Appendix E.4

Biological Resource Reports

Wetland Delineation, RMTII Samoa Effluent Pipeline

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Wetland Delineation

RMTII Samoa Effluent Pipeline
Samoa, California

Prepared for:

County of Humboldt and
Humboldt Bay Harbor, Recreation, and Conservation District

Project Funding Provided by:

U.S. Department of Commerce 07-79-07177

SHN Engineers & Geologists

812 W. Wabash Ave.
Eureka, CA 95501-2138
707-441-8855

March 2017
015147.100

Reference: 015147.100

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QA/QC: JLS/cg___

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List of Illustrations

Abbreviations and Acronyms

APN	Assessor's parcel number
CFR	Code of Federal Regulations
CT	control point
CWA	Clean Water Act
DI	drainage inlet
EPA	United States Environmental Protection Agency
FAC	facultative wetland plant species
FACU	facultative-upland wetland plant species
FACW	facultative-wet wetland plant species
GIS	geographic information system
GPS	global positioning system
NL	not listed plant species
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	obligate wetland plant species
OHWM	ordinary high water mark
QISP	Qualified Industrial Stormwater Practioner
Redox	redoximorphic
RWQCB	California Regional Water Quality Control Board
SHN	SHN Engineers & Geologists
SWRCB	State Water Resources Control Board
TP	test pit
UPL	upland wetland plant species
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WDRs	waste discharge requirements
WETS	Climate Analysis for Wetlands Tables
WoS	waters of the State
WoUS	waters of the United States

1.0 Introduction

SHN Engineers & Geologists has prepared this preliminary jurisdictional wetland delineation for the RMTII Samoa Effluent Pipeline. Fieldwork was performed by SHN staff.

1.1 Purpose

The purpose of this report is to identify potential wetlands and other waters of the United States and State at the project site, as defined by the United States Army Corps of Engineers (USACE) methodology. The delineation of these features will help guide the design and construction of future development within the study area and avoid impacts to potential wetlands.

1.2 Project Location

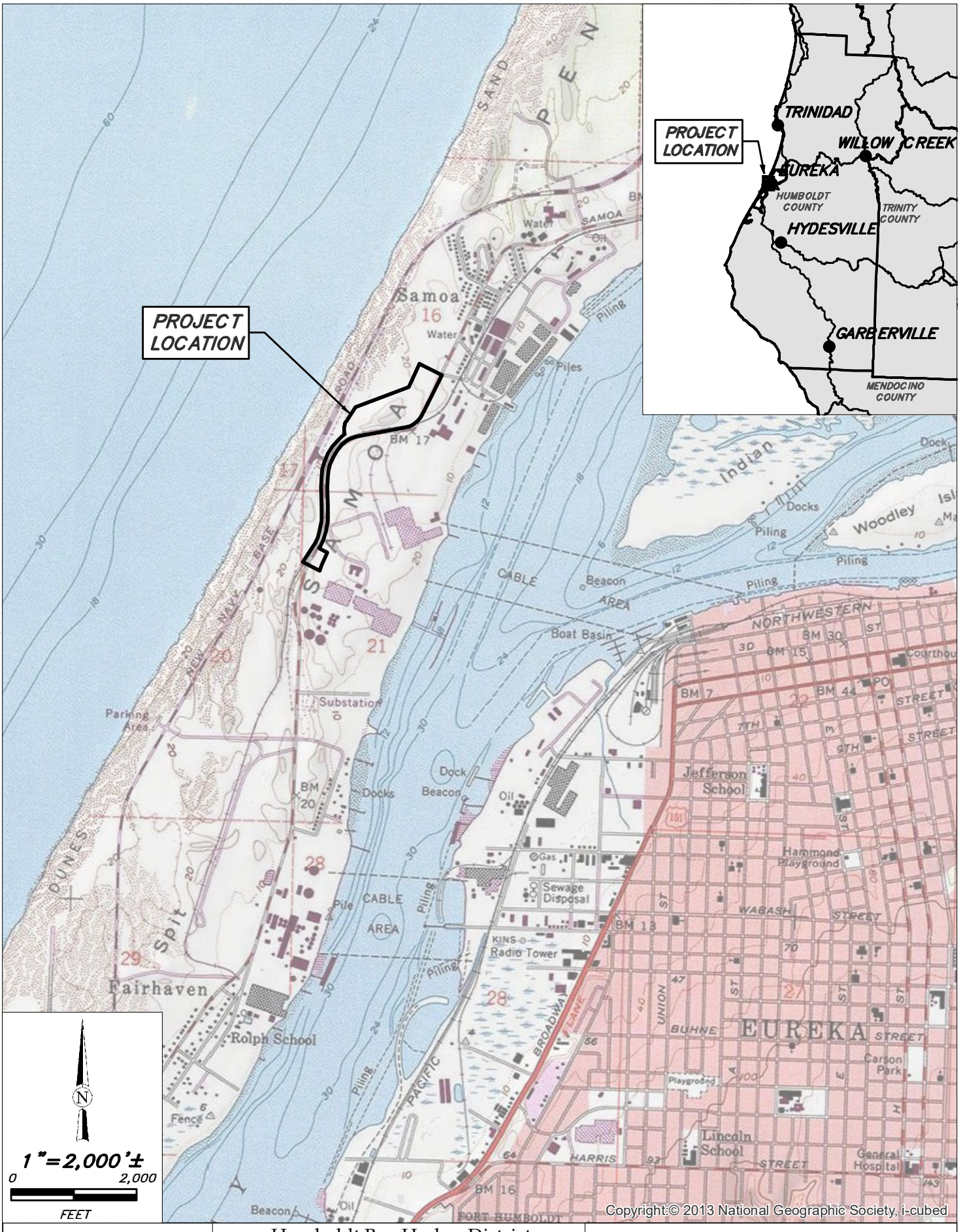
The project is located in Samoa, California, an unincorporated community within Humboldt County (Figure 1; United States Geological Survey [USGS] Eureka 7.5-minute Quadrangle, Township 5 North, Range 1 west, Sections 15, 16, and 17, Humboldt Meridian). The project is located across 10 adjacent parcels; (APN 401-031-039, 059, 061, 065, 067, 068 and 401-112-003, 021, 022, and 023) however the wetland delineation took place within a limited area of potential effects surrounding the proposed pipeline alignment. The area of potential effects (APE) includes a 100 foot wide right of way surrounding the proposed pipeline alignment as well as two widened areas at each end for staging (Figure 2). The proposed pipeline has an approximate length of 3,200 feet with an APE of approximately 23 acres. The majority of the project occurs within the Vance Avenue and railroad right of way (APN 401-031-039 and 401-112-003) The wetland delineation took place within the 23 acre APE with a central location at latitude and longitude 40.811009° and -124.195243° (County of Humboldt GIS 2017). The wetland delineation was approximately 250 feet east of New Navy Base Road at its nearest point, and approximately 1,130 feet west of Humboldt Bay at its nearest point, and 1 air mile west of the City of Eureka.

2.0 Project Description

Environmental management constraints are being considered for the study area. This report will assist in considering site management options.

