Final

Environmental Assessment

Advanced Water Treatment Facility/ Utility Corridor Project (P-113) at Marine Corps Base Camp Pendleton San Diego County, California

December 2010

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DEPARTMENT OF DEFENSE
UNITED STATES MARINE CORPS
FINDING OF NO SIGNIFICANT IMPACT
FOR THE ADVANCED WATER TREATMENT FACILITY CORRIDOR (P-113) PROJECT
MARINE CORPS BASE CAMP PENDLETON, CALIFORNIA

Pursuant to the Council on Environmental Quality regulations (40 CFR Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA) (42 USC §4321 *et seq.*), Department of the Navy procedures for implementing NEPA (32 CFR Part 775) and Marine Corps Order P5090.2A, Change 2, the U.S. Marine Corps (USMC) gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement (EIS) will not be prepared for the Advanced Water Treatment Facility Corridor (P-113) Project at Marine Corps Base (MCB) Camp Pendleton, California. Based on the analysis provided in the EA, I find that Alternative 4, which I have selected, will not have a significant impact on the human environment. Therefore, an EIS is not needed.

Background: Twelve wells in the Santa Margarita River Basin and three wells in the Las Pulgas/Las Flores Basin provide the water supply for the MCB Camp Pendleton Southern Water System. Two parameters of the well water, total dissolved solids (TDS) and total organic carbon (TOC), directly affect MCB Camp Pendleton's ability to comply with water quality regulations: (1) the national secondary drinking water standard (color, taste and odor) for TDS of 500 milligrams per liter (mg/L), and (2) the Regional Water Quality Control Board Basin Plan limit of 750 mg/L TDS for surface and groundwater discharge in the project area. Currently, the TDS concentration for potable water distributed by the Southern Water System is 755 mg/L. The elevated TDS concentrations in potable water distributed by the Southern Water System have also resulted in elevated TDS concentrations in wastewater effluent from the existing MCB Camp Pendleton sewage treatment plants, which in turn reduces the ability of MCB Camp Pendleton to optimize reuse of its reclaimed wastewater as per the overall wastewater compliance strategy outlined in the P002/P110 Tertiary Treatment Plant and Associated Wastewater Conveyance Facilities EIS and Record of Decision. A reduction of TOC is needed because TOC is a precursor to total trihalomethane (TTHM) formation within the water distribution system as a byproduct of using chlorine for disinfection. TOC reduction in potable water distributed by the Southern Water System will be beneficial, as it will aid in compliance with Disinfection By-product Rule drinking water standards. In addition, the Proposed Action will also provide corrosivity reduction by controlling the acidity (pH) in the water. This control of pH will support efforts by MCB Camp Pendleton to meet wastewater discharge requirements by reducing the levels of dissolved copper below the level that requires that wastewater sludge to be handled as hazardous waste.

Proposed Action: The purpose of the Proposed Action is to construct, operate, and maintain an Advanced Water Treatment facility and associated infrastructure at MCB Camp Pendleton. The Proposed Action is needed to ensure compliance with more stringent secondary drinking water standards for TDS and to meet the Federal Stage 2 Disinfectants and Disinfection By-products Rule requirements for TTHMs in drinking water by removing TOC in well water. The Proposed Action consists of adding treatment processes to the Haybarn Canyon Drinking Water Iron/Manganese Removal Treatment Facility and constructing a pipeline for disposal of brine that will be generated by the facility. An up to 16-inch (41-centimeter) internal-diameter brine disposal pipeline will extend approximately 10 miles (16 kilometers) from the Haybarn Facility to the ocean on the southern coast of MCB Camp Pendleton.

Alternatives: The EA analyzed five alternatives: Alternatives 1-4 and the No-Action Alternative. Under Alternatives 1, 2, and 3 the end of the pipeline would have been fixed to the Del Mar Boat Basin jetty in the wave splash zone for brine disposal. Under Alternative 4, a dispersal system based on the concept of a radial collector well under the ocean floor will be used for brine disposal at Del Mar Recreation Beach.

Summary of Environmental Effects: The EA analyzed the potential environmental impacts resulting from implementation of Alternatives 1–4 and the No-Action Alternative. The resources most likely to be affected by the Proposed Action are biological resources, cultural resources, air quality, utilities, and hydrology and water quality. Conversely, impacts to the following resources were considered negligible or non-existent and were not analyzed further in the EA: aesthetics; geology, soils, and seismicity; hazardous materials/wastes; land use; noise; public health and safety; socioeconomics and environmental justice; and transportation and circulation. The Proposed Action will have negligible direct, indirect, and cumulative impacts on the quality of the local environment and will comply with all regulatory requirements; no significant impacts will occur.

The Proposed Action will be conducted in compliance with the terms and conditions, special conservation measures, and avoidance and minimization measures specified in the Biological Opinion provided by the USFWS to the USMC (refer to Appendix F of the EA). A Record of Non-Applicability for Clean Air Act General Conformity requirements has been prepared and approved for this project (refer to Appendix E of the EA). The USMC prepared and submitted a cultural resources survey report to the State Historic Preservation Office (SHPO). The SHPO provided a Memorandum of Agreement to the USMC (refer to Appendix F of the EA) concurring that a finding of No Adverse Effect with conditions is appropriate pursuant to 36 CFR § 800.5(b) for this project and that the documentation supporting this finding has been provided pursuant to 36 CFR § 800.11 (d). The USMC consulted with the California Coastal Commission (CCC) to request concurrence with its Coastal Consistency Negative Determination. The CCC provided a letter to the USMC concurring with the determination that the Proposed Action will not adversely affect coastal resources (refer to Appendix F of the EA). The USMC consulted with the National Marine Fisheries Service (NMFS). The NMFS provided a letter to the USMC concurring that the Proposed Action will not adversely affect essential fish habitat (refer to Appendix F of the EA).

Public Involvement: A Notice of Availability of the Draft EA was published in the North County Times and San Diego Union-Tribune Newspapers on November 30–December 16, 2009. A draft of the EA was available for public review in local libraries and on the MCB Camp Pendleton MCCS website from November 30, 2009 through December 16, 2009. No public comments have been received on the Draft EA.

Findings: There will not be any disproportionately high and adverse human health or environmental effects from the Proposed Action on minority and low-income populations. Nor will there be any impacts associated with the protection of children from environmental health and safety risks.

The EA and FONSI addressing this action are on file and may be reviewed by interested parties at the place of origin: Commanding Officer, Marine Corps Base Camp Pendleton (Attn: Assistant Chief of Staff, Environmental Security), California 92055-5010, telephone (760) 725-4512.

N. F. MARANO
Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Base, Camp Pendleton

20100604

Date

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FINAL
ENVIRONMENTAL ASSESSMENT

Lead Agency for the EA: United States Marine Corps

Title of Proposed Action: Advanced Water Treatment Facility/Utility Corridor Project (P-113)

Affected Jurisdiction: San Diego County

Designation: Environmental Assessment

Abstract

The United States Marine Corps has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969, 42 United States Code §§ 4321-4370h, as implemented by the Council on Environmental Quality Regulations, 40 Code of Federal Regulations Parts 1500-1508. The Proposed Action is to construct, operate, and maintain an advanced water treatment facility and associated pipelines at Marine Corps Base Camp Pendleton, California. This EA describes the potential environmental consequences resulting from the Proposed Action (Alternative 4), three Action Alternatives (Alternatives 1, 2, and 3), and the No-Action Alternative on the following resource areas: biological resources, cultural resources, air quality, utilities, and hydrology and water quality.

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December 2010

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EXECUTIVE SUMMARY

The United States Marine Corps (USMC) has prepared this Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations under 40 Code of Federal Regulations (CFR) Parts 1500-1508, Department of the Navy (DON) procedures for implementing NEPA, 32 CFR Part 775 and Marine Corps Order (MCO) P5090.2A, Change 2.

The purpose of the Proposed Action is to construct, operate, and maintain an Advanced Water Treatment (AWT) facility and associated infrastructure at Marine Corps Base (MCB) Camp Pendleton. The Proposed Action is needed to ensure compliance with more stringent secondary drinking water standards for total dissolved solids (TDS) and to meet the Federal Stage 2 Disinfectants and Disinfection By-products Rule requirements for TTHMs in drinking water (USEPA 1998) by removing the total organic carbon (TOC) in well water. The Proposed Action would also provide corrosivity reduction by controlling the acidity (pH) in the water. This control of pH would support efforts by MCB Camp Pendleton to meet wastewater discharge requirements by reducing the levels of dissolved copper below the level which requires that wastewater sludge to be handled as hazardous waste. The Proposed Action once completed, would also reduce the TDS levels in the wastewater allowing MCB Camp Pendleton to meet current wastewater standards necessary for the wastewater's reuse.

The Proposed Action consists of adding treatment processes to the Haybarn Canyon Drinking Water Iron/Manganese Removal Treatment Facility, and constructing an up to 16-inch (41-centimeter) internal-diameter pipeline for disposal of brine that would be generated by the upgraded facility. This EA analyzes environmental impacts that would result from upgrading the water treatment facility, and the construction and maintenance of four brine disposal pipeline alternative routes that would result in brine disposal to the Pacific Ocean via discharge from Camp Pendleton's Del Mar Boat Basin jetty (Alternatives 1, 2, and 3) or a dispersal system based on the concept of a radial collector well under the ocean floor (Alternative 4).

The following resource areas were evaluated for potential environmental consequences: biological resources, cultural resources, air quality, utilities, and hydrology and water quality. The potential environmental consequences associated with implementation of the Proposed Action (Alternative 4), three Action Alternatives (Alternatives 1, 2, and 3), and the No-Action Alternative are summarized in Table ES-1. For a detailed description and analysis, refer to Chapter 3, Affected Environment and Environmental Consequences. Conversely, the following resource areas were considered but eliminated from detailed analysis in this EA, as potential impacts were considered to be negligible or non-existent: aesthetics; geology, soils, and seismicity; hazardous materials/wastes; land use; noise; public health and safety, including environmental health and safety risks to children; socioeconomics and environmental justice; and transportation and circulation. Section 3.1 of this EA includes a brief description of these resources and the rational for their elimination from detailed analysis.

As shown in Table ES-1, no significant impacts to any resource area would occur with implementation of the Proposed Action or alternatives. However, the No-Action Alternative would result in negative impacts to utilities due to the inability of MCB Camp Pendleton to comply with current drinking water and wastewater standards. Based on the analysis presented in this EA, the USMC has identified Alternative 4 as the Preferred Alternative.

Table ES-1 Summary of Environmental Consequences

Resource Area	*Alternative 1*	*Alternative 2*	*Alternative 3*	*Alternative 4 (Preferred Alternative)*	*No-Action Alternative*
Biological Resources	**Potential impacts to known biological resources in segment unique to route.**	**Potential impacts to known biological resources in segment unique to route.**	**Potential impacts to known biological resources in segment unique to route.**	Potential impacts to known biological resources in segment unique to route, but overall impacts would be less, when compared with Alternatives 1, 2, and 3.	Existing conditions would remain unchanged; therefore, no significant impacts would occur.
Cultural Resources	**Potential impacts to known cultural resources in segment unique to route.**	**Potential impacts to known cultural resources in segment unique to route.**	**Potential impacts to known cultural resources in segment unique to route, but overall impacts would be less when compared with Alternatives 1 and 2.**	Potential impacts to known resource areas in segment unique to route, but overall impacts would be less when compared with Alternatives 1, 2, and 3.	Existing conditions would remain unchanged; therefore, no significant impacts would occur.
Air Quality	**No significant impacts.**	**No significant impacts.**	**No significant impacts.**	No significant impacts.	Existing conditions would remain unchanged; therefore, no significant impacts would occur.
Utilities	Beneficial impacts would occur as a result of the ability to comply with current drinking water and wastewater standards.	Beneficial impacts would occur as a result of the ability to comply with current drinking water and wastewater standards.	Beneficial impacts would occur as a result of the ability to comply with current drinking water and wastewater standards.	**Beneficial impacts would occur as a result of the ability to comply with current drinking water and wastewater standards.**	**Existing conditions would remain unchanged; therefore, adverse impacts would occur as a result of the inability to comply with current drinking water and wastewater standards.**

Resource Area	*Alternative 1*	*Alternative 2*	*Alternative 3*	*Alternative 4 (Preferred Alternative)*	*No-Action Alternative*
Hydrology and Water Quality	No significant impacts.	No significant impacts.	No significant impacts.	**No significant impacts.**	**Existing conditions would remain unchanged; therefore, no significant impacts would occur.**

FINAL
ENVIRONMENTAL ASSESSMENT
ADVANCED WATER TREATMENT/UTILITY CORRIDOR PROJECT (P-113)
AT MARINE CORPS BASE CAMP PENDLETON
SAN DIEGO COUNTY, CALIFORNIA

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CHAPTER 1
PURPOSE AND NEED FOR PROPOSED ACTION

1.1 INTRODUCTION

This Environmental Assessment (EA) has been prepared by the United States Marine Corps (USMC) in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations under 40 Code of Federal Regulations (CFR) Parts 1500-1508, Department of the Navy (DON) procedures for implementing NEPA, 32 CFR Part 775 and Marine Corps Order (MCO) P5090.2A, Change 2. This EA describes the potential environmental consequences resulting from a proposal to construct and operate an advanced water treatment (AWT) facility and a utility corridor to accommodate an associated brine disposal pipeline at Marine Corps Base (MCB) Camp Pendleton, California.

1.2 PROJECT LOCATION

The Proposed Action would be implemented at MCB Camp Pendleton, the USMC's major amphibious training center for the West Coast (Figure 1-1). MCB Camp Pendleton is a 200-square mile (518-square kilometer [km]) area located primarily within the northern portion of San Diego County, 40 miles (64 km) north of downtown San Diego. The Orange County line is contiguous with the northwest boundary of MCB Camp Pendleton; Riverside County is to the north but not adjacent to the boundary of MCB Camp Pendleton. The City of San Clemente and the Cleveland National Forest border MCB Camp Pendleton to the north and east, with the community of Fallbrook and the Naval Weapons Station (NWS) Seal Beach, Detachment Fallbrook to the east, and the City of Oceanside to the south. Regional access to MCB Camp Pendleton is provided by Interstate (I)-5 from the west, I-15 from the east, and State Route (SR)-78 from the south.

1.3 BACKGROUND

Twelve wells in the Santa Margarita River (SMR) Basin and three wells in the Las Pulgas/Las Flores Basin provide the water supply for the MCB Camp Pendleton Southern (potable) Water System. Two parameters of the well water, total dissolved solids (TDS) and total organic carbon (TOC), directly affect MCB Camp Pendleton's ability to comply with water quality regulations: (1) the national secondary drinking water standard (color, taste and odor) for TDS of 500 milligrams per liter (mg/L), and (2) the Regional Water Quality Control Board (RWQCB) Basin Plan limit of 750 mg/L TDS for surface and groundwater discharge in the project area (RWQCB 1994). Currently, the TDS concentration for potable water distributed by the Southern Water System is 755 mg/L (MCB Camp Pendleton 2007). The elevated TDS concentrations in potable water distributed by the Southern Water System have also resulted in elevated TDS concentrations in wastewater effluent from the existing MCB Camp Pendleton sewage treatment plants (STPs), which in turn reduces the ability of MCB Camp Pendleton to optimize reuse of its reclaimed wastewater as per the overall wastewater compliance strategy outlined in the P002/P110 Tertiary Treatment Plant and Associated Wastewater Conveyance Facilities Environmental Impact Statement (EIS) and Record of Decision (ROD).

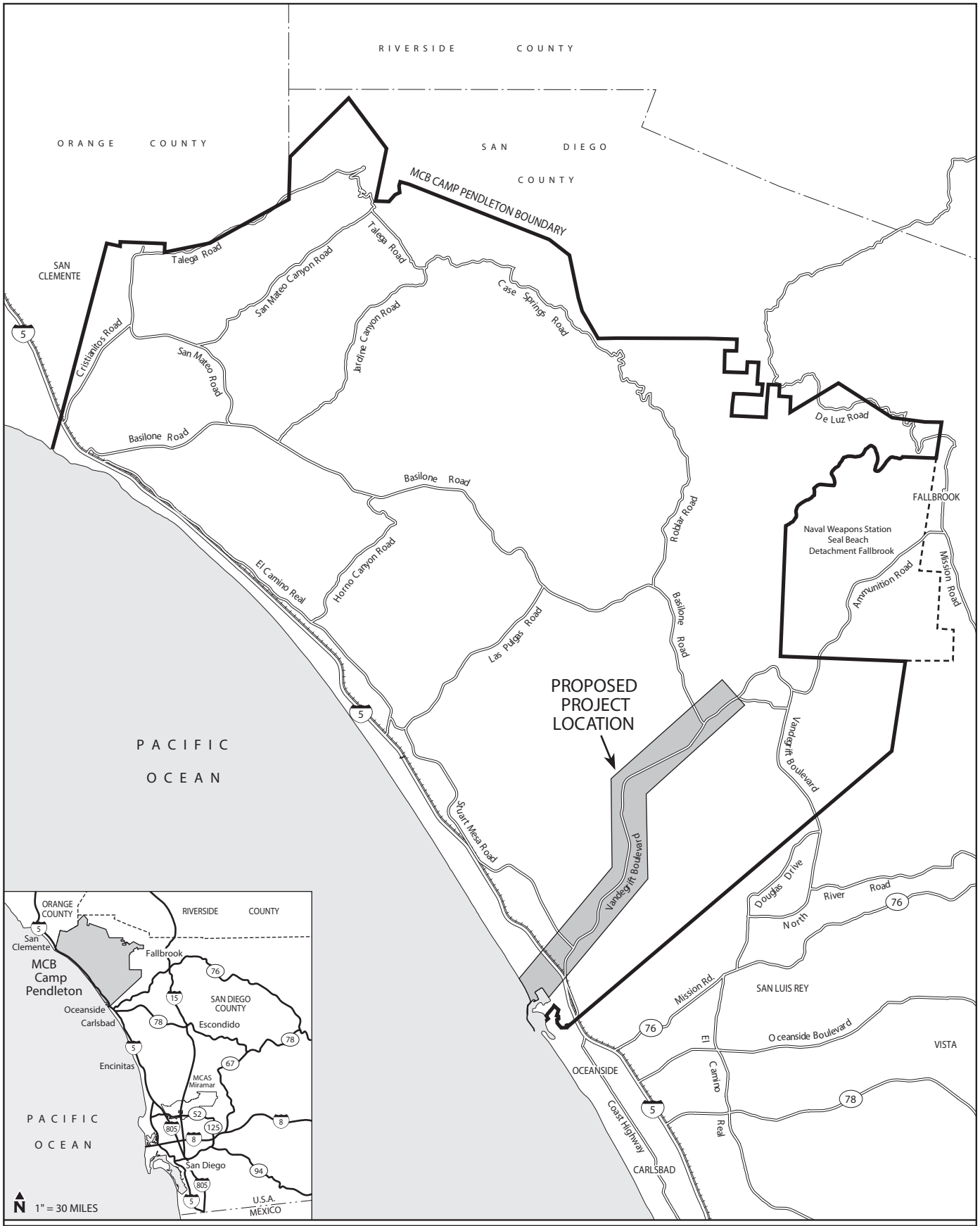


Figure 1-1
Regional Vicinity Map
MCB Camp Pendleton

Through reduction of TDS in the drinking water, the following is anticipated:

- compliance with secondary drinking water standards for TDS;
- reduction in TDS concentrations in wastewater to meet current Basin Plan standards for reclaimed wastewater discharge to surface and/or ground water; and
- An ancillary reduction in water hardness.

Reduction of TOC is needed because TOC is a precursor to total trihalomethane (TTHM) formation within the water distribution system as a byproduct of using chlorine for disinfection. TOC reduction in potable water distributed by the Southern Water System would be beneficial, as it would aid in compliance with Disinfection By-product Rule drinking water standards (CFR 40 Parts 41-43).

1.4 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is the reduction of (1) TDS to comply with San Diego County Water Authority (SDCWA) and Title 22 drinking water quality standards, and (2) TOC to facilitate compliance with Federal Stage 2 Disinfectants and Disinfection By-products Rule requirements for TTHMs in drinking water (USEPA 1998). By reducing TDS in the drinking water and fortuitously in treated wastewater effluent, implementation of the Proposed Action would also allow the Base to expand water reclamation opportunities.

1.5 ORGANIZATION OF THIS ENVIRONMENTAL ASSESSMENT

This EA is organized as follows: Chapter 1 defines the purpose of and need for the Proposed Action. Chapter 2 describes the Proposed Action (Alternative 4), three Action Alternatives (Alternatives 1, 2, and 3), and the No-Action Alternative. Chapter 3 examines the affected environment and the environmental consequences of each alternative. Chapter 4 addresses the cumulative impacts of the Proposed Action and other projects in the area. Chapter 5 addresses various other considerations required by NEPA. Chapter 6 provides a List of Acronyms and Abbreviations. This is followed by References (Chapter 7), Persons and Agencies Contacted (Chapter 8), and a List of Preparers (Chapter 9).

1.6 THE ENVIRONMENTAL REVIEW PROCESS

This EA has been prepared based on NEPA requirements as outlined in the following guidance documents:

- NEPA of 1969 (42 U.S. Code [USC] §§ 4321-4370h), which requires an environmental analysis for major federal actions having the potential to significantly impact the quality of the human environment;
- Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), which implement the requirements of NEPA;
- DON procedures for implementing NEPA (32 CFR Part 775), which provides DON policy for implementing the CEQ regulations and NEPA; and
- Marine Corps Order (MCO) P5090.2A, Change 2, Chapter 12, dated 21 May 2009, Environmental Compliance and Protection Manual, which establishes procedures for implementing NEPA.

This EA has also been prepared in accordance with the following requirements:

- National Historic Preservation Act (NHPA), 16 USC §§ 470-470x-6;
- Clean Water Act (CWA), 33 USC §§ 1251-1387;
- Clean Air Act (CAA), as amended, 42 USC §§ 7401-7671q, including 1990 General Conformity Rule;
- Endangered Species Act (ESA), 16 USC §§ 1531-1544;
- Migratory Bird Treaty Act (MBTA), 16 USC §§ 703-712;
- Magnuson-Stevens Fishery Conservation and Management Act, 16 USC §§ 1801-1812;
- Executive Order (EO) 11900 – Protection of Wetlands;
- EO 11988 – Floodplain Management;
- EO 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations;
- EO 13045 – Protection of Children from Environmental Health Risks and Safety Risks;
- EO 13148 – Greening the Government through Leadership in Environmental Management;
- EO 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds;
- Coastal Zone Management Act, 16 USC §§ 1451-1466;
- Safe Drinking Water Act, 42 USC §§ 300f-300j-26;
- Resource Conservation and Recovery Act (RCRA), 42 USC §§ 6901-6992k; and
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC §§ 9601-9675.

As part of this EA, the USMC invited public comments on the Proposed Action. The USMC announced the availability of the Draft EA with the publication of the Notice of Availability in the San Diego Union Tribune, the San Clemente Times, and the North County Times on 29 and 30 November and 1 December 2009. The USMC also placed copies of the Draft EA in the City of San Clemente Public Library, the City Of Oceanside Public Library, and the Fallbrook Public Library. In addition, the USMC posted the Draft EA to the MCB Camp Pendleton public environmental website. The public review and comment period ran from 29 November to 16 December 2009. The USMC did not receive any public comments on the Draft EA.

CHAPTER 2
PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The Proposed Action consists of adding treatment processes to the Haybarn Canyon Drinking Water Iron/Manganese Removal Treatment Facility (I/M plant), and constructing a pipeline for disposal of brine that would be generated by the upgraded facility. This EA analyzes environmental impacts that would result from upgrading the water treatment facility, and the construction and maintenance of four brine disposal pipeline alternative routes that would result in brine disposal to the Pacific Ocean via discharge from Camp Pendleton's Del Mar Boat Basin (DMBB) jetty (Alternatives 1, 2, and 3) or a dispersal system based on the concept of a radial collector well under the ocean floor (Alternative 4). The components of the Proposed Action, including the four brine disposal pipeline alternatives and two alternative disposal methods are described in detail in this chapter.

Screening criteria are used in determining alternatives that meet the requirements of the project and Base. Screening criteria are also used to streamline the EA process by eliminating from further consideration those alternatives that do not meet all the project and Base requirements. The screening criteria, based on the recommendations presented in *Drinking Water TDS TOC Treatment and Corrosion Control Feasibility Stud*y *MCB Camp Pendleton* (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2000) for this project include:

- minimization of environmental impact;
- effectiveness in meeting MCB Camp Pendleton and the RWQCB Basin Plan goals for TDS in discharged wastewater;
- effective TOC reduction;
- economic feasibility;
- long-term sustainability; and
- capacity to accommodate projected total brine flow volumes and rates.

2.2 COMPONENTS OF THE PROPOSED ACTION

2.2.1 Advanced Water Treatment (AWT) Facility

The existing Haybarn Canyon I/M plant in the 24 Area is in the process of adding treatment processes to provide additional volumetric treatment (reduction) of iron and manganese to supply influent to the AWT plant. The upgraded I/M plant would be combined with the new AWT plant and be known as the AWT facility. The upgrades for the I/M plant would consist of the installation of several modules (capable of expansion) control systems, and a supervisory control and data acquisition (SCADA) system. The I/M plant expansion is not part of this EA and would be analyzed under its own environmental document. The AWT plant would be located adjacent to the existing 24 Area I/M plant. The AWT plant would consist of three primary components: microfiltration; liquid granulated activated carbon (LGAC); and reverse osmosis (RO) filtration, and two secondary components: pH stabilization/corrosion control; and disinfection units (Figure 2-1). Both the primary and secondary components are described below:

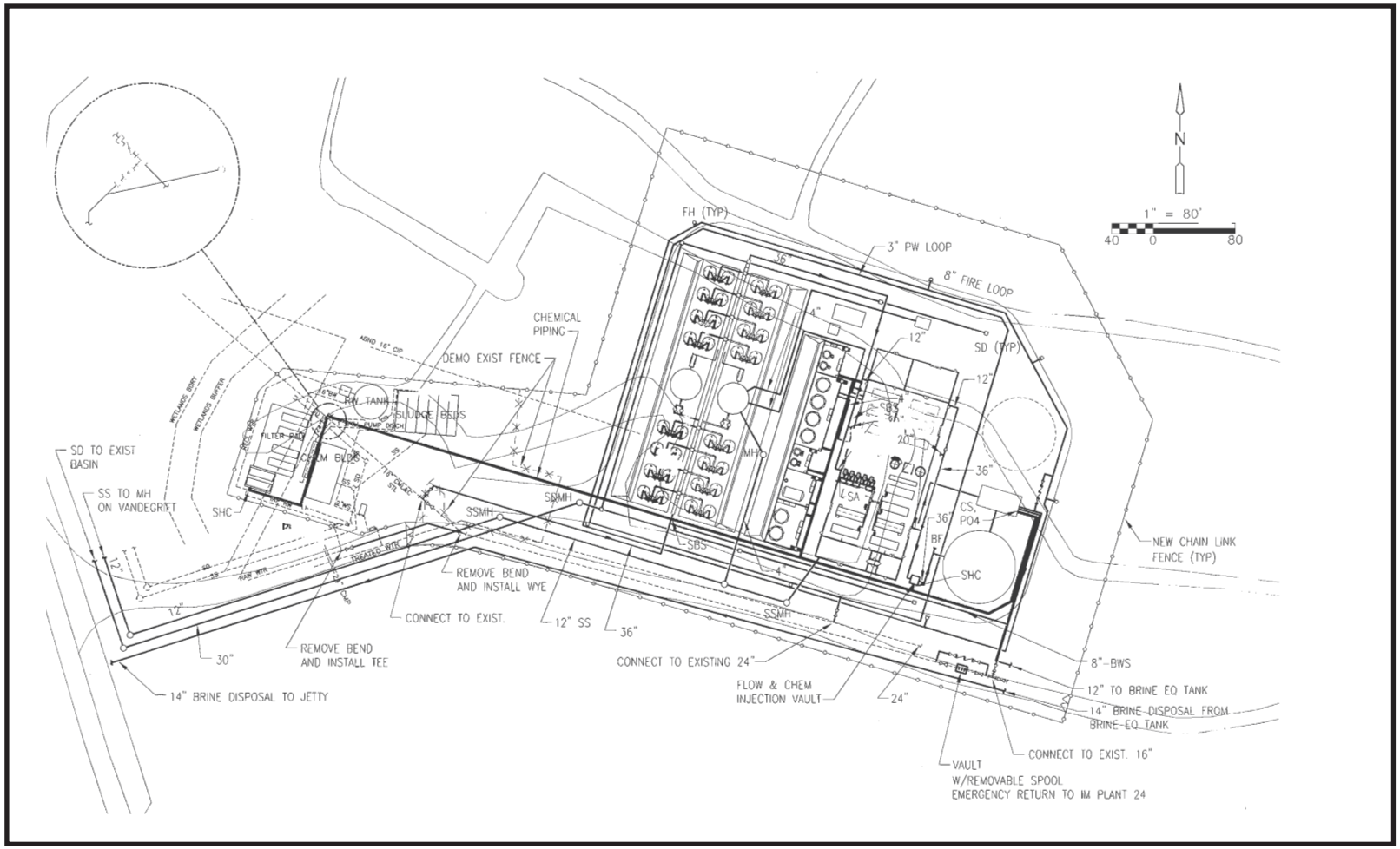


Figure 2-1
P-113 Conceptual AWT Facility Layout
MCB Camp Pendleton

Not to Scale

- The first module would consist of microfiltration and would be used to remove those constituents which would otherwise clog the LGAC and RO components.
- The second module would consist of a system containing granular activated carbon (GAC) also known as LGAC treatment. The processed effluent from the microfiltration component would proceed through the LGAC component to remove dissolved organic constituents. The LGAC would reduce TOC and the subsequent potential for TTHM formation within the water distribution system, which would improve the color, taste, and odor of the water.
- The third (final) module would consist of a RO module designed to remove/reduce the TDS and other entrainment constituents from the product water.
- Finally, the secondary components of pH stabilization/corrosion control and disinfection adjust the AWT outflow water, stabilize the pH for the drinking water, and disinfect the drinking water for use.

The modular design would allow for all modules to be assembled independently off-site and brought to Haybarn Canyon for installation. The installation period for the modules is not expected to exceed three months (MCB Camp Pendleton 2008). When all components are operating at their individual design efficiencies, the total production capacity would be 7,500 acre-feet of potable water per year (6.7 million gallons per day). More than half of the water would be treated by the RO system to obtain the final product water TDS objective of 325 mg/L for treated water.

2.2.2 Brine Disposal Pipeline

The existing 24 Area I/M Plant at Haybarn Canyon currently removes iron and manganese from the raw well water stream. The proposed GAC module would reduce TOC and the proposed RO module would reduce TDS, producing two output streams: clean (product) water for the drinking water distribution system, and concentrate (brine) from the RO TDS reduction process for disposal (NAVFAC SW 2000). Brine outflow volume at total production capacity is estimated at 1.2 million gallons per day (mgd). A pipeline would be needed to pump the brine from the RO treatment process to the ocean, where it would be discharged. The brine composition would be dissolved mineral salts and trace metals in the estimated concentrations as shown in Tables 2-1 and 2-2, respectively. Brine from the RO process would be disposed of through this pipe; any potential future increase in brine discharge would be subject to environmental review. As the brine discharges from the pipe, it would combine with the surrounding receiving waters in an area known as a "mixing zone." As authorized by the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge into waters of the U.S. As the Proposed Action would include discharge to waters of the U.S., the Proposed Action would require obtaining a NPDES permit to ensure compliance with applicable water quality standards.

Used carbon filters (solid waste) associated with the GAC process removed from the site would be disposed of through the normal MCB Camp Pendleton procedures (MCB Camp Pendleton 2009a). A brine storage tank and force main would be constructed to send the projected volume of brine from the AWT facility by gravity flow to the point of discharge. Electrical upgrades to Haybarn canyon power supply would consist of a new electrical service line and transformer.

Table 2-1 Estimated RO Brine Concentrations

Name	*Symbol*	*Unit*[4]	*RO Feed Average Quality*	*Brine Concentrate Average Quality*[1]	*Brine Concentrate Maximum Quality (30 Percent [%] Higher)*[1]
Calcium	Ca^{2+}	mg/L	87	578	751
Magnesium	Mg^{2+}	mg/L	34.2	227	295
Sodium	Na^{+}	mg/L	115	751	936
Potassium	K^{+}	mg/L	15	97.4	127
Barium	Ba^{2+}	mg/L	0.06	0.4	0.52
Bicarbonate	HCO_3^{-}	mg/L	250	1630	2119
Sulfate	SO_4^{2-}	mg/L	185	1231	1600
Chloride	Cl^{-}	mg/L	160	1056	1373
Nitrate	NO_3^{-}	mg/L	4.05	25.7	33.4
Fluoride	F^{-}	mg/L	0.41	2.72	3.54
Silicon dioxide	SiO_2	mg/L	24.9	164	213
Carbon dioxide	CO_2	mg/L	18.7	18.7	18.6
Arsenic	As	µg/L	<1	<6	<8
Selenium	Se	µg/L	0	0	0
Sum of ions[2, 3]	Sum of ions[2, 3]	mg/L	876	5767	7497
Total Dissolved Solids[2, 3]	TDS (180 deg. C)[2, 3]	mg/L	748.6	4937	6100
Hardness (as $CaCO_3$)	Hardness (as $CaCO_3$)	mg/L	358.1	2379	3093
pH	pH	su	7.4	8.22	8.9
Ammonia	NH_4^{+}	µg/L	0	0	0

Notes:[1] These projections are based on using Koch Membrane RO elements operating at a certain pressure without acid feed. The concentrate quality can be slightly different with other vendors' elements operating at a different pressure and with acid feed.
[2] The sum of ions may not be exactly the sum of the constituents shown in the table due to cation-anion balancing by the program used to estimate the RO.
[3] The sum of ions and TDS analyzed at 180 degrees Celsius are not the same because of the partial conversion of bicarbonate to carbon dioxide.
µg/L = 1/1000 mg/L
Sources: B&C 2009; CDM 2009.

