracking, and the dominant vegetation was Italian rye grass. Sample points were not taken in these features.

W14 is located just east of W13 and is in a shallow, closed depression in a shallow, manmade, linear swale that had been mowed. Paired sample points were taken in this feature. The wetland sampling point (SP28) met all three of the wetland indicator criteria. The dominant species were Italian rye grass and prostrate knotweed. Soils had a clay texture, were brownish gray to a grayish yellow brown (10YR 4/1 and 4/2), and redox was brown (7.5YR 3/4). Hydric soil indicators met included depleted matrix and redox depressions. Wetland hydrology indicators met were surface soil cracks and biotic crust. The upland sample point (SP29) did not meet any wetland indicators.

Wetland depressions W20 through W22 are located in the eastern portion of the Study Area. Similar to the other seasonal depressions in the Study Area, they are narrow, linear, and shallow depressions that have been mowed. Paired sample points were taken at W20 and W21. Both wetland points (SP23 and SP26) met the three wetland criteria. Dominant species included common spikerush (*Eleocharis macrostachya*; OBL) and Mediterranean barley (*Hordeum marinum*; FAC). Soil textures were gravelly clay loam and gravelly clay at both of the wetland sample points. Soil colors were dull yellowish brown (10YR 4/3 and 5/3), brownish black (10YR 3/2), and brownish black (7.5YR 3/1). SP23 had redox in the gravelly clay section (7.5YR 3/4). Both wetland sample points met the biotic crust wetland hydrology indicator, and W21 also met the surface soil cracks wetland hydrology indicator. SP20 and 21 met the problematic hydric soil indicator based on the fact that they both met hydrophytic vegetation and wetland hydrology

indicators and they are located in shallow, closed depressions that pond seasonally. W22 was not sampled, but it was dominated by prostrate knotweed, and biotic crust was present.

Seasonal wetland depressions W23 and W24 are located in the far western portion of the Study Area, between the primary and secondary fences, south of Friendship Park. W23 is in a flat, very slight depression in the terrace. It appears to be fed by runoff from landscaping immediately across the primary fence on the Mexico side, extending slightly into Mexico under the primary fence. W24 is located in a concrete drainage channel that is located just east of W23, and surrounded by ephemeral stream S16. Paired sample points were taken for the features. The wetland sample point (SP30) met all three wetland criteria. The dominant species at W23 and W24 were Hyssop loosestrife (*Lythrum hyssopifolia*; OBL), annual bear grass (*Polypogon monspeliensis*; FACW), and eastern annual saltmarsh aster (*Symphyotrichum subulatum*; OBL). The wetland hydrology indicators met were saturation and oxidized rhizospheres along living roots for W23 and W24. Soil textures were sandy clay loam for W23. Soil colors were grayish yellow brown (10YR 4/2) and yellowish gray (2.5Y 5/1), with a brown redox (7.5YR 3/4). Hydric soil was assumed at W24, based on landscape position (a closed depression at the base of a slope that ponds), and the fact that hydrophytic vegetation and wetland hydrology indicators were met.

Wetland Ditch

A wetland ditch was mapped within a concrete drainage channel that is located just to the east of the Tijuana River, and appears to drain to the Tijuana River at the west end of the ditch. Two wetlands (W03 and W04) were mapped in the ditch, but the two sections appear to be connected by a culverted pipe. W03 is approximately 150 feet long. W04 is approximately 0.25 mile long. Although the ditch is concrete-bottomed; sufficient sediment has accumulated to allow for the establishment of vegetation, and the ditch is now vegetated throughout the daylighted portions. Standing water was present in W03, and the vegetation was dominated by cattails. Hydric soils are assumed. W04 is located just to the east of W03, but was inaccessible at the time of the October 2017 site visit. Based on aerial imagery (Google Earth 2017), W04 appears to be similar in hydrology and vegetation as W03.

### *5.1.2 Non-Wetland Waters*

The Study Area contains two categories of non-wetland waters, ephemeral and perennial streams (Appendix A). All mapped features are likely to be considered jurisdictional by the Corps. Just like the wetland waters, the majority of these features occur in areas that have been heavily altered by human activity.

Ephemeral Stream

Ephemeral streams are episodic stream channels that appear to convey flows only during and immediately after precipitation events. Many of these features are narrow, deeply incised channels located on steep slopes and have a single low-flow channel, with a small or non-existent active floodplain and no terrace. However, the category also includes features that have broader floodplains or concrete channelized portions of larger streams (Smugglers Gulch). Many of these features receive runoff from manmade features, such as concrete, v-shaped drainages and culverts that convey urban runoff.

Ephemeral streams S01, S02, and S03 are located in a disturbed valley depression at the western base of Bunker Hill. They are a low gradient with discharge channels located in a highly erodible sedimentary substrate in coastal scrub vegetation. S01 originates from a culvert that receives runoff, erosion, and trash from Mexico on its eastern edge and then drains west. It begins as a

single, deeply incised channel on a hillslope and then widens into a floodplain at the valley bottom, where it drains via a culvert out of the Study Area at the northwest end of the feature. S01 also receives runoff from roads that border and cross it and from under the primary fence from Mexico. S02 is a deeply incised erosional gully that is a tributary to S01 and drains into the east end of that feature. S03 is located just to the south of S02 and is a tributary to it. S03 is a steep, incised drainage receives runoff from the road along the primary fence and surrounding slopes. The dominant species in S01, S02, and S03 are California sagebrush and California brittlebush. At the downstream end of S01, which may be wetter for longer than upstream portions of the feature, tarragon (*Artemisia dracunculus*; NL), mulefat, and arroyo willow (*Salix lasiolepis*; FACW) are also present. CS01 sampled the downstream portion of S01. Observed OHWM indicators include mudcracks, benches, surface relief, change in average sediment texture, break in bank slope, drift and/or debris, presence of band and bank, and ripples. CS02 sampled the lower portion of S02, and observed OHWM indicators include change in average sediment texture, change in vegetation cover, break in bank slope, sediment deposits, benches, surface relief, and the presence of bed and bank.

Ephemeral stream S04 is located on the steep, eastern slope of Bunker Hill. It is a narrow, deeply incised channel that receives runoff from the adjacent landscape as well as from constructed roadside drainages. It drains into a culvert and out of the Study Area at the bottom of the slope. The channel bottom is unvegetated. CS03 sampled the upper portion of S04, and observed OHWM indicators include change in average sediment texture, change in vegetation species, change in vegetation cover, break in bank slope, presence of bed and bank, scour, and sediment sorting.

S07 is comprised of a short section of Smugglers Gulch. It is partly natural and partly a concrete channel. It enters the Study Area from the Mexico side and exits the Study Area via culvert. The channel receives discharge from culverts coming out of Mexico, several concrete, V-shaped drainage ditches, and two steep, erosional channels (S05 and S06) on the west side. S05 is a deeply incised, approximately 6-foot-deep channel with a small tributary (S06) of similar description to the north. Near the base of the slope, the stream abruptly changes to sheet flow. Common vegetation includes California buckwheat and California sagebrush. S08 is located on the east slope of Smuggler's Gulch and is a steep, deep erosional gully that starts in the U.S. but discharges into the Mexico side of Smuggler's Gulch. The vegetation in this feature is sparse, and common species include tree tobacco (*Nicotiana glauca*; FAC) and Russian thistle. CS04 sampled the upper portion of S05, and the observed OHWM indicators include change in average sediment texture, change in vegetation cover, break in bank slope, presence of bed and bank, benches, scour, and sediment sorting.