3.0 Environmental Setting

The study area is situated at an approximate 15-32 foot elevation above mean sea level (See Figures 1 and 2 and Appendix A). The study area has been used for industrial purposes since the 1960s. Several lumber mills operated on the northern portion of the site closing at different times within the last 20 years. These facilities have mostly been demolished leaving vacant industrial land. The southern portion of the project area has been the location of a pulp mill from the 1960s until 2008 when it closed. The area still contains structures from the shuttered mill; however, the majority of the site is composed of broad stretches of vacant asphalt with some small scale industrial use continuing on site. The western portion of the project area passes by an industrial recycling facility that will be skirted by the proposed effluent pipeline. Currently, the majority of the project area is covered in old asphalt, broken up concrete, compacted gravel within former log decks, and railroad infrastructure. Small areas of semi-natural dune habitat occur between the vacant industrial lands



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SHN Consulting Engineers & Geologists, Inc.

Humboldt Bay Harbor District
Samoa Effluent Pipeline, RMT II
Samoa, California

Project Location

SHN 015147.100

March 2017 | Wetland_Fig1_ProjectLocation | Figure 1

WETLAND AREA 3

EDGE OF WETLAND (EXTENT NOT SURVEYED)

LP DR

PROPOSED ALIGNMENT

LIMITS OF AREA OF POTENTIAL EFFECT

TP5

TP6

WETLAND AREA 2

CULVERT

RECYCLING FACILITY

WETLAND NOT SURVEYED

VANCE AVE

TP4

TP3

CULVERT

TP2

TP1

MANHOLE #5

POTENTIAL STOCKPILE OR STAGING LOCATION

WETLAND AREA 1

POTENTIAL STOCKPILE OR STAGING LOCATION

N

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Consulting Engineers & Geologists, Inc.

Humboldt Bay Harbor District
Samoa Effluent Pipeline, RMT II
Samoa, California

Wetland Delineation Results
SHN 015147.100

March 2017 | Wetland_Fig2_DelineationResults | Figure 2

in areas that were used as drainages, or along property lines. The area is characterized by a mix of disturbance-adapted, primarily non-native, herbaceous species, along with shrub dominated regions, and areas with higher native vegetation cover. The native vegetation dominated communities usually had an overstory dominated by coast willow (*Salix hookeriana*) and California wax-myrtle (*Morella californica*), indicating a longer period since it was last disturbed. Vegetation encroachment has been limited within areas of concrete, asphalt and compacted gravel, however these areas were not typically the location of wetlands. It was not necessary to excavate test pits in areas without vegetation cover, due to a lack of wetland features in those areas (See Figure 2, Appendix A, and Appendix B, Photos B1-8 for site description). Nearly the entire project area has been manipulated at some point in the past and continues to be manipulated, as evidenced by on-going vegetation maintenance, equipment movement and some continued industrial use.

Field investigations were conducted March 23, and 24, 2017. The average annual 30-year precipitation data for this area from 1981 to 2010 is 40.33 inches (NOAA Woodley Island Station, 2017). The March 24, 2017 total since October 1, 2016 was 54.56 inches (NOAA, 2017), indicating that the 2016/2017 rain season is above average. Rainfall for the first three weeks of March 2017, prior to the initiation of the field investigation, was higher than normal, with several wet rainy days preceding the two days of field work. The United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Climate Analysis for Wetlands Table (WETS) reviews the previous three months before the investigation (or the same month and two prior if after the 15th) to determine precipitation conditions at the time of the delineation. The WETS table analysis indicates that the three most recent months are considered a wetter than normal rainfall period (Table 1; USDA-NRCS, 2017).

Table 1
WETS Rainfall Data
RMTII Samoa Effluent Pipeline, Samoa, CA

Month	WETS data	Rank	Weight	Value
March 2017	Wet	3	3	9
February 2017	Wet	3	2	6
January 2017	Wet	3	1	3
			Total[1]	**18**

1. A sum of 6-9 prior to site investigation is considered a drier than normal rainfall.
   10-14 prior to site investigation is considered a normal rainfall.
   15-18 prior to site investigation is considered a wetter than normal rainfall.

4.0 Vegetation

The study area consists of a generally flat graded surface, sloping in different directions throughout the project area along the proposed effluent pipeline alignment, with a primarily west to east slope. There is considerable coverage of non-native species, with the majority of the project area dominated by non-native grassland interspersed with asphalt, concrete and gravel areas. Dominant species within the non-native grassland included large quaking grass (*Briza maxima*; upland, [NL]), velvet grass (*Holcus lanatus*; facultative [FAC]), small fescue (*Festuca microstachys*; [NL]), birds-foot trefoil (*Lotus corniculatus*; [FAC]), sweet vernal grass (*Anthoxanthum odoratum*; facultative upland [FACU]), pampas grass (*Cortaderia jubata*; FACU]) and iceplant (*Carpobrotus edulis*; [FAC]). Less disturbed areas had a shrub layer dominated by coyote brush (*Baccharis pilularis*; upland [NL]), yellow bush lupine (*Lupinus arboreus*; [NL]), and California blackberry (*Rubus ursinus*; [FACU]) in

thickets. A tree layer existed in two locations along the proposed pipeline alignment. These areas were dominated by coast willow [FACW] and California wax myrtle [FAC]. These areas are not proposed to be impacted by the project, but were investigated for wetland conditions to establish correct buffer distances during the construction of the project. A complete list of plants observed within the study area is compiled in Table C-1 in Appendix C.

5.0 Geologic and Soil Composition

The site is set on coastal dunes on a narrow spit of land between Humboldt Bay and the Pacific Ocean. The majority of the project area has been manipulated for industrial development which included the importation of industrial fill material, grading of the site, and installation of utilities. The Samoa spit and dune features developed over time from mixed alluvium from adjacent rivers deposited by prevailing ocean currents. Dune features shift naturally over time with the introduction of additional sediment deposits and prevailing wind patterns. Older dunes further inland become stabilized as vegetation colonizes exposed sand. Deflation basins become established as prevailing winds continue to develop drift deposits. It is within the deflation basins that natural dune wetlands form. The majority of the natural dune landscape has been removed within the project area for industrial development, however natural wetland systems were observed within the area. The majority of wetland conditions expected within the area of potential effects are expected to be a result of improper drainage due to poor slope and grading within the former industrial areas. Various soil colors and textures were found during test pit (TP) analysis that were indicative of numerous sources of fill, which did not fit with the surrounding soil matrix. Other areas contained colors and textures that appeared to represent more natural dune soils.

The underlying soils in the project site have a USDA classification of Samoa-Clambeach-Duneland complex, 0 to 50 percent slopes (map unit 155) and industrial fill (NOTCOM). Due to the unknown source of fill found onsite, these descriptions are the general depiction of what may be encountered. The actual soil description at each exploratory soil TP is described in the field data forms found in Appendix D.