Table 2-2 Estimated Trace Metal Concentrations

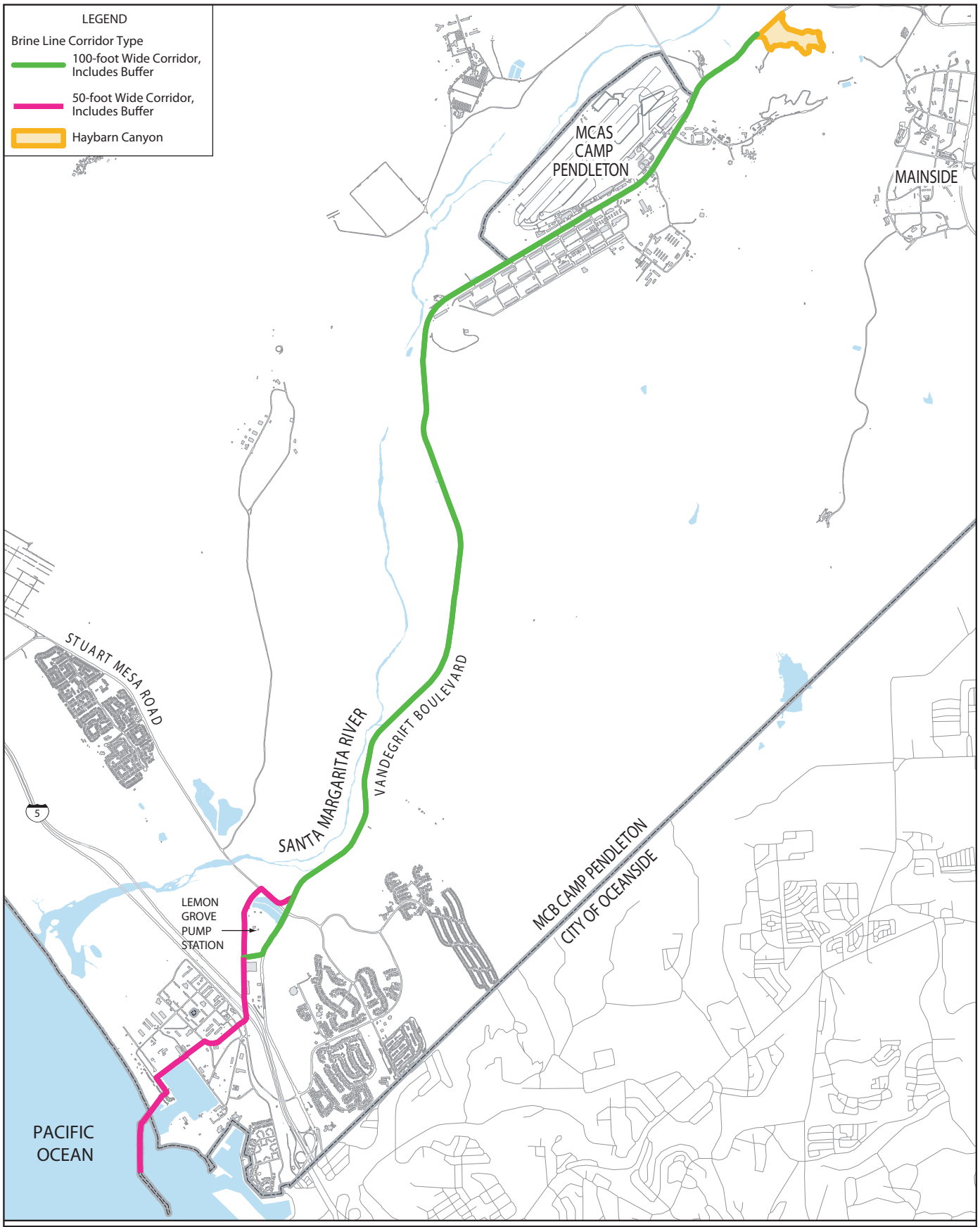
Metal	*Units*[3]	*RO Feed Average Quality*[1]	*Brine Concentrate Average Quality*[2]	*Brine Concentrate Maximum Quality (30% Higher)*[2]
Arsenic	µg/L (ppb)	1.11	7.39	9.6
Cadmium	µg/L (ppb)	0.25	1.7	2.2
Chromium	µg/L (ppb)	0.25	1.7	2.2
Copper	µg/L (ppb)	9.31	62.0	80.7
Lead	µg/L (ppb)	2.46	16.4	21.4
Mercury	µg/L (ppb)	0.05	0.33	0.43
Nickel	µg/L (ppb)	0.57	3.8	5.0
Selenium	µg/L (ppb)	0.49	3.3	4.3
Silver	µg/L (ppb)	0.25	1.7	2.2
Zinc	µg/L (ppb)	17.39	115.9	150.7

Notes:[1] The RO feed averages assume that sample results found to be non-detect have a concentration of 50 % of the method detection limit. The Regional Water Quality Control Board indicated that permits have been issued with this assumption but that the actual value assumed for the permit evaluation would be determined at the time of the permit.
[2] These projections assume 100% metal removal from feed water by the RO membranes and 85% permeate recovery. The trace metals in the RO Feed water would be concentrated in the Brine Concentration (a.k.a., RO by-product) by the following factor: RO by-product = 1/(1-0.85) = 6.67.
ppb = parts per billion
µg/L = 1/1000 mg/L
Sources: B&C 2009; CDM 2009.

Under Alternatives 1, 2, and 3 the pipeline would be fixed to the jetty in the wave splash zone with metal brackets. The pipeline would be perforated, beginning at the second bend in the jetty, with holes that increase in diameter with distance from shore to limit brine dispersal in shallow waters. The end of the pipeline would be capped. The outfall location at the DMBB jetty for Alternatives 1, 2 and 3, was selected because it offers a site within the MCB Camp Pendleton boundary for offshore brine discharge in deeper waters with greater dispersion capability. Pipeline construction at the jetty would include the use of a crane positioned on the jetty surface, a barge, and in-water construction (MCB Camp Pendleton 2008). Under Alternative 4 a dispersal system based on the concept of a radial collector well under the ocean floor would be used for brine disposal (see Alternative 4 for more details).

This component of the Proposed Action would consist of the excavation of a utility trench approximately 6 feet (ft) (2 meters [m]) below grade to accommodate an up to 16-inch (41-centimeter [cm]) interior-diameter brine disposal pipeline extending from the Haybarn AWT facility location to the ocean near the DMBB on the southern coast of MCB Camp Pendleton (Figures 2-2, 2-3, 2-4, and 2-5). A backhoe or pipe auger would be used to excavate a trench for the pipeline, which would take approximately 12 months to complete. The following pipeline construction corridor route alternatives were derived from the recommendations in NAVFAC SW 2000 to incorporate existing utility corridors along established roadways to the extent possible, and environmental and engineering data from MCB Camp Pendleton.

Alternative 1 – The Alternative 1 corridor route would exit the AWT facility at the west end of Haybarn Canyon and follow Vandegrift Boulevard (Blvd.) from Haybarn Canyon southwestward, passing between the 22 Area of MCB Camp Pendleton and Marine Corps Air Station (MCAS) Camp Pendleton (Figure 2-2). For the entire length of the Vandegrift Blvd. segment, there would be a 50-ft (15-m) wide construction footprint within a 100-ft (30-m) wide study corridor as measured from the western (river side) roadway shoulder. The 100-ft (30-m) wide study corridor would account for any indirect impacts to species and allow for avoidance of existing utilities, and flexibility during the design/build process. The pipeline corridor would then continue to follow Vandegrift Blvd. southward to Lemon Grove Road, a distance of approximately 7 miles (11 km). At Lemon Grove Road, the corridor would turn westward and parallel Lemon Grove Road for about 500 ft (152 m). While going along Lemon Grove Road a "T" junction with a shut off valve would be inserted into the pipeline allowing a secondary pipe to connect to the Lemon Grove Pump Station. Through this pump station the pipeline would connect to the Oceanside Outfall. This secondary pipe would only be used during times of maintenance or repair on the primary brine dispersion system. The pipeline would then turn south, cross beneath the I-5 freeway, and align southwesterly to enter the 21 Area at the intersection of A Street and 8th Street. Under a second routing option, the pipeline would turn northwestward on Stuart Mesa Road north of Lemon Grove Road for approximately 1,200 ft (366 m), then turn southward to run due south, past the Lemon Grove Pump Station entering the 21 Area as described above. The second routing option would allow flexibility in the design/build process. From here, it would follow 8th Street southwest, and then turn northwest on C Street until aligned with 9th Street. The portion of the pipeline route not located along Vandegrift Blvd. would have a 50-ft (15-m) wide construction buffer as measured from the roadway shoulder. Following the southwesterly direction of 9th Street, along the west side of the DMBB, the pipeline route would then intersect with a paved road adjacent to the beach. It would then follow this road southeasterly until aligned with the jetty. To keep the brine discharge away from Oceanside Harbor located east of the jetty's end point, the pipeline would terminate at the second bend in the jetty (approximately 2,300 ft [701 m] along the jetty from the shore) (MCBCP 2008). The total length of pipe laid for this alternative would be approximately 9.9 miles (15.9 km).



Meters
0 1,200
0 Feet 4,500

Figure 2-2
P-113 Alternative Route 1
MCB Camp Pendleton

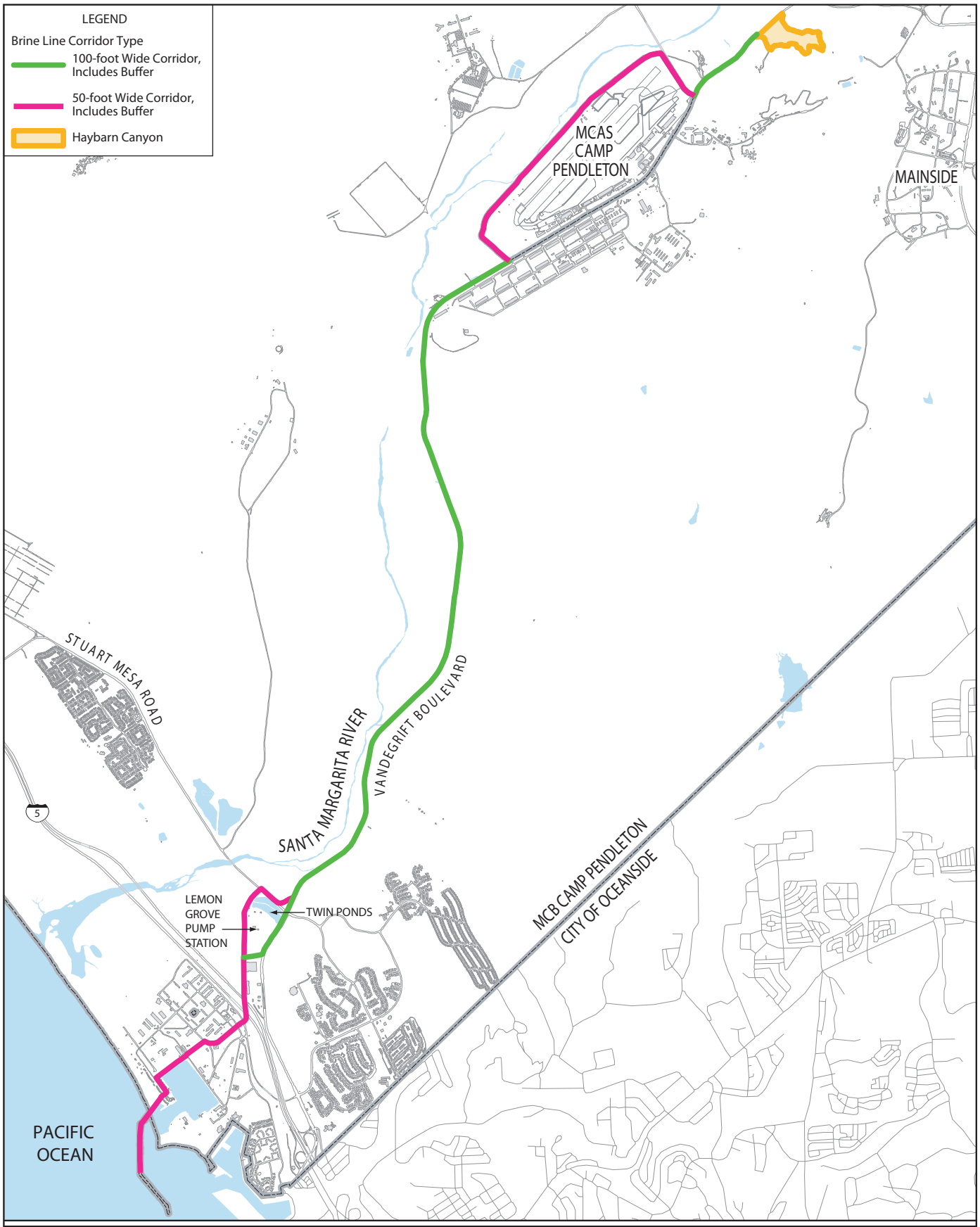


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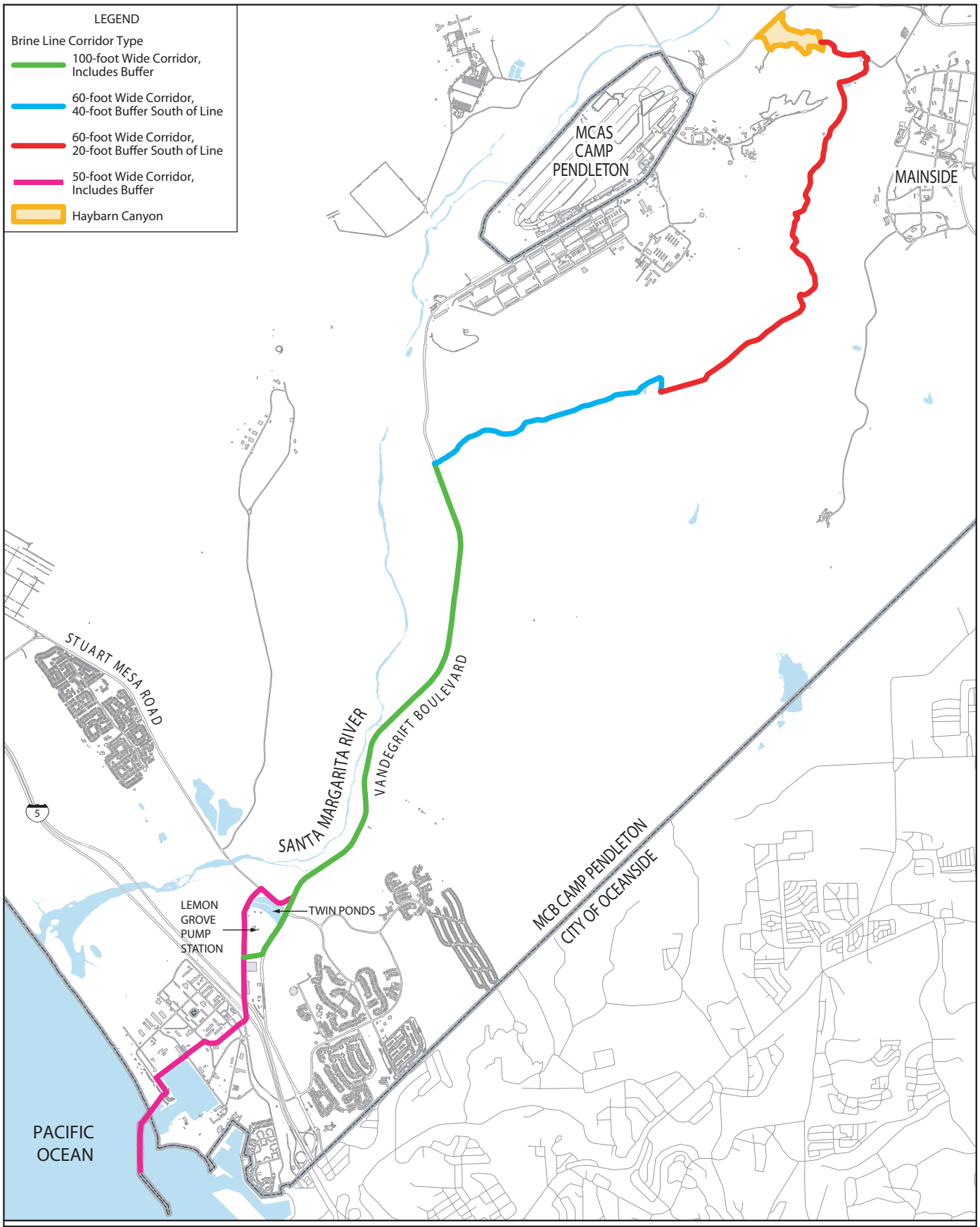
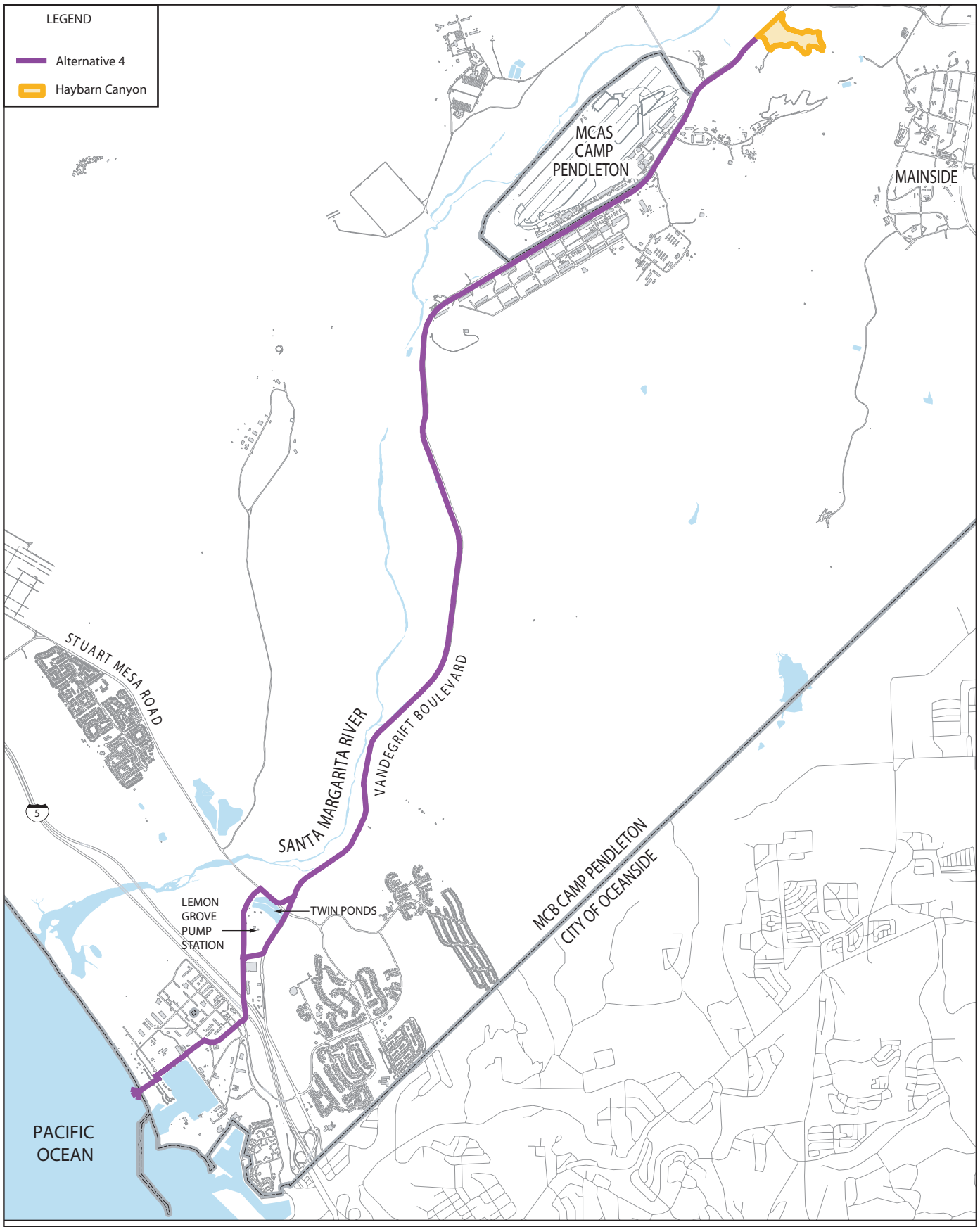
Figure 2-3
P-113 Alternative Route 2
MCB Camp Pendleton



Meters
0 1,200
0 4,500 Feet

Figure 2-4
P-113 Alternative Route 3
MCB Camp Pendleton



Meters
0 1,200
0 Feet 4,500

Figure 2-5
P-113 Alternative Route 4
MCB Camp Pendleton

Alternative 2 – The Alternative 2 corridor route would also exit the AWT facility at the west end of Haybarn Canyon. This route would then follow Vandegrift Blvd. to the intersection of Basilone Road and Vandegrift Blvd. where it would turn northwest along the north side of Basilone Road to the toe of the Santa Margarita River levee and turn southward. From there, the route would run south and then eastward along the western perimeter of the MCAS until intersecting with Vandegrift Blvd. From this point on, the pipeline route would be the same as described for Alternative 1 (see Figure 2-3). The total length of pipe laid for this alternative would be approximately 10.5 miles (16.9 km).

The pipeline corridor widths would be the same as described under Alternative 1 (i.e., 100 ft [30 m] west from the roadway shoulder along Vandegrift Blvd. and 50 ft [15 m] from the roadway shoulder on all other roads).

Alternative 3 – The Alternative 3 pipeline corridor route would extend from the AWT facility and traverse up the eastern end of Haybarn canyon, and then follow existing fire roads and trails to the east and south into the Mike Training Area down to Pueblitos Canyon where it would follow Pueblitos Canyon and cross Vandegrift Blvd. From this point on, the pipeline corridor route would be the same as described for Alternative 1 (see Figure 2-4). The total length of pipe laid for this alternative would be approximately 11.3 miles (18.2 km). The pipeline construction study corridors would include the Alternative 1 buffers (i.e., 100 ft [30 m] from the west shoulder of Vandegrift Blvd. and 50 ft [15 m] from the roadway shoulder of other existing roadways). In addition, one additional study corridor width (80 ft [24 m]) would be included in the fire roads and Pueblitos Canyon areas (see Figure 2-4).

Alternative 4 – Alternative 4 consists of a route similar to Alternative 1, except centered on Vandegrift Blvd. rather than 50 ft (15 m) off the shoulder, and an alternative brine disposal method. The Alternative 4 pipeline corridor route would exit the AWT facility at the west end of Haybarn Canyon and follow the centerline of Vandegrift Blvd. from Haybarn Canyon southwestward, passing between the 22 Area of MCB Camp Pendleton and the MCAS (see Figure 2-5). For the entire length of the Vandegrift Blvd. segment, there would be a 50-ft (15-m) wide construction footprint within a 100-ft (30-m) wide study corridor centered on Vandegrift Blvd. The 100-ft (30-m) wide study corridor would account for any indirect impacts to species and allow for avoidance of existing utilities and flexibility during the design/build process. In areas where the disposal pipeline could encounter jurisdictional waters of the U.S. running under a paved road via a culvert, construction would bore under the culverts to avoid impacts to jurisdictional waters of the U.S.

The pipeline corridor would then continue to follow Vandegrift Blvd. southward to Lemon Grove Road, a distance of approximately 7 miles (11 km). At Lemon Grove Road, the corridor would turn westward and parallel Lemon Grove Road for about 500 ft (152 m). While going along Lemon Grove Road a "T" junction with a shut off valve would be inserted into the pipeline allowing a secondary pipe to connect to the Lemon Grove Pump Station and through this pump station the Oceanside Outfall. This secondary pipe would only be used during times of maintenance or repair on the primary brine dispersion system. The pipeline would then turn south, cross beneath the I-5 freeway, and align southwesterly to enter the 21 Area at the intersection of A Street and 8th Street. Under a second routing option, the pipeline would turn northwestward on Stuart Mesa Road north of Lemon Grove Road for approximately 1,200 ft (366 m), then turn southward to run due south, past the Lemon Grove Pump Station entering the 21 Area as described above. From here, it would follow 8th Street southwest and then turn northwest on C Street until aligned with 9th Street. The portion of the pipeline route not located along Vandegrift Blvd. would have a 50-ft (15-m) wide construction buffer as measured from roadway center. The varying buffer dimensions are due to topographical and other physical restrictions along the route.

Following the southwesterly direction of 9th Street, along the west side of the DMBB, the pipeline route would then intersect with a paved road running along the beach. It would then cross the road and proceed to the beach. This alternative would then use an alternative brine disposal method into the ocean. This method would consist of a drain system based on the concept of a radial collector well; however, rather than collecting water into the pipe for distribution, it would allow water to flow out of the pipe into the ocean. Water from the RO filtration would be collected in an underground concrete caisson located between the existing beach-front housing and the extreme high tide mark. Three diffusers would radiate out under the sand 200 ft to 250 ft (61 m to 76 m) from the caisson (Figure 2-6 and Figure 2-7). The diffusers would be formed from standard well screen material and terminate 10 ft (3 m) below the ocean floor. The brine discharge would be released in water depths of approximately 30 ft (9 m).

2.2.3 Laydown/Staging Areas

During installation of the AWT facility and construction of the brine disposal pipeline, laydown/staging areas would be established within the project footprint to accommodate construction equipment, construction materials, and excavation spoils. A laydown area would be designated within a previously disturbed area adjacent to the existing I/M plant (MCBCP 2008).

The construction contractor would be required to show all proposed laydown/staging areas on design plans and to obtain approval for use of those areas from MCB Camp Pendleton Assistant Chief of Staff, Environmental Security (AC/S ES). All laydown areas would be returned to their previous condition once they were no longer being utilized.

2.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the USMC would not construct, operate, or maintain the AWT facility and associated infrastructure at MCB Camp Pendleton. Although the No-Action Alternative is not considered a reasonable alternative because it does not meet the purpose of and need for the Proposed Action as required under CEQ regulations (40 CFR 1502.14[d]), it does provide a measure of the baseline conditions against which the impacts of the Proposed Action can be compared. As such, the No-Action Alternative is carried forward for analysis. In this EA, the No-Action Alternative represents the baseline conditions described in Chapter 3, Affected Environment and Environmental Consequences.

2.4 SPECIAL CONSERVATION MEASURES

Implementation of the Proposed Action would include the incorporation of the following Special Conservation Measures (SCMs) as part of project development to avoid or minimize any potential impacts.

2.4.1 General Special Conservation Measures

1. Before the bidding process, the construction contractor(s) would be informed of the biological constraints for this project by MCB Camp Pendleton. All areas to be avoided would be clearly marked on project maps provided to the contractor. These areas would be designated as “no construction” zones. These areas would be flagged before the onset of construction activities. The contractor(s) would be responsible for compensation for direct impacts to biological resources that occur as a direct result of construction activities outside the limits of construction, at a rate determined by the USFWS.

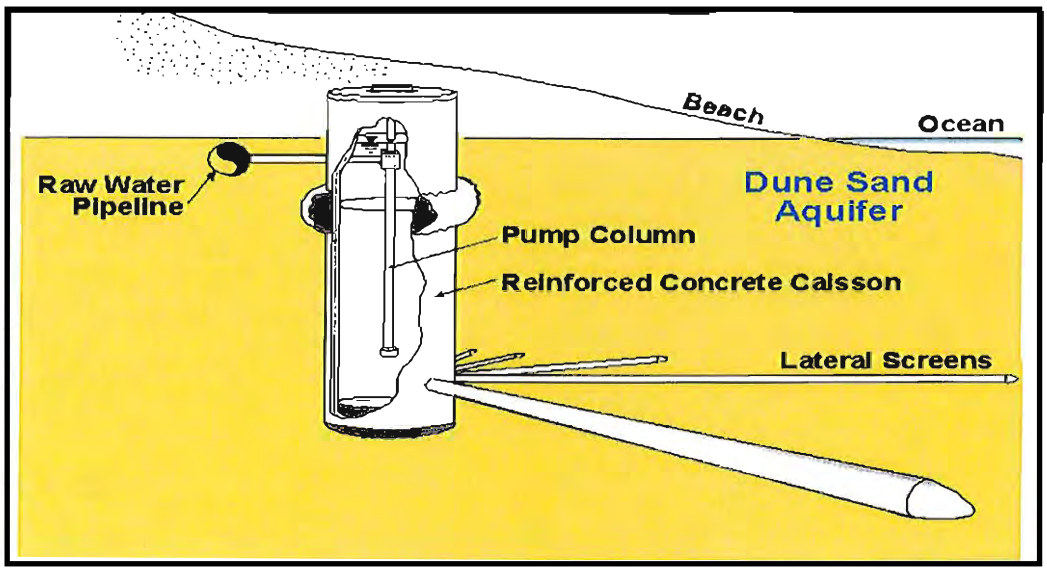


Figure 2-6 Schematic of P-113 Alternative 4 Brine Disposal Method
MCB Camp Pendleton

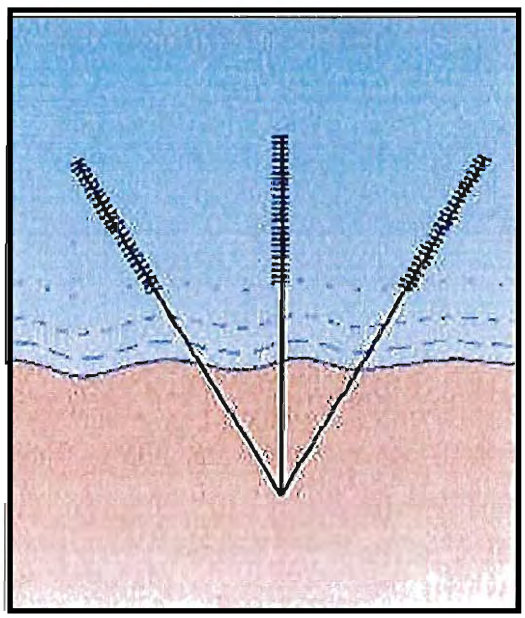


Figure 2-7 Plan View of P-113 Alternative 4 Brine Disposal Method
MCB Camp Pendleton

2. All disturbed soils would be immediately stabilized following the completion of work and be re-planted with native grass and shrub species that are consistent with native vegetation that occurred in the area before disturbance. Before approval of the final design, the contractor would obtain MCB Camp Pendleton AC/S ES Land Management Branch approval of a soil layering plan, seed mixes, container plants, planting/seeding, and monitoring methods proposed for use in revegetation. MCB Camp Pendleton AC/S ES Land Management Branch would specify minimum performance and success that must be met before the obligation is released. Noxious weeds (as listed by the Exotic Plant Pest Council) would be controlled by hand weeding or herbicide application in disturbed areas as necessary to prevent their establishment.
3. Construction equipment would be washed down when it first arrives on the project site from another construction site to remove any weedy plant seeds. In addition, the biological monitor would also look for invasive species within and immediately adjacent to the project area. If the biological monitor encounters new weedy populations within and immediately adjacent to the project area, he/she would report these populations to AC/S ES Land Management Branch.
4. The contractor would obtain coverage under the General Construction Storm Water Permit, State Water Resources Control Board (SWRCB) Order No. 99-08-DWQ and would comply with the provisions described below. Soil disturbance includes, but is not limited to, clearing, grading, excavation, stockpiling, demolition, paving, trenching, laydown areas, and construction of access roads.
    a. Prepare a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Permit and complete the SWPPP checklist developed by the SWRCB. The SWPPP and the SWPPP checklist would be submitted to the Resident Officer In Charge of Construction (ROICC) engineer before initiation of any soil disturbance.
    b. Obtain coverage under the General Permit by submitting a Notice of Intent (NOI) and fee. A Waste Discharge Identification (WDID) number would be received from the SWRCB before initiation of any soil disturbance.
    c. The project would comply with all provisions described in the Permit and would strictly follow the SWPPP. The SWPPP would be maintained at the project site and updated as necessary to track modifications, Best Management Practice (BMP) location and implementation, training, etc.
    d. After completion of construction activities, a Notice of Termination (NOT) would be submitted to the SWRCB. To terminate coverage, the project would meet permanent stabilization requirements specified within the Permit.

    Effective 1 July 2010, the General Construction Storm Water Permit, SWRCB Order No. 99-08-DWQ would be replaced with the new General Construction Storm Water Permit, SWRCB Order No. 2009-0009-DWQ. Existing construction projects covered under Order No. 99-08-DWQ would submit a new NOI and fee to obtain coverage under Order No. 2009-0009-DWQ at Risk Level 1.
5. Dust migration in or adjacent to riparian areas would be minimized by lightly spraying areas of exposed soil with water during excavation and grading activities and when weather conditions require the use of dust control measures. Dust control water would be sprayed at a rate such that no runoff would be generated.