S09 is located downstream from the Silva Drain Canyon Collector, approximately 2 miles west of the San Ysidro POE. Water discharges from Mexico through a concrete culvert then drains east through a steeply incised channel. The channel broadens when it reaches a flat area to the east, then ends when it reaches the road crossing and transitions to sheet flow. S09 receives a high volume of trash and debris from the concrete culvert entering from Mexico. CS05 sampled the upper portion of S09, and observed OHWM indicators include change in average sediment texture, change in vegetation species, break in bank slope, drift and/or debris, benches, presence of bed and bank, scour, and sediment sorting.

Ephemeral stream S11 is located between seasonal wetland depressions W12 and W13, approximately 3.5 miles east of the San Ysidro POE. It is a concrete, channelized portion of an unnamed ephemeral stream that flows from Mexico to the U.S. The portion of the stream within

the Study Area is entirely concrete channelized. S11 is unvegetated with a thin layer of sediment on the bottom.

S13 is located east of W22 and west of S14 on the eastern side of the Study Area. It is a small, very shallow ephemeral channel on the lower, southwestern slopes of Otay Mountain. The channel flows under the primary fence road to the south via a culvert, and drains into Mexico. The culvert inlet is mostly filled in with gravel and vegetation is dense, almost completely obscuring the channel. Erosion and sedimentation from off-highway vehicle traffic is along and within the channel, as well as primary fence road traffic. There is gravel fill placement at the downstream end of the channel, adjacent to the primary fence road. S14 is located east of S13 on the eastern side of the Study Area. It is a small, incised ephemeral channel on the lower, southwestern slopes of Otay Mountain. The channel sheet flows across the primary fence road to the southwest, and drains into Mexico via grates in the primary fence. There is erosion and sedimentation from the dirt road that crosses the S14 channel upstream from the sample location, as well as from primary road vehicle traffic.

Perennial Stream

A single perennial stream, the Tijuana River (S10), was mapped within the Study Area. The reach of the Tijuana River within the Study Area is entirely a maintained concrete flood control channel. Although sediment has accumulated on the concrete channel bottom, the sediment is periodically removed as part of regular channel maintenance activities. As stated in Section 4.1, the Tijuana River has a 1,750-square-mile watershed, which includes both undeveloped and densely urban areas.

S10 consisted of a narrow low-flow channel with a broad active floodplain. At the time of the October 2017 site visit, the low-flow channel was flowing and had a vegetated fringe dominated by watercress (*Nasturtium officinale*; OBL). Portions of the active floodplain had a thin layer of sparsely vegetated sediment, but much of the sediment and vegetation had been cleared as part of regular channel maintenance activities. The Tijuana River channel was not accessible at the time of the October 2017 survey, and was assessed with binoculars and aerial imagery (Google Earth 2017) analysis. OHWM indicators observed included ripples, drift and/or debris, benches, sediment deposition, and water marks (on the concrete channel banks).

## 5.2 Difficult Wetland Situations in the Arid West

As described in section 5.1, wetland determinations in some portions of the Study Area required the use of procedures for problematic situations outlined in the Arid West Supplement (Corps 2008). In all cases, the problematic situations involved natural phenomena, such as seasonal hydrology and, in one situation (W01), alkaline soils. However, these situations were often exacerbated or further complicated by human disturbance such as mowing. The most common problematic situation encountered was a shallow depression that is seasonally inundated (SP08, SP10, SP13, SP23, and SP26). As stated in the Arid West Supplement (Corps 2008), some wetlands in seasonally ponded soil “lack hydric soil indicators, due to limited saturation depth, saline conditions, or other factors.” In all sample points where a closed, seasonally ponded depression met hydrophytic vegetation and wetland hydrology indicators, the soil was assumed to be problematically hydric, and the feature was mapped as a wetland.

## 5.3 Manmade or Relict Features Not Mapped as Potentially Jurisdictional Features

The Study Area contains many manmade features that convey water but were not mapped as potentially jurisdictional. Such features include:

- Concrete V-shaped drainages and gravel drainages that convey roadside and other surface runoff from uplands. Although evidence of flow was sometimes observed within these features, such features are manmade structures constructed in uplands that drain only uplands and therefore were not considered jurisdictional;
- Larger, flatter-bottomed concrete features that convey urban runoff—typically from Mexico—but are not former jurisdictional features that have since been replaced by a manmade structure or are not an altered section of an otherwise natural existing jurisdictional feature. Although evidence of flow was sometimes observed within these features, such features are manmade structures constructed in uplands that drain only uplands and therefore were not considered jurisdictional. See discussions of W03, W04, S07, and S11 in section 5.1 for examples of flatter-bottomed concrete features that were mapped as potentially jurisdictional;
- Earthen swales. Beginning approximately 1.5 miles east of the Otay POE, where the Study Area begins to be characterized by flat to gently rolling terrain, a series of long, narrow, linear swales were constructed that are located within grassland vegetation between the primary and secondary fences and parallel the fences. At the topographic low points in the rolling terrain, these features were drained by culverts. Although these features were apparently designed to drain surface runoff, indicators of flow were not observed. Occasionally, small, closed depressions that met three wetland parameters were located within these swale features, and such features were mapped as seasonal wetland depressions. In some situations (SP12, SP25), hydrophytic vegetation characterized by non-native FAC species such as Italian ryegrass, Mediterranean barley, and prostrate knotweed was present, but hydric soils and/or wetland hydrology indicators were lacking and the area was not a closed depression subject to seasonal inundation. Such areas were not mapped as wetlands.
- Relict erosional features. On a steep, north-facing slope in California brittlebush scrub approximately 0.5 mile east of Friendship Park are two relict erosional features. One begins approximately two-thirds of the way up the slope toward the primary fence; the other begins just below the road that parallels the primary fence. Both are deeply incised gullies with small watersheds, and neither receives runoff from the dirt road that parallels the primary fence because a small roadside mound prevents runoff from leaving the roadbed. No indicators of current flow were observed in either feature during the October 2017 site visit. In addition, the vegetation within and adjacent to the features is characterized by upland species (e.g. California brittlebush, California sagebrush, crown daisy [*Glebionis coronaria*; NL], California buckwheat, broom baccharis [*Baccharis sarothroides*; FACU]). As such, it is assumed that these are relict features formed under historic hydrologic conditions, possibly before primary fence construction and alteration of the local topography by housing development in adjacent Mexico.

# 6.0 POTENTIAL JURISDICTIONAL AREAS

The conclusions of this report are based on conditions observed at the time of the field surveys conducted October 9-13, 2017, as well as November 17, 2017.

## 6.1 Potential Corps Jurisdiction

Based on the findings of the wetland delineation, the Study Area contains approximately 7.00 acres of potentially jurisdictional wetlands and 2.59 acres (4,258 linear feet) of potentially jurisdictional non-wetland Waters. Wetland areas included detention basins, emergent marshes, seasonal wetland depressions, and wetland ditches, while non-wetland Waters include the Tijuana River and ephemeral streams located throughout the Study Area. The wetlands displayed indicators of hydrophytic vegetation, hydric soil, and wetland hydrology. The non-wetland waters contained indicators of OHWM. All wetland and non-wetland waters features are tributary to a "navigable waters of the U.S." (the Pacific Ocean) or are assumed to be adjacent to such a feature; thus all wetlands and non-wetland waters within the Study Area are potentially jurisdictional under the Section 404 of the CWA.

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# APPENDIX A.