155—Samoa-Clambeach-Dune land Complex, 0 to 50 percent slopes

Map Unit Composition
Samoa and similar soils: 50 percent
Clambeach and similar soils: 30 percent
Dune land: 15 percent
Minor components: 5 percent

Description of Samoa

Typical profile
Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 6 inches: sand
AC - 6 to 18 inches: sand
C - 18 to 63 inches: sand

Properties and qualities
Slope: 2 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat):
High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.9 inches)

Description of Clambeach

Typical profile
A - 0 to 9 inches: sand
Cg1 - 9 to 20 inches: sand
Cg2 - 20 to 63 inches: sand

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat):
High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Description of Dune Land

Setting
Landform: Foredunes, dunes
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Eolian and marine sand derived from mixed sources

Properties and qualities
Slope: 2 to 15 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately high or high (0.599 to 1.999 in/hr)
Depth to water table: More than 6 feet

Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.6 inches)
(USDA, 2017b)

6.0 Regulatory Setting

6.1 Federal Laws

6.1.1 Section 401 and 404 of the Clean Water Act

Under Section 404 (33 U.S. Code [USC] 1344) of the Clean Water Act (CWA), as amended, the USACE and the Environmental Protection Agency (EPA) retain primary responsibility for permits to discharge dredged or fill material into "navigable waters of the United States." All discharges of dredged or fill material into jurisdictional waters of the United States (WoUS) that result in permanent or temporary losses of WoUS are regulated by the USACE. A permit from the USACE must be obtained before placing fill or grading in wetlands or other WoUS, unless the activity is exempt from CWA Section 404 regulation (for example, certain farming and forestry activities).

In summary, the definition of WoUS as defined by 33 Code of Federal Regulations (CFR) Section 328.3 (U.S. Code of Regulations) includes:

1. waters used for commerce,
2. interstate wetlands,
3. all other waters (including lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, and natural ponds),
4. impoundments of water,
5. tributaries to aforementioned waters,
6. territorial seas, and
7. wetlands adjacent to waters.

Under 33 CFR 328.3, WoUS do not include prior converted cropland or waste treatment systems. In 2008, the EPA and USACE released a guidance memorandum implementing the Supreme Court's decision in the cases of the Rapanos v. U.S. and Carabell v. U.S. Because of these cases, the agencies will apply a significant nexus standard to the following categories to determine if it meets the definition of a WoUS:

- Non-navigable tributaries that are not relatively permanent
- Wetland adjacent to non-navigable tributaries that are not relatively permanent
- Wetland adjacent to but that does not directly abut a relatively permanent tributary

Section 401 of the CWA (33 USC 1341) requires applicants for a federal license or permit to obtain a certification from the state in which the discharge originates or would originate, or if appropriate, from the interstate water pollution control agency having jurisdiction over the affected waters at the point where the discharge originates or would originate, that the discharge will comply with

the applicable effluent limitations and water quality standards. The responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs).

6.1.2 Rivers and Harbors Appropriation Act of 1899

The River and Harbors Appropriation Act of 1899 addresses activities that involve the construction of dams, bridges, dikes, and other structures across any navigable water. Placing obstructions to navigation outside established federal lines and excavating from or depositing material in such waters require permits from the USACE Section 10 (33 USC 403) of the Rivers and Harbors Appropriation Act and prohibits the unauthorized obstruction or alteration of any navigable WoUS.

6.2 State Laws

6.2.1 Porter-Cologne Water Quality Act

The state maintains independent regulatory authority over the placement of waste, including fill, into waters of the State (WoS) under the Porter-Cologne Water Quality Act. WoS are defined by the Porter-Cologne Water Quality Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The SWRCB protects all waters in its regulatory scope, but has special responsibility for isolated wetlands and headwaters. WoS are regulated by the RWQCBs under the State Water Quality Certification Program, which regulates discharges of dredged and fill material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act.

Projects that require an USACE permit, or fall under other federal jurisdiction, and have the potential to impact WoS are required to comply with the terms of the Water Quality Certification Program. If a proposed project does not require a federal license or permit, but does involve activities that may result in a discharge to WoS, then the local RWQCB has the option to regulate such activities under its state authority in the form of waste discharge requirements (WDRs) or certification of WDRs. Water Quality Order No. 2004-0004-DWQ specifies general WDRs for dredge or fill discharges to waters deemed by the USACE to be outside of federal jurisdiction under Section 404 of the CWA.

6.2.2 California Coastal Act

The California Coastal Act includes specific policies that address issues such as shoreline public access and recreation, lower cost visitor accommodations, terrestrial and marine habitat protection, visual resources, landform alteration, agricultural lands, commercial fisheries, industrial uses, water quality, offshore oil and gas development, transportation, development design, power plants, ports, and public works. The policies of the Coastal Act constitute the statutory standards applied to planning and regulatory decisions made by the California Coastal Commission and by local governments, pursuant to the Coastal Act.

7.0 Methodology

Wetland delineation methods described in *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and *The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE, 2010) were used to identify potential wetlands and other waters. The routine method for wetland delineation described in the USACE 1987 manual was used to identify potential wetlands within the study area. The USACE method relies on a three-parameter approach, in which criteria for hydrophytic vegetation, hydric soils, and wetland hydrology must each be met (present at the point of field investigation) to conclude that an area qualifies as a wetland. The wetland delineation was conducted within the coastal zone. Only one wetland parameter must be met for an area to be considered a wetland within the coastal zone.

Hydrophytic vegetation refers to plant species known to be adapted to wetland sites. To classify the hydrophytic plants onsite, the most recent *Western Mountains, Valleys, and Coast 2016 Regional Wetland Plant List* was used (USACE, 2016). Hydric soils are soils that are formed under saturated conditions, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile (USDA, 2010). Wetland hydrology is demonstrated through direct evidence (primary indicators) or indirect evidence (secondary indicators) of flooding, ponding, or saturation for a significant portion of the growing season (USACE, 2010).

TP locations were chosen based on site features such as geomorphic position, ponding, and increasing percentages of hydrophytic vegetation. Due to the highly manipulated nature of the site, and the continued use and size of the study area, pits were excavated to investigate conditions representative of a large area. Using paired pit investigation to ascertain the wetland boundary based on soils was difficult, due to the highly manipulated nature of the soils, however paired pits were excavated whenever possible. Wetland parameters met at each pit often varied widely within a small area, dependent on soil movement, vegetation disturbance, and the nature of fill. At each investigation point determined to lie within a three parameter wetland, the perimeter of the wetland was established based on hydrology, and changes in vegetation composition in addition to exploratory test pits. If a suspected wetland test pit was not determined to be a USACE-designated wetland, no additional analysis was done in the immediate area.

Prior to conducting the field investigation, SHN staff reviewed the USGS topographic quadrangle map (Figure 1); USDA-NRCS Web Soil Survey website (USDA, 2017); and NWI map (USFWS, 2017) (Appendix A). During the field investigation, TPs were characterized at the site for the aforementioned botanical, hydrological, and soil parameters.

TP locations were selected to:

- achieve appropriate coverage and characterization of wetland and upland habitats,
- document potential changes in the vegetative community (such as a shift in the dominant species), and
- determine the approximate boundary line between wetlands and uplands by determining the extent of key wetland criteria (hydrology, hydric soils, and hydrophytic vegetation).

Field investigations were conducted on March 23, and 24. Six (6) individual TPs were excavated to characterize the area and record information for soils, vegetation, and hydrology on USACE Wetland Determination Data Forms (Appendix D). Locations of TPs are shown on Figure 2. Photos of the study area are included in Appendix B.