6. Concreting operations would be conducted to ensure discharge water associated with these operations does not reach surrounding water bodies or pools. Concrete debris piles would be covered with tarps and staked to prevent contact with runoff or wind.
7. All mechanized clearing and grading vehicle traffic, equipment staging, and the deposition of soil would be confined to the footprints analyzed in this EA or to other disturbed or developed land. Construction site boundaries would be clearly delineated by flagging, stakes, survey lath, or silt fencing.
8. Heavy equipment and construction activities would be restricted to existing roads and disturbed areas to the maximum extent practicable. Staging areas would be located in disturbed areas and would be delineated on the grading plans. Vehicle operation and laydown areas would be defined by staking and flagging to prevent operations outside these areas.
9. To minimize wildfire risk, construction crews would exercise care when driving on unpaved roads and not park vehicles where they could ignite dry vegetation. In times of high fire hazard, trucks may need to carry water and shovels or fire extinguishers to the project site. The use of shields, protective mats, or other fire prevention equipment would be used during grinding and welding to prevent or minimize the potential for fire. No smoking or disposal of cigarette butts would take place within vegetated areas.
10. Fueling of equipment would be allowed only in designated bermed areas specified on the construction maps and would not occur within 100 ft (30 m) of drainages. Emergency provisions would be in place at all stream crossings before the onset of construction to prevent accidental spills from contaminating downstream habitats.
11. Any night lighting for the project would be placed, shielded, and directed away from all native vegetation communities.
12. MCB Camp Pendleton AC/S ES Land Management Branch would review any landscaping plan to verify that appropriate native plants and acceptable landscape plant species are used in accordance with the Base Exterior Architecture Plan and the USEPA's 1995 Guidance for the Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds.
13. Erosion and sedimentation controls would be monitored and maintained during construction, and for 12 months thereafter, to ensure stabilization of the site.
14. A qualified biologist would monitor all construction activities in and adjacent to CSS and riparian habitats to ensure compliance with the avoidance, minimization, and compensation measures in the above SCMs and would keep the project engineer and AC/S ES informed of construction activities that may threaten significant biological resources. The monitor would ensure that incidental disturbance is minimized and limited to activities essential to the project by monitoring the edge of the construction footprint and/or flagging the limits of construction.
15. The biological monitor would be empowered to halt work activity, if necessary, to avoid unauthorized effects to listed species. The biological monitor would contact AC/S ES immediately to discuss necessary actions. AC/S ES staff also would confer with USFWS to ensure the proper implementation of species and habitat protection measures.
16. A contractor education program would be conducted by a qualified biologist with oversight by MCB Camp Pendleton AC/S ES personnel. It would be conducted during all project phases and

cover the potential presence of listed species, the requirements and boundaries of the project; the importance of complying with avoidance, minimization, and compensation measures; and problem reporting and resolution methods. MCB Camp Pendleton would ensure the placement of signs indicating the necessity for all activities to be strictly confined to the project site (USFWS 2004).

17. The biological monitor would observe daily construction activities and provide electronic weekly biological monitoring reports to AC/S ES.
18. The nest of any bird species covered under the Migratory Bird Treaty Act would not be harmed or destroyed during construction.
19. No excavated or fill material would be placed in a delineated CWA Section 404 waters of the U.S. except as authorized by a permit from the U.S. Army Corps of Engineers (USACE).
20. Vernal pools and Clean Water Act (CWA) Section 404 waters of the U.S. adjacent to the project area would be flagged and avoided.
21. In compliance with Section 10 of the River and Harbors Appropriation Act of 1899 (33 USC 403) which "prohibits the obstruction or alteration of navigable waters of the United States" a pre-construction survey for the invasive marine alga species *Caulerpa taxifolia* in the affected areas would be conducted not more than 90 days or less than 30 days before any potential in-water construction. Results of the survey would be documented and reported to National Marine Fisheries Service (NMFS).
22. Groundwater is likely to be encountered during trenching in the Santa Margarita floodplain. If groundwater is encountered the contractor would contact the ROICC. The ROICC would then contact AC/S ES Storm Water Branch for guidance at (760) 725-9760. Sampling and/or treatment may be required and is the responsibility of the contractor performing the work. Disposal options for groundwater may include the following:
23. Discharges to land would comply with the San Diego Basin Plan Conditional Waiver No. 2, "Low Threat Discharges to Land" found in San Diego RWQCB Resolution No. R9-2007-0104.
24. Discharges to the sanitary sewer system would be coordinated through the AC/S ES Wastewater Branch at (760) 725-9761 and AC/S ES Facilities Wastewater Operation Supervisor at 725-4018.
25. Discharges to storm drains or surface waters (including seasonal waters) would obtain coverage under the General Groundwater Permit, San Diego RWQCB Order No. R9-2008-0002. Application for permit coverage would be submitted 60 days before the planned commencement of the discharge.
26. MCB Camp Pendleton would obtain a NPDES wastewater discharge permit for the brine disposal pipeline and conform to all permit conditions, including monitoring and reporting required by the permit. An Operations Manual and a Facility Response Plan would be prepared according to federal regulations and Marine Corps requirements to minimize potential adverse impacts on water quality that would result from operations and potential spill events. In addition, the contractor would implement a Spill Prevention and Response Procedures Program to prevent spills and minimize potential adverse impacts.
27. If the pipeline excavation encounters potentially contaminated soil or groundwater, the contractor would contact the ROICC. The ROICC would then contact AC/S ES RCRA Division and

prepare a Soil Management Plan (SMP) for handling and disposal of the contaminated soils. The procedures described in the SMP would be followed for installation of the pipeline. Appropriate health and safety measures would be followed and all requirements of USACE Manual EM 385-1-1 Safety and Health Requirements, Title 29 CFR (Labor) Part 1910 Occupational Safety, and Health Standards Subpart H Hazardous Materials Section 120 Hazardous Waste Operations and Emergency Response would be met.

28. All trash would be disposed of properly. All equipment and waste would be removed from the site. The site would be restored to as near the original physical and biological condition as soon as possible once the project is completed. If MCB Camp Pendleton's USEPA hazardous waste generator identification number is utilized on the manifest for hazardous waste disposal, then the manifest would come through the AC/S ES Hazardous Waste Branch office for signature.
29. Construction contractors would not bring pets to the construction site.

2.4.2 Species-Specific Measures

2.4.2.1 California Gnatcatcher, Least Bell's Vireo, Southwestern Willow Flycatcher

1. Final construction designs would minimize the removal of coastal sage scrub (CSS) and disturbed (D)-CSS that could support coastal California Gnatcatcher (CAGN). Any unavoidable removal or temporary disturbance of CSS would be documented during construction. Clearing of occupied CAGN habitat would take place only outside of the CAGN breeding season (15 February to 31 August) (USFWS 2004). Temporary effects would be restored on-site according to a CSS Restoration Plan approved before the start of construction. Permanent impacts to CAGN occupied CSS would be compensated by either on-Base restoration or off-Base conservation of CAGN occupied CSS vegetation at a ratio of 2:1. Compensation would be included in the CSS Restoration Plan that would be reviewed and approved by AC/S ES Land Management Branch and USFWS.
2. Clearing of Least Bell's Vireo (LBV)/Southwestern Willow Flycatcher (SWF) occupied riparian vegetation would take place only outside of the LBV and SWF breeding season (15 March to 31 August) (USFWS 2004). Permanent impacts to riparian vegetation would be restored according to the Riparian BO (USFWS 1995a).
3. Whenever feasible, construction activities in all suitable habitats would occur outside of the breeding season for the CAGN, LBV, and SWF (USFWS 2004).
4. The final acreages of riparian vegetation that are cleared would be provided to MCB Camp Pendleton's AC/S ES, Wildlife and Land Management Branches for recording into the Annual Riparian BO report.
5. After the initial site clearing, ongoing construction activities in or adjacent to CSS and riparian habitats would occur outside of the breeding season when practicable. When breeding season avoidance is not practicable, then the following additional measures would be applied for CAGN, LBV, and SWF and would be subject to review through consultation:
    a. If construction cannot occur outside of the breeding season, then pre-construction surveys would be conducted for all individual CAGNs, LBVs, SWFs and active nests in all suitable habitat within 300 ft (91 m) of the proposed construction area.

b. If an active CAGN, LBV, or SWF nest occurs within 300 ft (91 m) of the proposed construction corridor, the qualified biologist would report the nest to AC/S ES Wildlife Management Branch. A weekly nest status report would be sent to the branch as well.

c. If an active CAGN, LBV, or SWF nest occurs within 300 ft (91 m) of the proposed construction corridor, construction activities within that distance of the nest location, other than the use of existing roads, would be delayed until the nest fails or until at least 10 days after young fledge from the nest, unless the USMC and USFWS evaluate the circumstances and mutually agree that disturbance is not likely, in accordance with the BO and Conference Opinion for the Tertiary Treatment Plant and Associated Facilities (USFWS 2004).

6. A qualified biologist would monitor nest progress and construction activities in and adjacent to CSS and riparian habitats to ensure compliance with the SCMs and would keep the project engineer and AC/S ES Land Management Branch informed of the construction activities that may threaten significant biological resources.

2.4.2.2 Western Snowy Plover

A qualified shorebird biological monitor would be present during construction on Del Mar Recreation Beach during the breeding season (1 March – 15 September) to minimize impacts to the western snowy plover (WSP). The biological monitor would check the area each morning before construction begins for nests. If a nest is found construction would be delayed. The biological monitor would immediately notify the MCB Camp Pendleton AC/S ES biologist and the MCB Camp Pendleton AC/S ES biologist would contact the USFWS.

2.4.2.3 Arroyo Toad

No construction (trenching or other ground-disturbing activities) would occur in occupied riparian toad habitat during the breeding season (15 March through 15 August) to the maximum extent practical. Due to the nature of seasonal movement of the arroyo toad (AT), standard toad avoidance and minimization measures listed below are implemented year round in or adjacent to occupied toad habitat (defined as 1,640 ft [500 m] from any individual known toad location).

Arroyo Toad Protocol for Construction Projects

1. If construction occurs within Vandegrift Blvd. a road grate and steel plates would be installed during construction.
2. AC/S ES would coordinate with USFWS to determine areas along Vandegrift Blvd. where temporary silt fencing would need to be installed around the perimeter of work areas.
   - Such fencing would consist of woven nylon netting approximately 3 ft (1 m) high attached to wooden stakes.
   - Before installing the fencing, a narrow trench approximately 6 inches (15 cm) deep would be excavated and the fence buried, to prevent burrowing beneath the fence.
   - If trenching is not possible the bottom lip of the fence should have sand bags laid against it to hold it in place and deter toads from burrowing under the fence.
   - All fencing materials (i.e., mesh stakes) would be removed following construction.
   - Ingress and egress of construction equipment and personnel would be kept to a minimum, but when necessary, equipment and personnel would use a single access point to the site.
   - This access point would be as narrow as possible and be closed off by exclusionary fencing when personnel are not on the project site and have a road grate.

- Photographs of the fencing would be submitted to MCB Camp Pendleton AC/S ES Wildlife Management Branch after installation and immediately before initiating project impacts.
- Excavation units and trenches that have not been backfilled at the end of the day would be completely covered with rigid and durable materials to exclude toads and avoid toad entrapment.
- The excavated soil materials/stockpiles would be completely covered with a tarp at the end of the day.

3. Before construction activities, but after exclusionary fencing has been installed, at least two surveys for arroyo toads would be conducted within the fenced area by an USFWS-qualified biologist.
    - The qualified biologist would submit to AC/S ES Wildlife Management Branch, in writing, the names, any permit numbers, resumes, and at least three references (of people who are familiar with the relevant qualifications of the proposed biologist), of all biologists who might need to handle, move, survey, or monitor arroyo toads for the proposed project.
    - This information would be submitted to AC/S ES Wildlife Management Branch to obtain USFWS approval 15 days before the initiation of any arroyo toad surveys.
    - Proposed activities would not begin until an authorized qualified biologist has been approved by the Service conducted pre-construction surveys.
4. Surveys would be conducted during appropriate climatic conditions and during the appropriate time of day or night to maximize the likelihood of encountering arroyo toads.
    - If arroyo toads are found within the Action Area they would be captured and translocated, by the qualified biologist, to the closest area of suitable habitat along the closest creek.
    - Each morning, the qualified biologist would be present before initial ground disturbance activities and during removal of excavation unit covers and soil stockpile tarps to check for any toads that may have entered the area.
    - A qualified biologist would be present at the end of the day to ensure that the excavations are properly covered to prevent toads from entering any open pits.
    - The qualified biologist would be on call and available as needed at other times in the event that a toad is encountered during the activities. The qualified biologist would be present on site full-time, for two days to three days, following any measurable rainfall.
    - Upon notification of a toad sighting, the qualified biologist would contact the MCB Camp Pendleton AC/S ES Wildlife Management Branch, and MCB Camp Pendleton would contact the USFWS directly. Any type of "take" of toads, which includes: digging up, handling (i.e., relocating the toad), injury, or death would be reported immediately to MCB Camp Pendleton AC/S ES Wildlife Management Branch. The point of contact is Sherri Sullivan, Riparian Biologist (760-725-0377).
    - The qualified biologist would document and submit a weekly report on all arroyo toad related activities and actions taken.

2.4.2.4 Riparian Habitat

1. All temporarily disturbed LBV/SWF occupied riparian areas would be restored to original or better condition, through a combination of exotic vegetation control and vegetation management (including replanting if necessary) that will permit native species to regenerate in a timely manner (approximately 3-8 years). This restoration would include weeding and monitoring of affected

areas for a minimum of 3 years. Non-native plants, including noxious weeds (as listed by the California Invasive Plant Council), would be prevented from establishing in disturbed sites, either by hand-weeding or the selective application of herbicide to the target species, using an U.S. Environmental Protection Agency-approved herbicide and manner of application which would not have toxic effects on fish and wildlife or non-target plant species. The control of noxious weeds in temporarily disturbed areas of this riparian ground is mandated by the Riparian/Estuarine BO. Rehabilitation of natural (non-weedy) areas disturbed by construction would use the original topsoil to the maximum extent practical. Salvaging of native vegetation would be implemented where feasible. Topsoil in these areas would be salvaged, stockpiled, and then reapplied as the surface horizon following construction, as stated in the Riparian BO (USFWS 1995a). The topsoil would be stockpiled in designated areas presently lacking native vegetation within the limits of construction or an area approved by AC/S ES Land Management Branch. The soil would be stockpiled in a manner that would facilitate survival of mycorrhizal organisms (e.g., tarps would be removed during the day because the high heat would kill the organisms in the soil). Stockpile management methods would be reviewed by AC/S ES Land Management Branch.

2. Final construction designs would include plans to minimize the removal of riparian habitat that could support listed species. Any unavoidable removal or temporary disturbance of riparian habitat would be compensated in accordance with the MCB Camp Pendleton Riparian BO (USFWS 1995a). All riparian areas temporarily disturbed by construction activities would include native vegetation restoration at the sites affected and be treated for a minimum of three years post-construction to control the establishment of exotic vegetation within the cleared or otherwise disturbed area.
3. Consistent with the MCB Camp Pendleton Riparian BO (USFWS 1995a), temporarily disturbed areas of LBV/SWF occupied riparian vegetation would be weeded for at least three years after the cessation of the disturbance.

2.4.2.5 Coastal Sage Scrub

Final construction designs would minimize the removal of CSS and D-CSS that could support coastal CAGN. Any unavoidable removal or temporary disturbance CAGN occupied CSS would be recorded and either compensated or restored according to a CSS Restoration Plan approved before the start of construction. The CSS Restoration Plan would be reviewed and approved by AC/S ES Land Management Branch and the USFWS. Temporary effects would be restored on-site, permanent impacts to CAGN occupied CSS would be compensated by either on-Base restoration or off-Base conservation of CAGN occupied CSS vegetation at a ratio of 2:1.

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED

Several water treatment methods and disposal options, including those selected for the Proposed Action, were evaluated in *Drinking Water TDS TOC Treatment and Corrosion Control Feasibility Study MCB Camp Pendleton* (NAVFAC SW 2000*)*. As part of MCB Camp Pendleton's decision-making process in selecting those carried forward for further analysis, alternatives were considered that could potentially accomplish the project purpose and need. Below is a brief description of each of these options as described in the 2000 study.

2.5.1 Zero Liquid Discharge

Further treatment of the brine residues using an evaporation and crystallization system would eliminate liquid waste disposal and the associated brine disposal piping. A Zero Liquid Discharge (ZLD) system uses an electrical evaporator and crystallizer to convert brine to pure water (distilled) and crystal salts for landfill disposal. Evaporator/crystallizers are primarily used in industrial applications where high quality pure water is required. Table 2-3 shows the construction and operations and maintenance (O&M) costs for two ZLD systems. The costs were based on the treatment capacity for peak brine flow without flow equalization facilities. Due to high energy consumption, the annual operational cost of this alternative technology is substantial. Because the construction and operation costs of ZLD (Table 2-3) are substantially higher than those of the brine disposal pipeline to the jetty ($4,784,000) (NAVFAC SW 2000), this alternative is not considered a viable alternative and was not carried forward for further analysis.

Table 2-3 Expected Brine Evaporator/Crystallizer Capital and O&M Costs in 2000

Item	*Cost*
Total Construction	$23,083,000
Annual O&M Cost	$7,716,000

2.5.2 Percolation Ponds

Percolation ponds allow wastewater to infiltrate back into the ground. If percolation ponds are used to dispose of brine into the shallow saltwater aquifer at MCB Camp Pendleton they would be far enough downstream from existing wells to prevent an increase in aquifer water TDS. Percolation ponds cannot be constructed within the shallow fresh water aquifer at MCB Camp Pendleton as this would increase TDS in downstream aquifers. When percolation ponds are located in a saltwater aquifer, the percolation rate is determined by geological formation. A percolation study of the geologic materials underlying the former percolation ponds in the Lemon Grove area found that approximately 0.6 mgd of effluent could be disposed of in the percolation ponds without causing substantial groundwater surfacing in the vicinity of the Lemon Grove Pump Station and between I-5, Vandegrift Blvd., and Stuart Mesa Road (NAVFAC SW 2000). Due to a limited infiltration rate in the upper strata, brine disposal via the former Lemon Grove percolation ponds would have substantially changed the groundwater gradient in the immediate area.

The former MCB Camp Pendleton Lemon Grove percolation ponds have been converted and are currently being used for wastewater effluent storage. Since the Lemon Grove ponds currently store wastewater effluent, it is not considered a viable option and was not carried forward for analysis in the EA.

2.5.3 Evaporation Ponds

RO plant brine may be disposed of using lined evaporation ponds or drying beds utilizing sunlight. However, this option depends primarily on the regional evaporation rate and rainfall. As shown in Table 2-4, the annual evaporation rate at Lake O'Neill at MCB Camp Pendleton from 1957-1984 averaged 60 inches (152 cm).

Table 2-4 Historic Lake O'Neill Pan Evaporation Data (1957-1984)

Calendar Year	*Evaporation (Inches)*	*Calendar Year*	*Evaporation (Inches)*
1957	66.5	1975	66.5
1958	55.4	1976	55.4
1959	62.7	1977	62.7
1960	53.1	1978	53.1
1961	60.9	1979	60.9
1962	61.7	1980	61.7
1963	61.1	1981	61.1
1964	58.9	1982	58.9
1965	57.6	1983	57.6
1966	62.7	1984	62.7

The average annual rainfall during the same time period (1957 through 1984) was 13.7 inches (34.8 cm). Based on evaporation rate and rainfall data, it is estimated that a pond with a surface area of 152 acres (62 hectares [ha]) would be required for this alternative (NAVFAC SW 2000). This estimate is for a future average brine flow of 1344 acre-ft (1.2 mgd) if the AWT plant runs at a rate to meet the future average daily demand for the SWS, assuming that the peak brine discharge is equalized at the existing outfall equalization ponds. The average brine flow of 1.2 mgd is based on future average water demand (7,000 gallons per minute) and recovery rate of about 83%. Documents cited in the NAVFAC SW 2000 study indicated that even less evaporation occurred in the period from 1996 through 1997 (only 40 inches [102 cm]), therefore, more land would be required. A large evaporation pond would be needed to contain the projected volume of brine throughout the slow evaporation process. Evaporation ponds would need to be lined to prevent the potential for accidental subsurface brine loss. Any brine leakage over time would likely cause TDS to increase in the groundwater. Although evaporation ponds do not need much regular maintenance once constructed, periodic removal and disposal of bottom salt deposits from the pond would be labor-intensive and could damage pond liners. The capital costs associated with constructing such a large pond and related disposal pipeline (Table 2-5) is substantially higher than those capital costs associated with the brine disposal pipeline to the jetty ($4,784,000) (NAVFAC SW 2000); therefore, this option was eliminated as an alternative. Converting existing percolation ponds would not be feasible because their locations could impact the groundwater aquifer underlying the ponds. Evaporation ponds; therefore, were not carried forward for analysis.

Table 2-5 Expected Evaporation Pond Capital Cost in 2000

Item	*Cost*
Pond Construction	$14,689,000
High Density Polyethylene (HDPE) Liner	$3,310,000
Brine Disposal Pipeline	$4,359,000
Total Cost	**$22,358,000**

2.5.4 Deep Well Injection

The area within MCB Camp Pendleton west of I-5 and north of the mouth of the SMR was considered as a potential candidate site for deep well injection, in association with the Fallbrook Public Utility District Conjunctive Use Study (NAVFAC SW 2000). However, it is uncertain whether the soil strata conditions are actually suitable for deep well injection (below 900 ft [274 m]). The soil strata conditions west of I-5 would need to be further investigated to ensure that injected brine would not pose a threat by surfacing

into the shallow groundwater aquifer. Sufficient hydraulic conductivity to accept the desired brine volume would be determined. The injection site should also have confinement above the injection aquifer to prevent brine surfacing. The federal Underground Injection Control (UIC) program requires that the aquifer accepting the brine disposal be a Class IV aquifer having a TDS level higher than 10,000 mg/L. To further explore the deep well injection, pilot testing is needed to determine whether injected brine would migrate over long distances and infiltrate the SMR aquifer. Injection rate, injection pressure, well depth, and number of wells need to be determined in a pilot test. Deep wells need to be grouted to prevent brine migration along the casing from reaching the drinking water aquifer or ground surface. The cost of such hydrogeological investigations and pilot tests is often substantial.

Deep injection wells often become plugged by suspended solids, precipitates of calcium carbonate and bacteria growth, substantially reducing the infiltration rate. Plugged wells are difficult to recover and frequently require re-drilling. UIC regulations require backup wells for Class 1 injection and monitoring wells. Monitoring local groundwater quality during injection and the uncertainty of a deep injection well's life span add to the well operating cost. Periodic well inspection to determine its condition requires that the well be out of service for a few days to one week, which means that backup wells would always be available. The injection flow rate for this method is limited due to the potential for deep injection, especially with pressure injection, to create a buildup of pressure in the receiving aquifer formation and affect seismicity.

The capital cost for large diameter (16-inch) casing deep wells is estimated at more than $300 per ft of well depth because of strict standards for injection well construction (NAVFAC SW 2000). Depending on the geological formation, this equates to a capital cost of $200 to $400 thousand per well (NAVFAC SW 2000). Because of the long distance, approximately 7.7 miles (12.4 km) between the AWT facility at Haybarn Canyon and the required injection manifold, the total capital cost of constructing deep wells would be about $12 million as shown in Table 2-6.

Table 2-6 Expected Deep Well Injection Capital Cost in 2000

Item	*Cost*
20 deep wells, 1,200 ft deep, 1.2 mgd* total injection	$7,200,000
Brine Transmission Piping	$4,359,000
Total capital cost	$11,559,000

Notes: *mgd=million gallons per day.

Due to the uncertain long-term functionality of deep injection wells operational costs, costs associated with the initial drilling of injection wells, and any additional drilling required to replace plugged wells, this alternative was not considered viable and was not carried forward for further analysis.

2.5.5 Brine Disposal via City of Oceanside's Outfall

MCB Camp Pendleton currently has a short-term (less than 5 years) agreement with the City of Oceanside to allow for disposal of wastewater through the City's ocean outfall. The brine outflow from the proposed AWT RO system would meet the criteria for discharge via this outfall, which has hydraulic capacity to accommodate the projected RO brine average daily discharge (1.2 mgd). The only additional construction required for ocean disposal through this outfall would be construction of approximately 7.2 miles (11.6 km) of brine disposal pipeline from the Haybarn AWT plant to the Lemon Grove Pump Station to connect the AWT to the existing MCB Camp Pendleton P-527B ocean outfall connection pipeline, and a booster pump station (NAVFAC SW 2000). The pipeline corridor for this alternative disposal point would take either Alternatives 1, 2, 3, or 4's route to Vandegrift Blvd., then follow Vandegrift Blvd. southward and connect to the Lemon Grove Pump Station, rather than continue on to the

DMBB jetty (Figure 2-5). From the Lemon Grove Pump Station, the P-527B pipeline would carry the brine southeastward past the MCB Camp Pendleton property boundary to the ocean outfall offshore from the City of Oceanside. The corridor footprints would be the same as those described for Alternatives 1, 2, 3, or 4. Disposal via the P-527B project pipeline and the City of Oceanside ocean outfall would be less costly and is expected to have less environmental impacts.

MCB Camp Pendleton is currently in negotiation with the City of Oceanside to extend the length of the agreement for use of the ocean outfall. However, because there is no current long-term (greater than 5 years) agreement between MCB Camp Pendleton and the City of Oceanside for use of the ocean outfall, this option is not considered sustainable at this time, and is not carried forward for further analysis in the EA. Should the Base and the City of Oceanside arrive at a long-term agreement with respect to the ocean outfall, this alternative would become viable.

2.5.6 Alternative AWT Facility Location

Although a nearby existing Iron/Manganese Removal Treatment Facility in the 22 Area was considered as a possible location for upgrades, it was eliminated from further analysis because it did not have the necessary infrastructure, such as manifold piping. Additional pipeline construction would be required to connect the Iron/Manganese Removal Treatment Facility in the 22 Area. Therefore, the 24 Area Haybarn Canyon facility is considered the only viable option to support implementation of the Proposed Action.

2.5.7 Summary of Alternatives Considered But Eliminated

The above-listed alternatives were considered but were not carried forward for analysis in this EA due to the specific engineering, funding, and/or environmental constraints listed in Table 2-7. Also, as described in Section 2.1.2, because the action is expected to be a design-build project, some flexibility exists in the engineering design and/or materials used during construction activities. These possible technical differences arising from the design-build process are not sufficient as to constitute separate alternative(s).

Based upon the elimination of the six alternatives presented in Table 2-7, the only alternatives carried forward for analysis in this EA are the alternatives discussed in Section 2.1.

Table 2-7 Alternatives Considered but Eliminated from Further Analysis

Alternative	*Advantages to Proposed Action*	*Disadvantages to Proposed Action*	*Reason For Elimination*
Zero Liquid Discharge (Evaporator/Crystallizer)	• Water Recycled • No Liquid Waste Disposal • No Brine Disposal Piping	• High Capital Cost • High O&M Cost • High Energy Consumption	• Not Economically Feasible
Percolation Ponds	• No NPDES Permit • Low O&M Cost	• Limited Infiltration Capacity • Potential Ground Water Surfacing • Potential Increase to Shallow Aquifer TDS	• Insufficient capacity • Does not Minimize Environmental Impacts
Evaporation Ponds	• No NPDES Permit • Low O&M Cost	• High Capital Cost • Large Land Area Required	• Not Economically Feasible
Deep Well Injection	• No NPDES Permit	• High Capital Cost • High O&M Cost • Requires a UIA Permit	• No Long Term Sustainability • Does not Minimize Environmental Impacts • Not Economically Feasible
Brine Disposal via City of Oceanside's Outfall	• No New Permits Needed	• Currently No Long Term Contract In Place For Use	• Currently No Long Term Viability
Alternative AWT Facility Location	• None	• Additional Piping Required • Existing Infrastructure Inadequate	• Does not Minimize Environmental Impacts

2.6 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The following resource areas are analyzed in this EA: biological resources, cultural resources, air quality, utilities, and hydrology and water quality. Table 2-8 provides a summary of environmental consequences, by resource area for the Proposed Action (Alternative 4), three Action Alternatives (Alternatives 1, 2, and 3), and the No-Action Alternative.

Table 2-8 Summary of Environmental Consequences

Resource Area	*Alternative 1*	*Alternative 2*	*Alternative 3*	*Alternative 4 (Preferred Alternative)*	*No-Action Alternative*
Biological Resources	**Potential impacts to known biological resources in segment unique to route.**	**Potential impacts to known biological resources in segment unique to route.**	**Potential impacts to known biological resources in segment unique to route.**	Potential impacts to known biological resources in segment unique to route, but overall impacts would be fewer, when compared with Alternatives 1, 2, and 3.	Existing conditions would remain unchanged; therefore, no significant impacts would occur.
Cultural Resources	**Potential impacts to known cultural resources in segment unique to route.**	**Potential impacts to known cultural resources in segment unique to route.**	**Potential impacts to known cultural resources in segment unique to route, but overall impacts would be less when compared with Alternatives 1 and 2.**	Potential impacts to known resource areas in segment unique to route, but overall impacts would be fewer when compared with Alternatives 1, 2, and 3.	Existing conditions would remain unchanged; therefore, no significant impacts would occur.
Air Quality	**No significant impacts.**	**No significant impacts.**	**No significant impacts.**	No significant impacts.	Existing conditions would remain unchanged; therefore, no significant impacts would occur.
Utilities	Beneficial impacts would occur as a result of the ability to comply with current drinking water and wastewater standards.	Beneficial impacts would occur as a result of the ability to comply with current drinking water and wastewater standards.	Beneficial impacts would occur as a result of the ability to comply with current drinking water and wastewater standards.	**Beneficial impacts would occur as a result of the ability to comply with current drinking water and wastewater standards.**	**Existing conditions would remain unchanged; therefore, adverse impacts would occur as a result of the inability to comply with current drinking water and wastewater standards.**

Resource Area	*Alternative 1*	*Alternative 2*	*Alternative 3*	*Alternative 4 (Preferred Alternative)*	*No-Action Alternative*
Hydrology and Water Quality	No significant impacts.	No significant impacts.	No significant impacts.	**No significant impacts.**	**Existing conditions would remain unchanged; therefore, no significant impacts would occur.**

2.7 PREFERRED ALTERNATIVE

Based upon the screening criteria and the greater potential of environmental impacts associated with Alternatives 1 and 2 (which have a greater potential to impact biological resources, cultural resources, and a greater potential for damage to the pipeline than Alternative 4), and Alternative 3 (which has a greater potential to impact biological resources and a greater potential for damage to the pipeline than Alternative 4), the USMC has identified the construction and operation of an AWT facility in Haybarn Canyon and the Alternative 4 brine pipeline alignment and alternative brine disposal method as the Preferred Alternative.

CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the conditions of the existing environment and environmental consequences in and around MCB Camp Pendleton for resources potentially affected by implementation of the Proposed Action or alternatives discussed in Chapter 2. Information presented in this chapter represents baseline conditions against which the Proposed Action and alternatives are evaluated to identify potential impacts.

3.1 RESOURCES CONSIDERED BUT ELIMINATED

In compliance with NEPA, CEQ regulations, and DON and USMC procedures for implementing NEPA, the description of the affected environment focuses only on those resources potentially subject to impacts. In addition, the level of analysis should be appropriate with the anticipated level of impact. Accordingly, the discussion of the affected environment and associated environmental consequences focuses on biological resources, cultural resources, air quality, and utilities within the defined Region of Influence (ROI) for each resource. Conversely, the following resource areas were not carried forward for analysis in this EA, as potential impacts were considered to be negligible or non-existent:

Aesthetics. Implementation of the Proposed Action would have a negligible effect on aesthetics since the Proposed Action would occur in areas where the visual environment is already characteristic of a military installation and the construction of pipelines and associated facilities would be consistent with the Base Exterior Architectural Plan and current land use at MCB Camp Pendleton. Minor landscape modifications would occur during construction activities; however, disturbed areas would be re-vegetated as appropriate and allowed to return to their natural state. The caisson associated with the preferred alternative would be buried and not visible. Therefore, impacts related to aesthetics would be minimal.

Geology, Soils, and Seismicity. Construction activities would be completed in compliance with the geotechnical recommendations incorporated into project design and a General Construction Permit. As part of the permit, a SWPPP would incorporate erosion control measures. Provisions for both temporary and permanent erosion and sediment controls would be implemented in accordance with the SWPPP prepared and designed specifically for the construction sites. Project components would be constructed in compliance with the seismic design criteria identified in the Uniform Building Code, the NAVFAC SW Design Manual, and the criteria identified in the latest design specifications of the Structural Engineering Association of California. Therefore, impacts related to geology, soils, and seismicity would be minimal.