# PRELIMINARY SECTION 404 JURISDICTIONAL MAP


# San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 1

## Legend

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

- Detention Basin
- Wetland
- Emergent Marsh
- Ephemeral Stream
- Perennial Stream
- Seasonal Wetland Depression
- Wetland Ditch

0 100 200 Feet

Path: J:\Acad 2000 Files\240000\24228-36\GIS\ArcMap\Report Mapbook\DelinMapbook.mxd

**Sources**: Esri Streaming - NAIP 2016, WRA | Prepared By: pkobylarz, 1/17/2018


San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 2

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

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- Wetland Ditch

0 100 200 Feet

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# San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 3

## Legend

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

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0 100 200 Feet

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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 4

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

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0 100 200 Feet

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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 5

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 6

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 7

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

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- Wetland Ditch

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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 8

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

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- Perennial Stream
- Seasonal Wetland Depression
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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 9

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 10

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

- Detention Basin Wetland
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- Wetland Ditch

0 100 200 Feet

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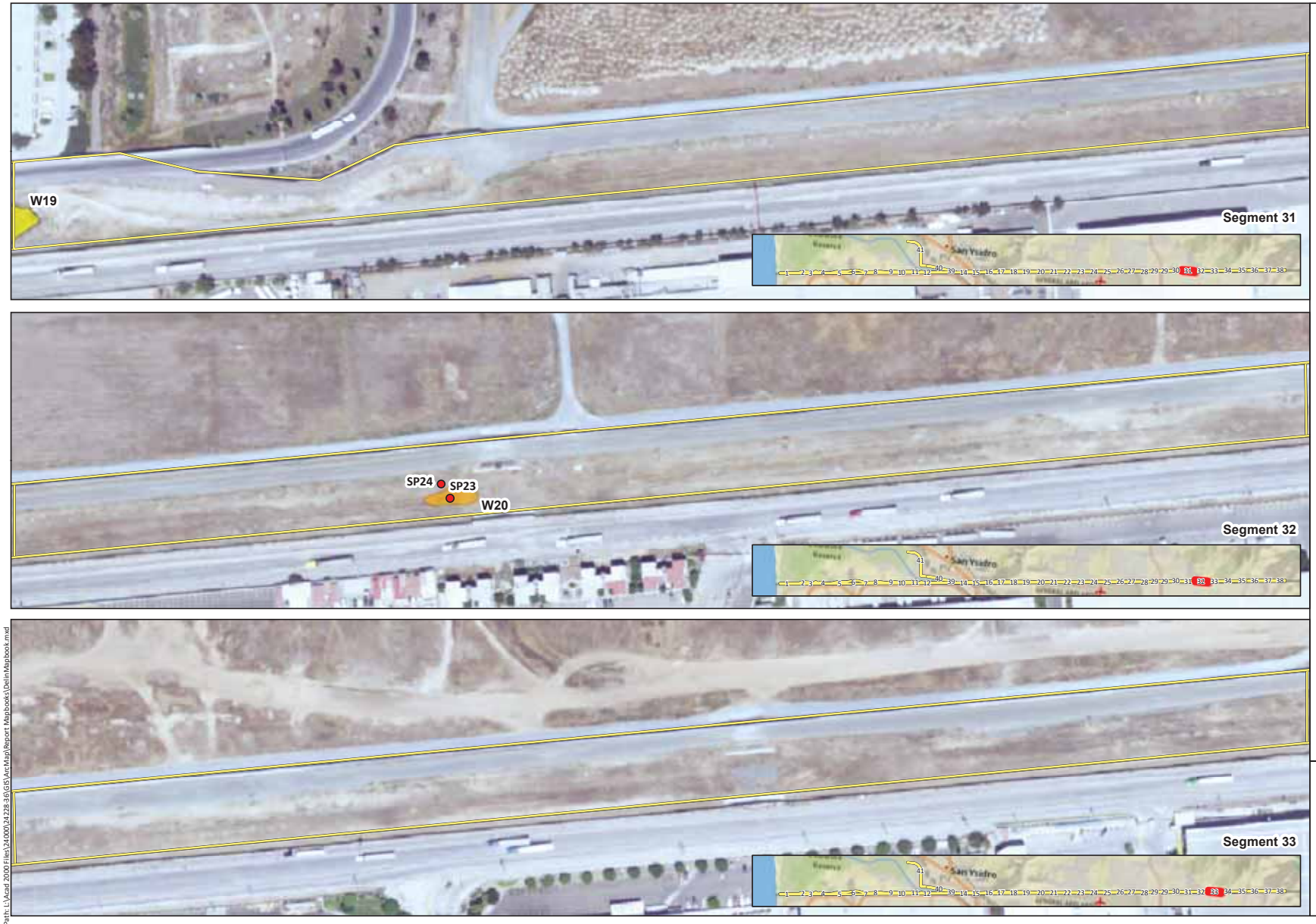
**Sources**: Esri Streaming - NAIP 2016, WRA | Prepared By: pkobylarz, 1/17/2018




San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 11

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

- Detention Basin Wetland
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0 100 200 Feet

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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 12

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

- Detention Basin Wetland
- Emergent Marsh
- Ephemeral Stream
- Perennial Stream
- Seasonal Wetland Depression
- Wetland Ditch

0 100 200 Feet

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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 13

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

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San Diego Sector Fence Replacement Project

San Diego County, California

Potential Section 404 Jurisdictional Areas

Page 14

**Legend**

- Sample Points
- Sample Transects

**Potential Section 404 Jurisdictional Areas**

- Detention Basin Wetland
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0 100 200 Feet

**Sources**: Esri Streaming - NAIP 2016, WRA | Prepared By: pkobylarz, 1/17/2018

## APPENDIX B.

## ARID WEST DELINEATION DATA SHEETS

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** 14 Mile Border Fence Replacement
**Project Number:** 24228
**Stream:** S01
**Investigator(s):** WRA, Inc. (Scott Batiuk, Nicole Tautfest)

**Date:** 10/9/2017
**Town:** San Diego
**Photo begin file#:** SJB 137

**Time:** 1530
**State:** California
**Photo end file#:** SJB 137

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

**Location Details:**
downstream of Silva Drain Canyon Collector

**Projection:** NAD 83 California State Plan Zone VI US'
**Coordinates:** 32.535993. -117.111261

**Potential anthropogenic influences on the channel system:**
Erosion and sedimentation from adjacent roads. Trash from Mexico.

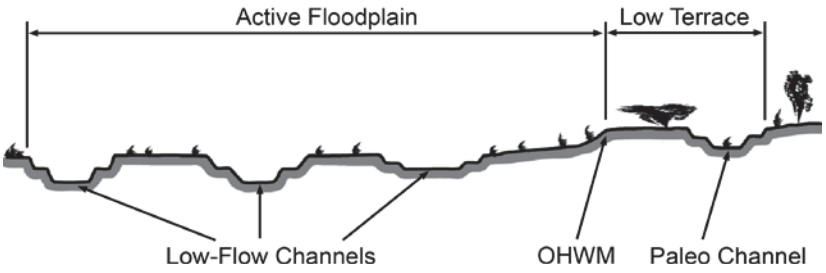
**Brief site description:**
Deeply incised channel downstream of the concrete Silva Drain Canyon Collector, which slows urban runoff from Mexico that outfalls under the border fence via a concrete box culvert. Large amounts of trash in the channel.