7.1 Vegetation Methodology

Prior to the field investigation, a review of plant species reported to be within the project area was performed by querying the "Consortium of California Herbaria" (Consortium of California Herbaria, 2017) database records and "Calflora" (Calflora, 2017) and California Native Plant Society (CNPS 2017) observations. It was determined that the site investigation was performed during an above normal rainfall period by reviewing rainfall data (see Section 3.0 and Table 1). Absolute percent cover of each plant species was visually estimated within the TP and within each vegetation stratum. The tree stratum was inspected at a 30-foot radius centered on the TP, the herbaceous and sapling/shrub strata at a 5-foot radius. Botanical nomenclature follows *The Jepson Manual, Vascular Plants of California* (Baldwin et al., 2012) in addition to the online Jepson Interchange (U. C. Berkeley, 2017) for verification of species whose taxonomy may have changed since its publication.

The wetland indicator status of plant species for this investigation was based on the *Western Mountains, Valleys, and Coast 2016 Regional Wetland Plant List* (USACE, 2016). Synonyms were checked for species that did not appear on the USACE wetland plant list. Plant species were classified as:

- ***Obligate (OBL)–almost always occurs in wetlands***
- ***Facultative-wet (FACW)–usually occurs in wetlands, but may occur in non-wetlands***
- ***Facultative (FAC)–occurs in wetlands and non-wetlands***
- ***Facultative-upland (FACU)–usually occurs in non-wetlands, but may occur in wetlands***
- ***Upland (UPL)–almost never occurs in wetlands***
- ***Not listed (NL)-scored as an upland plant and calculated as such on wetland determination forms***

The 50/20 method[1] was applied to each stratum to determine the dominant plant species and to satisfy the hydrophytic vegetation criteria. If either hydric soils or wetland hydrology were present, the prevalence index[2] was applied. The occurrence and type of plant cover determine whether jurisdictional areas are identified as satisfying the vegetation criteria of a wetland or other waters. Those sites with little or no hydrophytic plant cover, or other sites not capable of supporting hydrophytic plant communities in normal circumstances, are identified as other waters, provided they have an ordinary high water mark (OHWM).

1. The 50/20 rule: for each stratum of the plant community, dominant species are the most abundant species that (when ranked in descending order of abundance and cumulatively totaled) immediately exceed 50% of total dominance measure for the stratum, plus any additional species that individually comprise 20% or more of the total dominance measure for the stratum (USACE, 2010).
2. The prevalence index is a weighted-average wetland indicator status of all plant species in the sampling plot or other sampling unit, where each indicator status category is given a numeric code (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5) and weighting is by abundance (absolute percent cover).

7.2 Soils Methodology

Soils were field-verified for the presence or absence of hydric conditions. All TPs were dug to a minimum depth of 20 inches, and the thickness of each soil horizon was measured. The Munsell Soil Color Chart (Kollmorgen Instruments Corporation, 1998) was referenced to determine the colors of the moist soil matrix and redoximorphic (redox) features (if present). Soils were closely inspected for hydric soil indicators, as defined by the NRCS "Field Indicators of Hydric Soils in the United States" (Version 7.0; USDA, 2010).

7.3 Hydrology Methodology

The presence (or lack) of wetland hydrology indicators was determined by direct observation of surface water, groundwater, or shallow soil saturation during the field investigation. In some cases, hydrology determinations were sought based on hydrology indicators (for example, drainage patterns, geomorphic placement, and water-stained leaves) rather than actual direct evidence from saturation or inundation itself. Additionally, observations were sought to indicate if the site is subject to flooding or standing water. Potential indicators would include water marks, drift deposits, sediment deposits, alpha, alpha-dipyridyl, and similar features. Indicators of extended period saturation would include oxidized rhizospheres surrounding living roots or the presence of reduced iron or sulfur in the soil profile. A site location must contain at least one primary indicator or two secondary indicators to have the hydrology parameter.

Alpha, alpha-dipyridyl was not used due to the above-average rainfall indicated by the WETS rainfall data (Table 1), the occurrence of staining on soil peds was not used as a primary hydrology indicator (Presence of Reduced Iron: C4).

7.4 Ordinary High Water Mark Methodology

For purposes of Section 404 of the CWA, the lateral limits of jurisdiction over non-tidal water bodies in the absence of adjacent wetlands extend to the OHWM. When adjacent wetlands are present, CWA jurisdiction extends beyond the OHWM to the limits of the adjacent wetlands. For purposes of Sections 9 and 10 of the Rivers and Harbors Act of 1899, the lateral extent of federal jurisdiction, which is limited to the traditional navigable waters of the United States, extends to the OHWM, whether or not adjacent wetlands extend landward of the OHWM (USACE, 2014).

USACE regulations define the term OHWM for the purposes of the CWA lateral jurisdiction as follows:

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

The OHWM in non-perennial streams corresponds with the boundaries of the active channel, which are typically expressed by some combination of three primary indicators: a topographic break in slope, change in sediment characteristics, and change in vegetation characteristics (USACE,

2014). The following supporting features should be considered when making an OHWM determination, to the extent that they can be identified and are deemed reasonably reliable (USACE, 2014):

- Drift/wrack
- Erosion/scour
- Bank undercutting
- Root exposure
- Point bars
- Water staining
- Litter water staining
- removal
- Silt deposits
- Shelving
- Headcut/knickpoint
- Macroinvertebrates

No streams or drainages passed through the study area or area of potential effects and no OHWM was observed.

8.0 Discussion and Results

Field investigations were conducted on March 23, and 24, 2017. Six TPs were excavated to characterize the area and record information for vegetation, soils, and hydrology. Once the relationship was established between hydric soils, vegetation, and hydrology in a portion of the study area, changes in hydrology and vegetation were used along with exploratory soil probing to delineate the boundaries of the wetland.

Locations of TPs are shown on Figure 2. Photos of the study area are shown in Appendix B. In the following sections, the TPs are individually discussed, describing the physical features and considerations of the site, followed by a Data section that summarizes information from the completed "Wetland Determination Data Forms" located in Appendix D.

8.1 TP1 Test Site

8.1.1 Discussion

TP1 is located in the northeastern portion of the study area (Figure 2), and was investigated on March 23, following recent rains during an abnormally wet rainy season. This area is representative a large depression alongside Vance Avenue that supports a number of native species and an isolated native vegetation community. TP1 was excavated within the Vance Avenue right of way on the eastern edge of the depression within an area gently sloping (1-2 percent slope) toward the center of the depression. The TP was excavated on the edge of dune willow and California wax myrtle canopy, at the edge of wetland conditions, and near the beginning of industrial asphalt (See Figure 2 and Photos B1, B2, B3 and B4).

8.1.2 Data

TP1 met two wetland parameters of hydrophytic vegetation and hydric soils. The vegetation parameter was met due to dominance of the area by slough sedge (*Carex obnupta* [OBL]) with 18 percent cover and velvet grass [FAC] with 19 percent cover in the herb stratum and coast willow [FACW] with 42 percent cover and California wax myrtle [FAC] with 13 percent cover in the tree stratum. Lesser dominants included California blackberry [FACU] with 3 percent cover, large quaking grass with 20 percent cover and European beach grass (*Ammophila arenaria* [FACU]) with 5

percent cover. Thirty eight percent of the area within TP1 was bare ground, a result of leaf litter, the nearby road base and a fire hose box. Hydric soils were present as evidenced by the presence of the black histic (A3) indicator. The hydrology parameter was not met at this site due to a lack of wetland hydrology indicators, even following abnormally high recent and seasonal rainfall amounts. Soils were sandy at this location, and well drained. Hydric soils may be a remnant from previous conditions, or a reflection of stormwater flows off of the expanse of asphalt, although a lack of flow patterns suggests this might not be the case.