Hazardous Materials/Wastes. Construction activities would be conducted in compliance with all federal, state, and MCB Camp Pendleton requirements for use, storage, and disposal of hazardous materials/ hazardous wastes. Contractors would be required to prepare and implement hazardous materials/hazardous wastes management plans that include contingencies for accidental releases and construction equipment would include spill containment kits. Construction equipment would be re-supplied with fuel from fuel trucks at the contractors' lay-down area only. The fuel trucks would meet the requirements of CFR Title 49 Subtitle B and include absorbent spill clean-up materials. The lay-down area would be specified on the construction map and would not be placed within 100 ft (30 m) of drainages. Emergency provisions would be in place at all crossings before the onset of construction to prevent accidental spills from contaminating downstream habitats. All construction vehicle and equipment maintenance would be avoided in the construction area, except in the event of an emergency

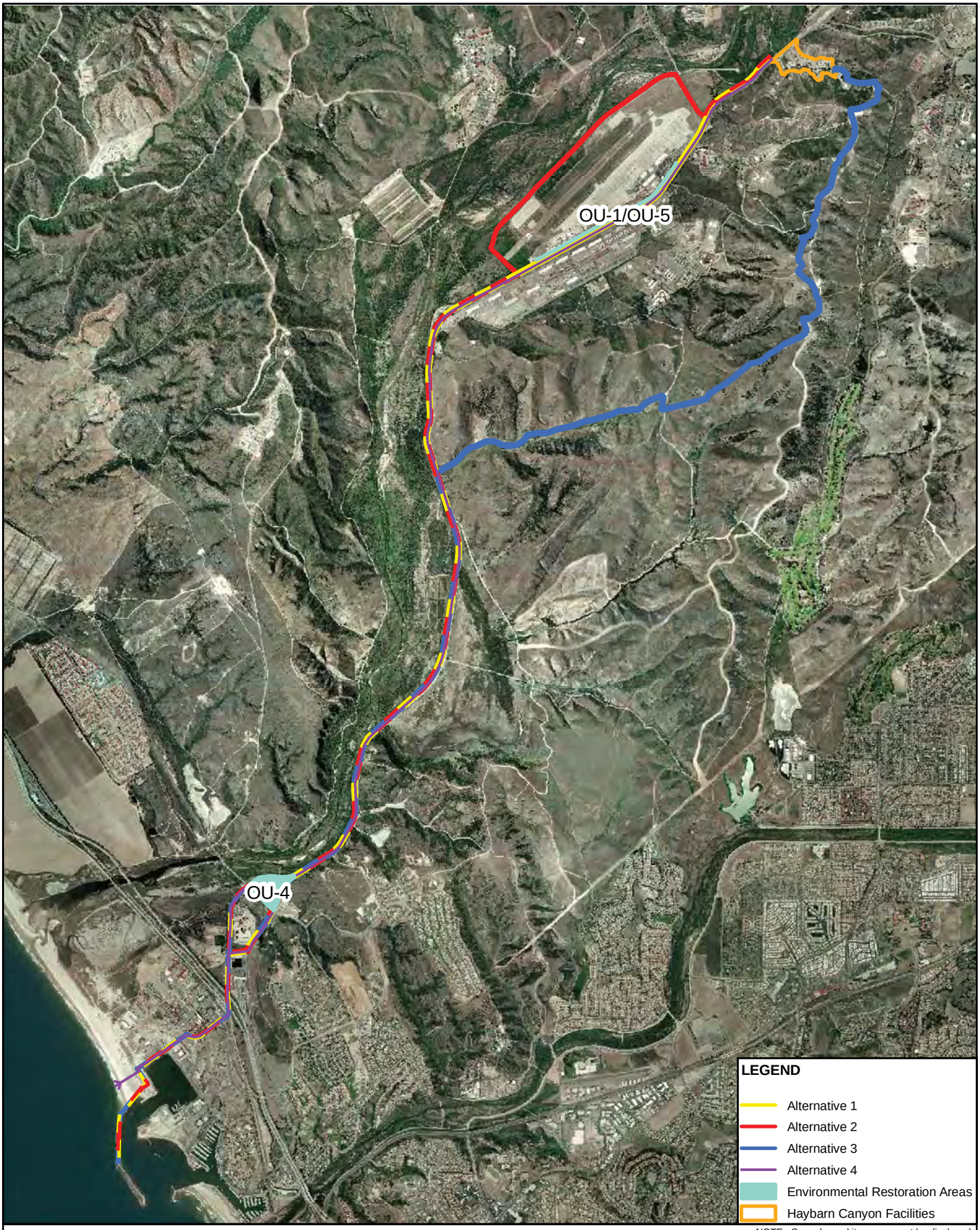
(e.g., equipment breakdown in the field). Only minimal quantities of lubricants and other vehicle and equipment fluids would be stored in covered storage areas within the construction lay-down areas. Hazardous materials and hazardous wastes associated with operation of the proposed facilities would be managed in accordance with all federal, state, and MCB Camp Pendleton requirements. Installation Restoration (IR) sites are grouped into operable units. Operable unit (OU)-1, OU-4 and OU-5 are within the footprint of the proposed project (Figure 3.1-1). OU-4 (Figure 3.1-2), comprising IR Site 1D, would not impact the proposed project because soil remediation has been completed and groundwater is currently being remediated within the site. The proposed project is not expected to impact the groundwater in this area. OU-1, comprising IR Site 6, and OU-5, comprising IR Site 22 and IR Site 23 (Figure 3.1-3) would impact the proposed project only if Alternative 1 is chosen. These impacts are expected to be minimal, if any, due to the location of the Installation Restoration Program (IRP) sites primarily under existing structures and along the edge of the footprint. OU-1 and OU-5 do not extend into the roadway and would therefore not be impacted by Alterative 4. If soils are suspected to contain hazardous materials/waste, due to odor or soil discoloration, SCM 26 and 28, in Section 2.3 of the EA, would be followed and Base environmental would be informed. Therefore, impacts related to hazardous materials/wastes are expected be minimal.

Land Use. Construction activities related to the placement of pipelines may temporarily disrupt access to streets adjacent to pipelines or training areas; however, this disruption would be minimized by the short-term nature of the construction process and efforts to maintain access along the roadways through the use of signage and alternative routes, as appropriate. Construction or operation of pump stations would not result in changes to existing land use. Therefore, impacts related to land use would be minimal. In addition, the USMC consulted with the California Coastal Commission (CCC) to request concurrence with its Coastal Consistency Negative Determination. The CCC provided a letter to the USMC concurring with the determination that the Proposed Action would not adversely affect coastal resources (Appendix F).

Noise. Standard construction equipment used for site preparation and development would increase noise in the project area temporarily. Once construction is completed, construction noise would cease. The proposed pump stations would generate intermittent instances of noise when they operate. The project area is far enough away from any sensitive noise receptor that both the construction noise and the intermittent pump station noise would attenuate to accepted ambient levels. Therefore, project noise impacts would be negligible.

Public Health and Safety, including Environmental Health and Safety Risks to Children. During construction activities, measures such as fencing, signs, security, and other BMPs would be implemented to minimize safety risks and unauthorized access. To ensure that no cross-connection contamination occurs between wastewater and potable water, pipes would be constructed and maintained, per the separation distance required by CCR Title 22. In addition, warning signs stating that water is not for drinking would be posted. The Proposed Action would not result in disproportionate environmental health or safety risks. Therefore, impacts related to environmental health and safety would be minimal.

Socioeconomics and Environmental Justice. Construction of this project would not result in the displacement of people or businesses and would not change the economic character or stability of the surroundings. Contractors would be drawn from the neighboring communities and project facilities would be staffed predominantly by personnel already on MCB Camp Pendleton. The Proposed Action would not result in the disproportionate impacts to minority and low-income populations. Therefore, impacts related to socioeconomics and environmental justice would be minimal.

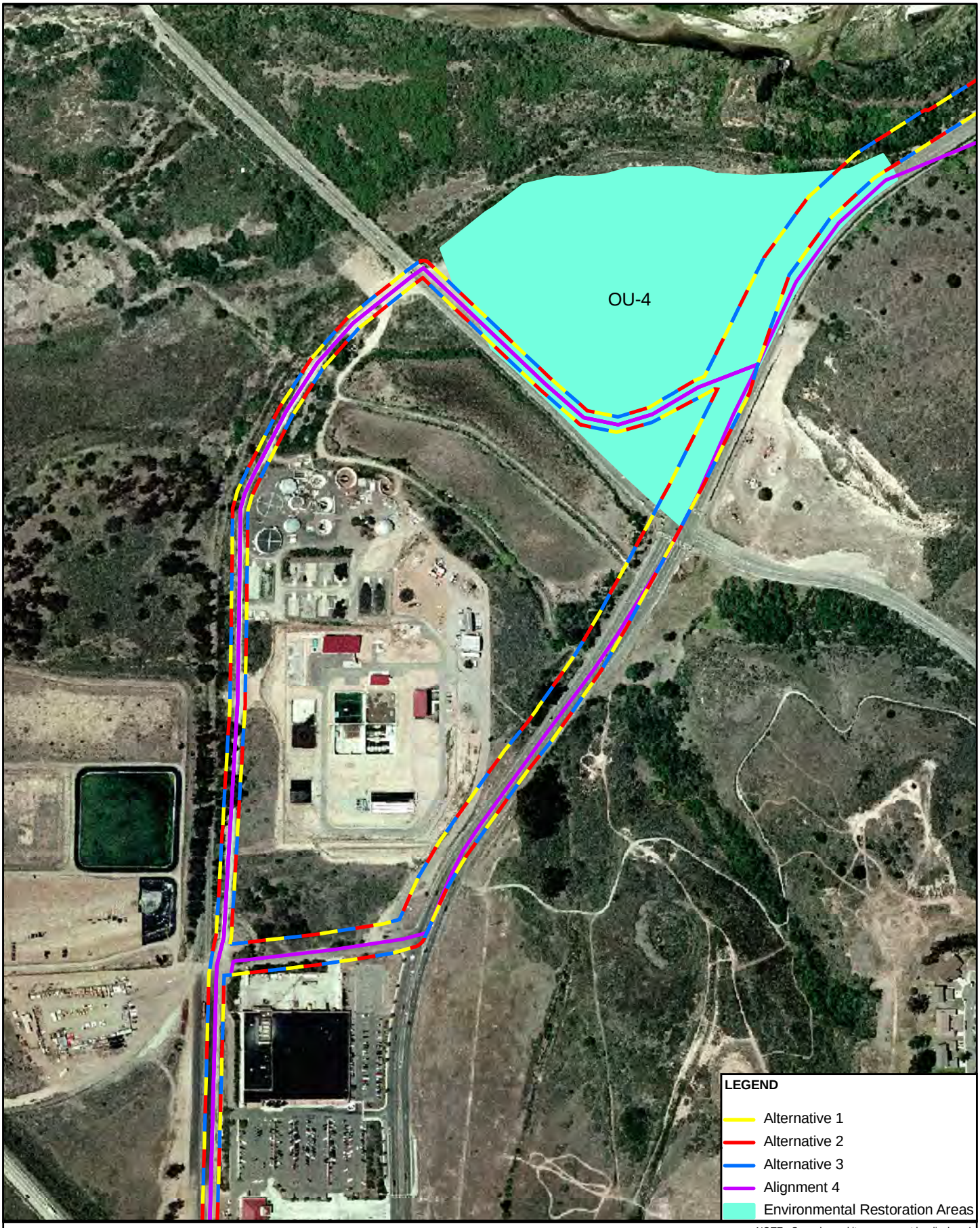


NOTE: Some legend items may not be displayed

0 2,500 5,000 Feet

0 250 500 1,000 1,500 2,000 2,500 Meters

Figure 3.1-1
IRP Site Near the Proposed
Action and Alternatives



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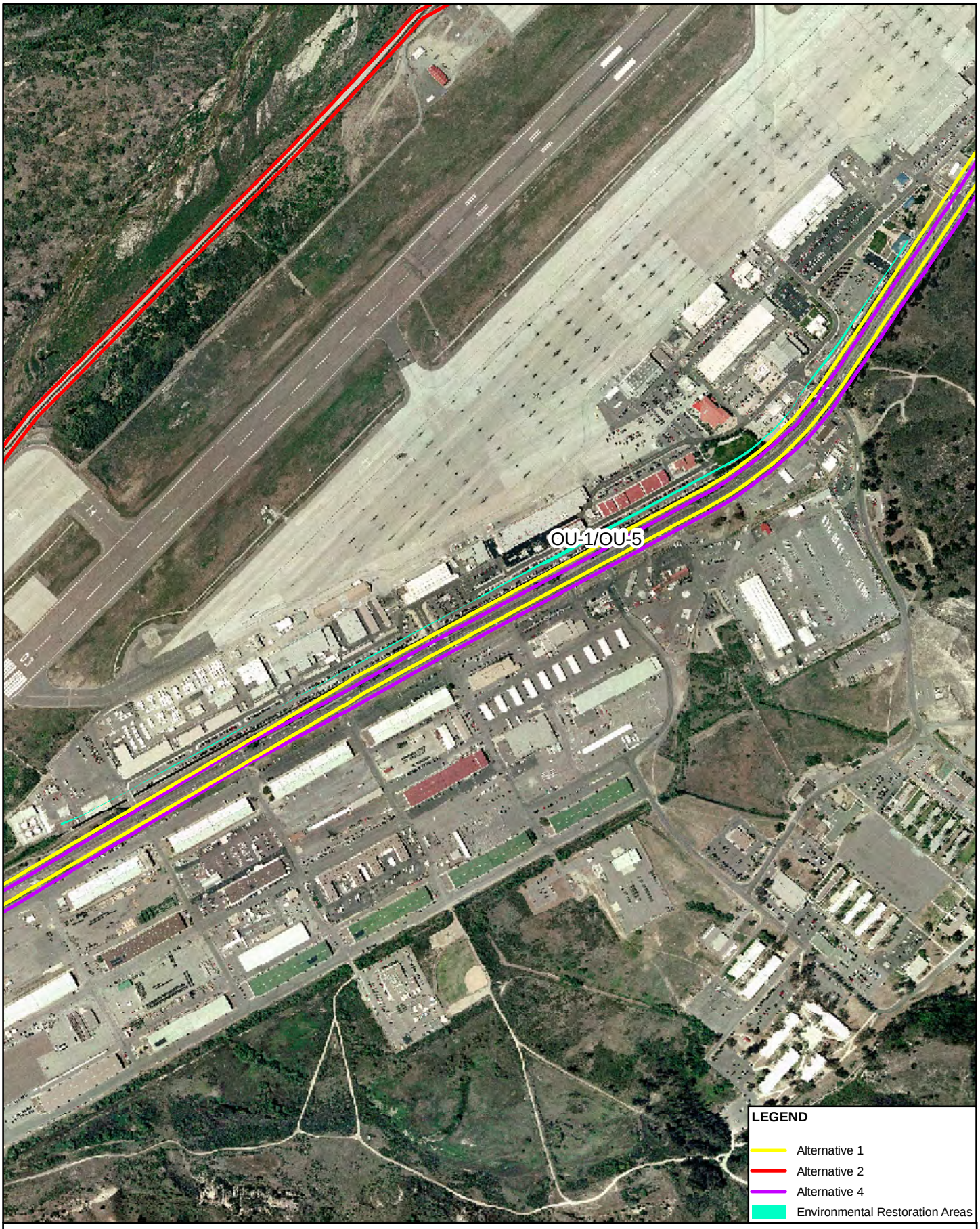
0 100 200 400 Feet
0 50 100 200 Meters

Figure 3.1-2
OU-4 in Relationship to the Proposed Action and Alternatives



0 100 200 400 600 Feet
0 50 100 200 300 Meters

Figure 3.1-3
OU-1 and OU-5 in Relationship to the
Proposed Action and Alternatives

Transportation and Circulation. Projected increases in traffic volumes due to implementation of the Proposed Action would constitute a negligible portion of the total existing traffic volumes at the Base. Operation of the pipelines and associated facilities would be limited to vehicle traffic associated with periodic maintenance, which would be intermittent and would represent a negligible increase in traffic on the Base. Construction trips would be distributed throughout each work day. Because of this, these trips would affect an individual route or intersection only intermittently during any given phase of construction. During the construction phase of Alternative 4, traffic on parts of Vandegrift Blvd. would be disrupted during the pipeline installation. To minimize traffic impacts work would occur between 1800 hrs and 0600 hrs. Temporary asphalt patches and metal plates would be used to cover the ditches created by the pipe installation the night before, daytime traffic to fully use Vandegrift Blvd. and thus minimize impacts to traffic. Therefore, impacts related to transportation and circulation would be minimal.

3.2 BIOLOGICAL RESOURCES

3.2.1 Definition of Resource

Biological resources include plants and animals and the habitats in which they occur. Biological resources are divided into three major categories: 1) Plant Communities and Aquatic Habitats, including existing terrestrial plant communities, waters of the U.S., wetlands, aquatic plant communities, Essential Fish Habitat (EFH), and Special Aquatic Sites (SAS); 2) Wildlife, including migratory birds and marine mammals; and 3) Special-Status Species, including plants and animals that are federally listed or proposed for listing as threatened or endangered by the USFWS, and other special concern species.

3.2.2 Existing Conditions

For purposes of this EA, the description of existing conditions refers to areas directly or indirectly affected by the Proposed Action. The description of existing conditions is based on the 2004 Tertiary Treatment Plant (TTP) EIS (NAVFAC SW 2004), P-110 Supplemental EA (USMC 2007a) and references therein, natural resources data contained in the MCB Camp Pendleton Geographic Information System (GIS) as of 2009 (MCBCP 2009), and data gathered and observations made during project-specific field surveys conducted in 2007 and 2008. Project-specific mapping efforts or surveys were conducted for vegetation, wetlands, and waters of the U.S. in the project areas that were not included in the 2004 TTP EIS (NAVFAC SW 2004) and P-110 Supplemental EA (USMC 2007a). These specific surveys were conducted by TEC biologists on 5 and 10 September 2007, 11 October 2007, and 6 and 9 February 2008.

3.2.2.1 Plant Communities and Aquatic Habitats

<u>Plant Communities</u>

Plant communities have been mapped according to the classification developed by Holland (1986). Holland's system includes lists of dominant and characteristic species found in each community. Oberbauer (1996) developed a slightly expanded version of Holland's system for use in San Diego County, and Oberbauer's additions to the basic system have been incorporated here where applicable. In addition, higher categories and/or subtypes of the Holland/Oberbauer system have been used in previous vegetation mapping on MCB Camp Pendleton, and have been used here where they provide a better fit.

Plant communities were mapped at Haybarn Canyon and throughout a 200-ft (61-m) wide study area that included the 50-ft (15-m) to 100-ft (30-m) wide construction corridor, at a scale of 1:2,400 (1 inch equals 200 ft) using a relatively high-resolution digital aerial photograph from April 2007 (see Figures in

Appendix A) (MCBCP 2009). Previous GIS plant community maps overlapping the project study area, including maps prepared for the Tertiary Treatment Plant P-002 and P-110 projects (NAVFAC SW 2004; USMC 2007a), and a draft Basewide map prepared in 2006 (using the MCB Camp Pendleton's 2003 aerial photograph) were initially combined for desktop review. Boundaries and the plant community classifications were modified based on changes apparent in the 2007 aerial photograph and TEC Inc (TEC) biologists' previous knowledge and ground-truthing of the project study area. Plant community maps of the entire project area are included in Appendix A (Figures 1 through 28).

Tables 3.2-1 and 3.2-2 show the potential temporary and permanent impacts, respectively, to plant communities within the P-113 Alternative Project Footprints. The permanent impacts shown in Table 3.2-2 would be the same for Alternatives 1, 2, and 3. Permanent access roads would not be needed for Alternative 4. Plant community maps in Appendix A include 50-ft (15-m) to 100-ft (30-m) wide footprint buffers on either side of the centerline of the pipeline route alternatives. The buffer distances vary by alternative due to different conditions along some of the pipeline route alternatives. Descriptions of plant communities (with Holland/Oberbauer classification in parentheses) follow Table 3.2-2.

Table 3.2-1 Potential Temporary Impacts to Plant Communities in P-113 Alternative Project Footprints

Plant Communities	*Alternative 1 (acres)*	*Alternative 2 (acres)*	*Alternative 3 (acres)*	*Preferred Alternative Alternative 4 (acres)*	*Haybarn Canyon (acres)*
Coastal Sage Scrub					
Coastal Sage Scrub (Diegan) (CSS)	0.92	0.92	8.00	5.70	0.17
CSS-dominated by *Baccharis pilularis* [CSS(P)]	0.54	0.54	0.53	0.94	0.71
Coastal Sage Scrub-Chaparral Scrub (CS-CS)	-	-	3.60	-	-
Total Coastal Sage Scrub	**1.46**	**1.46**	**12.13**	**6.64**	**0.89**
Disturbed Coastal Sage Scrub					
Disturbed CSS (D-CSS)	1.64	1.64	2.31	1.63	0.99
Disturbed CSS(P) [D-CSS(P)]	0.68	0.68	1.13	1.04	3.67
Total Disturbed Coastal Sage Scrub	**2.32**	**2.32**	**3.34**	**2.67**	**4.66**
Riparian					
Mulefat Scrub (MFS)	2.35	2.35	2.12	0.72	1.55
Southern Arroyo Willow Riparian Forest (SWRF)	6.46	6.47	10.62	1.69	-
Southern Willow Scrub (SWS)	2.91	2.91	3.83	0.15	0.07
Southern Riparian Scrub (RIP SCRUB)	-	0.02	-	0.13	-
Total Riparian	**11.72**	**11.75**	**16.57**	**2.69**	**1.62**
Miscellaneous					
Beach	0.19	0.19	0.19	3.96	-
Cismontane Alkali Marsh (CAM)	-	-	1.34	-	-
Coastal and Valley Freshwater Marsh (CVFM)	0.16	0.16	0.29	0.26	-
Developed (DEV)	67.86	62.96	13.71	80.88	0.02
Disturbed (DIST)	20.53	19.05	13.43	19.80	15.23
Eucalyptus Woodland (EUC)	0.12	0.12	0.12	0.36	1.69
Exotics-Arundo (EX-ARU)	-	0.01	-	-	
Native Grassland (NG)	-	-	0.06	-	1.02
Non-Native Grassland (NNG)	0.26	0.59	5.92	1.86	-
Open Water	0.0003	0.0003	0.0003	-	-
Unvegetated Channel (UNVEG CHANNEL)	0.21	0.21	0.77	-	-
Total	**104.83**	**98.83**	**67.97**	**119.12**	**26.04**

Table 3.2-2 Potential Permanent Impacts to Plant Communities in P-113 Alternative Project Footprints

Plant Communities	*Haybarn Canyon (acres)*	*Access Roads (Alternatives 1, 2, and 3) (acres)*[1]	*Total*
Coastal Sage Scrub			
Coastal Sage Scrub-Chaparral Scrub (CS-CS)	-	-	-
Diegan Coastal Sage Scrub (CSS)	-	-	-
CSS-dominated by *Baccharis pilularis* [CSS(P)]	-	-	-
Total Coastal Sage Scrub	-	-	-
Disturbed Coastal Sage Scrub			
Disturbed CSS (D-CSS)	-	-	-
Disturbed CSS(P) [D-CSS(P)]	0.29	-	0.29
Total Disturbed Coastal Sage Scrub	**0.29**	**-**	**0.29**
Riparian			
Mulefat Scrub (MFS)	0.01	-	0.01
Southern Arroyo Willow Riparian Forest (SWRF)	-	0.07	0.07
Southern Willow Scrub (SWS)	-	-	-
Total Riparian	**0.01**	**0.07**	**0.08**
Miscellaneous			
Beach	-	-	-
Cismontane Alkali Marsh (CAM)	-	-	-
Coastal and Valley Freshwater Marsh (CVFM)	-	-	-
Developed (DEV)	0.97	-	0.97
Disturbed (DIST)	0.97	-	0.97
Eucalyptus Woodland (EUC)	0.23	-	0.23
Native Grassland (NG)	-	-	-
Non-Native Grassland (NNG)	-	-	-
Unvegetated Channel (UNVEG CHANNEL)	-	-	-
Total	**2.47**	**0.07**	**2.54**

Note: [1] Alternative 4 would have no permanent impacts.

Beach (13400) is an area of unvegetated sand. Plant cover is typically less than 20%. The majority of the beach habitat within the Action Area is unvegetated. Potential dominant species include beach-bur (*Ambrosia chamissonis*), beach evening-primrose (*Camissonia cheiranthifolia* ssp. *suffruticosa*), and two non-native species, sea fig (*Carpobrotus chilensis*) and sea rocket (*Cakile maritima)*. Beach habitat occurs on the southwestern edge of the Action Area.

Cismontane Alkali Marsh (CAM) (52310) is an association of halophytic (salt-tolerant) herbs and subshrubs that form a moderate to dense cover to a height of 3 ft (1 m). These areas are on saline soils derived from old salt marsh sediments and maintained by evaporation and poor drainage. The most common species observed in the project area are Parish's pickleweed (*Arthrocnemum subterminale*), Pacific pickleweed (*Sarcocornia pacifica*), alkali-heath (*Frankenia salina*), and alkali weed (*Cressa truxillensis*). CAM occurs within Alternative 3 along Pueblitos Canyon.

Coastal and Valley Freshwater Marsh (CVFM) (52410) is typically dominated by perennial, emergent monocots (e.g., grasses, lily, iris, rushes, sedges, palms), some of which achieve a height 13-15 ft (4-5 m) tall and often consist of uniform stands with closed canopies. This community occurs in wetlands that are permanently flooded by standing freshwater lacking a significant current. Prolonged saturation of such areas permits the accumulation of deep, peaty soils. Characteristic species include bulrushes (*Schoenoplectus* spp.) and broad-leaf cattail (*Typha latifolia*). CVFM occurs within Alternative 3 along Pueblitos Canyon, within Alternatives 1, 2, and 4 along Vandegrift Blvd. just south of MCAS and within

Alternatives 1, 2, 3, and 4 just south of Stuart Mesa Road, and behind the Southern Region Tertiary Treatment Plant (SRTTP) along the railroad access road.

Coastal Sage Scrub (Diegan) (CSS) (32510) occurs on dry slopes and is typically dominated by California sagebrush (*Artemisia californica*) and other soft-woody shrubs including coast California buckwheat (*Eriogonum fasciculatum* ssp. *fasciculatum*), laurel sumac (*Malosma laurina*), sage (*Salvia* spp.), and coastal goldenbush (*Isocoma menziesii* var. *vernonioides*). Shrub cover varies considerably and native perennial grasses and forbs commonly occur in the understory. CSS in the project area occurs on the east side of Vandegrift Blvd. north and south of Pueblitos Canyon, on the east side of Vandegrift Blvd. south of Ysidora Flats to Stuart Mesa/Ash Road, along the dirt access road on the west side of the SRTTP, on the south side of SRTTP along Lemon Grove Road, and along the access road south of SRTTP. Although these areas are not mapped as disturbed much of the CSS habitat in the Action Area is on the edge of Vandegrift Blvd. and is low quality CAGN habitat. The majority of the CSS from Ysidora Flats to Stuart Mesa/Ash Road is along a steep cliff on the east side of Vandegrift Blvd.

Disturbed CSS (D-CSS) has a ground cover of 20 to 50% of woody subshrubs and a significant cover of bare ground and/or non-native species. D-CSS in Alternative 4 occurs on the southwest edge of Haybarn Canyon, a small patch on the west side of Vandegrift Blvd. south of Ysidora Flats, on the north side of Stuart Mesa Road north of SRTTP, along Vandegrift Blvd. on the east side of SRTTP, and a few patches near I-5.

Coastal Sage Scrub (Pilularis) (CSS[P]) is a subtype of CSS dominated by coyote brush (*Baccharis pilularis*). This vegetation type most often occurs in disturbed floodplains and on mesic slopes above drainages and wetlands. The majority of the CSS in the project area occurs within Alternative 3 along dirt access roads in MIKE training area southeast of Haybarn Canyon and along Pueblitos Canyon Road. CSS(P) occurs within Alternatives 1, 2, 3, and 4 near the SRTTP along Vandegrift Blvd. between Stuart Mesa Road and Lemon Grove Road; along the dirt road behind SRTTP from Stuart Mesa Road to the railroad access road; within Alternative 2 route near Basilone Road and within Haybarn Canyon; and within the Alternative 4 route along the east side of Vandegrift Blvd.

Coastal Sage-Chaparral Scrub (CS-CS) (37G00) is a mixed community of both low, soft leaved coastal sage species and taller leathery leaved shrubs. The dominant taller evergreen species within the project area include lemonadeberry (*Rhus integrifolia*), toyon (*Heteromeles arbutifolia*) and laurel sumac. Dense CS-CS occurs within Alternative 3 east of Haybarn Canyon. Additional CS-CS is found within Haybarn Canyon.

Developed (DEV) (12000) areas include buildings, parking lots, pavement, concrete, freeways, maintained dirt roads, and the jetty.

Disturbed Habitat (DIST) (11300) is where past or present physical disturbance is prevalent and where more than 50% of the ground is bare or covered by non-native invasive plants. Characteristic invasive plant species occurring on disturbed sites in the study area include black mustard (*Brassica nigra*), sweet fennel (*Foeniculum vulgare*), red-stem filaree (*Erodium cicutarium*), Russian-thistle (*Salsola kali* ssp. *tragus*), tamarisk (*Tamarix* spp.), and Bermuda grass (*Cynodon dactylon*). The majority of the disturbed habitat in project area is the unpaved areas on the east and west sides of Vandegrift Blvd.

Eucalyptus Woodland (EUC) (11100) is a type of non-native woodland dominated by large naturalized blue and/or red gum trees (*Eucalyptus* spp.). The majority of EUC occurs within Alternatives 1, 2, 3, and 4 in Haybarn Canyon and a small patch along the dirt road on the west side of the SRTTP. Eucalyptus

woodlands within MCB Camp Pendleton have been used as rest stops for the migration of the Monarch Butterfly.

Exotic-Arundo (EX-ARU) occurs in drainages and is dominated by giant reed (*Arundo donax*). A small patch of EX-ARU occurs within Alternative 2 south of MCAS.

Mulefat (*Baccharis salicifolia*) Scrub (MFS) (63310) is an herbaceous riparian scrub community, with greater than 50% ground cover, that typically occurs on coarse alluvial soils in intermittent streambeds and on floodplains. It is generally a species-poor community dominated by mulefat and often represents an early seral stage in the establishment of willow- or sycamore-dominated riparian forests. Other species that are characteristic of this vegetation community within the study area include arroyo willow (*Salix lasiolepis*) and poison-hemlock (*Conium maculatum*), a non-native species. Patches of mulefat scrub are typically found associated with the arroyo/willow riparian forest along drainages. The majority of the MFS in the project area occurs within Alternatives 1, 2, 3, and 4 between Vandegrift Blvd. and the SMR, near Pueblitos Canyon Road, and in Haybarn Canyon.

Native Grassland (NG) (42100) consists of perennial, tussock-forming native grasses dominated by purple needlegrass (*Nassella pulchra).* A small patch of NG occurs at the northwest corner of Haybarn Canyon and another patch occurs within Alternative 3 at the corner of the dirt access road in the MIKE Training Area and Pueblitos Canyon Road.

Non-Native Grassland (NNG) (42200) is dominated by non-native annual grasses and weedy herbaceous species. Dominant exotic species include ripgut grass (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), wild oats (*Avena* spp.), wild barley (*Hordeum* spp.), Italian ryegrass (*Lolium multiflorum*), filaree (*Erodium* spp.), and soft chess (*Bromus hordeaceus*). The majority of NNG in the project area occurs within Alternative 3 along dirt roads and fire roads in the MIKE Training Area southeast of Haybarn Canyon to Pueblitos Canyon Road. Additional NNG occurs within Alternative 2 behind MCAS and within Alternatives 1, 2, 3, and 4 along Vandegrift Blvd.

Open Water (OW) (13100) areas include the waters and substrates of mostly unvegetated bodies of water; however, macroalgae exists on the rocks and in the intertidal and subtidal zones of the man-made jetty bordering the DMBB and the open ocean. Portions of the DMBB and the ocean are within the project footprint.

Southern Arroyo Willow Riparian Forest (SWRF) (61320) occurs in seasonally flooded areas along rivers and streams. The forest is a tall, open, broad-leaved winter-deciduous forest. In the project area it is dominated by arroyo willow, red willow (*Salix laevigata*), and black willow (*Salix gooddingii*). The understory is usually composed of mulefat or shrubby willows. The majority of the SWRF in the project area occurs within Alternatives 1, 2, 3, and 4 along Vandegrift Blvd. adjacent to the SMR, between Pueblitos Canyon Road and Stuart Mesa Road. Additional SWRF occurs within Alternative 2 along the west side of the MCAS and within Alternative 3 along Pueblitos Canyon Road.

Southern Riparian Scrub (RIP SCRUB) (63300) is streamside vegetation varying from open to impenetrable, and dominated by mulefat and willows. RIP SCRUB occurs within Alternative 2 along the west side of the MCAS.

Southern Willow Scrub (SWS) (63320) is dense, winter-deciduous riparian scrub community with greater than 60% ground cover found along the major rivers of southern California. In the project area, it is typically dominated by arroyo willow and may include several other willow species (e.g., red willow and western sand bar willow [*Salix exigua*]) and mulefat. Associated understory herbaceous species include western poison-oak (*Toxicodendron diversilobum*), western ragweed (*Ambrosia psilostachya)*,

and non-native species such as giant reed (*Arundo donax*) and poison hemlock. The majority of the SWS in the project area occur within Alternatives 1, 2, 3, and 4 between Vandegrift Blvd. and the SMR. Additional SWS occurs within Haybarn Canyon, Alternatives 1, 2, and 4 along Vandegrift Blvd. (north end), and Alternative 3 along Pueblitos Canyon.

Aquatic Habitats

Aquatic habitats in the project area include freshwater wetlands and perennial, ephemeral, and intermittent (seasonal) streams that drain to the SMR, along with marine habitats in the DMBB including both sides of the jetty. These represent waters of the U.S., subject to regulatory jurisdiction of the USACE under Section 404 of the CWA. The ocean waters on both sides of the jetty are also EFH, and subject to the regulatory jurisdiction of NMFS under the Magnuson-Stevens Fishery Conservation and Management Act. The jurisdictional limits of Section 404 of the CWA extend to navigable waters, tributaries to navigable waters, and wetlands adjacent to navigable waters and their tributaries.

Freshwater Habitats

TEC delineated wetlands and other waters of the U.S. for the proposed project and a complete report and figures are included in Appendix B. Areas in the uplands or developed areas are not shown on figures in Appendix B. In addition to field evaluations by TEC staff, wetland determinations for the P-113 conveyance pipeline also referenced other delineation reports that included: 1) the Investigation and Delineation of Waters of the U.S. in support of the EIS for the TTP and the Associated Facilities (December 2003); and 2) the P-110 Supplemental EA (January 2007) (NAVFAC SW 2004, USMC 2007a). Below is a list of jurisdictional waters of the U.S. and wetlands within the P-113 project footprint from north to south. Table 3.2-3 shows potential temporary impacts to jurisdictional wetlands and waters of the U.S. in the P-113 project footprint including Alternatives 1, 2, 3, and 4. Table 3.2-4 includes temporary impacts to non-jurisdictional wetlands within the project footprint.