**Checklist of resources (if available):**

- ☒ Aerial photography
  Dates: 1994-2017
- ☒ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

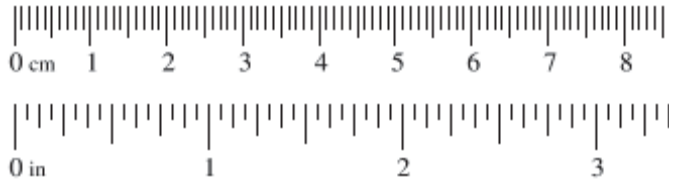



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☒ Mapping on aerial photograph
   - ☒ Digitized on computer
   - ☒ GPS
   - ☐ Other:

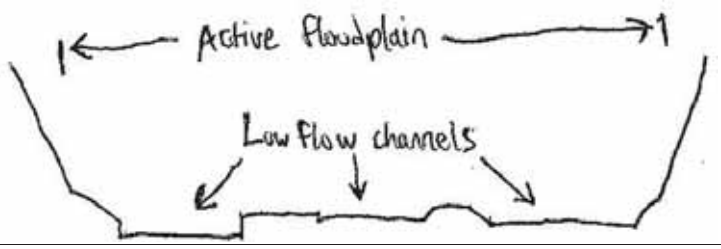
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** 24228 **Cross section ID:** CS01 **Date:** 10/9/2017 **Time:** 1530

**Cross section drawing:**




## OHWM

**GPS point:** _____

**Indicators:**

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: _____
- [ ] Other: _____

**Comments:**

No low terrace present.

**Floodplain unit:** [ ] Low-Flow Channel [x] Active Floodplain [ ] Low Terrace

**GPS point:** S09-AF

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: 60 % Tree: 0 % Shrub: 0 % Herb: 60 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [x] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

**Indicators:**

- [ ] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [ ] Presence of bed and bank
- [x] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

**Comments:**

**Project ID:** 24228 **Cross section ID:** CS01 **Date:** 10/9/2017 **Time:** 1530

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** S09-LF-01

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: <1 % Tree: 0 % Shrub: 0 % Herb: <1 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☒ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☒ Other: scour
- ☒ Other: sediment sorting
- ☐ Other: _____

**Comments:**

---

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** _____

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

**Project ID:** 24228 **Cross section ID:** CS01 **Date:** 10/9/2017 **Time:** 1530

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** S09-LF-01

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: <1 % Tree: 0 % Shrub: 0 % Herb: <1 %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☑ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☐ Surface relief
- ☑ Drift and/or debris
- ☑ Other: scour
- ☑ Presence of bed and bank
- ☑ Other: sediment sorting
- ☐ Benches
- ☐ Other: _____

**Comments:**

---

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** _____

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☐ Surface relief
- ☐ Drift and/or debris
- ☐ Other: _____
- ☐ Presence of bed and bank
- ☐ Other: _____
- ☐ Benches
- ☐ Other: _____

**Comments:**

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** 14 Mile Border Fence Replacement
**Project Number:** 24228
**Stream:** S02
**Investigator(s):** Scott Batiuk

**Date:** 10/13/2017
**Town:** San Diego
**Photo begin file#:** SJB 459

**Time:** 08045
**State:** California
**Photo end file#:** SJB 462

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

**Location Details:**
Approximately 0.4 miles east of Friendship Park

**Projection:** NAD 83 California State Plan Zone VI US'
**Coordinates:** 32.535953, -117.108829

**Potential anthropogenic influences on the channel system:**

Runoff, erosion, and trash from the adjacent area in Mexico. Runoff and erosion from roads in the Study Area that border and cross the stream.

**Brief site description:**

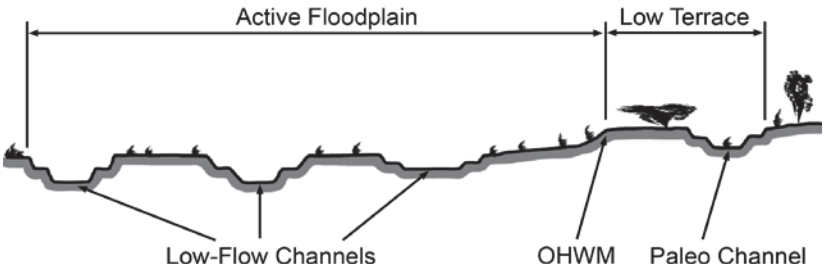
Disturbed, low-gradient, ephemeral stream channel. It begins at the east end at a culvert that drains from Mexico. It is also fed by two tributary erosional gullies (S02 and S03) at the east end. The feature begins as a single, deeply incised channel along the hillslope reach and broadens into a wide floodplain at the valley bottom. Surface runoff flows into the valley portion of the feature from Mexico under the border fence and from dirt roadways in the U.S.

**Checklist of resources (if available):**

- ☒ Aerial photography
  Dates: 1994-2017
- ☒ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

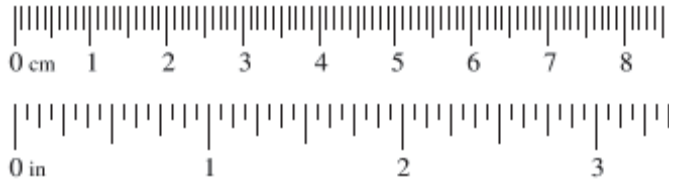



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☒ Mapping on aerial photograph
   - ☒ Digitized on computer
   - ☒ GPS
   - ☐ Other:

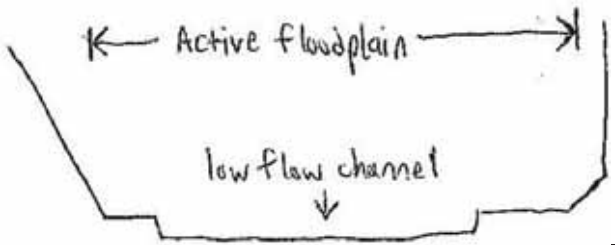
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** 24228 **Cross section ID:** CS02 **Date:** 10/13/2017 **Time:** 0845

**Cross section drawing:**




## OHWM

**GPS point:** _____

**Indicators:**

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: Presence of bed and bank
- [ ] Other: _____

**Comments:**

No low terrace.

## Floodplain unit: [ ] Low-Flow Channel [x] Active Floodplain [ ] Low Terrace

**GPS point:** S1-AF

**Characteristics of the floodplain unit:**

Average sediment texture: fine sand

Total veg cover: 70 % Tree: 0 % Shrub: 65 % Herb: 5 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [x] Mid (herbaceous, shrubs, saplings)
- [x] Late (herbaceous, shrubs, mature trees)

**Indicators:**

- [x] Mudcracks
- [x] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [x] Benches
- [ ] Soil development
- [x] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

**Comments:**

Very narrow bench above low-flow channel with dense vegetation.

**Project ID:** 24228 **Cross section ID:** CS02 **Date:** 10/13/2017 **Time:** 0845

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** S09-LF-01

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: <1 % Tree: 0 % Shrub: 0 % Herb: <1 %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☑ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☐ Surface relief
- ☑ Drift and/or debris
- ☑ Other: scour
- ☑ Presence of bed and bank
- ☑ Other: sediment sorting
- ☐ Benches
- ☐ Other: _____

**Comments:**

---

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** _____

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☐ Surface relief
- ☐ Drift and/or debris
- ☐ Other: _____
- ☐ Presence of bed and bank
- ☐ Other: _____
- ☐ Benches
- ☐ Other: _____

**Comments:**

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** 14 Mile Border Fence Replacement
**Project Number:** 24228
**Stream:** S04
**Investigator(s):** Scott Batiuk

**Date:** 10/13/2017
**Town:** San Diego
**Photo begin file#:** SJB 465

**Time:** 0910
**State:** California
**Photo end file#:** SJB 467

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☑ Is the site significantly disturbed?