8.2 TP2 Test Site

8.2.1 Discussion

TP2 is located in the northeastern portion of the study area (Figure 2), approximately 130 feet northwest of TP1, on the opposite edge of the same isolated geomorphic depression. TP2 was excavated on March 23, 2017 following recent rains during an abnormally wet rainy season. TP2 is representative of the northwestern side of the geomorphic depression. The area appears to be relatively undisturbed as evidenced by a higher percentage of native species in spite of its being surrounded by former industrial development. Standing water and a fully closed canopy of coast willow and California wax myrtle indicate the undisturbed nature of the location represented by TP2. The wetland area may be remnants of a former deflation basin that was left relatively undisturbed during the development of the surrounding area (See Figure 2 and Photos B1, B2 and B4).

8.2.2 Data

TP2 had all three wetland parameters present. The vegetation parameter was met due to a dominance of the area surrounding TP2 by slough sedge [OBL] with 19 percent cover in the herb stratum, Himalayan blackberry [FAC] with 5 percent cover in the shrub stratum, and coast willow [FACW] with 70 percent cover and California wax myrtle with 18 percent cover in the tree stratum. Lesser dominants include California blackberry with 1 percent cover and English ivy (*Hedera helix* [FACU]) with 1 percent cover. Eighty-one percent of the area within TP2 was bare ground, a result of pooled water at the time of the survey, deep leaf litter and shade under the California wax myrtle and coast willow canopy. Hydric soils were present as evidenced by the histic epipedon indicator (A2) from 0-12 inches, which is a highly organic soil that forms under saturated conditions. Wetland hydrology was evident within the location surrounding TP2 with numerous wetland hydrology indicators. Primary indicators observed at this location included saturation (A3), high water table (A2), surface water (A1), water marks (B1), and aquatic invertebrates (B13). Secondary indicators included water stained leaves (B9) and a geomorphic position (D2).

8.3 TP3 Test Site

8.3.1 Discussion

TP3 is located in the northwestern portion of the study area (Figure 2), and was investigated on March 23, 2017, following recent rains during an abnormally wet rainy season. TP3 is representative of a large, highly manipulated area in the northwestern section of the project area. The area was at one point the location of a log deck, and is covered in very compacted gravels. On-going manipulation and disturbance within this area is evident, with exposed soils, tire-tracks and

heavy equipment work. Vegetation density varies across the elevated former log deck, with more disturbed and compacted areas supporting very little plant growth. Water was seen ponding in the area as a result of somewhat recent heavy equipment work, including tire tracks and scalping, and recent rainfall within the previous week. The area was mostly level with 0-1 percent slopes (See Figure 2 and Photo B6).

8.3.2 Data

TP3 did not meet any wetland parameters; however several hydrology indicators were observed that falsely indicate wetland hydrology. The vegetation parameter was not met due to dominance of the area by upland indicator species. This included small fescue [NL] with 39 percent cover and large quaking grass [NL] with 20 percent cover. Lesser dominants included creeping bentgrass [FAC] with 4 percent cover, birds-foot trefoil [FAC] with 3 percent cover, among others. Thirty one (31) percent of the area surrounding TP3 was bare soil. This was a result of compacted gravel and recent scalping of the area by heavy equipment. No hydric soil indicators were present, with soils consisting of very compacted gravel over well drained sand. Several wetland hydrology indicators were observed at this location that gave false positive wetland hydrology. Saturation (A3) was observed, however no water table or surface water was present. Saturation was most likely due to recent rainfall, including precipitation the day prior to the field work. Well drained sandy soils and elevation prevent water from pooling. Additional hydrology parameters observed included a sparsely vegetated concave surface (B8) and geomorphic depression (D2). Both of these indicators observed were a direct result of recent heavy equipment work. The sparse vegetation was a result of scalping of the surface the preceding year, which also created the geomorphic depression. The area was investigated to ensure that no wetland areas were overlooked during the wetland delineation, however, TP3 is not considered to meet the hydrology parameter.

8.4 TP4 Test Site

8.4.1 Discussion

TP4 is located in the northern portion of the study area near the recycling facility (Figure 2), and was investigated on March 23, 2017, following recent rains during an abnormally wet rainy season. TP4 is representative of the a geomorphic depression with a DI in the low portion of the swale indicating that this area was likely excavated as a drainage during industrial development. Vegetation was less manipulated than the surrounding elevated areas, with a developed shrub layer, and an isolated Sitka spruce (*Picea sitchensis*). TP4 was excavated within the lowest elevation of the swale, away from the DI in order to investigate the wettest possible location of this swale (See Figure 2).

8.4.2 Data

No wetland indicators were present at TP4. The vegetation parameter was not met due to a dominance of the area surrounding TP4 by upland shrubs. The shrub stratum was dominated by coyote brush [NL], and California blackberry [FACU] with 20 and 13 percent cover respectively. The herb stratum was dominated by the wetland indicator species canary reedgrass (*Phalaris arundinacea* [FACW]) with 30 percent cover, with lesser dominance by the upland indicator species sword fern (*Polystichum munitum* [FACU]) and cutleaf geranium [NL]. Tree stratum was present at this location, provided by Sitka spruce [FAC] with 10 percent cover. Sixty-eight (68) percent of the area around TP4 was bare ground, a result of shading and heavy duff from the shrub and tree

stratums. No hydric soil indicators were present with soils composed of a well draining loam above well drained sand. The two primary wetland hydrology indicators of a high water table (A2), and Saturation (A3) were observed at this location, however, the lack of hydric soils, and lack of dominance of the area by hydrophytic vegetation suggest that these indicators are a result of recent rainfall and abnormally high rainfall totals for the year, rather than wetland hydrology. The nearby DI prevents water from pooling in the area, while the lack of connectivity between the swale and other drainages prevents water from flowing into this area. Due to the lack of additional wetland hydrology indicators, and a lack of additional wetland parameters met at this site, it is determined the area surrounding TP4 does not meet the wetland hydrology parameter and is not considered a wetland.

8.5 TP5 Test Site

8.5.1 Discussion

TP5 is located in the middle western portion of the study area between Vance Avenue and the railroad right of way (Figure 2), and was investigated on March 24, 2017, following recent rains during an abnormally wet rainy season. TP5 is representative of a drainage way between Vance Avenue and the Railbed. The drainage flows through a culvert under the railroad and into a willow dominated wetland to the west of the project area. The area is characterized by non-native grassland reflecting the disturbed nature of the site, and regular disturbance within this area. Slopes ranged between 2 and 3 percent within the area immediately surrounding TP5 (See Figure 2 and Photo B7).