Haybarn Canyon: Jurisdictional drainage ditches and a wetland within Haybarn Canyon were delineated (Appendix B Figure 2). The affected area of Haybarn Canyon is the same for all four alternative routes. For Alternatives 1, 2, and 4 from Haybarn Canyon to Basilone Road the proposed pipeline would follow the west side of Vandegrift Blvd. within the SMR watershed outside of any jurisdictional waters (Appendix B, Figure 3). The SMR channel is well east of the proposed project footprint. For Alternative 3 the proposed pipeline would follow an upland route to Pueblitos Canyon.

MCAS: The delineation of jurisdictional wetlands along the southwest side of MCAS Camp Pendleton was provided by MCB Camp Pendleton (MCBCP 2009). The proposed project footprint within the northwest section of MCAS does not contain jurisdictional areas. The MCAS is crossed by Alternative 2.

Vandegrift Blvd. STP3 to Pueblitos Canyon: Jurisdictional wetlands, BCL-WET-1 and VandeCntrl-WET-1 (north), occur along the west side of the Alternative 1 and 2 project footprints on the edge of the SMR (NAVFAC SW 2004).

Pueblitos Canyon: Alternative 3 overlaps Pueblitos Canyon. Jurisdictional wetland, B, and non-wetland waters of the U.S., PC-WUS-5, occur along the south side of Pueblitos Canyon (Appendix B Figures 4 and 5). A non-jurisdictional isolated wetland, wetland A, and unconnected drainage ditches occur further upstream (Appendix B Figure 3). The Pueblitos Canyon culvert under Vandegrift Blvd. connects the Pueblitos Canyon wetland B, and waters of the U.S., PC-WUS-5, to the SMR (Appendix B Figure 5).

Table 3.2-3 Potential Temporary Impacts to Jurisdictional Waters of the U.S. and Wetlands in P-113 Alternative Project Footprints

Location	*Alternative*	*Name of Water Feature*	*Figure Reference[1]*	*Linear Ft*	*Wetland Acreage*	*Waters of U.S. Acreage*	*Total Acreage*
Haybarn Canyon	1, 2, 3, 4	Channel A	Figure 2	705	-	0.05	0.05
		Channel B (Main)	Figure 2	2,320	-	0.16	0.16
		Channel B (Side)	Figure 2	307	-	0.01	0.01
		HC WET	Figure 2	150	0.03	-	0.03
MCAS[2]	2	MCAS	-	4330	3.56	-	3.56
Vandegrift: STP3 to Pueblitos[2]	1, 2	BCL-WET-1	-	1265	0.20	-	0.20
		VandeCntrl-WET-1 (north)	-	360	0.11	-	0.11
Pueblitos Canyon	3	B	Figure 5	1,360	2.04	-	2.04
		PC-WUS-5	Figure 4	420	-	0.12	0.12
Vandegrift Blvd./SMR	1, 2, 3	C	Figures 5 & 6	2,700	3.73	-	3.73
		D	Figures 6 & 7	910	0.87	-	0.87
		E	Figure 7	2,140	2.38	-	2.38
		F	Figures 7-9	3,800	4.70	-	4.70
		G	Figure 9	590	0.37	-	0.37
		H	Figures 10 & 11	610	0.21	-	0.21
		I	Figure 10	1,400	1.50	-	1.50
		WUS1	Figure 10	61	-	0.01	0.01
		J	Figure 10	1,430	1.50	-	1.50
SRTTP	1, 2, 3, 4	STP13-WUS-1a	Figure 11	275	-	0.02	0.02
		STP13-WET-3	Figure 11	80	0.01	-	0.01
		STP13-WET-6	Figure 11	80	0.03	-	0.03
Total				**25,293**	**21.24**	**0.37**	**21.61**

Notes: [1] Refer to Figures in Appendix B.
[2] Existing data used (MCBCP 2009; NAVFAC SW 2004).

Table 3.2-4 Potential Temporary Impacts to Isolated Non-Jurisdictional Wetlands in the P-113 Project Footprint

Location	*Alternative*	*Name of Water Feature*	*Figure Reference[1]*	*Linear Ft*	*Wetland Acreage*
Pueblitos Canyon	3	A	Figure 3	315	0.50
Vandegrift Blvd./Stuart Mesa	1, 2, 3	K	Figure 11	110	0.05
Total				**425**	**0.55**

Notes: [1] Refer to Figures in Appendix B

Vandegrift Blvd. Pueblitos Canyon to SRTTP: This area is the same for all alternative routes. Jurisdictional wetlands C-J and WUS 1 occur along the west side of Vandegrift Blvd. (Appendix B Figures 5 through 10). A non-jurisdictional isolated wetland, wetland K, occurs near Vandegrift Blvd. and Stuart Mesa (Appendix B Figures 5 through 11). See Appendix B for more information.

SRTTP: This area is the same for all alternative routes. Jurisdictional wetlands occur within and in the vicinity of Twin Ponds (see Figure 2-2 for Twin Ponds location). The northeast side, STP13-WET-6, and west side, STP13-WET-3, of Twin Ponds are on the edge of the project footprint. A drainage, STP13-WUS-1a, along the west side of Vandegrift Blvd. south of Twin Ponds flows through the project footprint into Twin Ponds (Appendix B Figure 11) (NAVFAC SW 2004; USMC 2007a).

Marine Habitats

Marine habitat is the same for Alternatives 1, 2, and 3; the areas immediately adjacent to the jetty on both sides are rocky intertidal, shallow rocky subtidal, and shallow sandy bottom. The marine habitat adjacent to the Alternative 4 proposed discharge location is a shallow sandy bottom. The discharge from the proposed pipeline for Alternatives 1, 2, and 3 would occur at the end section of the perforated pipeline and release on to the rocks located on the ocean side of the jetty. The channel, which includes primarily sandy bottom, was recently dredged (April 2009) from the mouth of the jetty/breakwater to the DMBB (Pers. Comm., John 2009). The channel on the east side of the jetty is exposed to frequent marine vehicle traffic from both military personnel out of DMBB and patrons utilizing the MCB Camp Pendleton and Oceanside harbors. The jetty/breakwater consists of very large rock riprap, which reduces wave action and allows sea water to flow through into the harbor channel. The west side of the jetty/breakwater is consistently inundated with sea water and high wave action. The depth on the west side of the rock jetty is approximately 13 to 14 ft (3.96 to 4.97 m), and rapidly becomes deeper toward the ocean. The depth on the east side (channel) of the rock jetty, post-dredging, ranges from approximately 1.65 to 22.97 ft (0.5 to 7 m).

The only marine plant known to occur near the project area is eelgrass. Eelgrass (*Zostera marina*) is a grass-like marine plant that provides shelter for many species of juvenile fish and invertebrates, as well as a foraging area for federally and state listed endangered and threatened bird species. Thus, eelgrass is a Habitat Area of Particular Concern (see EFH section, below). Favorable growth conditions for this plant are periods of low rainfall, runoff and sedimentation, good light penetration, optimum temperature range (50-68 degrees Fahrenheit), moderate dissolved oxygen concentration, limited algal growth, and good water quality. This plant grows most commonly from depths of +1 ft to -10 ft (+0.3 m to -3 m). Eelgrass is not a federally listed species; however, the habitat eelgrass creates is highly protected by federal agencies for its high habitat value. Eelgrass occurs inside the DMBB near the west amphibious vehicle launch ramp and the quay wall. No eelgrass was observed on either side of the jetty/breakwater during site visits by TEC biologists on 6 and 8 February 2008. Eelgrass is not expected to occur at the conveyance pipeline outlet on either side of the jetty due to constant sand movement which would decrease the ability of the grass to anchor, and the decreased sun exposure and high wave action on the ocean side which would inhibit this species from thriving. MCB Camp Pendleton conducted a Basewide ocean bottom surveys from the shoreline out to three miles (4.8 km) along the MCB Camp Pendleton coastline, which includes species occurrences of marine plants and animals. The draft nearshore habitat characterization survey data is currently being reviewed by AC/S ES Wildlife Management Branch.

Essential Fish Habitat (EFH)

The Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended by the Sustainable Fisheries Act of 1996, requires federal agencies to consult with NMFS on activities that may

adversely affect EFH. The objective of an EFH assessment is to describe potential effects of a proposed action to designated EFH for federally managed fisheries. The Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." 16 USC § 1802(10). The Act's implementing regulations at 50 CFR § 600.10 further defines "waters" to include "aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include areas historically used by fish." The regulations further define "substrate" to include "sediment, hard bottom, structures underlying the waters, and associated biological communities."

Many marine habitats are critical to the productivity and sustainability of marine fisheries. The 1996 amendments to the Magnuson-Stevens Act set forth the EFH provisions to identify and protect important habitats of federally managed marine and anadromous fish species. Section 1855(b)(2) of the Act directs each Federal agency to consult with NMFS with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH identified under the Act.

The project area is located within an area designated as EFH for two Fishery Management Plans (FMPs): West Coast Groundfish (Pacific Fishery Management Council [PFMC] 2006) and Coastal Pelagic Species (PFMC 1998). Coastal pelagic species are those fish that live in the water column as opposed to living near the sea floor. They can generally be found anywhere from the surface to 3,300 ft (1,000 m) deep. Although groundfish are those fish considered demersal (fish that live on or near the seabed), they occupy diverse habitats at all stages in their life histories. EFH areas may be large because a species' pelagic eggs and larvae are widely dispersed, for example, or comparatively small as is the case with the adults of many nearshore rockfishes which show strong affinities to a particular location or type of substrate.

The West Coast Groundfish FMP manages 83 species over a large ecologically diverse area (PFMC 2006). The FMP for Coastal Pelagic Species includes four finfish and one invertebrate (PFMC 1998). Only two of these species, Northern anchovy and Pacific sardine, occur in the project area, however they are highly transient and can be found all along the coast in southern California (Allen et al. 2002).

EFH that is considered to be particularly important to the long-term productivity of populations of one or more managed species, or to be particularly vulnerable to degradation, may also be identified by NMFS as Habitat Areas of Particular Concern (HAPC). For types or areas of EFH to be considered HAPC, the following must be demonstrated:

- the importance of the ecological function provided by the habitat;
- the extent to which the habitat is sensitive to human-induced environmental degradation;
- whether, and to what extent, development activities are, or will be, negatively impacting the habitat type; or
- the rarity of the habitat.

The only HAPC that occurs near the project area is eelgrass (described above), and none is expected to occur near the jetty where the brine conveyance pipeline would be located.

Special Aquatic Sites (SAS)

In addition to EFH/HAPC, the USEPA defined SAS as "geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values." 40 CFR § 230.3(q-1). SAS are recognized as those that significantly influence or positively contribute to the general overall environmental health or vitality of the entire ecosystem of a region, and include sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes. Wetlands located in the project area are SAS, and are described in

detail in the Wetlands section, above, and included in Appendix B. Eelgrass qualifies as vegetated shallows, but eelgrass is not expected to occur near the jetty where the brine conveyance pipeline would be located.

3.2.2.2 Fish and Wildlife

Wildlife includes all animal species on MCB Camp Pendleton, with the exception of special-status species discussed in Section 3.2.2.3. With its large extent and diversity of aquatic and terrestrial habitats, MCB Camp Pendleton has documented the presence of more than 60 fish, 10 amphibian, 30 reptile, 50 mammal, and 300 bird species (USMC 2007b). Some species, especially among the special-status species (see Section 3.2.2.3), are limited in distribution to a single habitat (e.g., riparian habitat, coastal sage scrub, or vernal pools). Most, however, are generalists and will utilize multiple habitats for shelter and foraging. All of MCB Camp Pendleton's reptiles and amphibians, most of the mammals, and a small percentage of the birds, are year-round residents. The remainder are seasonal residents, wide-ranging migrants, or transient visitors. Nearly all of the bird species are protected under the MBTA and are given special consideration under EO 13186, *Migratory Bird Conservation*.

The proposed project area overlaps a number of plant communities (see Table 3.2-1) resulting in a diverse assemblage of wildlife species within or adjacent to the project area.

The majority of the proposed project area is DIST or DEV and does not support many wildlife species. Species likely to occur in DIST and DEV are those adapted to human disturbances and include the American crow (*Corvus brachyrhynchos*), European starling (*Sturnus vulgaris*), mourning dove (*Zenaida macroura),* California ground squirrel (*Spermophilus beecheyi*), and desert cottontail (*Sylvilagus audubonii*) (NAVFAC SW 2004, 2006).

The jetty is included in Alternatives 1, 2, and 3 and is part of DEV; however, a variety of marine organisms live in the area, including marine mammals. The habitats in the area immediately adjacent to the jetty are rocky intertidal, shallow rocky subtidal, and shallow sandy bottom. Species occurrences were observed during a site visit to the jetty on 6 to 8 February 2008. The organisms living in the area from above the waterline down to the sandy bottom include those typical of southern California, and are mainly composed of a variety of algae, mussels, barnacles, limpets, sea stars, sea anemones, and small fish. The rocky areas above water and in the high intertidal zone commonly include California sea mussel (*Mytilus californianus*), owl limpet (*Lottia gigantea*), and goose/leaf barnacle (*Pollicipes polymerus).* Some examples of species commonly found in the low intertidal down to the sand bottom include algae, giant kelp (*Macrocystis pyrifera*), beaded brown beauty (*Cystoseira osmundacea*), ochre sea star (*Pisaster ochraceus*), and solitary anemone (*Anthopleura sola*). The sandy bottom below the jetty is less diverse, with several flatfish and small fish species present.

The marine habitat southwest of the Preferred Alternative is shallow sandy bottom with scattered rocks. The organisms likely to occur in the area include those typical of southern California, and are mainly composed of a variety of algae, mussels, barnacles, limpets, sea stars, sea anemones, octopi, and small fish. Anchovy are likely to occur in the area. Marine mammals typical of coastal southern California have been sighted near the project area (pers. comm., Rouse 2009). Marine mammals with the potential to occur in the Pacific Ocean in the vicinity of the project area include harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), bottle-nosed dolphins (*Tursiops truncates*), and long-beaked common dolphins (*Delphinus capensis).* Northern elephant seals (*Mirounga angustirostris*), northern fur seals (*Callorhinus ursinus*), and migrating gray whales (*Eschrichtius robustus*) occasionally pass nearshore. Sea turtles have occasionally been seen in the Pacific Ocean west/southwest of the Action Area.

Marine mammals are protected from "taking" under the federal Marine Mammal Protection Act (MMPA) of 1972. Taking is defined as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." 16 USC § 1362(13). The term harassment is defined under the MMPA as "any act of pursuit, torment, or annoyance which:

- has the potential to injure a marine mammal or marine mammal stock in the wild; or
- has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." 16 USC § 1326(18)(A).

An action that results in any change in behavior attributable to human activity may be considered a "take by harassment," depending on the circumstances.

Pacific harbor seal, California sea lion, northern elephant seals, northern fur seals, and dolphin species are known to transit the area (pers. comm. Pacific Marine Mammal Center), but generally do not occur near the jetty for any prolonged period of time. These organisms are highly mobile, often passing through areas while feeding. Pinnipeds, including seals and sea lions, exhibit behavior which includes hauling out on rocks and other above-water substrates. There are no known haul out sites for harbor seals or California sea lions within or in the vicinity of the project area.

Most terrestrial mammals are not frequently observed in the project area, but mammal signs, including tracks or scat, are more common. Tracks commonly observed along dirt roads on MCB Camp Pendleton include mule deer (*Odocoileus hemionus*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), desert cottontail, California ground squirrel, pocket gopher (*Thomomys bottae*), and deer mouse (*Peromyscus maniculatus*). Dusky-footed woodrat (*Neotoma fuscipes*) nests are common in native vegetation on MCB Camp Pendleton. Long-tailed weasels (*Mustela frenata*) occur on MCB Camp Pendleton and have the potential to occur in the project area.

Common lizards likely within the project area include the western fence lizard (*Sceloporus occidentalis*) and southern alligator lizard (*Elgaria multicarinata*). Snakes likely within the project area include the gopher snake (*Pituophis catenifer*), common kingsnake (*Lampropeltis getula*), red coachwhip (red racer) (*Masticophis flagellum piceus*), and southern Pacific rattlesnake (*Crotalus oreganus helleri*). Pacific tree frogs (*Pseudacris regilla*), western toad (*Anaxyrus boreas*), spadefoot toad (*Spea hammondii*), and the non-native American bullfrog (*Lithobates catesbeiana*) are also likely within the project area.

Common birds likely to occur in CSS and D-CSS include the bushtit (*Psaltriparus minimus*), wrentit (*Chamaea fasciata*), California towhee (*Pipilo crissalis*), spotted towhee (*Pipilo maculatus*), Anna's hummingbird (*Calypte anna*), and house wren (*Troglodytes aedon)*. Common birds likely to occur in riparian habitat within the project area include the song sparrow (*Melospiza melodia*), lesser goldfinch (*Spinus psaltria*), mourning dove (*Zenaida macroura*), common yellow-throat (*Geothlypis trichas*), and black phoebe (*Sayornis nigricans*) (NAVFAC SW 2004). Common birds likely to occur in NNG within the project area include the western meadowlark (*Sturnella neglecta),* red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), and American kestrel (*Falco sparverius*) (NAVFAC SW 2004).

Several species of birds were observed during site visits to the jetty portion of the project footprint on 6 to 8 February 2008, which include gulls (*Larus* spp.), California brown pelican (CBP) (*Pelecanus occidentalis californicus*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), double-crested cormorant (*Phalacrocorax auritus*), western grebe (*Aechmophorus occidentalis*), willet (*Tringa*

semipalmata), turnstones (*Arenaria* spp.), marbled godwit (*Limosa fedoa*), red-breasted merganser (*Mergus serrator*), surf scoter (*Melanitta perspicillata*), black-bellied plover (*Pluvialis squatarola*), sanderling (*Calidris alba*), osprey (*Pandion haliaetus*), Forster's tern (*Sterna forsteri*), common tern (*Sterna hirundo*), dunlin (*Calidris alpina*), whimbrel (*Numenius phaeopus*), sandpiper (*Calidris* spp.) and phoebes (*Sayornis* spp.). During a recent visit, the largest congregation of shore birds was observed near the end of the jetty.

3.2.2.3 Special Status Species

This section includes federally listed threatened and endangered species and other special status species.

Federally Listed Species

Seventeen federally threatened or endangered species and two candidate terrestrial and aquatic species are found on, transit through, or have the potential to occur on MCB Camp Pendleton (USMC 2007b). Descriptions of all threatened and endangered species known or likely to occur on MCB Camp Pendleton are included in the Integrated Natural Resource Management Plan (INRMP) (USMC 2007b). Table 3.2-5 summarizes the potential for each species to occur within or in the vicinity of the proposed project area, based on the most current MCB Camp Pendleton GIS information (MCBCP 2009), previous GIS information, the TTP EIS (NAVFAC SW 2004), and the P-110 Supplemental EA (USMC 2007a).

Table 3.2-5 Potential Occurrence of Federally Listed Threatened and Endangered Species and Candidate Species on P-113 Project Sites

Common Name	*Scientific Name*	*Federal Status*	*Habitat*	*Known or Potential Occurrence on Project Sites*
Plants				
San Diego button-celery	Eryngium aristulatum var. parishii	Endangered	Vernal pools	Not observed or likely; sites are outside geographic range
spreading navarretia	Navarretia fossalis	Threatened	Vernal pools	Not observed or likely due to lack of habitat
thread-leaved brodiaea	**Brodiaea filifolia**	**Threatened**	**Grasslands**	**Potential habitat in NG within Haybarn Canyon**
Brand's phacelia	Phacelia stellaris	Candidate	Sandy washes and coastal dunes	Not observed or likely due to lack of habitat
Invertebrates				
Riverside fairy shrimp	Streptocephalus woottoni	Endangered	Vernal pools	Not known or likely to occur due to lack of habitat
San Diego fairy shrimp	Branchinecta sandiegonensis	Endangered	Vernal pools	Not known or likely to occur due to lack of habitat
Fish				
southern California steelhead	Oncorhynchus mykiss	Endangered	Rivers and major streams	Not known or likely to occur due to lack of habitat
tidewater goby	Eucyclogobius newberryi	Endangered	Estuaries/coastal brackish water	Not known or likely to occur due to lack of habitat
Amphibians				
arroyo toad	**Anaxyrus californicus**	**Endangered**	**Rivers, streams, surrounding uplands**	**Occur in SMR. Potential to occur within Alternatives 1, 2, 3 and 4 along Vandegrift Blvd. and Alternative 2 along MCAS Camp Pendleton**

Common Name	*Scientific Name*	*Federal Status*	*Habitat*	*Known or Potential Occurrence on Project Sites*
Birds				
California brown pelican	**Pelecanus occidentalis californicus**	**Endangered**	**Coastal shorelines, open water**	**Potential to forage in adjacent waters**
California least tern	**Sterna antillarum browni**	**Endangered**	**Sandy beaches and coastal dunes**	**Likely occurrence foraging in adjacent waters.**
coastal California gnatcatcher	**Polioptila californica californica**	**Threatened**	**Coastal sage scrub**	**Occurs in CSS within the project footprint. The majority of the CSS is within Alternative 3**
least Bell's vireo	**Vireo bellii pusillus**	**Endangered**	**Willow-dominated riparian**	**Occurs in riparian habitat within and adjacent to Alternative route 1, 2, 3, and 4**
light-footed clapper rail	Rallus longirostris levipes	Endangered	Coastal fresh and salt water marshes	Not known or likely due to lack of habitat
southwestern willow flycatcher	**Empidonax trailli extimus**	**Endangered**	**Willow-dominated riparian**	**Occurs in riparian habitat within and adjacent to Alternative route 1, 2, 3, and 4**
western snowy plover	**Charadrius alexandrinus nivosus**	**Threatened**	**Sandy beaches**	**Potential wintering habitat on Del Mar Recreation Beach**
western yellow-billed cuckoo	Coccyzus americanus occidentalis	Candidate	Riparian	Not known or likely to occur
Mammals				
Pacific pocket mouse	Perognathus longimembris pacificus	Endangered	Coastal mesas, in grassland with sandy clay loam soil	Not known or likely; sites are outside of known range
Stephens' kangaroo rat	Dipodomys stephensi	Endangered	Sparse coastal sage scrub and grassland	Not known or likely to occur

Note: **Bold** indicates known or likely occurrence.
Source: MCBCP 2009.

MCB Camp Pendleton's GIS information on locations of federally listed threatened and endangered species and their habitats was provided by the Base for use on this project (MCBCP 2009). For CAGN and LBV, where large numbers of observations are available in GIS, only data from 2006 or later have been used. In cases where observations are few or sporadic, older data have been included. A 1,640 ft (500 m) buffer from site locations for AT, used by the Base for planning purposes, has been used in lieu of point data for this species. Occurrences of listed bird species and/or habitat within a nominal 300-ft (91-m) distance of the centerline of proposed facilities was plotted onto the April 2007 digital aerial photographic Base map along with the plant communities, at a scale of 1:24,000 (1 inch equals 2,000 ft). Each species that is known or likely to occur in areas affected by the project is discussed in more detail below.

Based on review of MCB Camp Pendleton's current GIS information, site conditions, and field surveys conducted in 2007, the CAGN, LBV, SWF, and AT are known to occur within or in the vicinity of the action area. CBP and California least tern (CLT) have the potential to forage in the Pacific Ocean on the southwest edge of the project area. WSP has the potential to occur on the Del Mar Recreation Beach within or in the vicinity of the proposed project area. Figures 3.2-1, 3.2-2, and 3.2-3 show known occurrences of listed species and their habitats.

No federally listed plant species were detected during a series of 2007 rare plant surveys of the project site, which includes Haybarn Canyon and the area associated with the conveyance pipeline (Appendix C).Two California Native Plant Society (CNPS) rare plant species occur within the Alternative 4 footprint and are discussed below in the other special status species section (MCBCP 2009).

According to MCB Camp Pendleton GIS, federally listed species of fairy shrimp have not been documented within the areas of potential disturbance (MCBCP 2009). No federally listed fairy shrimp were detected during one dry and one wet season protocol survey of the project site in the fall-winter of 2007-2008 (Appendix D); therefore, listed fairy shrimp are not discussed further in this document.

Thread-leaved Brodiaea (TLB)

The TLB was listed as federally threatened in October 1998 (USFWS 1998b). Critical habitat was finalized by the USFWS in December 2005 (USFWS 2005b); no lands on MCB Camp Pendleton are critical habitat. This species grows from a corm and is typically found in clay or clay loam soils in grasslands on level to gradually (< 10%) sloping sites, and is unlikely to be observed except during its short flowering season, typically in late spring. No TLB was found within the project area during rare plant surveys in 2007, which was, however, a very dry year (see Appendix C). The most likely areas of potential habitat in the project area are a small patch of NG on the northwest side of Haybarn Canyon and on the south side of Pueblitos Canyon Road near a dirt access road in MIKE Training Area, Alternative 3.

Arroyo Toad (AT)

The AT was listed as federally endangered on 16 December 1994 (USFWS 1994b). On 13 April 2005, a final rule designating critical habitat was published; however, on 13 October 2009 revised critical habitat was proposed (USFWS 2005c, 2009b). In both the 2005 final rule and the revised 2009 proposed rule, areas of essential habitat on MCB Camp Pendleton were excluded from critical habitat designation under Section 4(b)(2) or Section 4(a)3 of the ESA because of protection afforded to the species by the 2007 INRMP (USFWS 2005c, 2009b). A recovery plan is available for this species (USFWS 1999). On 5 March 2008, a 5-year review of AT was initiated along with 57 other California and Nevada species (USFWS 2008a).

The AT is a small, light greenish-grey or buff-colored toad with dark-spotted, warty skin. Historically, ATs were found along the length of drainages from central California to as far south as San Quintin in Baja California, Mexico. On MCB Camp Pendleton, the AT occurs in three drainages: SMR, San Onofre, and San Mateo. The AT requires shallow, slow moving streams and riparian habitat for breeding and is dependent on upland terraces and the marginal zones between stream channels and upland terraces during the non-breeding season, generally late fall and winter (Sweet 1992).

ATs occur along the SMR within the project area. The project area within Alternatives 1, 2, 3, and 4 along Vandegrift Blvd. and Alternative 2 along the west side of MCAS Camp Pendleton is within the AT buffer.

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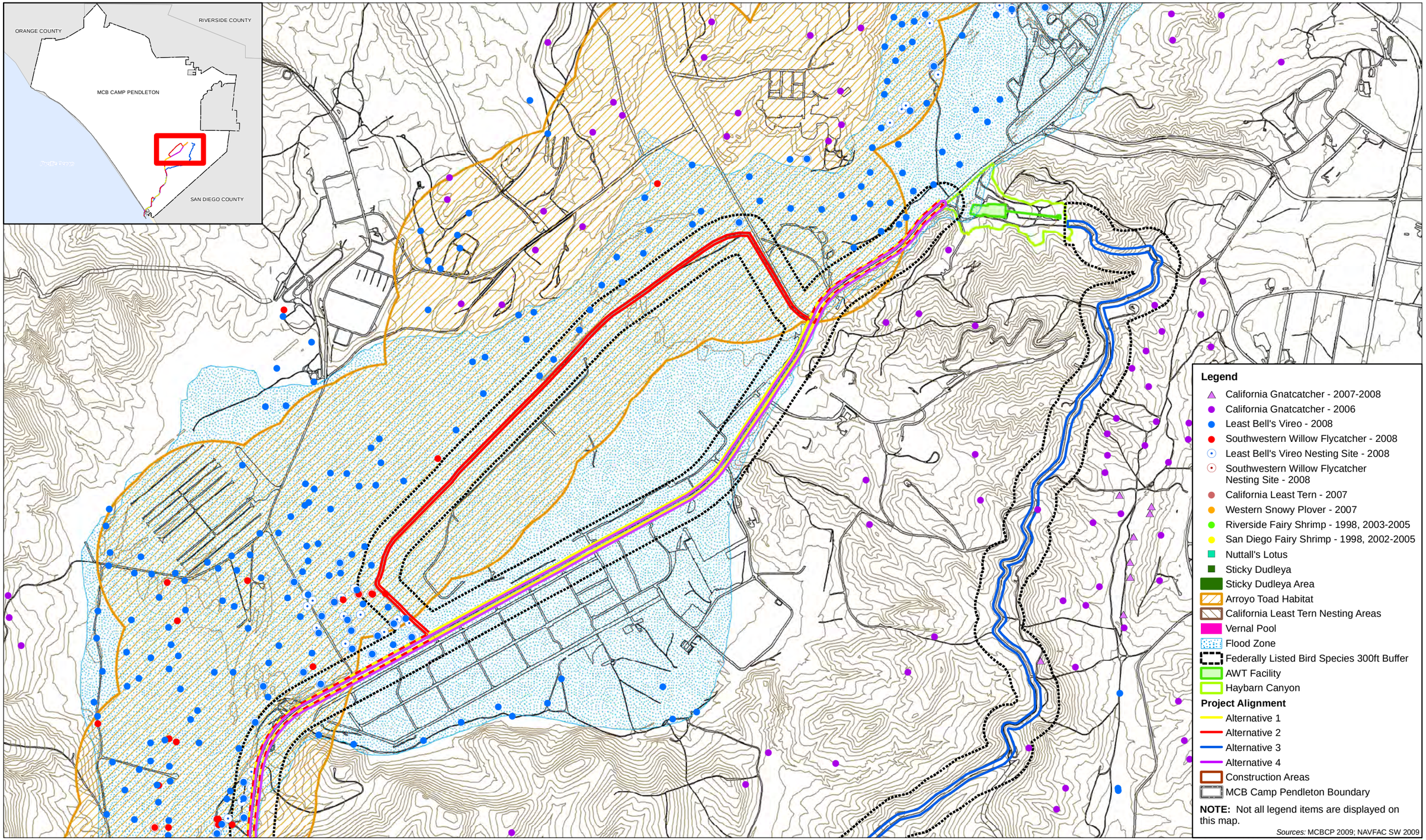

Figure 3.2-1. Special-Status Species for Alternative Routes 1, 2, 3 and 4 (Northeast)

Feet
0 500 1,000 1,500
0 50 100 200 300 400 500
Meters

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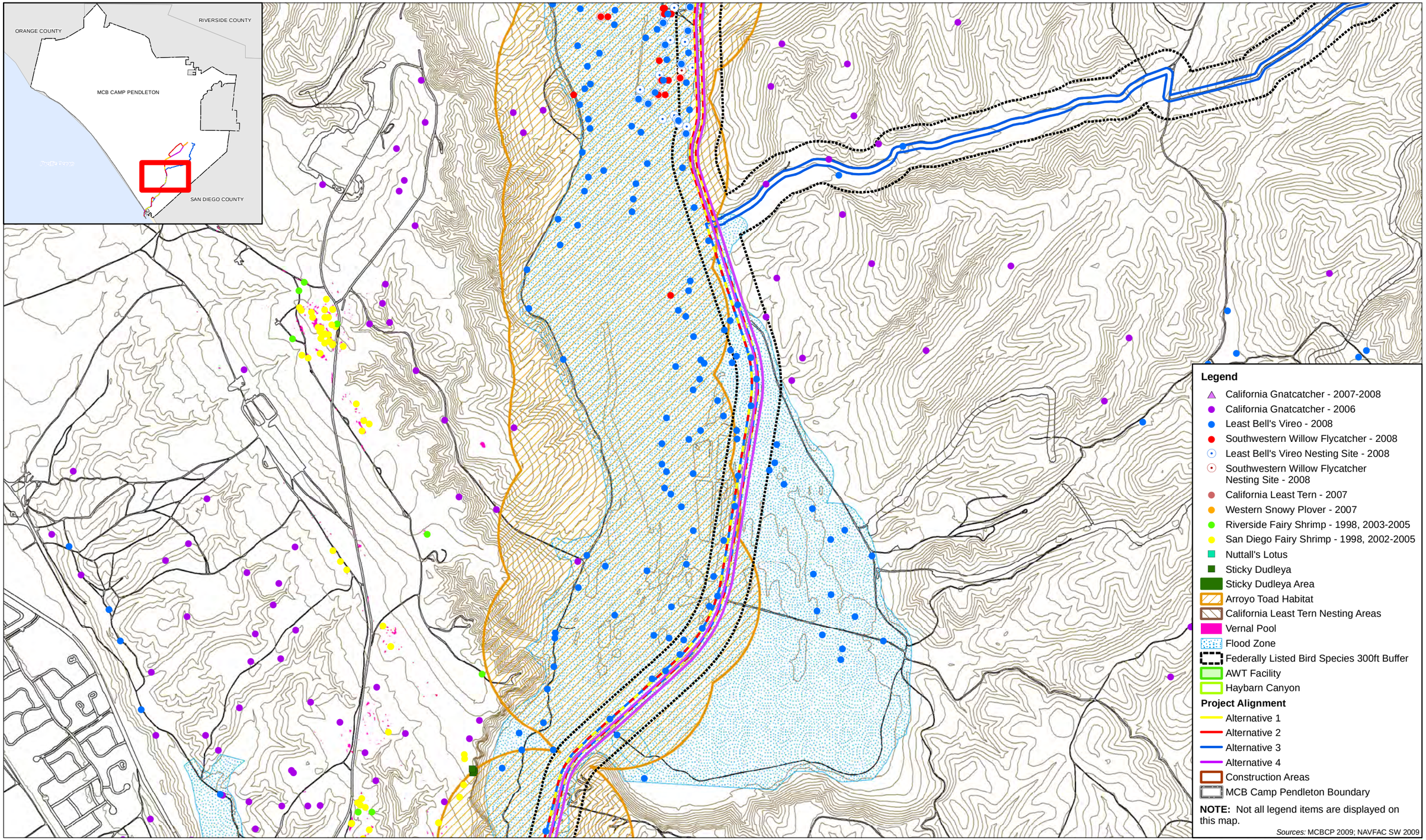