**Location Details:**
Approximately 0.4 miles east of Friendship Park

**Projection:** NAD 83 California State Plan Zone VI US'
**Coordinates:** 32.536375. -117.02574

**Potential anthropogenic influences on the channel system:**

Runoff, erosion, and trash from the adjacent area in Mexico. Runoff and erosion from roads in the Study Area that border and cross the stream.

**Brief site description:**

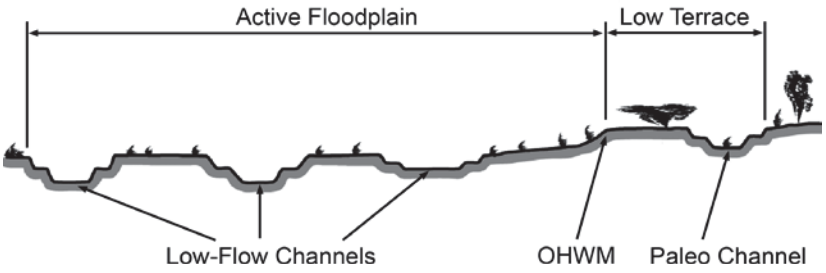
Disturbed, low-gradient, ephemeral stream channel. It begins at the east end at a culvert that drains from Mexico. It is also fed by two tributary erosional gullies (S02 and S03) at the east end. The feature begins as a single, deeply incised channel along the hillslope reach and broadens into a wide floodplain at the valley bottom. Surface runoff flows into the valley portion of the feature from Mexico under the border fence and from dirt roadways in the U.S.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates: 1994-2017
- ☑ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☑ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

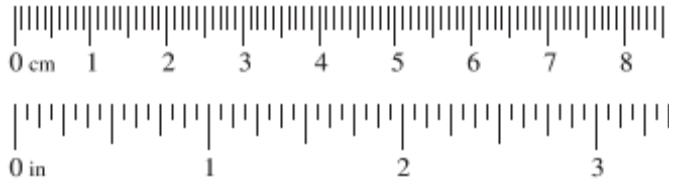



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

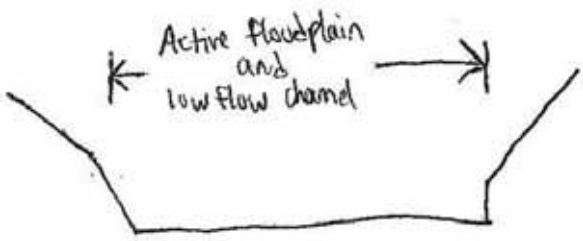
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** 24228 **Cross section ID:** CS03 **Date:** 10/13/2017 **Time:** 0910

**Cross section drawing:**




## OHWM

**GPS point:** _____

**Indicators:**

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: Presence of bed and bank
- [ ] Other: _____

**Comments:**

No low terrace.

## Floodplain unit: [ ] Low-Flow Channel [x] Active Floodplain [ ] Low Terrace

**GPS point:** S1-AF

**Characteristics of the floodplain unit:**

Average sediment texture: fine sand

Total veg cover: 70 % Tree: 0 % Shrub: 65 % Herb: 5 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [x] Mid (herbaceous, shrubs, saplings)
- [x] Late (herbaceous, shrubs, mature trees)

**Indicators:**

- [x] Mudcracks
- [x] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [x] Benches
- [ ] Soil development
- [x] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

**Comments:**

**Project ID:** 24228 **Cross section ID:** CS03 **Date:** 10/13/2017 **Time:** 0910

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** S09-LF-01

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: <1 % Tree: 0 % Shrub: 0 % Herb: <1 %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☑ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☑ Other: scour
- ☑ Other: sediment sorting
- ☐ Other: _____

**Comments:**

---

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** _____

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** 14 Mile Border Fence Replacement
**Project Number:** 24228
**Stream:** S05
**Investigator(s):** Scott Batiuk

**Date:** 10/13/2017
**Town:** San Diego
**Photo begin file#:** SJB 468

**Time:** 0935
**State:** California
**Photo end file#:** SJB 470

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

**Location Details:**
Approximately 0.4 miles east of Friendship Park

**Projection:** NAD 83 California State Plan Zone VI US'
**Coordinates:** 32.537667, -117.087581

**Potential anthropogenic influences on the channel system:**

Runoff, erosion, and trash from the adjacent area in Mexico. Runoff and erosion from roads in the Study Area that border and cross the stream.

**Brief site description:**

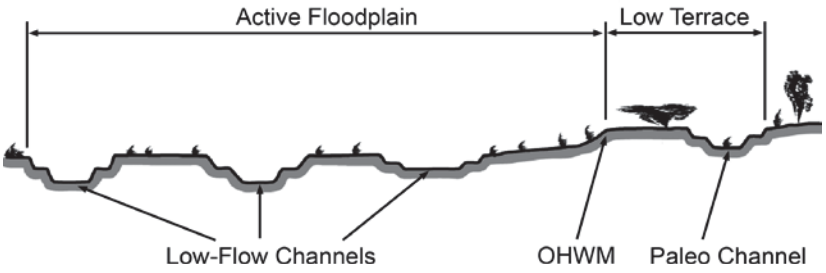
Disturbed, low-gradient, ephemeral stream channel. It begins at the east end at a culvert that drains from Mexico. It is also fed by two tributary erosional gullies (S02 and S03) at the east end. The feature begins as a single, deeply incised channel along the hillslope reach and broadens into a wide floodplain at the valley bottom. Surface runoff flows into the valley portion of the feature from Mexico under the border fence and from dirt roadways in the U.S.

**Checklist of resources (if available):**

- ☒ Aerial photography
  Dates: 1994-2017
- ☒ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

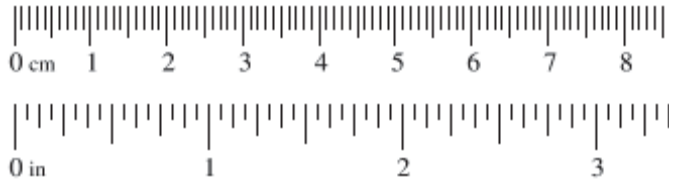



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☒ Mapping on aerial photograph
   - ☒ Digitized on computer
   - ☒ GPS
   - ☐ Other:

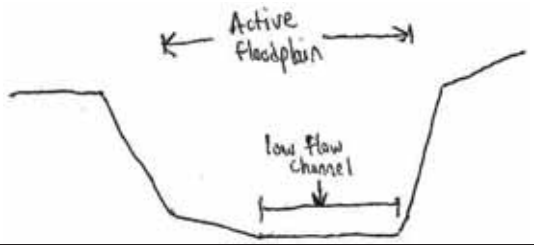
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** 24228 **Cross section ID:** CS04 **Date:** 10/13/2017 **Time:** 0935

**Cross section drawing:**




## OHWM

**GPS point:** _____

**Indicators:**

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: Presence of bed and bank
- [ ] Other: _____

**Comments:**

No low terrace.