8.5.2 Data

TP5 met both the hydric soil and wetland hydrology parameters, however hydrophytic vegetation was not dominant within the area surrounding TP5. The vegetation parameter was not met due to a dominance of the area surrounding TP 5 by large quaking grass [NL] and sweet vernal grass [FACU] with 18 and 14 percent cover respectively. Additional dominance by the wetland indicator species, velvet grass [FAC] with 15 percent cover was observed. Lesser dominants included birds foot trefoil [FAC], beach strawberry (*Fragaria chiloensis* [FACU]), cutleaf plantain (*Plantago coronopus* [FACU], and creeping bentgrass [FAC]. Thirty-four (34) percent of the area around TP5 was bare ground, a result of pooled water and poor soil conditions associated with disturbance and previous development. Hydric soils were present as indicated by the hydric soil indicators of sandy redox (S5) and a redox dark surface (F6). Soils were sandy with a 5 inch upper horizon with a significant percentage of organic matter. The presence of sandy redox and a redox dark surface indicates pooling at this site for large portions of the year and persistent wet conditions at this location. Wetland hydrology was observed at this location as evidenced by the wetland hydrology primary indicators of surface water (A1) within 2 feet of the pit, a high water table (A2), saturation (A3), watermarks (B1), a sparsely vegetated concave surface (B8), and aquatic invertebrates (B13). Secondary wetland hydrology indicators observed included water-stained leaves, drainage patterns and a geomorphic position between Vance Avenue and the railroad. The lack of hydrophytic vegetation indicates the disturbed nature of the site rather than a lack of wetland conditions.

8.6 TP6 Test Site

8.6.1 Discussion

TP6 is located in the southern portion of the study area to the west of the railroad tracks (Figure 2), and was investigated on March 24, 2017, following recent rains during an abnormally wet rainy season. TP6 is representative of the edge of the wetland to the west of the project area which receives the drainage from the wetland area represented by TP5. The railroad bed represents an abrupt edge to the wetland; however conditions were investigated to the west of the tracks to ascertain wetlands adjacent to the area of potential effects, and to analyze potential setback requirements. The area at TP6 was not as manipulated as TP5, although conditions were similar. TP6 represents the edge of industrial development and area of natural dune habitat between the railroad and New Navy Base Road. The area was mostly flat with a 0-1% slope preventing water from flowing quickly out of the area (See Figure 2 and Photo B7).

8.6.2 Data

Conditions at TP6 were similar to those found at TP5. TP6 met both the hydric soil and wetland hydrology parameters, however hydrophytic vegetation was not dominant within the area surrounding TP6. The vegetation parameter was not met due to co-dominance of the area surrounding TP6 by the wetland indicator species, dune rush (*Juncus lescurii* [FACW]) with 30 percent cover, and the upland indicator species large quaking grass [NL], with 28 percent cover. Lesser dominants include small fescue [NL], velvet grass [FAC], European beach grass [FACU] and dune knotweed (*Polygonum paronychia* [NL]), among others. Only 14 percent of the area around TP6 was bare ground. This was a result of scattered railroad bed gravel, juvenile large quaking grass and grass thatch. Hydric soils were present as evidenced by a reduced matrix observed in the second horizon, as well as the hydric soil indicators of sandy redox (S5), and a redox dark surface (F6). Soils were sandy from the top horizon down to 24 inches. Much less organic material was observed in the upper horizon at TP6 than was observed at TP5. The presence of a reduced matrix, sandy redox and a redox dark surface indicates pooling at this site for portions of the year and persistent wet conditions at this location. Wetland hydrology was observed at this location as evidenced by the wetland hydrology primary indicators of a high water table (A2), saturation (A3), and oxidized rhizospheres along living roots (C3). The secondary wetland hydrology indicator observed included a geomorphic position west of the railroad. The lack of hydrophytic vegetation dominance, and the heavy dominance of the site by the FACW dune rush, indicates the disturbed nature of the site rather than a lack of wetland conditions.

8.7 Ordinary High Water Mark (OHWM)

No streams or drainages passed through the study area or area of potential effects and no OHWM was observed.

8.8 National Wetlands Inventory (NWI)

The USFWS NWI website (Appendix A) shows freshwater emergent wetland (PEM1C) and excavated freshwater pond (PAB4Hx) NWI designation in the study area. While freshwater emergent wetland was found within the study area, the NWI mapping was found to be inaccurate during the site-specific analysis. Many areas designated as wetland by the NWI mapping were

found not to exhibit wetland parameters, primarily the area to the west and north of the recycling facility. The NWI map does reflect wetland conditions to the west of the project area within the southern portion of the project area. The wetland area represented by TPs 1 and 2 was not depicted on the NWI map, however wetland conditions were present. The area depicted as excavated freshwater pond does reflect conditions on the ground. The NWI map is a good tool for estimating wetland location, type, and extent for reconnaissance purposes, but must be confirmed by on the ground study and delineation. It is stated within the data limitation, exclusions and precautions page that the data contained within the NWI is to be used for reconnaissance level information of wetlands, and a margin of error is inherent with the use of aerial imagery in wetland determination (NWI Data limitations, Exclusions, and Precautions 2017).

9.0 Conclusions

The site investigation occurred during an above-normal rainfall season during the spring of 2017. Following the USACE wetland parameter approach in the coastal zone, where only one wetland parameter is needed for an area to be considered wetland, TP1, TP2, TP5, and TP6 meet one or more of the three wetland parameters of hydrophytic vegetation, hydric soils, and wetland hydrology indicators necessary to place them within wetland boundaries (Figure 2; Table 2).

These pits represent three wetland areas delineated within the project area, and area of potential effects. The first wetland area, represented by TP1 and TP2 is approximately square feet and represents freshwater emergent wetland, within a relatively undisturbed isolated basin. The wetland within this location has a well developed canopy composed of dune willow and California wax myrtle, with a primarily native understory and shrub layer. The area represented by TP1 and TP2 represents valuable wetland habitat surrounded by heavily manipulated industrial development. It is recommended that this hollow be avoided during the project with an appropriate buffer to avoid potential impacts to the wetland habitat at this location.

The second wetland area is represented by TP5 and TP6. TP5 represents a wetland area between Vance Avenue and the railroad tracks that is hydrologically connected to the wetland represented by TP6 through a culvert under the rail bed. Conditions within the wetland at TP5 and TP6 are disturbed, as evidenced by an overwhelming dominance of the area by non-native species and invasive grass species. Stormwater from upland paved industrial areas to the east collect within in the depression between Vance Avenue and the railroad after passing through a culvert under Vance Avenue. Hydric soils, pooled water, and other wetland hydrology indicators indicate the edge of wetland due to the invasive vegetation being a poor indicator of wetland extent. It is recommended that the wetland represented by TP5 and TP6 be avoided during construction, however the lack of quality wetland conditions between the railroad and Vance Avenue may warrant reduced setbacks for the duration of the project. Willow dominated wetland beyond the fence line and area of potential effects represents high quality habitat and should be avoided.

The third wetland area observed exists beyond the fence line and area of potential effects, and was not sampled with a test pit due to lack of wetland conditions on the eastern side of the fence. Even though the area was not sampled, the region beyond the fence represents native dune deflation basin wetland and should be avoided during the life of the project. The existing fence and railroad

tracks represent an established boundary that should prevent encroachment into the wetland area just beyond the fence line. Appropriate buffers should be established to minimize impacts to wetland habitat in the area.

The wetlands across the project area and area of potential effects are freshwater emergent wetlands that occur within historic dune deflation basins, or within industrial drainages. The project area has historically been, and continues to be, highly manipulated and in a state of constant disturbance due to past and ongoing industrial use. The establishment of appropriate buffers surrounding wetland habitat is necessary to ensure that wetland conditions are not disturbed and that habitat remains within the mosaic of disturbed industrial land. The Humboldt Bay Area Plan of the Humboldt County Local Coastal Program sets forth appropriate wetland buffers, buffer reductions and development potential within the vicinity of wetlands at this location. See Figure 2 for the extent of wetlands found at each site. Table 2 describes the wetland conditions found at each TP within this project area.