Figure 3.2-2. Special-Status Species for Alternative Routes 1, 2, 3, and 4 (Central)

Feet
0 500 1,000 1,500
0 50 100 200 300 400 500
Meters

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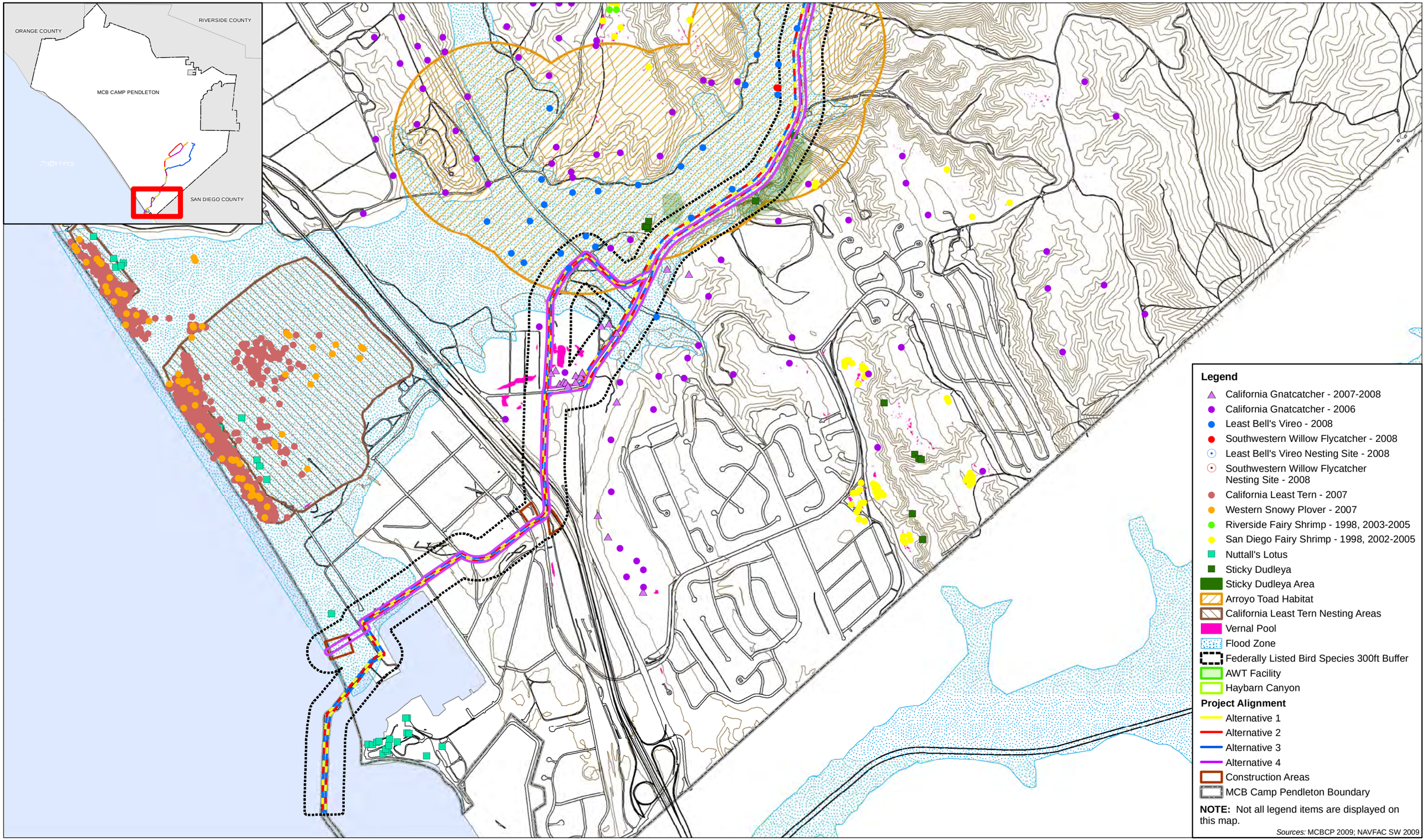

Figure 3.2-3. Special-Status Species for Alternative Routes 1, 2, 3, and 4 (Southwest)

Feet
0 500 1,000 1,500
0 50 100 200 300 400 500
Meters

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California Brown Pelican (CBP)

The CBP was listed as endangered on June 1970 (USFWS 1970) due to a dramatic population decline. This decline resulted primarily from eggshell thinning induced by the presence of dichloro-diphenyl-trichloroethane (DDT) in the environment. Since the USEPA banned the use of DDT and similar pesticides in 1972, the residues of these compounds in CBP eggs have shown a steady decrease, and CBP population numbers have risen substantially. A recovery plan is available for this species (USFWS 1983). On 20 February 2008, the USFWS initiated the 12-month petition to remove the CBP from the federal list of endangered and threatened wildlife (USFWS 2008c). On 3 March 2008, the USFWS recommended delisting the CBP and in September 2009 the Draft Post-Delisting Monitoring Plan for the Brown Pelican (*Pelecanus occidentalis*) was available (USFWS 2008c, 2009a). The coast of California is one of the areas that will be monitored during the post-delisting monitoring. The USFWS recommends monitoring the BP nesting areas for 10 years and the ESA requires monitoring at least 5 years (USFWS 2009a).

These social colonial birds are large, heavy seabirds, with a huge dark bill and large throat pouch. Adults are grayish brown with a white head. The closest CBP nesting area is on the Coronado Islands; others breed in Mexico (NAVFAC SW 1999). On MCB Camp Pendleton, the CBP transits through and potentially roosts on beaches, the jetty, pilings, or rocks, and may forage in shallow estuarine and inshore waters. Even though the pelican feeds in shallow estuary waters and uses sand spits and offshore sandbars for daily loafing and nocturnal roosting adjacent to the Base, it does not use the Base as a breeding ground (USMC 2007b).

The CBP is known to occur and was observed during a site visit, resting on the jetty approximately 1,500-ft (457-m) from the end of the project footprint and resting/foraging in the adjacent waters. The CBP could also forage in the ocean on the southwest edge of Alternative 4.

California Least Tern (CLT)

The USFWS designated CLT as endangered in June 1970 (USFWS 1970). No critical habitat has been designated for this species and the recovery plan has been revised several times (USFWS 1980, 1985). In February 2007, the USFWS recommended downlisting the CLT from endangered to threatened based on the 2006 CLT 5-Year Review (USFWS 2006b, 2007c).

This species is the smallest tern, and is white with gray back and wings, a black crown and a white forehead, and a slightly forked tail. Habitat preferences include seacoasts, beaches, bays, estuaries, lagoons, lakes, and banks of rivers and lakes. CLTs migrate from wintering areas in Central America and are present on MCB Camp Pendleton from mid-April to September (USMC 2007b). Tern populations have increased on MCB Camp Pendleton due to focused management strategies and specific management practices for protecting the CLT and its breeding habitat. Programmatic instructions, habitat protection and enhancement measures outlined in the Estuarine and Beach Ecosystem Conservation Plan guide the management of breeding habitat and foraging areas (USMC 2007b). Nesting areas are present near the mouth of the SMR (see Figure 3.2-3). In 2008, 1,604 pairs of CLT were observed on MCB Camp Pendleton with the largest colony adjacent to the SMR. Statewide, MCB Camp Pendleton continues to have the largest nesting colony, which in 2008 represented 21% of the 7,698 nesting pairs (Marschalek 2009).

The CLT breeding season occurs from 1 March through 15 September. CLTs are likely to forage in the ocean waters adjacent to the jetty and Del Mar Recreation Beach during the spring-summer period when

the species is present and nesting near the mouth of the SMR. The closest nesting area is approximately 2,000 ft (609 m) north of the project area.

Coastal California Gnatcatcher (CAGN)

The CAGN is a small gray songbird that is an obligate, permanent resident of CSS vegetation, which will also make limited use of adjacent habitats outside of the breeding season. The breeding season extends from 15 February through 31 August, with peak nesting activities occurring from mid-March through May, as identified by the USFWS Carlsbad office (USFWS 2007a). CAGNs usually begin to molt into breeding plumage in early February. Males select the site for nesting, and nest building begins two to four weeks after the molt. The nest is constructed primarily by the male, and takes between 4 and 11 days to complete. Eggs are incubated for 12 days, and nestlings fledge at 13 days. Young remain with their parents for three to five weeks after fledging. If there is persistent predation of eggs and young, up to ten nests can be constructed during the breeding season.

The USFWS designated the CAGN as threatened in March 1993 (USFWS 1993a). Currently there is no recovery plan for the CAGN. Since the time of listing, MCB Camp Pendleton has developed several conservation management programs and policies to protect the CAGN.

On 19 December 2007, the USFWS designated revised final critical habitat for the CAGN. All lands on MCB Camp Pendleton were exempted from final critical habitat (USFWS 2007b). MCB Camp Pendleton is currently working cooperatively with the USFWS to provide conservation and protection for uplands habitat throughout MCB Camp Pendleton. On 5 March 2008, a 5-year review of CAGN was initiated along with 57 other California and Nevada species (USFWS 2008a).

The population of CAGN on MCB Camp Pendleton has expanded greatly with protective management of the species and its habitat under the INRMP (USMC 2007b). Surveys in 2006 detected approximately 640 nesting pairs of the species on MCB Camp Pendleton, a substantial increase. Under the Base's INRMP and Range and Training Regulations, the removal of or damage to CSS is prohibited, and training activities in the vicinity of occupied habitat are required to remain on existing roads during the breeding season.

CAGN occupied CSS within the project area is found within Alternative 3 along the dirt roads in the MIKE Training Area in the uplands east of Haybarn Canyon south toward Vandegrift Blvd. Within Alternatives 1, 2, 3, and 4, CAGN occupied CSS occurs near the intersection of Vandegrift Blvd. and Ash Road/Stuart Mesa Road, and near the SRTTP. The 2006 MCB Camp Pendleton CAGN points shown on Figures 3.2-1, 3.2-2, and 3.2-3 are territories and the TEC P-110 2007-2008 CAGN points are individual observations (MCBCP 2009; NAVFAC SW 2009).

Least Bell's Vireo (LBV)

The LBV is a small migratory songbird. The LBV arrives at Camp Pendleton as early as mid-March and leaves for its wintering grounds in Baja California in August. The breeding season is from 15 March through 31 August. LBVs primarily inhabit dense willow-dominated riparian habitats with lush understory vegetation. LBVs forage and nest primarily in willows (*Salix* spp.). The decline of LBVs is mainly due to loss of riparian habitat and nest parasitism by cowbirds (USMC 2007b).

The USFWS listed the LBV as an endangered species on 2 May 1986 (USFWS 1986). A draft recovery plan is available for this species (USFWS 1998a). Critical habitat for the LBV was designated in six southern California counties on 2 February 1994 (USFWS 1994a). MCB Camp Pendleton was excluded from this designation due to a Memorandum of Understanding with the USFWS in response to the

ongoing management of LBVs and riparian habitat on Base. In February 2007, the USFWS recommended downlisting the LBV from endangered to threatened based on the 2006 LBV 5-Year Review (USFWS 2006a, 2007c).

LBVs occur within 300 ft (76 m) of Alternatives 1, 2, 3, and 4 in the riparian vegetation along the SMR west of Vandegrift Blvd. and along Stuart Mesa Road northwest of the SRTTP. Within Alternative 2, LBVs occur west of MCAS Camp Pendleton. Within Alternative 3, LBVs occur in Pueblitos Canyon.

Southwestern Willow Flycatcher (SWF)

The SWF is a sparrow-sized neotropical migrant. It arrives at Camp Pendleton for the breeding season as early as 15 March and may be present through 31 August (USMC 2007b). Its breeding range extends from southern California, east to western Texas, north to extreme southern Utah and Nevada, and south to extreme northern Baja California, Mexico. The flycatcher inhabits riparian areas along rivers, streams, and other wetlands. It typically nests in even-aged, structurally homogeneous, dense stands of trees and shrubs approximately 13 to 23 ft (4 to 7 m) tall with a high percentage of canopy cover and dense foliage. Nesting flycatchers prefer willow and mulefat thickets and invariably nest near surface water or saturated soil, which increases the production of flying insects, the SWF's primary food. Threats to the species are habitat loss, human disturbance, and nest parasitism by cowbirds (USMC 2007b).

The SWF was federally listed as an endangered species by the USFWS on 27 February 1995 (USFWS 1995b). On 22 July 1997, the USFWS designated critical habitat for this species (USFWS 1997). Critical habitat was designated along the SMR. The ruling was vacated and remanded in May 2002. A final rule designating critical habitat was issued on 19 October 2005 (USFWS 2005a); land owned by MCB Camp Pendleton was exempted from the designation because areas are managed through the INRMP and the Riparian Conservation Plan (USMC 2007b; USFWS 1995a). A recovery plan is available for this species (USFWS 2002). On 20 March 2008 a 5-year review of SWF was initiated along with 27 other southwestern species (USFWS 2008b).

The total population of SWF is relatively small, consisting of approximately 70 pairs at the time the species was listed, and numbers have not appreciably increased since that time (USFWS 2005a; Howell and Kus 2009; MCBCP 2009).

Survey data for SWF from 2004 through 2008 on MCB Camp Pendleton reveal individual and nest locations in riparian habitat along the middle part of the Santa Margarita River and adjacent riparian areas (MCBCP 2009). The SMR system and its tributaries are the only areas known to support breeding SWF anywhere on MCB Camp Pendleton. Transient willow flycatchers have been observed along several other creeks on MCB Camp Pendleton, but these birds have been considered members of the other non-federally listed subspecies (Howell and Kus 2009). During 2008, there were only five breeding pairs of SWFs, all of which occurred in the river floodplain between the southern end of MCAS and the mouth of Pueblitos Canyon. This represents a 50% reduction in numbers from 2006 and 2007 (Howell and Kus 2009). The reduction in numbers is attributed to a statewide decline that has affected other breeding locations as well (Howell and Kus 2009). During 2008, two birds previously banded at Whelan Lake on the San Luis Rey River were found to have immigrated to MCB Camp Pendleton, indicating dispersal and connectivity between these two breeding areas. SWF breeding as of 2008 was only found in areas that had been the subject of previous exotic plant (giant reed) removal efforts, suggesting a positive response to these efforts. SWFs were absent from areas they previously occupied but where exotic plants have not been removed (Howell and Kus 2009).

SWFs occur within Alternatives 1, 2, 3, and 4 in the riparian vegetation along the SMR outside the project footprint but within 300 ft (76 m) of the footprint.

Western Snowy Plover (WSP)

The WSP is a small shorebird (length 6 inches [15 cm]), pale in color, with a thin dark bill, dark or grayish legs, partial breast band and a dark ear patch. They typically forage above the water line of coastal beaches and lagoons, feeding on invertebrates (flies, beach hoppers, etc.) from the sand surface, stranded vegetation, marine-mammal carcasses, or low foredune vegetation (USFWS 2005d). WSPs regularly run back and forth short distances between resting sites in the foredunes, where they are well camouflaged, and foraging areas along the high-tide line or at the water's edge.

The WSP was listed by the USFWS as threatened on 5 March 1993 (USFWS 1993b). A small area of critical habitat was designated on California State Parks leased beach on the northwest corner of MCB Camp Pendleton (USFWS 2005d). Citing the effectiveness of protective and conservation measures implemented by MCB Camp Pendleton as part of its INRMP, including the Beach and Estuarine Conservation Plan and related Biological Opinion (USFWS 1995a; USMC 2007a), USFWS did not designate critical habitat elsewhere on MCB Camp Pendleton (USFWS 2005d). There is not any critical habitat within the Action Area. The recovery plan for the WSP was finalized in 2007 (USFWS 2007d).

Protection and management of the WSP and its habitat is provided for through the INRMP (USMC 2007a). Programmatic instructions for avoidance and minimization of impacts to the species and its habitat, particularly during the breeding season, are provided in the Riparian/Estuarine BO (USFWS 1995a) and Base Order P3500.1M (*Range and Training Regulations*).

The WSP breeding season occurs from 1 March through 15 September. Many of the WSP on MCB Camp Pendleton are year round residents. Wintering and migratory WSPs also occur on MCB Camp Pendleton beaches in the winter and before the start of breeding. Primary factors contributing to the decline and listing of the WSP are predation, loss of habitat, and anthropogenic disturbances (USMC 2007b).

Two main breeding sites exist for the WSP in San Diego County: MCB Camp Pendleton and the Silver Strand. Other breeding sites include: Batiquitos Lagoon, San Elijo Lagoon, Mariner's Point (Mission Bay), Sweetwater River Estuary, Chula Vista Wildlife Reserve, and the Tijuana River mouth (USMC 2007b).

MCB Camp Pendleton is one of the most important WSP breeding sites in southern California. Since 1994, MCB Camp Pendleton has been performing yearly surveys on the Base for the WSP. Detected nest locations are marked for avoidance with orange carsonite "off limits" markers. Undetected/unmarked nests are still protected and must be avoided under the ESA. Nesting locations occur from the Santa Margarita River salt flats and foredune habitat and are widely dispersed north beyond Red Beach (Las Flores Beach) (USMC 2007b). The nesting population has more than doubled during the past decade, with 212 nests during 2004 (Foster 2008; USMC 2007b). From 2005 through 2007 the numbers of WSP nests on MCB Camp Pendleton has decreased, in 2005 there were 169 nests, in 2006 there were 159 nests and in 2007 there were 124 nests (Foster 2008).

MCB Camp Pendleton beaches also provide important habitat for wintering and migratory WSPs. As described by MCB Camp Pendleton biologists (Sullivan 2007), during the winter, WSPs aggregate in large groups at the north end of Del Mar beach, at the mouth of the Santa Margarita River, at Cockleburr

pond, and small groups have been seen at Red Beach. They also use areas between the crest of the beach and the foredunes for foraging at low tide.

The nearest documented WSP nest is within the CLT nesting area approximately 2,000 ft (610 m) north of the project area (refer to Figure 3.2-3). WSP forage and roost on the Del Mar Recreation Beach throughout the year. The beach section on the south end of the proposed project area could potentially be used by WSP (refer to Figure 3.2-3). WSP are unlikely to nest on the recreation beach because of the amount of pedestrian activity and vehicle (lifeguard) traffic on the beach in the spring and summer (Sullivan 2009). There are 3.96 acres (1.60 ha) of beach habitat within the proposed project area.

Other Special Status Species

Fifteen California Department of Fish and Game species of special concern (three reptiles and twelve birds) potentially occur within the proposed project areas. The species of concern were observed during biological monitoring for the SRTTP construction and during surveys for the TTP EIS (NAVFAC SW 2004, 2006). The two-striped garter snake (*Thamnophis hammondii*) and the coastal rosy boa (*Lichanura trivirgata roseofusca*) were observed in the vicinity of the SRTTP. The northern red-diamond rattlesnake (*Crotalus ruber ruber*) occurs in CSS, NNG, and DIST on MCB Camp Pendleton. The Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) occurs in pickleweed dominated vegetation. The Bell's sage sparrow (*Amphispiza belli belli*) was observed in CSS and scrubby vegetation in the vicinity of the SRTTP. The California horned lark (*Eremophila alpestris actia*) was observed in grassland habitat west of the SRTTP. The yellow warbler (*Dendroica petechia*) was observed in riparian areas and woodland edges in the vicinity of the SRTTP. The Cooper's hawk (*Accipiter cooperii*) was observed in the vicinity of the SRTTP. The loggerhead shrike (*Lanius ludovicianus*) was observed in open areas in the vicinity of the SRTTP. The northern harrier (*Circus cyaneus*) was observed in the vicinity of the SRTTP. The prairie falcon (*Falco mexicanus*) was observed west of the golf course and in the vicinity of the SRTTP. The sharp-shinned hawk (*Accipiter striatus*) was observed in riparian habitats in the vicinity of the SRTTP. The white-tailed kite (*Elanus leucurus*) was observed in open habitat in Ysidora Flats and in the vicinity of the SRTTP. The yellow-breasted chat (*Icteria virens*) was observed in riparian habitat in the vicinity of the SRTTP. The southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*) was observed in grasslands and CSS in the vicinity of the SRTTP (NAVFAC SW 2004, 2006). The double-crested cormorant and osprey, were observed during site visits adjacent to the jetty portion of the project footprint.

One CNPS rare plant, sticky dudleya (*Dudleya viscida*), is within the Alternative 4 footprint and one CNPS rare plant, Nuttall's lotus (*Lotus nuttallianus*) is approximately 400 ft (122 m) north of the Alternatives 1, 2, 3, and 4 footprints on the Del Mar Recreation Beach. Sticky Dudleya is a CNPS 1B.2 species, fairly endangered in California. It occurs in San Diego, Riverside, and Orange Counties. It usually occurs on rocky or bluff slopes in coastal bluff scrub, chaparral, or coastal scrub. It is known from approximately twenty locations and is threatened by development and road construction (CNPS 2009a). The sticky dudleya within the Alternative 4 footprint is on the slope on the east side of Vandegrift Blvd. north of Ash Road (see Figure 3.2-3).

Nuttall's lotus is a CNPS 1B.1 species, seriously endangered in California, which occurs in coastal San Diego County and Baja California, Mexico. It occurs in coastal dunes and sandy coastal scrub at sea level (0-10 meters). It is threatened by development, non-native plants, and land management activities (CNPS 2009b). The Nuttall's lotus near the project footprint is on the Del Mar Recreation Beach. This appears to be an isolated population, larger populations of Nuttall's lotus occur within the CLT nesting area approximately 2,000 ft (610 m) north of the project footprint and south of the DMBB (see Figure 3.2-3).

3.2.3 Environmental Consequences

The following section describes the potential direct and indirect impacts on biological resources that would result from the Proposed Action and alternatives. Factors especially relevant to determining whether impacts would be significant include the severity of any effects on individuals or habitats of threatened and endangered species.

Direct impacts are associated with ground-disturbing activities resulting from construction of the facilities. Direct impacts may be either temporary (reversible) or permanent (irreversible). Temporary impacts include disturbances caused by construction activities and operations, such as noise, emissions, and traffic. Removal of vegetation can be a temporary or permanent impact. If the vegetation is restored after construction, the impact would be temporary. If a permanent structure is built, the vegetation cannot be restored and the impact is permanent. Permanent impacts include direct mortality of species.

Indirect impacts are caused by or result from project-related activities, but occur later in time and can extend beyond the immediate construction footprint(s). Indirect impacts are often diffuse, variable, resource-specific, and less amenable to quantification or mapping than direct impacts, but still need to be considered.

3.2.3.1 Preferred Alternative (Alternative 4)

<u>Plant Communities and Aquatic Habitats</u>

Plant Communities

Potential temporary and permanent impacts to vegetation from the implementation of Alternative 4 are summarized in Table 3.2-1 and Table 3.2-2. Pipeline construction would impact plant communities and aquatic habitats temporarily and would be aligned along existing roads to the maximum extent possible. A 100-ft (30-m) wide construction buffer representing the maximum area of temporary disturbance has been evaluated along the pipeline segments (see Appendix A).

Permanent impacts to vegetation from the implementation of Alternative 4 could be as much as 0.29 acre (0.12 ha) of D-CSS(P) and 0.01 acre (0.004 ha) of riparian habitat for the construction of the AWT Facility in Haybarn Canyon.

Coastal sage scrub vegetation including CSS, CSS(P), D-CSS, and D-CSS(P) would be avoided to the maximum extent possible. As much as 15.77 acres (6.38 ha) of coastal sage scrub, including Haybarn Canyon, could be temporarily impacted, including 0.92 acre (0.37 ha) of CS-CS, 5.87 acres (2.38 ha) of CSS, 1.75 acres (0.71 ha) of CSS(P), 2.52 acres (1.02 ha) of D-CSS, and 4.71 acres (1.91 ha) of D-CSS(P). The majority of the coastal sage scrub within Alternative 4 is along the east edge of Vandegrift Blvd. and small patches of habitat surrounding the SRTTP; therefore, based on the limited areas of impact and implementation of the SCMs presented in Section 2.3, significant impacts to CAGN occupied CSS and D-CSS would not occur.

Riparian vegetation including MFS, RIP SCRUB, SWRF, and SWS would be avoided to the maximum extent possible. As much as 4.31 acres (1.74 ha) of riparian habitat, including Haybarn Canyon, would be temporarily impacted, including 2.27 acres (0.92 ha) of MFS, 0.13 acre (0.05 ha) of RIP SCRUB, 1.69 acres (0.68 ha) of SWRF, and 0.22 acres (0.09 ha) of SWS. The majority of the riparian habitat within Alternative 4 is along the edge of Vandegrift Blvd.; therefore, based on the limited areas of impact, its limited value as wildlife habitat, and implementation of the SCMs presented in Section 2.3, significant impacts to riparian habitat would not occur.

Following construction, revegetation of temporarily disturbed areas would occur in accordance with the SCMs. The areas of potential construction do not present difficult conditions such as steep slopes or large areas of sensitive habitat or difficult to restore habitat, such as riparian or CSS. The majority of the project area is disturbed or developed. As a result, confinement of construction activities to specified areas and implementation of SCMs for erosion control and revegetation would minimize corresponding indirect impacts.

Aquatic Habitats

Freshwater Habitats

The majority of jurisdictional waters of the U.S. would be avoided by the Alternative 4 alignment. In areas where the disposal pipeline could encounter jurisdictional waters of the U.S. running under a paved road via a culvert, construction would bore under the culverts to avoid permanent impacts to jurisdictional waters of the U.S.

All waters of the U.S. and wetlands within the project area would be avoided to the maximum extent possible. As shown in Table 3.2-6, up to 0.31 acre (0.13 ha) of jurisdictional waters, including 0.07 acre (0.03 ha) of wetlands and 0.24 acre (0.10 ha) of waters of the U.S., would be temporarily impacted by Alternative 4. As shown in Table 3.2-7 no non-jurisdictional wetlands would be impacted by Alternative 4 (Appendix B). Known jurisdictional areas west of Vandegrift Blvd. near Alternative 4 would be flagged to ensure avoidance.

Table 3.2-6 Summary of Potential Temporary Impacts to Jurisdictional Waters of the U.S. and Wetlands in P-113 Alternative Project Footprints

Alternative	*Wetland Acreage*	*Waters of U.S. Acreage*	*Linear Ft*	*Total Acreage*
Alternative 1	15.64	0.25	19,183	15.89
Alternative 2	19.20	0.25	23,513	19.45
Alternative 3	17.37	0.37	19,289	17.74
Alternative 4	0.07	0.24	3,917	0.31

Table 3.2-7 Summary of Temporary Impacts to Isolated Non-Jurisdictional Wetlands in the P-113 Project Footprint

Alternative	*Linear Ft*	*Wetland Acreage*
Alternative 1	110	0.05
Alternative 2	110	0.05
Alternative 3	425	0.55
Alternative 4	0	0

Haybarn Canyon: Construction at Haybarn Canyon would remain within the existing facilities to the maximum extent possible and would avoid the jurisdictional wetlands and waters to the maximum extent possible. The area of potential temporary impact to the waters of the U.S. is 0.22 acre (0.09 ha). The area of potential temporary impact to jurisdictional wetlands is 0.03 acre (0.01 ha). See Appendix B for more details.

SRTTP: Pipeline construction would be located along the edge of Vandegrift Blvd. and within the existing dirt access road and would avoid the jurisdictional wetlands and waters to the maximum extent

possible. As much as 0.04 acre (0.02 ha) of wetlands, STP13-WET-3 and STP13-WET-6 may be impacted. The area of potential temporary impact to the waters of the U.S., STP13-WUS-1a, is 0.02 acre (0.01 ha) (Appendix B Figure 11).

Marine Habitats

As part of this EA, the USMC consulted with the NMFS. The NMFS provided a letter to the USMC concurring that the Proposed Action would not adversely affect EFH (see Appendix F).

The construction of the pipeline into the Pacific Ocean would be installed by drilling laterally underground from the caisson constructed above the high tide line; therefore, there would not be any significant impacts to marine habitats as there would be no disturbance of the sea floor; therefore, there would not be any significant impacts to marine habitats as it would not come in contact with any marine habitats. Implementation of Alternative 4 would have minimal impacts on marine fish and wildlife habitats in the Pacific Ocean where the brine discharge would be released. The discharged water would meet the NPDES permit requirements for water quality. Organisms in the vicinity of the discharge and those species living on the sandy seafloor are not likely to be affected, as the discharged water would mix with ambient ocean waters.

Fish and Wildlife

Implementation of Alternative 4 would eliminate or displace wildlife temporarily and permanently from undeveloped land that provides wildlife habitat; no impacts are associated with the use of existing developed/disturbed land. Individuals of the smaller, less mobile and burrowing species could be injured or harmed by construction, whereas mobile species would disperse to surrounding areas. Given the relatively small areas of construction in relation to surrounding habitat, the impact on wildlife populations would be minimal. Areas of CSS and riparian habitat surrounding the proposed project area would remain unaffected. In areas temporarily impacted, wildlife species would likely re-colonize the area after construction. No long-term permanent impacts to wildlife are likely. Therefore, no significant impacts to wildlife, including migratory birds, would occur because of of construction activities associated with the Proposed Action.

Implementation of Alternative 4 could have minimal impacts on marine fish and wildlife in the Pacific Ocean where the brine discharge would be released. The discharged water would meet the NPDES permit requirements for water quality and the organisms in the vicinity of the discharge. Those species living on the sandy seafloor are not likely to be affected, as the discharged water would be mixed with ambient ocean waters.

Marine mammals, if present, would not be harmed by the marine discharge as the chemical constituent concentrations would meet NPDES permit requirements for water quality. There would be no negative impacts to or foreseeable take (as defined by the MMPA) of marine mammals.

Special-Status Species

Federally Listed Species

Based on the information provided in Section 3.2.2.3, this section evaluates potential impacts to special-status species that could be present in areas affected by Alternative 4. As presented in the BO prepared by the USFWS for the P-113 project, with the implementation of all required terms and conditions, significant impacts on special-status species would be avoided (Appendix F).

Thread-leaved Brodiaea

The TLB was not found within the proposed project area including Alternative 4; therefore, no impact to TLB would occur.

Arroyo Toad

Potential impacts to ATs could occur within Alternative 4 along Vandegrift Blvd. east of the SMR from south of MCAS to SRTTP. To minimize impacts to ATs potentially occurring within Alternative 4, SCMs would be implemented. Before construction begins an AT plan would be submitted to the USFWS. If an AT is observed within Alternative 4, all construction would stop until a qualified biologist could identify and relocate the AT. Based on the limited areas of impact and implementation of the SCMs presented in Section 2.3, significant impacts to AT habitat would not occur.

California Brown Pelican

The CBP could occur in the Pacific Ocean on the west edge of Alternative 4. Proposed construction would be short term and would create only minor noise and visual disturbances, as well as localized disturbance of the ocean bottom and water column. Direct impacts would be negligible due to the species' tolerance of human activity and wide-range foraging habits. In addition, there are many foraging opportunities adjacent to the Action Area and CBPs can relocate easily. Use of the brine discharge pipeline is not expected to adversely affect water quality (refer to Section 3.6) or fish populations and foraging habitat for the CBP. Overall, the Proposed Action would not result in significant impacts to the CBP.

California Least Tern

Direct impacts to CLT nesting are unlikely due to the distance of over 2,000 ft (610 m) to the nearest nesting area. Proposed construction would be short term and would create only minor noise and visual disturbances. Direct impacts, if any, would involve birds having to relocate their foraging activities a short distance away. No indirect impacts on foraging habitat are anticipated due to the short-term nature of construction. Use of the brine discharge pipeline is not expected to impact water quality (refer to Section 3.6) or fish populations and foraging habitat for the CLT. Overall, the Proposed Action would not result in significant impacts to the CLT.

Coastal California Gnatcatcher

Potential impacts to CAGN occupied CSS could occur in the CSS surrounding SRTTP (refer to Figure 3.2-3). Impacts to CAGN occupied CSS and D-CSS would be minimized to the maximum extent possible. As much as 0.78 acre (0.32 ha) of occupied CSS surrounding SRTTP could be temporarily impacted by the implementation of the Proposed Action. No CAGN occupied habitat would be permanently impacted. There is one CAGN territory within Alternative 4 on the south side of the SRTTP and there are four additional territories within 300 ft (91 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, but a small number of nesting CAGNs could be disturbed by construction if the breeding season cannot be avoided.

The CAGN occupied CSS within Alternative 4 surrounding the SRTTP are small areas that have limited value as wildlife habitat and would only be temporarily impacted. The habitat would recover, assisted by re-vegetation efforts as proposed. Individual birds would be displaced to adjacent habitat and may experience increased stress, competition, or risk of predation from the temporary loss of foraging, dispersal, and nesting habitat. Temporarily impacted CSS would be restored onsite following

construction. MCB Camp Pendleton is consulting with the USFWS on whether additional conservation measures for CAGN would be warranted. Therefore, with the implementation of the SCMs presented in Section 2.3 and any additional measures identified through consultation with the USFWS, no long-term significant impacts on individuals or the CAGN population would occur.

Least Bell's Vireo

Potential impacts to LBVs could occur in occupied riparian vegetation along Vandegrift Blvd. east of the SMR from the south of MCAS to SRTTP, in riparian vegetation on Stuart Mesa Road, and in riparian vegetation along Vandegrift Blvd. south of Stuart Mesa Road. As much as 4.31 acres (1.74 ha) of riparian habitat, including Haybarn Canyon, would be temporarily impacted, including 2.27 acres (0.92 ha) of MFS, 0.13 acre (0.05 ha) of RIP SCRUB, 1.69 acres (0.68 ha) of SWRF, and 0.22 acres (0.09 ha) of SWS. There would be no permanent impact to riparian habitat. There are two LBV territories within Alternative 4 and 44 LBV territories within 300 ft (91 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, specifically brush clearing before breeding season, but a small number of nesting LBVs could be disturbed by construction if the breeding season cannot be avoided.