## Floodplain unit: [ ] Low-Flow Channel [x] Active Floodplain [ ] Low Terrace

**GPS point:** S1-AF

**Characteristics of the floodplain unit:**

Average sediment texture: fine sand

Total veg cover: 70 % Tree: 0 % Shrub: 65 % Herb: 5 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [x] Mid (herbaceous, shrubs, saplings)
- [x] Late (herbaceous, shrubs, mature trees)

**Indicators:**

- [x] Mudcracks
- [x] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [x] Benches
- [ ] Soil development
- [x] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

**Comments:**

**Project ID:** 24228 **Cross section ID:** CS04 **Date:** 10/13/2017 **Time:** 0935

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** S09-LF-01

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: <1 % Tree: 0 % Shrub: 0 % Herb: <1 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☒ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☒ Other: scour
- ☒ Other: sediment sorting
- ☐ Other: _____

**Comments:**

---

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** _____

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** 14 Mile Border Fence Replacement
**Project Number:** 24228
**Stream:** S09
**Investigator(s):** Scott Batiuk

**Date:** 10/13/2017
**Town:** San Diego
**Photo begin file#:** SJB 471

**Time:** 1005
**State:** California
**Photo end file#:** SJB 473

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☑ Is the site significantly disturbed?

**Location Details:**
Approximately 0.4 miles east of Friendship Park

**Projection:** NAD 83 California State Plan Zone VI US'
**Coordinates:** 32.539727, -117.064630

**Potential anthropogenic influences on the channel system:**

Runoff, erosion, and trash from the adjacent area in Mexico. Runoff and erosion from roads in the Study Area that border and cross the stream.

**Brief site description:**

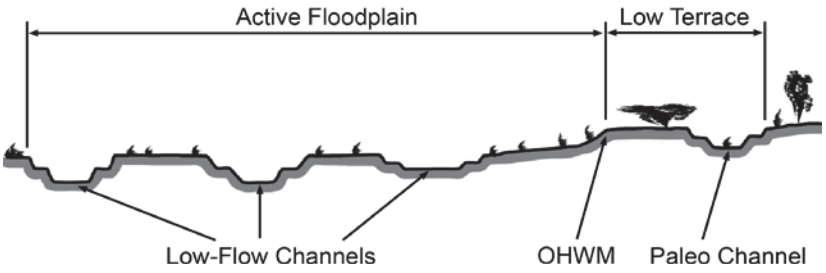
Disturbed, low-gradient, ephemeral stream channel. It begins at the east end at a culvert that drains from Mexico. It is also fed by two tributary erosional gullies (S02 and S03) at the east end. The feature begins as a single, deeply incised channel along the hillslope reach and broadens into a wide floodplain at the valley bottom. Surface runoff flows into the valley portion of the feature from Mexico under the border fence and from dirt roadways in the U.S.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates: 1994-2017
- ☑ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☑ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

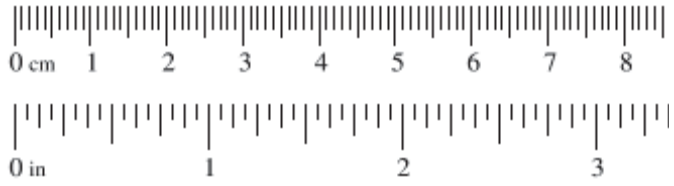



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

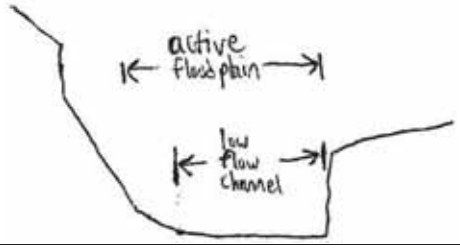
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** 24228 **Cross section ID:** CS05 **Date:** 10/13/2017 **Time:** 1005

**Cross section drawing:**




## OHWM

**GPS point:** _____

**Indicators:**

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: Presence of bed and bank
- [ ] Other: _____

**Comments:**

No low terrace.

## Floodplain unit: [ ] Low-Flow Channel [x] Active Floodplain [ ] Low Terrace

**GPS point:** S1-AF

**Characteristics of the floodplain unit:**

Average sediment texture: fine sand

Total veg cover: 70 % Tree: 0 % Shrub: 65 % Herb: 5 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [x] Mid (herbaceous, shrubs, saplings)
- [x] Late (herbaceous, shrubs, mature trees)

**Indicators:**

- [x] Mudcracks
- [x] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [x] Benches
- [ ] Soil development
- [x] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

**Comments:**

South side of the active floodplain is a bench with dense iceplant cover. The north side of the active floodplain is a vertical bank.

**Project ID:** 24228 **Cross section ID:** CS05 **Date:** 10/13/2017 **Time:** 1005

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** S09-LF-01

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: <1 % Tree: 0 % Shrub: 0 % Herb: <1 %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☑ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☐ Surface relief
- ☑ Drift and/or debris
- ☑ Other: scour
- ☑ Presence of bed and bank
- ☑ Other: sediment sorting
- ☐ Benches
- ☐ Other: _____

**Comments:**

---

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** _____

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☐ Surface relief
- ☐ Drift and/or debris
- ☐ Other: _____
- ☐ Presence of bed and bank
- ☐ Other: _____
- ☐ Benches
- ☐ Other: _____

**Comments:**

## APPENDIX C.

## REPRESENTATIVE PHOTOGRAPHS OF THE STUDY AREA


**Photograph 1.** Image is taken at W19, a manmade detention basin wetland, approximately 0.4 mile east of the Otay POE. Significant areas of these features were saturated or inundated during the surveys. View facing east. Photograph taken on October 12, 2017.

**Photograph 2.** Emergent marsh, W02, a saturated and inundated area at the entrance to a culvert, south of the water treatment plant west of the Tijuana River. The feature is dominated by cattails and barnyard grass. View facing east. Photograph taken on October 10, 2017.

**Photograph 3.** Image depicts W01, a highly disturbed emergent marsh wetland characterized by pickleweed and alkali heath, located approximately 0.4 mile east of Friendship Park. View facing southwest. Photograph taken on October 9, 2017.

**Photograph 4.** Image depicts emergent marsh W05, a portion of a remnant stream channel located approximately 0.6 mile east of the San Ysidro POE. The feature was inaccessible during the survey but was assessed with binoculars and aerial imagery and appears to remain inundated and/or saturated for a substantial duration. It is dominated by cattails, with giant reed and willows at the edges of the feature. View facing south. Photograph taken on October 11, 2017.

**Photograph 5.** Image depicts a portion of the Tijuana River approximately 300 feet downstream of the Study Area. The portion of the Tijuana River within the Study Area, mapped as a perennial stream (S10), contained less sediment than what is depicted above. View facing north. Photograph taken October 10, 2017.

**Photograph 6.** Image is of wetland ditch W03, located in a concrete drainage channel near the north bank of the Tijuana River, approximately 0.4 mile west of the San Ysidro POE. Sufficient sediment has accumulated to support vegetation dominated by cattails and dock. Based on aerial imagery, it is expected that W04, the eastern portion of the concrete channel, is similar in hydrology and vegetation to W03. View facing south. Photograph taken on October 12, 2017.

**Photograph 7.** Image depicts the narrow, deeply incised upper reach of S01, approximately 0.75 miles east of Friendship Park. View facing south. Photograph taken October 9, 2017.

**Photograph 8.** Image depicts the broad, floodplain portion at the lower portion of S01, approximately 0.6 mile east of Friendship Park. View facing east. Photograph taken October 9, 2017.

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**Photograph 9.** Image depicts the narrow, deeply incised upper reach of S09, below the outfall of the Silva Drain Canyon Collector, approximately 2 miles west of the San Ysidro POE. The location was sampled as CS05. View facing southwest. Photograph taken October 13, 2017.

**Photograph 10.** Image depicts the broad, floodplain portion at the lower portion of S09, approximately 1.8 miles west of the San Ysidro POE. View facing west. Photograph taken October 13, 2017.
.