Table 2
Wetland Delineation Results
RMTII Samoa Effluent Pipeline, Samoa, CA

Test Pit	# Parameters[1] met	Parameters[1] met	Cowardian Type
1	**2**	Vegetation, Hydric soils	**Freshwater, emergent**
2	**3**	All	**Freshwater, emergent**
3	**0**	None	**None**
4	**0**	None	**None**
5	**2**	Hydric soils, Hydrology	**Freshwater, emergent**
6	**2**	Hydric soils, Hydrology	**Freshwater, emergent**

1. ACOE Wetland parameters of Hydrophytic Vegetation, Hydric Soils and Hydrology

10.0 Limitations

The conclusions in this report represent a "snapshot in time" and it is possible that some species were not present at the time of the fieldwork. This report documents the investigation by using the best professional judgment of SHN's botanist and soil scientist. The conclusions should be verified by the USACE through receipt of a jurisdictional determination letter.

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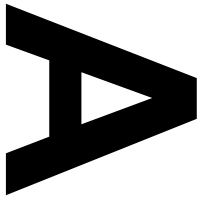

National Wetlands Inventory

U.S. Fish and Wildlife Service
National Wetlands Inventory

RMT II Samoa Effluent Pipeline Project
NWI Map

March 2, 2017

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

B

Site Photographs

Photo B1: TP1 and TP2 Area, looking south. **Note well developed dune willow and California wax myrtle canopy.**

Photo B2: TP1 and TP2 Area, looking west. **Note abrupt edge of willow canopy and beginning of disturbed industrial area characterized by non-native herbaceous vegetation.**

Photo B3: Soil profile at TP1. **Note black histic layer underlain by very loose sand. (Dark color of upper horizon somewhat lost due to direct sun and photo quality).**

Photo B4: TP2 Site looking north beneath the canopy **(3 parameter). Note pooled water in background (dark region), and dominance of the area by native vegetation.**

Photo B5: Region west of the Recycling facility. **Note lack of wetland conditions and wetland vegetation. NWI aerial mapping mistook California blackberry thicket for wetland vegetation.**

Photo B6: Region northwest of the recycling facility. **Note lack of wetland conditions and wetland vegetation. Gorse in foreground extremely invasive, with great potential to invade surrounding land.**

Photo B7: Southern study area, looking south. **Wetland found along side Vance Avenue and Railroad, in vicinity of willow thicket on the right side of the photo.**

Photo B8: Southern terminus of the project area, looking east. **Note dominance by upland vegetation, and lack of wetland conditions.**

Plant List

Table C-1
Plants Observed at Wetland Pits
RMTII Samoa Effluent Pipeline, Samoa, California

Scientific Name	Common Name	Indicator 2016[1]
Agrostis stolonifera	creeping bentgrass	FAC
Ammophila arenaria	European beach grass	FACU
Anthoxanthum odoratum	sweet vernal grass	FACU
Baccharis pilularis	coyote brush	NL
Briza maxima	large quaking grass	NL
Cardionema ramosissimum	sand mat	NL
Carex obnupta	slough sedge	OBL
Festuca microstachys	small fescue	NL
Fragaria chiloensis	beach strawberry	FACU
Geranium dissectum	cutleaf geranium	NL
Hedera helix	English ivy	FACU
Holcus lanatus	velvet grass	FAC
Juncus lescurii	dune rush	FACW
Lotus corniculatus	birds-foot trefoil	FAC
Morella californica	California wax-myrtle	FAC
Phalaris arundinacea	Canary reedgrass	FACW
Picea sitchensis	Sitka spruce	FAC
Plantago coronopus	cutleaf plantain	FACU
Polygonum paronychia	dune knotweed	NL
Polystichum munitum	sword fern	FACU
Rubus armeniacus	Himalayan blackberry	FAC
Rubus ursinus	California blackberry	FACU
Salix hookeriana	dune rush	FACW
Vicia sativa	spring vetch	UPL

1. Indicators are abbreviated as follows:
   OBL: Obligate
   FACW: Facultative
   FAC: Facultative
   FACU: Facultative upland
   UPL: Upland
   NL: Not listed (considered upland)

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: RMT II Samoa Effluent Pipe City/County: Humboldt Sampling Date: 3/23/2017

Applicant/Owner: HB Harbor District State: CA Sampling Point: TP 9

Investigator(s): Saler, J.; Poll, S. Section, Township, Range: Sec. 15, 16+17, T5N, R1W, HBM

Landform (hillslope, terrace, etc.): Sandy Dunes (Ind. fill) Local relief (concave, convex, none): Concave Slope (%): 1-2

Subregion (LRR): A, MLRA 4B Lat: 40.813128° Long: -124.190174° Datum:

Soil Map Unit Name: Samoa-clambeach-Dunelands, Industrial fill NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: by red fire hydrant
~170% above normal rainfall

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix hookeriana	42	✓	FACW
2. Morella californica	13	✓	FAC
3.			
4.			
	55 = Total Cover		27.5/11
Sapling/Shrub Stratum (Plot size: ____)			
1. Rubus ursinus	3	✓	FACU
2.			
3.			
4.			
5.			
	3 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Carex obnupta	18	✓	OBL
2. Briza maxima	20	✓	NL
3. Hal cus lanatus	19	✓	FAC
4. Ammophila arenaria	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	62 = Total Cover		31/12.4
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 38%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: TP 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					MSand	Jet Black Mucky w/ Sand grains
10-24+	10YR 4/2	100					Sand	very loose

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: RMT II Samoa Effluent Pipeline City/County: Humboldt Sampling Date: 3/23/2017

Applicant/Owner: Humboldt Bay Harbor District State: CA Sampling Point: TP 2

Investigator(s): Sam Polly, Joseph Saler Section, Township, Range: Sec. 15, 16+17, T5N, R1W, HBM

Landform (hillslope, terrace, etc.): Deflation Basin Local relief (concave, convex, none): Concave Slope (%): 3-45 (sloping into bowl)

Subregion (LRR): A, MLRA, 4B Lat: 40.813128° Long: -124.190174° Datum: _____

Soil Map Unit Name: Samoa-Clambeach-Dunelands, Industrial fill NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

~170% above normal rainfall for the season

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix hookeriana	70	✓	FACW
2. Morella californica	18	✓	FAC
3.			
4.			
	88 = Total Cover		4/4 = 11.6
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus ursinus	1		FACU
2. Rubus armeniacus	5	✓	FAC
3.			
4.			
5.			
	6 = Total Cover		3/1.2
Herb Stratum (Plot size: _____)			
1. Carex obnupta	19	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	19 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. Hedera helix	1	✓	FACU
2.			
	1 = Total Cover		

% Bare Ground in Herb Stratum 81%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

- Bare ground includes open water.