Impacts to LBV occupied riparian habitat would be minimized. If occupied LBV habitat is present within 300 ft (76-m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The LBV breeding season is 15 March to 31 August. If seasonal avoidance is not feasible then SCMs would be implemented. The majority of LBV occupied riparian habitat within Alternative 4 is along the edge of Vandegrift Blvd. This area has limited value as wildlife habitat and would only be temporarily impacted. The habitat would recover, assisted by re-vegetation efforts as proposed. Compensation for temporary impacts to LBV habitat would occur in accordance with the Riparian/Estuarine BO (USFWS 1995a). Therefore, with the implementation of the SCMs presented in Section 2.3, no long-term significant impacts on individuals or the LBV population would occur.

Southwestern Willow Flycatcher

Potential impacts to SWF could occur in occupied riparian vegetation along Vandegrift Blvd. east of the SMR from south of MCAS to SRTTP and in riparian vegetation along Vandegrift Blvd. south of Stuart Mesa Road. As much as 4.31 acres (1.74 ha) of riparian habitat, including Haybarn Canyon, would be temporarily impacted, including 2.27 acres (0.92 ha) of MFS, 0.13 acre (0.05 ha) of RIP SCRUB, 1.69 acres (0.68 ha) of SWRF, and 0.22 acres (0.09 ha) of SWS. There would be no permanent impact to riparian habitat. There is one known individual found within 300 ft (91 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, specifically brush clearing before breeding season, but a small number of nesting SWFs could be disturbed by construction if the breeding season cannot be avoided.

Impacts to SWF occupied riparian habitat would be minimized. If occupied SWF habitat is present within 300 ft (91 m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The SWF breeding season is 15 March to 31 August. If seasonal avoidance is not feasible then SCMs would be implemented. SWF occupied riparian habitat within 300 ft (76 m) of Alternative 4 is along the west side of Vandegrift Blvd. This area would only be temporarily impacted, and the habitat would recover, assisted by re-vegetation efforts as proposed. Compensation for temporary impacts to SWF habitat would occur in accordance with the Riparian/Estuarine BO (USFWS 1995a). Therefore,

with the implementation of the SCMs presented in Section 2.3, no long-term significant impacts on individuals or the SWF population would occur.

Western Snowy Plover

Potential impacts to WSP could occur at Del Mar Recreation Beach. WSP are year round residents at MCB Camp Pendleton and use Del Mar Recreation Beach for roosting and foraging. WSP have never been documented nesting on Del Mar Recreation Beach most likely because this beach is heavily used for recreational activities during the spring and summer (Foster 2008, Sullivan 2009).

As much as 3.96 acres (1.60 ha) of Del Mar Recreation Beach could be temporarily impacted during pipeline construction. A manhole sized cap would be placed on the beach for an underground caisson for the brine pipeline.

A qualified shorebird biological monitor would be present during construction on the Del Mar Recreation Beach to minimize impacts to WSP (Refer to SCMs, Section 2.3). If WSP are present during construction, they could easily disperse and use the beach north of the area. Thus, no long-term significant impacts on individuals or the WSP population would occur.

Other Special Status Species

As described in Section 3.2.2.3, several California Department of Fish and Game wildlife species of special concern have the potential to occur in the proposed project areas. Because construction disturbance would be temporary, mostly confined to disturbed areas, with only small areas of native habitat permanently altered, no significant impacts to populations or the overall availability of habitat for these species would occur.

No impacts to the CNPS 1B Nuttall's lotus or sticky dudleya are anticipated. Nuttall's lotus is outside the project footprint and would be avoided and sticky dudleya is on the east edge of the project footprint and can be avoided.

3.2.3.2 Alternative 3

Plant Communities and Aquatic Habitats

Plant Communities

Potential temporary and permanent impacts to vegetation from the implementation of Alternative 3 are summarized in Table 3.2-1 and Table 3.2-2.

Plant community maps in Appendix A include 50-ft (15-m) to 100-ft (30-m) wide footprint buffers. The 100-ft (30-m) buffer areas are needed along Vandegrift Blvd. to avoid existing underground utility lines. However, impacted acreages for Alternative 3 were calculated from a 50-ft (15-m) wide temporary pipeline construction footprint (see Table 3.2-1). The project footprint buffer is 100 ft (30 m) wide through Mike Training Area (Appendix A Figures 3-8) and Pueblitos Canyon (Appendix A, Figures 8-10). To provide a conservative estimate of the impact to sensitive CSS habitat in these areas, the 50-ft (15-m) temporary impact corridor was calculated along the southeast edge of the project farthest from the dirt road within the 100-ft (30 m) study corridor. This method was used to calculate the maximum impact to sensitive CSS habitat. Due to the 100-ft (30-m) wide project footprint buffer along Vandegrift Blvd. (Appendix A, Figures 10-17), the 50-ft (15-m) temporary corridor was calculated along the west edge of the footprint farthest from Vandegrift Blvd. and closest to the SMR within the 100-ft (30-m) study corridor. The pipeline would be placed closer to or within the dirt road or Vandegrift Blvd. wherever

possible, resulting in impacts to sensitive CSS and riparian habitats that would be less than shown in Table 3.2-1. The project footprint shown in Appendix A Figures 18-20, is 50-ft wide.

Pipeline construction would impact plant communities and aquatic habitats temporarily and would be aligned along existing dirt access roads to the maximum extent possible. Permanent impacts that are expected to occur from the implementation of the Proposed Action are the construction of the AWT Facility and the construction of up to twelve 10-ft by 25-ft (3-m by 8-m) access roads from Vandegrift Blvd. to the pipeline (Table 3.2-2). To provide a conservative estimate the permanent impacts from the construction of the access roads were based on the entire impacted habitat as southern arroyo willow riparian forest (SWRF). The permanent impacts to SWRF riparian habitat are expected to be much less.

Coastal sage scrub vegetation including CSS, CSS(P), D-CSS, and D-CSS(P) would be avoided to the maximum extent possible. As much as 22.03 acres (8.92 ha) of coastal sage scrub, including Haybarn Canyon, could be temporarily impacted, including 4.52 acres (1.83 ha) of CS-CS, 8.17 acres (3.31 ha) of CSS, 1.24 acres (0.50 ha) of CSS(P), 3.30 acres (1.34 ha) of D-CSS and 4.80 acres (1.94 ha) of D-CSS(P). The majority of the coastal sage scrub within Alternative 3 is along the edge of dirt roads; therefore, based on the limited areas of impact, its limited value as wildlife habitat, and implementation of the SCMs presented in Section 2.3, significant impacts to CAGN occupied CSS and D-CSS would not occur.

Riparian vegetation including MFS, RIP SCRUB, SWRF, and SWS would be avoided to the maximum extent possible. As much as 18.19 acres (7.36. ha) of riparian habitat, including Haybarn Canyon, could be temporarily impacted, including 3.67 acres (1.49 ha) of MFS, 10.62 acres (4.30 ha) of SWRF, and 3.90 acres (1.58 ha) of SWS. The majority of the riparian habitat within Alternative 3 is along the edge of Vandegrift Blvd.; therefore, based on the limited areas of impact, its limited value as wildlife habitat, and implementation of the SCMs presented in Section 2.3, significant impacts to riparian habitat would not occur.

Following construction, revegetation of temporarily disturbed areas would occur in accordance with the SCMs. The areas of potential construction do not present difficult conditions such as steep slopes or large areas of sensitive habitat or difficult to restore habitat, such as riparian or CSS. The majority of the project area is disturbed or developed. As a result, confinement of construction activities to specified areas and implementation of SCMs for erosion control and revegetation would minimize corresponding indirect impacts.

Aquatic Habitats

<u>Freshwater Habitats</u>

All waters of the U.S. and wetlands within the project area would be avoided to the maximum extent possible. Shown in Table 3.2-6 as much as 17.74 acres (7.18 ha) of jurisdictional waters, including 17.37 acres (7.03 ha) of wetlands and 0.37 acre (0.15 ha) of waters of the U.S., may be temporarily impacted by Alternative 3 as evaluated in the Delineation of Wetlands and Other Waters of the U.S. Report (Appendix B). As shown in Table 3.2-7 as much as 0.55 acre (0.22 ha) of isolated non-jurisdictional wetlands may be impacted by Alternative 3 (Appendix B).

Haybarn Canyon: See Section 3.2.3.1 Alternative 4 Aquatic Habitats (Appendix B Figure 2).

Pueblitos Canyon: The pipeline would be constructed within the dirt access road to the maximum extent possible and would avoid the jurisdictional wetlands and waters to the maximum extent possible. The area of potential temporary impact to the waters of the U.S., PC-WUS-5, is 0.12 acre (0.05 ha). The area

of potential temporary impacts to jurisdictional wetland B is 2.04 acres (0.83 ha) (Appendix B Figures 4 and 5). The area of potential temporary impacts to non-jurisdictional wetland A is 0.50 acre (0.20 ha) (Appendix B Figure 3).

Vandegrift Blvd. Pueblitos Canyon to SRTTP: Pipeline construction would be located along the edge of Vandegrift Blvd. and would avoid the jurisdictional wetlands and waters to the maximum extent possible. The area of potential temporary impact to the waters of the U.S. is 0.01 acre (0.004 ha). The area of potential temporary impact to jurisdictional wetlands, C-J, is 15.26 acres (6.18 ha) (Appendix B Figures 5 through 10). The area of potential temporary impacts to non-jurisdictional wetland K is 0.05 acre (0.020 ha) (Appendix B Figure 11).

SRTTP: See Section 3.2.3.1 Alternative 4 Aquatic Habitats (Appendix B Figure 11).

Implementing the SCMs presented in Section 2.3, specifically flagging wetlands and waters of the U.S., and the presence of a biological monitor during construction would ensure that the sensitive aquatic areas would be avoided to the maximum extent possible. The SWPPP and BMPs would avoid or minimize indirect impacts to wetlands and drainages outside the project area. The majority of the aquatic habitats, including wetlands and waters of the U.S., within Alternative 3 are along the edge of Vandegrift Blvd. and along the edge of dirt roads; therefore, based on the limited areas of impact and implementation of the SCMs presented in Section 2.3, significant impacts to aquatic habitats, including wetlands and waters of the U.S., would not occur. A restoration plan would be provided to address any areas where impacts to wetlands and waters of the U.S. cannot be avoided.

Marine Habitats

Pipeline construction would be completed on the surface of the man-made jetty; therefore, construction activities would not alter any natural habitat. The water from the perforated pipeline would discharge to the west/ocean side of the jetty, rather than directly adjacent to the jetty. The discharged water would flow down the rock-covered side of the jetty into the ocean. The chemical and physical properties of the discharged brine (salinity, contaminants, organic matter) would determine whether impacts to marine habitats would be experienced (CCC 2004). The use of a perforated pipeline and discharge water that meets the NPDES permit requirements would decrease the probability of negative impacts to marine habitats.

Impacts from the brine discharge to be considered include changes in chemical concentrations and the temperature of the receiving water. Because of the large volume of seawater and the influence of tides, currents, and waves, the discharge would be rapidly dispersed and mixed with ocean water, resulting in a relatively small mixing zone and a limited area of potential effects on water quality. The brine would meet requirements set forth by the NPDES permit in the discharge mixing zone. Outside of the permit-specified discharge mixing zone, state water quality standards or objectives, or the USEPA National Ambient Water Quality Criteria, would be met (see Table 3.6-1 and Table 3.6-2 for a comparison of brine discharge components in relation to the Water Quality Control Plan Ocean Waters of California [SWRCB 2005]). Since the brine solution would be discharged in the splash zone and would meet the standards set forth by the NPDES permit requirements, the potential for any change in water conditions that would result in negative impacts to marine organisms residing in the area is very low. Consultation with the California Coastal Commission and National Marine Fisheries Service is currently underway.

Eelgrass is not known or expected to occur in the immediate vicinity of the conveyance pipeline outlet, which would be at least 6 ft (2 m) above potential eelgrass habitat in the low intertidal to subtidal zone. Both sides of the jetty experience frequent sand movement that does not provide a stable habitat for

eelgrass to anchor. For the reasons mentioned above, the brine discharge is not expected to affect water quality over an appreciable area of marine habitat due to dilution and mixing with the ocean water. Finally, since eelgrass frequently occurs in bays and estuaries with brackish salinities, and where maritime industries have impacted water quality, it is unlikely that eelgrass (if present) would be negatively impacted by the discharge of low-salinity brine water in the present case. For any future occurrence of eelgrass documented in the project area through Basewide surveys, the Southern California Eelgrass Mitigation Policy (Revision 11, 1991) would be implemented.

Essential Fish Habitat

EFH for Pacific Coast groundfish and Coastal Pelagic species is located in the project area. The species included in these EFH groups are highly transient and can be found throughout the nearby coastal area. Noise and activity during pipe installation on the jetty might cause fish to avoid the adjacent marine habitat, but such effects would be brief and of very limited extent. When operational, it is not expected that differences in temperature or dissolved solids associated with the brine discharge would extend more than a few feet beyond the point at which the discharge mixes with ocean water below the pipe, resulting in minimal, if any, effect on EFH. The only HAPC near the project area is eelgrass, and no negative impacts are expected to occur (see eelgrass discussion above).

Special Aquatic Sites

SAS found in or near the project area include wetlands and eelgrass. Temporary impacts to wetlands are expected, and described in the wetlands section, above. Negative impacts to eelgrass are not expected to occur, and are discussed above.

Fish and Wildlife

Implementation of Alternative 3 would eliminate or displace wildlife temporarily and permanently from undeveloped land that provides wildlife habitat; no impacts are associated with the use of existing developed/disturbed land. Individuals of the smaller, less mobile and burrowing species could be injured or harmed by construction, whereas mobile species would disperse to surrounding areas. Given the relatively small areas of construction in relation to surrounding habitat, the impact on wildlife populations would be minimal. Areas of CSS and riparian habitat surrounding the proposed project area would remain unaffected. In areas temporarily impacted, wildlife species would likely re-colonize the area after construction. No long-term permanent impacts to wildlife are likely. Therefore, no significant impacts to wildlife, including migratory birds, would occur as a result of construction activities associated with the Proposed Action.

Implementation of Alternative 3 would have some impacts on marine species residing near the end of the pipeline. Seabirds residing on or near the jetty would be temporarily displaced during construction activities. Although discharged water would meet the NPDES permit requirements for water quality, animals and plants living on the rocks (e.g., mussels, barnacles, algae) in the discharge area may become disturbed by the brine water discharge. Mobile animals would move from the area if distressed, but sessile organisms would possibly experience mortality, depending on their sensitivity to chemical and physical properties like salinity and dissolved nutrients. Similar impacts would be experienced by organisms living on rocks below the surface. Organisms living on the sandy seafloor would not be affected, as the discharged water would be mixed with ambient ocean waters before reaching the sand. Impacts would be permanent, as the discharged water would flow as long as the brine pipeline is in existence. The area of discharge would likely become devoid of many sessile marine organisms, but these impacts would remain local and would not impact any specific species on a larger scale.

Marine mammals, if present, may avoid the immediate vicinity of pipeline construction, but since the surrounding waters are heavily used by USMC as well as civilian (Oceanside Harbor) vessels, the level of activity associated with the project is not unusual and would not be expected to affect marine mammal use of the entrance channel and ocean waters on the seaward side of the jetty. Construction would take place above water, so no acoustic disturbances would be created for marine mammals. The brine discharge onto the jetty might deter pinnipeds from hauling out onto the rocks; although they are not known to do so at present, it would not be harmful to these animals as the chemical constituent concentrations would meet NPDES permit requirements for water quality. There would be no negative impacts to, or foreseeable takes (as defined by the MMPA) of marine mammals.

Special-Status Species

Federally Listed Species

Based on the information provided in Section 3.2.2.3, this section evaluates potential impacts to species that could be present in areas affected by Alternative 3.

Thread-leaved Brodiaea

The TLB was not found within the proposed project area including Alternative 3; therefore, no impacts to TLB would occur.

Arroyo Toad

Potential impacts to ATs could occur within Alternative 3 along Vandegrift Blvd. east of the SMR from the south of MCAS to SRTTP. To minimize impacts to ATs potentially occurring within Alternative 3, SCMs would be implemented. Before construction begins an AT plan would be submitted to the USFWS. If an AT is observed within Alternative 3, all construction would stop until a qualified biologist could identify and relocate the AT. Based on the limited areas of impact and implementation of the SCMs presented in Section 2.3, significant impacts to AT habitat would not occur. An undetermined but small number of individual ATs may need to be handled, and there is a slight possibility that an individual AT could be harmed or harassed during construction. MCB Camp Pendleton is formally consulting with the USFWS regarding this potential take of individuals and the need for any additional measures. Although a small number of individuals may be affected, there would be no significant impact on AT population numbers or distribution on MCB Camp Pendleton.

California Brown Pelican

The CBP is expected in the action area. Proposed construction would be short term and would create only minor noise and visual disturbances, as well as localized disturbance of the ocean bottom and water column. Direct impacts would be negligible due to the species' tolerance of human activity and wide-range foraging habits. Vessel traffic and activity in the area is routine due to military and non-military (Oceanside harbor) use of the entrance channel. In addition, there are many other similar foraging and roosting opportunities adjacent to the action area and CBPs can relocate easily. Following completion of the pipeline, CBPs are expected to roost on the jetty and rest and forage in the adjacent waters as before. Use of the brine discharge pipeline is not expected to adversely affect water quality (refer to Section 3.6) or fish populations and foraging habitat for the CBP. Overall, the proposed action would not result in significant impacts to the CBP.

California Least Tern

There would be no direct impacts on CLT nesting due to the distance of over 2,000 ft (610 m) to the nearest nesting area. Proposed construction would be short term and would create only minor noise and visual disturbances and localized turbidity. Direct impacts, if any, would involve birds having to relocate their foraging activities a short distance away. No indirect impacts on foraging habitat are anticipated due to the short-term nature of construction. Use of the brine discharge pipeline is not expected to impact water quality (refer to Section 3.6) or fish populations and foraging habitat for the CLT. Overall, the Proposed Action would not result in significant impacts to the CLT.

Coastal California Gnatcatcher

Potential impacts to the CAGN could occur in occupied coastal sage scrub along dirt roads east of Haybarn Canyon to Pueblitos Canyon, in coastal sage scrub east of Vandegrift Blvd. near Pueblitos Canyon, in coastal sage scrub surrounding SRTTP, and in coastal sage scrub near the intersection of Vandegrift Blvd. and Stuart Mesa Road (see Figures 3.2-1 and 3.2-2). Impacts to CAGN occupied CSS and D-CSS would be minimized. As much as 22.03 acres (8.92 ha) of coastal sage scrub, including Haybarn Canyon, could be temporarily impacted, including 4.52 acres (1.83 ha) of CS-CS, 8.17 acres (3.31 ha) of CSS, 1.24 acres (0.50 ha) of CSS(P), 3.30 acres (1.34 ha) of D-CSS and 4.80 acres (1.94 ha) of D-CSS(P).

There are a total of 16 known CAGN territories within 300 ft (91 m) of the action area. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, but a small number of nesting CAGNs could be disturbed by construction if the breeding season cannot be avoided.

If occupied CAGN habitat is present within 300 ft (91 m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The CAGN breeding season is 15 February to 31 August (USFWS 2007b). If seasonal avoidance is not feasible then SCMs would be implemented. The majority of the CAGN occupied coastal sage scrub within Alternative 3 is along the edge of Vandegrift Blvd., small patches of habitat surrounding the SRTTP, and along dirt roads in the MIKE training area. These small areas have limited value as wildlife habitat, and would only be temporarily impacted. Individual birds would be displaced to adjacent habitat and may experience increased stress, competition, or risk of predation from the temporary loss of foraging, dispersal, and nesting habitat. MCB Camp Pendleton is not proposing compensation for the temporary impacts but is formally consulting with the USFWS regarding this potential take of individuals and whether additional measures would be warranted. Therefore, with the implementation of the SCMs presented in Section 2.3 and any additional measures identified through consultation with the USFWS, no long-term significant impacts on individuals or the CAGN population would occur.

Least Bell's Vireo

Potential impacts to LBVs could occur in occupied riparian vegetation along Vandegrift Blvd. east of the SMR from Pueblitos Canyon to SRTTP, in riparian vegetation on Stuart Mesa Road, and in riparian vegetation along Vandegrift Blvd. south of Stuart Mesa Road. As much as 18.19 acres (7.36 ha) of riparian habitat, including Haybarn Canyon, could be temporarily impacted, including 3.67 acres (1.49 ha) of MFS, 10.62 acres (4.30 ha) of SWRF, and 3.90 acres (1.58 ha) of SWS. During the 2006 Basewide survey, 60 individuals were documented within 300 ft (91 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on

nesting individuals, but a small number of nesting LBV could be disturbed by construction if the breeding season cannot be avoided.

Impacts to LBV occupied riparian habitat would be minimized. If occupied LBV habitat is present within 300 ft (91 m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The LBV breeding season is 15 March to 31 August. If seasonal avoidance is not feasible then SCMs would be implemented. The majority of LBV occupied riparian habitat within Alternative 3 is along the edge of Vandegrift Blvd. This limited area would only be temporarily impacted and the habitat would recover, assisted by revegetation efforts as proposed. Compensation for temporary impacts to LBV habitat would occur in accordance with the Riparian/Estuarine BO (USFWS 1995a). Therefore, with the implementation of the SCMs presented in Section 2.3, no long-term significant impacts on individuals or the LBV population would occur.

Southwestern Willow Flycatcher

Potential impacts to SWF could occur in occupied riparian vegetation along Vandegrift Blvd. east of the SMR from Pueblitos Canyon to SRTTP and in riparian vegetation along Vandegrift Blvd. south of Stuart Mesa Road. As much as 18.19 acres (7.36. ha) of riparian habitat, including Haybarn Canyon, could be temporarily impacted, including 3.67 acres (1.49 ha) of MFS, 10.62 acres (4.30 ha) of SWRF, and 3.90 acres (1.58 ha) of SWS. During 2006 Basewide surveys, four SWF individuals were sighted in the riparian vegetation along the SMR within 300 ft (91 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, but a small number of nesting SWFs could be disturbed by construction if the breeding season cannot be avoided.

Impacts to SWF occupied riparian habitat would be minimized. If occupied SWF habitat is present within 300 ft (91 m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The SWF breeding season is 15 March to 31 August. If seasonal avoidance is not feasible then SCMs would be implemented. No SWF occupied riparian habitat occurs within Alternative 3. SWF occupied riparian habitat within 300 ft (91 m) of Alternative 3 is along the west side of Vandegrift Blvd. This limited area would only be temporarily impacted and the habitat would recover, assisted by revegetation efforts as proposed. Compensation for temporary impacts to SWF habitat would occur in accordance with the Riparian/Estuarine BO (USFWS 1995a). Therefore, with the implementation of the SCMs presented in Section 2.3, no long-term significant impacts on individuals or the SWF population would occur.

Other Special Status Species

As described in Section 3.2.2.3, several California Department of Fish and Game wildlife species of special concern have the potential to occur in the proposed project areas. Because construction disturbance would be temporary, mostly confined to disturbed areas, with only small areas of native habitat permanently altered, no significant impacts to populations or the overall availability of habitat for these species would occur.

3.2.3.3 Alternative 1

Plant Communities and Aquatic Habitats

Plant Communities

Potential temporary and permanent impacts to vegetation from the implementation of Alternative route 1 are summarized in Table 3.2-1 and Table 3.2-2. Pipeline construction would impact plant communities and aquatic habitats temporarily and would be aligned along existing dirt access roads to the maximum extent possible. Two construction buffers, 100-ft (30-m) and 50-ft (15-m) wide, representing the maximum area of temporary disturbance, have been evaluated along the pipeline segments. The 50-ft (15-m) buffers are the segments along Stuart Mesa Road, behind SRTTP, to the ocean. The 100-ft (30-m) buffer is the rest of the route along Vandegrift Blvd.

Permanent impacts to vegetation from the implementation of Alternative route 1 would be the same as the Alternative 4. The permanent impacts would be from the construction of the AWT Facility (See Section 3.2.3.1 Alternative 4 Plant Communities).

Coastal sage scrub vegetation including CSS, CSS(P), D-CSS, and D-CSS(P) would be avoided to the maximum extent possible. As much as 10.55 acres (4.27 ha) of coastal sage scrub, including Haybarn Canyon, could be temporarily impacted, including:

- 0.92 acre (0.37 ha) of CS-CS;
- 1.10 acres (0.44 ha) of CSS;
- 1.25 acres (0.51 ha) of CSS(P);
- 2.64 acres (1.07 ha) of D-CSS; and
- 4.65 acres (1.88 ha) of D-CSS(P).

The majority of the coastal sage scrub within Alternative route 1 is along the edge of Vandegrift Blvd. and small patches of habitat surrounding the SRTTP; therefore, based on the limited areas of impact, its limited value as wildlife habitat, and implementation of the SCMs presented in Section 2.3, significant impacts to CAGN occupied CSS and D-CSS would not occur.

Riparian vegetation including MFS, RIP SCRUB, SWRF, and SWS would be avoided to the maximum extent possible. As much as 13.35 acres (5.40 ha) of riparian habitat, including Haybarn Canyon, would be temporarily impacted, including 3.91 acres (1.58 ha) of MFS, 6.46 acres (2.62 ha) of SWRF, and 2.98 acres (1.21 ha) of SWS. The majority of the riparian habitat within Alternative route 1 is along the edge of Vandegrift Blvd.; therefore, based on the limited areas of impact, its limited value as wildlife habitat, and implementation of the SCMs presented in Section 2.3, significant impacts to riparian habitat would not occur.

Following construction, revegetation of temporarily disturbed areas would occur in accordance with the SCMs. The areas of potential construction do not present difficult conditions such as steep slopes or large areas of sensitive habitat or difficult to restore habitat, such as riparian or CSS. The majority of the project area is disturbed or developed. As a result, confinement of construction activities to specified areas and implementation of SCMs for erosion control and revegetation would minimize corresponding indirect impacts.

Aquatic Habitats

All waters of the U.S. and wetlands within the project area would be avoided to the maximum extent possible. As much as 15.89 acres (6.43 ha) of jurisdictional waters, including 15.64 acres (6.33 ha) of

wetland and 0.25 acre (0.10 ha) of waters of the U.S., may be temporarily impacted by Alternative route 1 as evaluated in the Delineation of Wetlands and Other Waters of the U.S. Report (Appendix B), the TTP EIS, and the P-110 Supplemental EA (see Table 3.2-6) (NAVFAC SW 2004; USMC 2007a). As shown in Table 3.2-7, as much as 0.05 ac (0.20 ha) of isolated non-jurisdictional wetlands may be impacted by Alternative route 1 (Appendix B).

Haybarn Canyon: See Section 3.2.3.1 Alternative 4 Aquatic Habitats (Appendix B Figure 2).

Vandegrift Blvd. at STP3 to Pueblitos Canyon: Pipeline construction would be located along the edge of Vandegrift Blvd. and would avoid the jurisdictional wetlands to the maximum extent possible. The area of potential temporary impact to jurisdictional wetlands, BCL-WET-1 and VandeCntrl-WET-1 (north), is 0.31 acre (0.13 ha).

Vandegrift Blvd. at Pueblitos Canyon to SRTTP: See Section 3.2.3.2 Alternative 3 Aquatic Habitats (Appendix B Figures 5 through 10).

SRTTP: See Section 3.2.3.1 Alternative 4 Aquatic Habitats (Appendix B Figure 11).

Implementing the SCMs presented in Section 2.3, specifically flagging wetlands and waters of the U.S., and the presence of a biological monitor during construction would ensure that the sensitive aquatic areas would be avoided to the maximum extent possible. The SWPPP and BMPs would avoid or minimize indirect impacts to wetlands and drainages outside the project area. The majority of the aquatic habitats, including wetlands and waters of the U.S., within Alternative route 1 are along the edge of Vandegrift Blvd. and along the edge of dirt roads; therefore, based on the limited areas of impact and implementation of the SCMs presented in Section 2.3, significant impacts to aquatic habitats, including wetlands and waters of the U.S., would not occur. A restoration plan would be prepared and implemented to restore the habitat in any areas where impacts to wetlands and waters of the U.S. cannot be avoided.

See Section 3.2.3.2 Alternative 3 Plant Communities and Aquatic Habitats for impacts to the marine habitat.

Fish and Wildlife

Implementation of Alternative route 1 would eliminate or displace wildlife temporarily from undeveloped land that provides wildlife habitat; no impacts are associated with the use of existing developed/disturbed land. There may be disturbances caused by construction activities and operations, such as noise, emissions, and traffic, which would be temporary and not likely to disrupt foraging or reproduction. Individuals of the smaller, less mobile and burrowing species could be injured or harmed by construction, whereas mobile species would disperse to surrounding areas. Given the relatively small areas of construction in relation to surrounding habitat, the effect on wildlife populations would be minimal. Areas of CSS and riparian habitat surrounding the proposed project area would remain unaffected. In areas temporarily impacted, wildlife species would likely re-colonize the area as the vegetation re-grows (or restoration is implemented) after construction. No permanent impacts to wildlife are likely. Therefore, no significant impacts to wildlife, including migratory birds, would occur as a result of construction activities associated with Alternative route 1.

See Section 3.2.3.2 Alternative 3 Fish and Wildlife for impacts to marine species.

Special-Status Species

Federally Listed Species

Based on the information provided in Section 3.2.2.3, this section evaluates potential impacts to species that could be present in areas affected by Alternative route 1.

Thread-leaved Brodiaea

The TLB was not found within the proposed project area including Alternative route 1; therefore, no impact to TLB would occur.

Arroyo Toad

Potential impacts to ATs could occur within Alternative route 1 along Vandegrift Blvd. east of the SMR from south of MCAS to SRTTP. To minimize impacts to ATs potentially occurring within Alternative route 1, SCMs would be implemented. Before construction begins an AT plan would be submitted to the USFWS. If an AT is observed within Alternative route 1, all construction would stop until a qualified biologist could identify and relocate the AT. Based on the limited areas of impact and implementation of the SCMs presented in Section 2.3, significant impacts to AT habitat would not occur.

An undetermined but small number of individual ATs may need to be handled, and there is a slight possibility that an individual AT could be harmed or harassed during construction. MCB Camp Pendleton is formally consulting with the USFWS regarding this potential take of individuals and the need for any additional measures. Although a small number of individuals may be affected, there would be no significant impact on AT population numbers or distribution on MCB Camp Pendleton.

California Brown Pelican

Potential impacts are the same as for Alternative 3; see Section 3.2.3.2, Special-Status Species.

California Least Tern

Potential impacts are the same as for the Alternative 3; see Section 3.2.3.2, Special-Status Species

Coastal California Gnatcatcher

Potential impacts to CAGN could occur in occupied CSS east of Vandegrift Blvd. near Pueblitos Canyon, in coastal sage scrub surrounding SRTTP, and in CSS near the intersection of Vandegrift Blvd. and Stuart Mesa Road (see Figures 3.2-1 and 3.2-2). Impacts to CAGN occupied CSS and D-CSS would be minimized to the maximum extent possible. As much as 10.55 acres (4.27 ha) of CSS, including Haybarn Canyon, could be temporarily impacted, including:

- 0.92 acre (0.37 ha) of CS-CS;
- 1.10 acres (0.44 ha) of CSS;
- 1.25 acres (0.51 ha) of CSS(P);
- 2.64 acres (1.07 ha) of D-CSS; and
- 4.65 acres (1.88 ha) of D-CSS(P).

There are three known territories found with 250 ft (76 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, but a small number of nesting CAGNs could be disturbed by construction if the breeding season cannot be avoided.

The majority of the CAGN occupied coastal sage scrub within Alternative route 1 is along the edge of Vandegrift Blvd. and within small patches of habitat surrounding the SRTTP. These small areas of impact have limited value as wildlife habitat and would only be temporarily impacted. The habitat would recover, assisted by re-vegetation efforts as proposed. Individual birds would be displaced to adjacent habitat and may experience increased stress, competition, or risk of predation from the temporary loss of foraging, dispersal, and nesting habitat. MCB Camp Pendleton is not proposing compensation for the temporary impacts but is formally consulting with the USFWS regarding this potential take of individuals and whether additional measures would be warranted. Therefore, with the implementation of the SCMs presented in Section 2.3 and any additional measures identified through consultation with the USFWS, no long-term significant impacts on individuals or the CAGN population would occur.

Least Bell's Vireo

Potential impacts to LBVs could occur in occupied riparian vegetation along Vandegrift Blvd. east of the SMR from the south of MCAS to SRTTP, in riparian vegetation on Stuart Mesa Road, and in riparian vegetation along Vandegrift Blvd. south of Stuart Mesa Road. As much as 13.35 acres (5.40 ha) of riparian habitat, including Haybarn Canyon, would be temporarily impacted, including 3.91 acres (1.58 ha) of MFS, 6.46 acres (2.62 ha) of SWRF, and 2.98 acres (1.21 ha) of SWS. There are 37 known individuals found within 250 ft (76 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, specifically brush clearing before breeding season, but a small number of nesting LBVs could be disturbed by construction if the breeding season cannot be avoided.

Impacts to LBV occupied riparian habitat would be minimized. If occupied LBV habitat is present within 300 ft (91 m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The LBV breeding season is 15 March to 31 August. If seasonal avoidance is not feasible then SCMs would be implemented. The majority of LBV occupied riparian habitat within Alternative route 1 is along the edge of Vandegrift Blvd. This area has limited value as wildlife habitat and would only be temporarily impacted. The habitat would recover, assisted by re-vegetation efforts as proposed. Compensation for temporary impacts to LBV habitat would occur in accordance with the Riparian/Estuarine BO (USFWS 1995a). Therefore, with the implementation of the SCMs presented in Section 2.3, no long-term significant impacts on individuals or the LBV population would occur.