**Photograph 11.** Image depicts a portion of S05, a steep, deeply incised ephemeral drainage on the western slope of Smugglers Gulch. The location was sampled as CS04. View facing east. Photograph taken on October 13, 2017.

**Photograph 12.** Image depicts S07, the natural and concrete channelized portion of the ephemeral drainage in Smugglers Gulch. View facing south. Photograph taken October 10, 2017.

.

**Photograph 13.** Image depicts a representative seasonal wetland depression (W11) in the Study Area, located approximately 2.3 miles west of the Otay POE, The depressions were shallow, closed, and seasonally ponded. View facing west. Photograph taken on October 11, 2017.

**Photograph 14.** Image depicts an example of a concrete, V-shaped drainage on the eastern slope of Bunker Hill. Such features are constructed in uplands and drain roadsides and other uplands. Such features were considered non-jurisdictional. View facing west. Photograph taken October 10, 2017.

**Photograph 15**. Example of a non-jurisdictional concrete drainage, located to the southeast of the waste treatment facility. View facing west. Photograph taken on October 13, 2017.

**Photograph 16.** Non-jurisdictional concrete drainage, located to the southwest of the waste treatment facility. View facing north. Photograph taken on October 10, 2017.

**Photograph 17.** Image depicts an example of the long, shallow, linear, upland, manmade swales in the grassland habitat located between the legacy and primary fences beginning approximately 1.5 miles east of the Otay POE. Indicators of flow were not observed in these features, and the three wetland parameters were typically not met, either. Occasional closed depressions within these swale met the three wetland parameters, and such features were mapped as seasonal wetland depressions. View facing east. Photograph taken October 11, 2017.

# APPENDIX D

# STUDY AREA NWI MAP


San Diego Sector Fence Replacement Project

San Diego County, California

National Wetland Inventory

Page 1

**Legend**

**National Wetland Inventory (ID Code, Type):**

- PEMA, Freshwater Emergent Wetland
- PSS/EMAh, Freshwater Forested/Shrub Wetland
- PUBHx, Freshwater Pond
- R4SBA, Riverine
- R4SBAx, Riverine
- R4SBC, Riverine
- R4SBCx, Riverine

0 100 200 Feet

Path: J:\Acad 2000 Files\240000\4228-36\GIS\ArcMap\Report Mapbook\NW\Mapbook.mxd

**Sources**: Esri Streaming - NAIP 2016, WRA | Prepared By: pkobylarz, 10/31/2017




San Diego Sector Fence Replacement Project

San Diego County, California

National Wetland Inventory

Page 2

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San Diego Sector Fence Replacement Project

San Diego County, California

National Wetland Inventory

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San Diego Sector Fence Replacement Project

San Diego County, California

National Wetland Inventory

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San Diego Sector Fence Replacement Project

San Diego County, California

National Wetland Inventory

Page 5

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San Diego Sector Fence Replacement Project

San Diego County, California

National Wetland Inventory



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**Sources**: Esri Streaming - NAIP 2016, WRA | Prepared By: pkobylarz, 10/31/2017




# San Diego Sector Fence Replacement Project

San Diego County, California

National Wetland Inventory

Page 7

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San Diego Sector Fence Replacement Project

San Diego County, California

National Wetland Inventory

Page 8

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San Diego Sector Fence Replacement Project

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**Sources**: Esri Streaming - NAIP 2016, WRA | Prepared By: pkobylarz, 10/31/2017

# APPENDIX E

# STUDY AREA SOIL MAPS




# San Diego Sector Fence Replacement Project

## San Diego County, California

### Soils

Page 1

**Soils**

- CbB: Carlsbad gravelly loamy sand, 2 to 5 percent slopes
- CfB: Chesterton fine sandy loam, 2 to 5 percent slopes
- ChA: Chino fine sandy loam, 0 to 2 percent slopes
- CkA: Chino silt loam, saline, 0 to 2 percent slopes
- DaF: Diablo clay, 30 to 50 percent slopes
- HrC2: Huerhuero loam, 5 to 9 percent slopes, eroded
- HrC: Huerhuero loam, 2 to 9 percent slopes
- HrD2: Huerhuero loam, 9 to 15 percent slopes, eroded
- HrD: Huerhuero loam, 9 to 15 percent slopes
- MIC: Marina loamy coarse sand, 2 to 9 percent slopes
- OhE: Olivenhain cobbly loam, 9 to 30 percent slopes
- OhF: Olivenhain cobbly loam, 30 to 50 percent slopes
- Rm: Riverwash
- oils
- SnG: San Miguel-Exchequer rocky silt loams, 9 to 70 percent slopes
- SuA: Stockpen gravelly clay loam, 0 to 2 percent slopes
- SuB: Stockpen gravelly clay loam, 2 to 5 percent slopes
- TeF: Terrace escarpments
- TuB: Tujunga sand, 0 to 5 percent slopes
- VbB: Visalia gravelly sandy loam, 2 to 5 percent slopes

0 100 200 Feet

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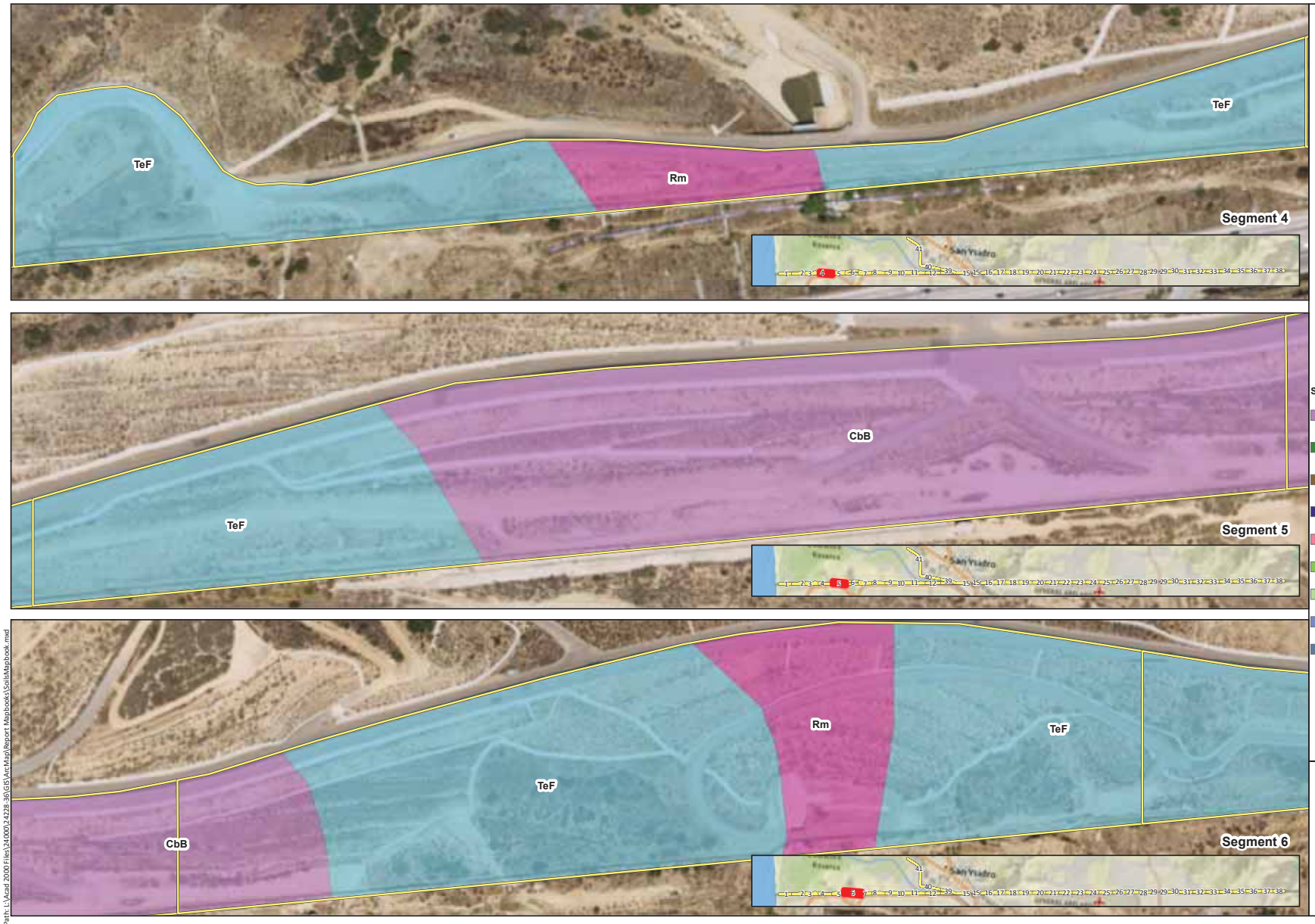
**Sources**: Esri Streaming - NAIP 2016, WRA | Prepared By: pkobylarz, 10/31/2017