SOIL

Sampling Point: TP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Muck	Small percentage of sand
12-24+	10Y 2.5/1	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- X Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- X Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): Surface

Water Table Present? Yes X No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: RMT II Samoa Effluent Pipeline City/County: Humboldt Sampling Date: 3/23/2017

Applicant/Owner: Humboldt Bay Harbor District State: CA Sampling Point: TP3

Investigator(s): Joseph Siler; Sam Polly Section, Township, Range: Sec. 15, 16 + 17, T5N, R1W, HBM

Landform (hillslope, terrace, etc.): Dunes on Ind. fill Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): A, MLRA, 4B Lat: 40.813128° Long: -124.190174° Datum: _____

Soil Map Unit Name: Samoa-Clambeach-Dunlands, Industrial fill NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present? see remarks →	Yes _____ No X	
Wetland Hydrology Present?	Yes X No _____	

Remarks: ~170 % above normal rainfall for the season
~ Excavated pit within industrial fill

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Agrostis stolonifera	4		FAC
2. Lotus corniculatus	3		FAC
3. Holcus lanatus	2		FAC
4. Briza maxima	20	✓	NL
5. Festuca microstachys	39	✓	NL
6. Vicia sativa	1		UPL
7.			
8.			
9.			
10.			
11.			
	69 = Total Cover		34.5 / 13.8
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 31

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks:
- Within shallow, excavated depression

SOIL

Sampling Point: TP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					Loam	
2-8	10YR 4/1	100					VCoL	Imported fill
8-24+	2.5Y 4/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

At 8inches: Thin layer 7.5Y 2.5/3

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 2-4 inches

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

- Hydrology reflects current high rainfall (no water table present)
- Sparsely vegetated surface potentially a result of recent heavy equipment use
- Geomorphic position a shallow excavated depression

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: RMT II Samoa Effluent Pipeline City/County: Humboldt Sampling Date: 3/23/2017
Applicant/Owner: Humboldt Bay Harbor District State: CA Sampling Point: TP4
Investigator(s): Sam Polly, Joseph Saker Section, Township, Range: Sec. 15, 16, + 17, T5N, R1W, HBM
Landform (hillslope, terrace, etc.): Industrial site in Dunes Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR): A, MLRA, 4B Lat: 40.812757° Long: -124.190930 Datum: _____
Soil Map Unit Name: Samoa-Dombeach-Dunelands, Industrial fill NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks: ~170% above normal rainfall for the season

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Picea sitchensis	10	✓	FAC
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus ursinus	13	✓	FACU
2. Baccharis pilularis	20	✓	NL
3.			
4.			
5.			
	33 = Total Cover		16.5/6.6
Herb Stratum (Plot size: _____)			
1. Phalaris arundinacea	30	✓	FACW
2. Cerastium dissectum	1		NL
3. Polystichum munitum	1		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	32 = Total Cover		16/5.4
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 68%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: Bareground due to shade from shrub and tree layer. Diff.

SOIL

Sampling Point: TP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/2	100					L	
7-24+	2.5Y 3/2	100					S	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): 11 inches

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 7 inches

see remarks

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology reflects recent high rainfall amounts and rain on day preceding field work. Note lack of hydrophytic vegetation or additional indicators

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: RMTII Samoa Effluent Pipeline City/County: Humboldt Sampling Date: 3/24/2017
Applicant/Owner: Humboldt Bay Harbor District State: CA Sampling Point: TP5
Investigator(s): Joseph Sater, Sam Polly Section, Township, Range: Sec. 15, 16, + 17, T5N, R1W, HBM
Landform (hillslope, terrace, etc.): Sandy Dunes, Ind. Site Local relief (concave, convex, none): Concave Slope (%): 2-3
Subregion (LRR): A, MLRA, 4B Lat: 40.812757° Long: -124.170930 Datum:
Soil Map Unit Name: Samoa-Clambeach-Dunelands, Industrial fill NWI classification: PEM1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	
Hydric Soil Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Wetland Hydrology Present?	Yes X	No _____	

Remarks: ~170% above normal rainfall for the season

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Holcus lanatus	15	✓	FAC
2. Lotus corniculatus	12		FAC
3. Agrostis stolonifera	2		FAC
4. Briza maxima	18	✓	NL
5. Anthoxanthum odoratum	14	✓	FACU
6. Fragaria chiloensis	3		FACU
7. Plantago coronopus	2		FACU
8.			
9.			
10.			
11.			
	66 = Total Cover		33/13.2
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 34%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	3	x 3 =	9
FACU species	3	x 4 =	12
UPL species	1	x 5 =	5
Column Totals:	7 (A)		26 (B)

Prevalence Index = B/A = 3.71

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: Bare ground a result of pooled water, poor soil conditions

SOIL

Sampling Point: TP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100					S	significant % organic matter
5-24+	5Y 2.5/1	61	2.5Y 3/3	1	C	M	S	
			2.5Y 3/2	38	C	M	S	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ! Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- X Salt Crust (B11)
- X Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 4inches (2ft from TP)

Water Table Present? Yes X No ____ Depth (inches): 4inches

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): Surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: RNT II Samoa Effluent Pipeline City/County: Humboldt Sampling Date: 3/24/2017

Applicant/Owner: Humboldt Bay Harbor District State: CA Sampling Point: TP6

Investigator(s): Sam Polly, Joseph Saler Section, Township, Range: Sec. 15, 16, + 17, T5N, R1W, HBM

Landform (hillslope, terrace, etc.): Sandy Dunes, Indust. Site Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): A, MLRA, 4B Lat: 40.812757° Long: -124.190930 Datum:

Soil Map Unit Name: Samoa-Clambeach-Dunelands, Industrial fill NWI classification: PEM 1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: ~170% above normal rainfall for the season

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Juncus lesueurii	30	✓	FACW
2. Holcus lanatus	6		FAC
3. Fragaria chiloensis	1		FACU
4. Brida maxima	28	✓	NL
5. Ammophila arenaria	5		FACU
6. Polygonum paronychia	3		NL
7. Geranium dissectum	1		NL
8. Cardionema ramosissimum	1		NL
9. Vicia sativa	1		UPL
10. Festuca microstachys	10		NL
11.			
	86 = Total Cover		43/11.2
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 14

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	1	x 3 =	3
FACU species	2	x 4 =	8
UPL species	6	x 5 =	30
Column Totals:	10 (A)		43 (B)

Prevalence Index = B/A = 4.3

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: TP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					S	
2-8	2.5Y 3/2	67	10YR 3/3	3	C	PL	S	
			5Y 3/2	30	C	M		
8-24+	5Y 3/1	100					S	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks: - Reduced matrix observed in second horizon

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ____

Water Table Present? Yes X No ___ Depth (inches): 7 inches

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 3 inches

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Figure 19–81 Rainfall documentation form

Rainfall Documentation
(Use with photographs)

Date 3/27/17

Weather station Woodley Island Landowner Humm. Bay Harbor Dist. Tract no. _____

County Humboldt (06023) State CA

Soil name _____ Growing season _____

Photo date _____

	Long-term rainfall records							
Month	3 yrs in 10 less then	Normal	3 yrs in 10 more then	Rain fall	Condition dry, wet normal	Condition value	Month weight value	Product of previous to columns
1st Prior month Mar	3.80	5.54	6.61	7.18	Wet	3	3	9
2nd Prior month Feb	3.57	5.51	6.63	11.10	Wet	3	2	6
3rd Prior month Jan	3.67	5.97	7.22	10.51	Wet	3	1	3
Compared to photo date							Sum	18

Note: If sum is

6-9	Then prior period had been drier than normal
10-15	Then prior period has been normal
15-18	Then prior period has been wetter than normal

Condition value

Dry	=1
Normal	=2
Wet	=3

Conclusion: Wetter than Normal