# San Diego Sector Fence Replacement Project

## San Diego County, California

### Soils

Page 2

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- HrD: Huerhuero loam, 9 to 15 percent slopes
- MlC: Marina loamy coarse sand, 2 to 9 percent slopes
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# San Diego Sector Fence Replacement Project

San Diego County, California

Soils

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# San Diego Sector Fence Replacement Project

## San Diego County, California

### Soils

Page 4

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# San Diego Sector Fence Replacement Project

San Diego County, California

Soils

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# San Diego Sector Fence Replacement Project

San Diego County, California

Soils



**Soils**

- CbB: Carlsbad gravelly loamy sand, 2 to 5 percent slopes
- CfB: Chesterton fine sandy loam, 2 to 5 percent slopes
- ChA: Chino fine sandy loam, 0 to 2 percent slopes
- CkA: Chino silt loam, saline, 0 to 2 percent slopes
- DaF: Diablo clay, 30 to 50 percent slopes
- HrC2: Huerhuero loam, 5 to 9 percent slopes, eroded
- HrC: Huerhuero loam, 2 to 9 percent slopes
- HrD2: Huerhuero loam, 9 to 15 percent slopes, eroded
- HrD: Huerhuero loam, 9 to 15 percent slopes
- MlC: Marina loamy coarse sand, 2 to 9 percent slopes
- OhE: Olivenhain cobbly loam, 9 to 30 percent slopes
- OhF: Olivenhain cobbly loam, 30 to 50 percent slopes
- Rm: Riverwash
- oils
- SnG: San Miguel-Exchequer rocky silt loams, 9 to 70 percent slopes
- SuA: Stockpen gravelly clay loam, 0 to 2 percent slopes
- SuB: Stockpen gravelly clay loam, 2 to 5 percent slopes
- TeF: Terrace escarpments
- TuB: Tujunga sand, 0 to 5 percent slopes
- VbB: Visalia gravelly sandy loam, 2 to 5 percent slopes

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**Sources**: Esri Streaming - NAIP 2016, WRA | Prepared By: pkobylarz, 10/31/2017

# San Diego Sector Fence Replacement Project

San Diego County, California

Soils

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**Soils**

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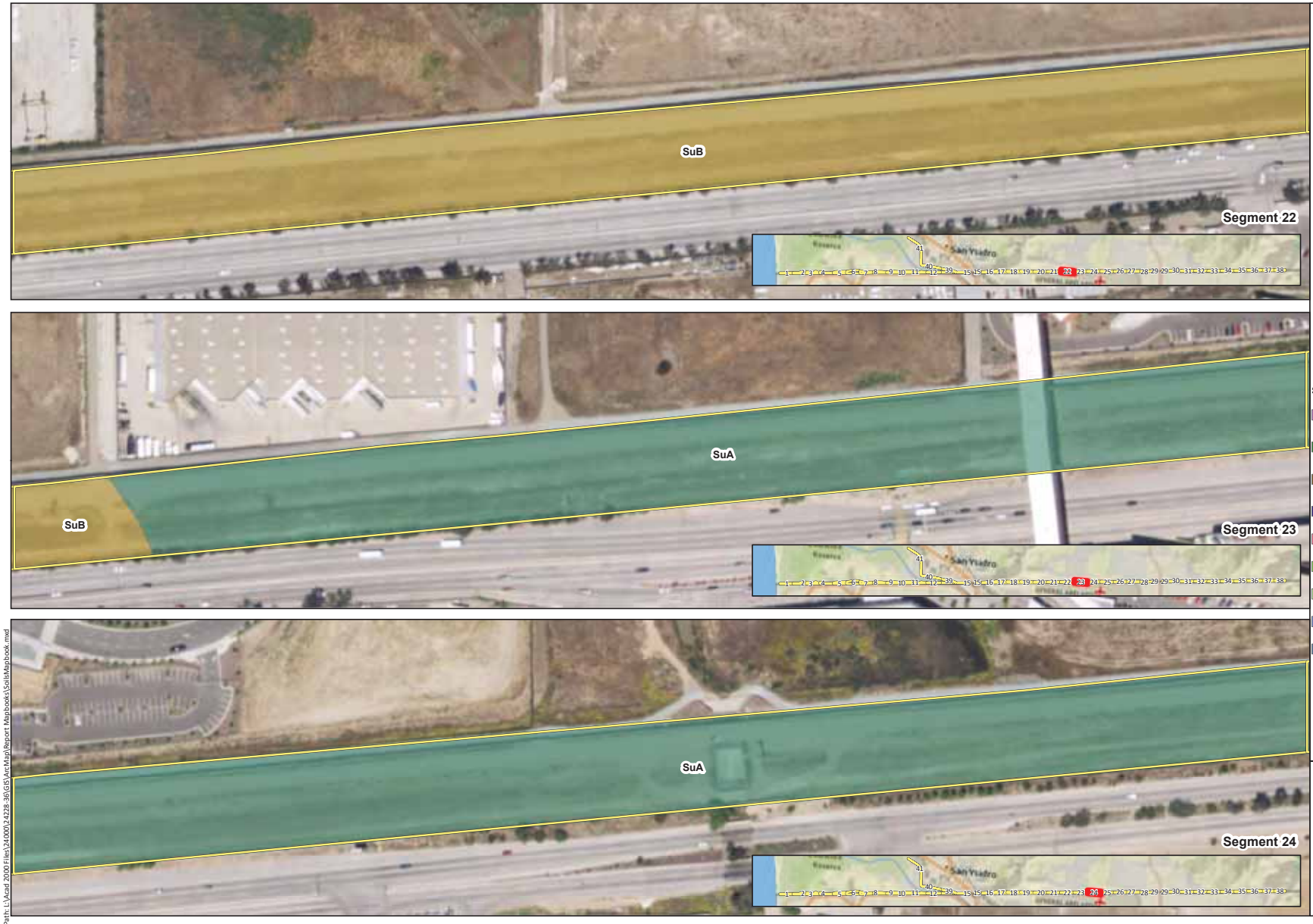


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San Diego County, California

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## San Diego County, California

## Soils



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