Southwestern Willow Flycatcher

Potential impacts to SWF could occur in occupied riparian vegetation along Vandegrift Blvd. east of the SMR from the south of MCAS to SRTTP and in riparian vegetation along Vandegrift Blvd. south of Stuart Mesa Road. As much as 13.35 acres (5.40 ha) of riparian habitat, including Haybarn Canyon, would be temporarily impacted, including 3.91 acres (1.58 ha) of MFS, 6.46 acres (2.62 ha) of SWRF, and 2.98 acres (1.21 ha) of SWS. There is one known individual found within 250 ft (76 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, specifically brush clearing before breeding season, but a small number of nesting SWFs could be disturbed by construction if the breeding season cannot be avoided.

Impacts to SWF occupied riparian habitat would be minimized. If occupied SWF habitat is present within 250 ft (76 m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The SWF breeding season is 15 March to 31 August. If seasonal avoidance is not feasible

then SCMs would be implemented. SWF occupied riparian habitat within 300 ft (91 m) of Alternative route 1 is along the west side of Vandegrift Blvd. This area would only be temporarily impacted, and the habitat would recover, assisted by re-vegetation efforts as proposed. Compensation for temporary impacts to SWF habitat would occur in accordance with the Riparian/Estuarine BO (USFWS 1995a). Therefore, with the implementation of the SCMs presented in Section 2.3, no long-term significant impacts on individuals or the SWF population would occur.

Other Special Status Species

As described in Section 3.2.2.3, several California Department of Fish and Game wildlife species of special concern have the potential to occur in the proposed project areas. Because construction disturbance would be temporary, mostly confined to disturbed areas, with only small areas of native habitat permanently altered, no significant impacts to populations or the overall availability of habitat for these species would occur.

3.2.3.4 Alternative 2

Plant Communities and Aquatic Habitats

Plant Communities

Potential temporary and permanent impacts to vegetation from the implementation of Alternative 2 are summarized in Table 3.2-1 and Table 3.2-2. Pipeline construction would impact plant communities and aquatic habitats temporarily and would be aligned along existing dirt access roads to the maximum extent possible. Two construction buffers, 100-ft (30-m) and 50-ft (15-m) wide, which is the maximum area of temporary disturbance, have been evaluated along the pipeline segments. The 50-ft (15-m) buffers are the segments along MCAS and Stuart Mesa Road, behind SRTTP, to the ocean. The 100-ft (30-m) buffer is the rest of the route along Vandegrift Blvd.

Permanent impacts to vegetation from the implementation of Alternative 2 would be the same as Alternative 4. The permanent impacts would be from the construction of the AWT Facility (See Section 3.2.3.1 Alternative 4 Plant Communities).

Coastal sage scrub vegetation including CSS, CSS(P), D-CSS, and D-CSS(P) would be avoided to the maximum extent possible. As much as 10.55 acres (4.27 ha) of coastal sage scrub, including Haybarn Canyon, could be temporarily impacted, including:

- 0.92 acre (0.37 ha) of CS-CS;
- 1.10 acres (0.44 ha) of CSS;
- 1.25 acres (0.51 ha) of CSS(P);
- 2.64 acres (1.07 ha) of D-CSS; and
- 4.65 acres (1.88 ha) of D-CSS(P).

The majority of the coastal sage scrub within Alternative 2 is along the edge of Vandegrift Blvd. and small patches of habitat surrounding the SRTTP; therefore, based on the limited areas of impact, its limited value as wildlife habitat, and implementation of the SCMs presented in Section 2.3, significant impacts to CAGN occupied CSS and D-CSS would not occur.

Riparian vegetation including MFS, RIP SCRUB, SWRF, and SWS would be avoided to the maximum extent possible. As much as 13.40 acres (5.42 ha) of riparian habitat, including Haybarn Canyon, would be temporarily impacted, including 3.91 acres (1.58 ha) of MFS, 0.04 acre (0.02 ha) of RIP SCRUB, 6.47 acres (2.62 ha) of SWRF, and 2.98 acres (1.21 ha) of SWS. The majority of the riparian habitat within

Alternative 2 is along the edge of Vandegrift Blvd. and along the edge of the road on the west side of MCAS Camp Pendleton; therefore, based on the limited areas of impact, its limited value as wildlife habitat, and implementation of the SCMs presented in Section 2.3, significant impacts to riparian habitat would not occur.

Following construction, re-vegetation of temporarily disturbed areas would occur in accordance with the SCMs. The areas of potential construction do not present difficult conditions such as steep slopes or large areas of sensitive habitat or difficult to restore habitat, such as riparian or CSS. The majority of the project area is disturbed or developed. As a result, confinement of construction activities to specified areas and implementation of SCMs for erosion control and re-vegetation would minimize corresponding indirect impacts.

Aquatic Habitats

All waters of the U.S. and wetlands within the project area would be avoided to the maximum extent possible. As much as 19.45 acres (7.87 ha) of jurisdictional waters, including 19.20 acres (7.77 ha) of wetlands and 0.25 acre (0.10 ha) of waters of the U.S., may be temporarily impacted by Alternative 2, as evaluated in the Delineation of Wetlands and Other Waters of the U.S. Report (Appendix B), the TTP EIS, and the P-110 Supplemental EA (NAVFAC SW 2004; USMC 2007a). As shown in Table 3.2-7 as much as 0.05 ac (0.02 ha) of isolated non-jurisdictional wetlands may be impacted by Alternative 2 (Appendix B).

Haybarn Canyon: See Section 3.2.3.1 Alternative 4 Aquatic Habitats (Appendix B Figure 2).

MCAS: Pipeline construction would avoid the jurisdictional wetlands to the maximum extent possible. The area of potential temporary impact to jurisdictional wetlands is 3.56 acres (1.44 ha).

Vandegrift Blvd. at STP3 to Pueblitos Canyon: See Section 3.2.3.2 Alternative 3 Aquatic Habitats.

Vandegrift Blvd. at Pueblitos Canyon to SRTTP: See Section 3.2.3.2 Alternative 3 Aquatic Habitats (Appendix B Figures 5 through 10).

SRTTP: See Section 3.2.3.1 Alternative 4 Aquatic Habitats (Appendix B Figure 11).

Implementing the SCMs presented in Section 2.3, specifically flagging wetlands and waters of the U.S., and the presence of a biological monitor during construction would ensure that the sensitive aquatic areas would be avoided to the maximum extent possible. The SWPPP and BMPs would avoid or minimize indirect impacts to wetlands and drainages outside the project area. The majority of the aquatic habitats, including wetlands and waters of the U.S., within Alternative 2 are along the edge of Vandegrift Blvd. and along the edge of dirt roads; therefore, based on the limited areas of impact, and implementation of the SCMs presented in Section 2.3, significant impacts to aquatic habitats, including wetlands and waters of the U.S., would not occur. A restoration plan would be provided to address any areas where impacts to wetlands and waters of the U.S. cannot be avoided.

See Section 3.2.3.2 Alternative 3 Plant Communities and Aquatic Habitats for impacts to the marine habitat.

<u>Fish and Wildlife</u>

Implementation of Alternative 2 would eliminate or displace wildlife temporarily and permanently from undeveloped land that provides wildlife habitat; no impacts are associated with the use of existing developed/disturbed land. Individuals of the smaller, less mobile and burrowing species could be injured or harmed by construction, whereas mobile species would disperse to surrounding areas. Given the

relatively small areas of construction in relation to surrounding habitat, the impact on wildlife populations would be minimal. Areas of CSS and riparian habitat surrounding the proposed project area would remain unaffected. In areas temporarily impacted, wildlife species would likely re-populate the area after construction. No long-term permanent impacts to wildlife are likely. Therefore, no significant impacts to wildlife, including migratory birds, would occur as a result of construction activities associated with the Proposed Action.

See Section 3.2.3.2 Alternative 3 Fish and Wildlife for impacts to marine species.

Special-Status Species

Federally Listed Species

Based on the information provided in Section 3.2.2.3, this section evaluates potential impacts to species that could be present in areas affected by Alternative 2.

Thread-leaved Brodiaea

The TLB was not found within the proposed project area including Alternative 2; therefore, no impacts to TLB would occur.

Arroyo Toad

Potential impacts to ATs could occur within Alternative 2 along MCAS and along Vandegrift Blvd. east of the SMR from south of MCAS to SRTTP. To minimize impacts to ATs potentially occurring within Alternative 2, SCMs would be implemented. Before construction begins an AT plan would be submitted to the USFWS. If an AT is observed within Alternative 2, all construction would stop until a qualified biologist could identify and relocate the AT. Based on the limited areas of impact and implementation of the SCMs presented in Section 2.3, significant impacts to AT habitat would not occur.

An undetermined but small number of individual ATs may need to be handled, and there is a slight possibility that an individual AT could be harmed or harassed during construction. MCB Camp Pendleton is formally consulting with the USFWS regarding this potential take of individuals and the need for any additional measures. Although a small number of individuals may be affected, there would be no significant impact on AT population numbers or distribution on MCB Camp Pendleton.

California Brown Pelican

Potential impacts are the same as for Alternative 3; see Section 3.2.3.2, Special-Status Species.

California Least Tern

Potential impacts are the same as for Alternative 3; see Section 3.2.3.2, Special-Status Species.

Coastal California Gnatcatcher

Potential impacts to CAGNs could occur in occupied coastal sage scrub east of Vandegrift Blvd. near Pueblitos Canyon, in coastal sage scrub surrounding SRTTP, and in coastal sage scrub near the intersection of Vandegrift Blvd. and Stuart Mesa Road (Figures 3.2-1 and 3.2-2). Impacts to CAGN occupied CSS and D-CSS would be minimized. As much as 10.55 acres (4.27 ha) of coastal sage scrub, including Haybarn Canyon, could be temporarily impacted, including 0.92 acre (0.37 ha) of CS-CS, 1.20 acres (0.44 ha) of CSS, 1.25 acres (0.51 ha) of CSS(P), 2.64 acres (1.07 ha) of D-CSS and 4.65 acres (1.88 ha) of D-CSS(P). There are three known territories found within 250 ft (76 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts

on nesting individuals, but a small number of nesting CAGNs could be disturbed by construction if the breeding season cannot be avoided.

If occupied CAGN habitat is present within 300 ft (91 m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The CAGN breeding season is 15 February to 31 August (USFWS 2007b). If seasonal avoidance is not feasible then SCMs would be implemented. The majority of the CAGN occupied coastal sage scrub within Alternative 2 is along the edge of Vandegrift Blvd. and small patches of habitat surrounding the SRTTP. These small areas of impact have limited value as wildlife habitat and would only be temporarily impacted. The habitat would recover, assisted by re-vegetation efforts as proposed. Individual birds would be displaced to adjacent habitat and may experience increased stress, competition, or risk of predation from the temporary loss of foraging, dispersal, and nesting habitat. MCB Camp Pendleton is not proposing compensation for the temporary impacts but is formally consulting with the USFWS regarding this potential take of individuals and whether additional measures would be warranted. Therefore, with the implementation of the SCMs presented in Section 2.3 and any additional measures identified through consultation with the USFWS no long-term significant impacts on individuals or the CAGN population would occur.

Least Bell's Vireo

Potential impacts to LBVs could occur in occupied riparian vegetation along MCAS Camp Pendleton, riparian vegetation along Vandegrift Blvd. east of the SMR from the south of MCAS to SRTTP, in riparian vegetation on Stuart Mesa Road, and in riparian vegetation along Vandegrift Blvd. south of Stuart Mesa Road. As much as 13.40 acres (5.42 ha) of riparian habitat, including Haybarn Canyon, would be temporarily impacted, including 3.91 acres (1.58 ha) of MFS, 0.02 acre (0.01 ha) of RIP SCRUB, 6.47 acres (2.62 ha) of SWRF, and 2.98 acres (1.21 ha) of SWS. There are 44 known individuals found within 250 ft (76 m) of the construction corridor. Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, but a small number of nesting LBVs could be disturbed by construction if the breeding season cannot be avoided.

Impacts to LBV occupied riparian habitat would be minimized. If occupied LBV habitat is present within 300 ft (91 m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The LBV breeding season is 15 March to 31 August. If seasonal avoidance is not feasible then SCMs would be implemented. The majority of LBV occupied riparian habitat within Alternative 2 is along the edge of Vandegrift Blvd. and along the edge of the road on the west side of MCAS Camp Pendleton. These limited areas would only be temporarily impacted, and the habitat would recover, assisted by re-vegetation efforts as proposed. Compensation for temporary impacts to LBV habitat would occur in accordance with the Riparian/Estuarine BO (USFWS 1995a). Therefore, with the implementation of the SCMs presented in Section 2.3, no long-term significant impacts on individuals or the LBV population would occur.

Southwestern Willow Flycatcher

Potential impacts to SWF could occur in occupied riparian vegetation along MCAS Camp Pendleton, riparian vegetation along Vandegrift Blvd. east of the SMR from the south of MCAS to SRTTP and in riparian vegetation along Vandegrift Blvd. south of Stuart Mesa Road. As much as 13.40 acres (5.42 ha) of riparian habitat, including Haybarn Canyon, could be temporarily impacted, including 3.908 acres (1.58 ha) of MFS, 0.04 acre (0.02 ha) of RIP SCRUB, 6.47 acres (2.62 ha) of SWRF, and 2.98 acres (1.21 ha) of SWS. There is one known individual found within 250 ft (76 m) of the construction corridor.

Implementation of the SCMs presented in Section 2.3 would minimize the likelihood of impacts on nesting individuals, but a small number of nesting SWFs could be disturbed by construction if the breeding season cannot be avoided.

Impacts to SWF occupied riparian habitat would be minimized. If occupied SWF habitat is present within 300 ft (91 m) of proposed construction areas, a biological monitor would be present during construction and construction would take place outside the breeding season to the maximum extent practicable. The SWF breeding season is 15 March to 31 August. If seasonal avoidance is not feasible then SCMs would be implemented. One SWF territory occurs within Alternative 2 on the southwest side of MCAS Camp Pendleton and SWF occupied riparian habitat within 250 ft (76 m) of Alternative 2 occurs along the west side of Vandegrift Blvd. These limited areas would only be temporarily impacted and the habitat would recover, assisted by re-vegetation efforts as proposed. Compensation for temporary impacts to SWF habitat would occur in accordance with the Riparian/Estuarine BO (USFWS 1995a). Therefore, with the implementation of the SCMs presented in Section 2.3, no long-term significant impacts on individuals or the SWF population would occur.

Other Special Status Species

As described in Section 3.2.2.3, several California Department of Fish and Game wildlife species of special concern have the potential to occur in the proposed project areas. Because construction disturbance would be temporary, mostly confined to disturbed areas, with only small areas of native habitat permanently altered, no significant impact to populations or the overall availability of habitat for these species would occur.

3.2.4 Mitigation Measures

Implementation of the Proposed Action and associated SCMs would not result in significant impacts to biological resources; therefore, no mitigation measures would be required.

3.2.5 No-Action Alternative

Under the No-Action Alternative, the construction of the Proposed Action would not occur; the USMC would not implement those additions and modifications to the MCB Camp Pendleton AWT facility and utility corridor discussed in this EA. Therefore, existing conditions (as described in Section 3.2.2) would remain unchanged and impacts to biological resources would not occur.

3.3 CULTURAL RESOURCES

3.3.1 Definition of Resource

The NHPA establishes guidelines for the protection, enhancement, and preservation of any property that possesses significant archaeological, architectural, historical, or cultural characteristics. Section 106 of the NHPA mandates that federal agencies take into account the effect of their undertakings on properties included in or eligible for inclusion in the National Register of Historic Places (NRHP). Section 110 mandates that federal agencies establish a program to locate, inventory, and nominate all their properties that might qualify for inclusion on the NRHP.

3.3.2 Regional Prehistory

Reddy (1998a, 1998b) and Byrd (1996a, 1996b) synthesized the various chronological sequences that have been applied to work in this region and specifically to the MCB Camp Pendleton area. Several summaries discuss the prehistory of San Diego County and provide a background for understanding the archaeology of the general area surrounding the project area. Moratto's (1984) review of the archaeology

of California contains important discussions of southern California, including the San Diego area. Bull (1983, 1987), Carrico (1987), Gallegos (1987), and Warren (1985, 1987) provide summaries of recent work and interpretations.

Carter (1957, 1978, 1980), Minshall (1976) and others (e.g., Childers 1974; Davis 1968, 1973) have long argued for the presence of Pleistocene humans in California, including the San Diego area. The earliest accepted archaeological manifestation of Native Americans in the San Diego area is the Paleoindian San Dieguito complex, dating to approximately 10,000 years ago (Warren 1967). The San Dieguito complex was originally defined by Rogers (1939), and Warren published a clear synthesis of the complex in 1967.

The Late Prehistoric period is represented by the San Luis Rey (SLR) complex in northern San Diego County and the Cuyamaca complex in the southern portion of the County. The SLR complex is the archaeological manifestation of the Shoshonean predecessors of the ethnohistoric Luiseño (named for the San Luis Rey Mission). The Cuyamaca complex represents the Yuman forebears of the Kumeyaay (Diegueño, named for the San Diego Mission). Agua Hedionda is traditionally considered to be the point of separation between Luiseño and northern Diegueño territories.

3.3.3 Ethnography

The name Luiseño derives from Mission San Luis Rey de Francia and has been used to refer to the Indians associated with the mission. The Indians associated with Mission San Juan Capistrano, called Juaneño by the Spanish, have sometimes been described as a separate group. The language, culture, and territory of the Luiseño and Juaneño are so closely related that the two are generally considered to be a single ethnic entity (Bean and Shipek 1978; White 1963). The following discussion of the Luiseño applies to Juaneño as well.

The territory of the Luiseño Indians is generally described as extending along the coast from Agua Hedionda Creek on the southwest to Aliso Creek on the northwest. On the north this boundary extended east beyond Santiago Peak to the eastern side of the Elsinore Fault Valley, continuing southeast to Palomar Mountain, then around the southern slope above the valley of San Jose. The southern boundary follows westerly to Agua Hedionda Creek (Bean and Shipek 1978; White 1963).

Ethnographic and ethnohistoric studies of the Luiseño include Bean and Shipek (1978), Boscana (1947), Kroeber (1976), Robinson (1947), Shipek (1977), Sparkman (1908), Talley (1982), and White (1963). Archaeological studies addressing the Late Prehistoric SLR complex include Meighan (1954), McCown (1955), True et al. (1974), and Wallace (1960). Most of the ethnographic studies, as well as the "classic" archaeological studies of the Luiseño, have concentrated on the Pauma Valley and the Palomar Mountain area, although Wallace's (1960) study was an archaeological survey of the Buena Vista Creek watershed.

3.3.4 Previous Cultural Resources Studies

Archaeological investigations over the past 85 years along the southern California coast have yielded a long sequence of prehistoric occupation (Moratto 1984). Occupation of the area is well documented both north and south of MCB Camp Pendleton, and extends from the early Holocene into the ethnohistoric period (e.g., Hines and Rivers 1991; Meighan 1954; True 1958; Vanderpot et al. 1993; Warren 1964).

MCB Camp Pendleton had little systematic research until the 1960s. Since this time, MCB Camp Pendleton has completed 82 surveys, recording approximately 600 archaeological sites of which more than 150 have been tested. Cultural sites spanning prehistoric, ethnohistoric and historic time periods have been documented within boundaries of the Base. Archaeological study on MCB Camp Pendleton has varied from adequate investigations to inadequate projects based on the generally accepted standards

of today (Byrd 1996a; Reddy 1998a, 1998b). Despite some limitations, the archaeological database of the Base is evolving into a resource that can be utilized to address issues related to regional settlement subsistence systems and human adaptation in the area.

3.3.5 Existing Conditions

The P-113 project areas were surveyed by ASM Affiliates in November 2006. The five areas surveyed included the pipeline alignment to Stuart Mesa Road; the golf course reclaimed pipeline alignment and entrance road irrigation area; the horse pasture pipeline alignment with STP-2 power pole locations and wastewater pipeline replacement; the Stuart Mesa housing re-use line, pump station, holding tank; and the pipeline alignment from SRTTP to the bluffs. For each study area, the Area of Potential Effect (APE) and a 100-ft (30-m) buffer zone was surveyed through a full coverage survey done at 50-ft (15-m) transect intervals. A concentrated effort was made to examine subsurface exposures such as animal burrows, eroded areas, drainages, road cuts, and areas disturbed by military activity for indications of buried cultural deposits. In addition to the survey effort, testing was also performed for a single site located within the APE.

There are no historical or traditional cultural resources located in the APE. However, ten archaeological sites are located in the APE for each of the potential alternate alignments (Table 3.3-1). Most of the sites are situated along a shared central portion of each alignment. These sites are, from southwest to northeast, SDI-14748, -14749, -14170, -14750, -14751, -14752, -12577, -14060, -12628, and -10156/12599 (Pigñiolo and Cleland 1996). Nine of the sites were determined eligible for NRHP listing and another was determined ineligible. In addition, several sites have eligible deposits that may extend underneath the roadway and into the path of existing utilities (ASM Affiliates 2009).

Table 3.3-1 Archaeological Sites Within or Near the APE for All Alternative Pipeline Routes

Site (SDI-)	*Alternative Route*	*Size (m)*	*In or Out of APE*	*Description*
12577	1, 2, 4	85 x 60	IN	Artifact scatter with flaked and ground stone, shell, and bone
12628	1, 2, 4	50 x 145	IN	Artifact scatter with flaked and ground stone, shell, and bone
10156/12599	1, 2, 4	760 x 450	IN	Village of Topamai: flaked and ground stone, ceramics, bone, shell, midden soils
14060	1, 2, 4	175 x 105	IN	Artifact scatter with flaked and ground stone, bone, shell, and midden soils
14170	1, 2, 3, 4	260 x 380	IN	Lithic scatter with shell
14748	1, 2, 3, 4	130 x 30	IN	Shell midden with flaked stone ground stone, FAR, and bone
14749	1, 2, 3, 4	50 x 10	IN	Shell midden with flaked stone artifacts
14750	1, 2, 3, 4	60 x 5	IN	Artifact scatter with flaked and ground stone, and shell midden
14751	1, 2, 3, 4	50 x 6	IN	Lithic scatter with shell and bone
14752	1, 2, 3, 4	30 x 6	IN	Artifact scatter with flaked and ground stone, ceramics, bone, and shell

Source: ASM Affiliates 2009.

3.3.6 Environmental Consequences

Cultural resources are subject to review under both federal and state laws and regulations. Section 106 of the NHPA of 1966, as amended, empowers the Advisory Council on Historic Preservation to comment on federally initiated, licensed, or permitted projects affecting cultural sites listed or eligible for inclusion in the NRHP. Once cultural resources have been identified, they are evaluated to determine if they meet one of the four criteria for significance as defined by 36 CFR § 60.4, including association with an important

event, association with an important person, embodiment of a style of architecture representing a particular period in history or work of a master, or the ability to contribute to the existing scientific database. Only cultural resources determined to be significant (i.e. eligible for the NRHP) are protected under the NHPA.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment that contribute to the importance of the resource, introducing visual or audible elements that are out of character for the period the resource represents (thereby altering the setting), or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the type and location of a Proposed Action and by determining the exact locations of cultural resources that could be affected. Indirect impacts are those that may result from a change in activity levels or other occurrence that is a byproduct of a Proposed Action, such as the effect of increased vehicular or pedestrian traffic in the vicinity of the resource.

The following impact analysis focuses only on ground disturbing activities that could affect NRHP-eligible resources (known and unknown).

3.3.6.1 Preferred Alternative (Alternative 4)

The area for this route falls under MCB Camp Pendleton's Memorandum of Agreement (MOA) with the State Historic Preservation Officer (SHPO) for the SRTTP. The Proposed Action was added to the MOA for the SRTTP. This MOA includes measures such as data recovery of direct effects if the sites are not avoided and archaeological and Native American monitoring of the APE as well as treatment and data recovery of archaeological sites discovered during construction. The SHPO concurred that a finding of No Adverse Effect with conditions is appropriate pursuant to 36 CFR § 800.5(b) and that the documentation supporting this finding has been provided pursuant to 36 CFR § 800.11 (d) (Appendix F).

Construction of the proposed pipeline would take place near several known archaeological resources along the length of the pipeline. Additionally, archaeological investigations along Vandegrift Blvd. indicate that additional buried sites may be present just beneath the existing roadbed. For this reason, archaeological monitoring would be necessary in selected areas, in addition to data recovery, to identify any known cultural deposits disturbed or undocumented cultural deposits found during construction. All nine archaeological sites, their eligibility, and potential treatment needs are listed in Table 3.3-2.

Table 3.3-2 Archaeological Sites Within the APE, Eligibility Status, Potential Impacts, and Treatment Needs

Site (SDI-)	*Eligibility*	*Adverse Impacts/Treatment Needs*
12577	Eligible	None expected/Monitoring
12628	Ineligible	None expected/Monitoring
10156/12599	Eligible	None expected/Monitoring
14060	Not Eligible	None expected/Monitoring
14170	Eligible	None expected/Monitoring
14748	Eligible	None expected/Monitoring
14749	Eligible	None expected/Monitoring
14750	Eligible	None expected/Monitoring
14751	Eligible	None expected/Monitoring
14752	Eligible	None expected/Monitoring

Source: ASM Affiliates 2009.

In the event that potentially eligible contributing elements of existing sites, or unknown archaeological resources, are discovered during construction monitoring, a data recovery plan would be in place to support further investigation and aid project construction. If the above sites cannot be avoided, data generated during construction monitoring or potential data recovery operations would be used to support further management recommendations for cultural resources in the project area. Table 3.3-3 highlights those sites, which if they cannot be avoided, would require data recovery.

Table 3.3-3 Archaeological Sites Within the APE, Treatment Needs if Impacts Cannot Be Avoided

Site (SDI-)	*Alignment*	*Size (m)*	*Description*	*Eligibility Status*	*Adverse Effects/ Treatment Needs*
12577	1, 2, 4	85 x 60	Artifact scatter with flaked and ground stone, shell, and bone	Eligible	Data Recovery
12628	1, 2, 4	50 x 145	Artifact scatter with flaked and ground stone, shell, and bone	Ineligible	None Expected/Monitoring
10156/ 12599	1, 2, 4	760 x 450	Village of Topamai: flaked and ground stone, ceramics, bone, shell, midden soils	Eligible	None Expected
14060	1, 2, 4	175 x 105	Artifact scatter with flaked and ground stone, bone, shell and midden soils	Not Eligible	None Expected
14170	1, 2, 3, 4	260 x 380	Lithic scatter with shell	Eligible	Data Recovery
14748	1, 2, 3, 4	130 x 30	Shell midden with flaked stone, ground stone, FAR, and bone	Eligible	Data Recovery
14749	1, 2, 3, 4	50 x 10	Shell midden with flaked stone artifacts	Eligible	Data Recovery
14750	1, 2, 3, 4	60 x 5	Artifact scatter with flaked and ground stone, and shell midden	Eligible	Data Recovery
14751	1, 2, 3, 4	50 x 6	Lithic scatter with shell and bone	Eligible	Data Recovery
14752	1, 2, 3, 4	30 x 6	Artifact scatter with flaked and ground stone, ceramics, bone, and shell	Eligible	Data Recovery

Source: ASM Affiliates 2009.

To comply with all applicable federal regulations governing archaeological resources, an archaeological monitor would be present during construction of the current project in the vicinity of all archaeological sites. Construction activities requiring monitoring involve all ground breaking activity. Since nine of the ten archaeological sites in the APE are eligible, monitoring of archaeological deposits would be directed at determining if cultural debris discovered during construction derives from a disturbed context or if potentially intact, contributing elements of the site have been discovered. It is likely that small bits of cultural debris, such as shell or debitage, would be found while excavating existing pipeline trenches because fill from cultural deposits may have been used to bury existing utilities. Construction would be halted only if it is determined that construction activities have uncovered previously undisturbed cultural deposits. If potentially intact cultural deposits are discovered during construction, data recovery operations would be necessary for those sites listed in Table 3.3-1, to explore and document the

archaeological deposit within the path of construction. If no potentially eligible archaeological deposits are discovered during construction activities by the archaeological monitor and data recovery operations are not conducted, monitoring activities would be documented in an Archaeological Monitoring Compliance Report. This report would provide a record of the presence or absence of cultural material discovered during the project work and would show the locations monitored and the results of the monitoring on a map.

3.3.6.2 Alternatives 1, 2, and 3

The discussion above for Alternative 4 (Section 3.3.6.2) is applicable to Alternatives 1, 2, and 3. Construction of the proposed pipeline would take place near several known archaeological resources along the length of the pipeline. Additionally, archaeological investigations along Vandegrift Blvd. indicate that additional buried sites may be present just beneath the existing roadbed. In the event that potentially eligible contributing elements of existing sites, or unknown archaeological resources, are discovered during construction monitoring, a data recovery plan would be in place to support further investigation and aid project construction. To comply with all applicable federal regulations governing archaeological resources, an archaeological monitor and Native American monitor would be present during construction of the current project in the vicinity of all archaeological sites. Therefore, although archaeological sites have a potential to be impacted, with the implementation of the measures listed in the MOA for the SRTTP, less than significant impacts to cultural resources would occur from the implementation of Alternatives 1, 2, or 3.

3.3.7 Mitigation Measures

Implementation of the Proposed Action would result in adverse effects to cultural resources; therefore, mitigation measures would be required. These measures would include data recovery of direct effects to the site, if the sites are not avoided, and archaeological and Native American monitoring of the APE. Also included would be measures dealing with the treatment and data recovery of new archaeological sites discovered during construction of the Proposed Action. With the implementation of these mitigation measures the impacts to this resource would be less than significant.

3.3.8 No-Action Alternative

Under the No-Action Alternative, construction of the P-113 pipelines and associated facilities would not occur; the USMC would not implement those additions and modifications to the MCB Camp Pendleton AWT facility and associated conveyance pipeline system discussed in this EA. Therefore, existing conditions (as described in Section 3.3.5) would remain unchanged, and impacts to cultural resources would not occur.

3.4 AIR QUALITY

3.4.1 Definition of Resource

Estimated emissions from a proposed federal action are typically compared with the relevant national and state standards to assess the potential for increases in pollutant concentrations. Impacts would occur if the Proposed Action or alternatives directly or indirectly produce emissions that would be the primary cause of, or would significantly contribute to, a violation of state or federal ambient air quality standards. Emission thresholds associated with CAA conformity requirements are another means of assessing the significance of air quality impacts. A formal conformity determination is required for federal actions occurring in nonattainment or maintenance areas when the total direct and indirect stationary and mobile source emissions of nonattainment pollutants or their precursors exceed thresholds or *de minimis* values.

Air quality in a given location is defined by pollutant concentrations in the atmosphere and is generally expressed in units of parts per million (ppm) or micrograms per cubic meter (µg/m³). One aspect of significance is a pollutant's concentration in comparison to a national and/or state ambient air quality standard. These standards represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare with a reasonable margin of safety. The national standards, established by the USEPA, are termed the National Ambient Air Quality Standards (NAAQS). The NAAQS represent maximum acceptable concentrations that generally may not be exceeded more than once per year; the annual standards are never allowed to be exceeded. State standards, established by the California Air Resources Board (CARB), are termed the California Ambient Air Quality Standards (CAAQS). The CAAQS are at least as restrictive as the NAAQS and include pollutants for which national standards do not exist (CARB 2009a) (Figure 3.4-1).

Areas that violate ambient air quality standards are designated as nonattainment areas. Nonattainment designations for ozone (O_3) and carbon monoxide (CO) include subcategories indicating the severity of the air quality problem (e.g., the classifications range from moderate to serious for CO and from marginal to severe for O_3). Areas that comply with federal air quality standards are designated as attainment areas. Areas that have been redesignated from nonattainment to attainment are designated as maintenance areas. Areas that lack monitoring data to demonstrate attainment or nonattainment status are designated as unclassified and are considered to be in attainment for regulatory purposes.

The air pollutants that are considered in this analysis include volatile organic compounds (VOCs), O_3, CO, nitrogen oxides (NO_x), particulate matter less than or equal to 10 microns in diameter (PM_{10}), and particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$). Emissions are often characterized as being "primary" or "secondary" pollutants. Primary pollutants are those emitted directly into the atmosphere such as CO, sulfur dioxide (SO_2), PM_{10} and $PM_{2.5}$. Secondary pollutants are those formed through chemical reactions in the atmosphere such as O_3 and nitrogen dioxide (NO_2). SO_2 and NO_2 are commonly referred to and reported as sulfur oxides (SO_x) and NO_x, respectively, as SO_2 and NO_2 constitute the majority of their respective oxides. Although VOCs (also referred to as hydrocarbons or reactive organic gases) and NO_x (other than nitrogen dioxide) have no established ambient standards, they are important as precursors to O_3 formation.

3.4.2 Regulatory Setting

3.4.2.1 Federal Requirements

Section 176(c) of the CAA, as amended, requires federal agencies to ensure that actions undertaken in nonattainment or maintenance areas are consistent with the CAA and with federally enforceable air quality management plans. The USEPA general conformity rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year) vary from pollutant to pollutant and are also subject to the severity of the nonattainment status. The applicable *de minimis* levels for the project area are listed in Table 3.4-1.

POLLUTANT	AVERAGING TIME	CALIFORNIA STANDARDS(1)	NATIONAL STANDARDS(2)	
			Primary	Secondary
Ozone (O_3)	8 Hour	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3)	Same as Primary Standards
	1 Hour	0.09 ppm (180 μg/m^3)	•	
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	•
	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	Same as Primary Standard
	1 Hour	0.18 ppm (339 μg/m^3)	•	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	•	0.030 ppm (80 μg/m^3)	•
	24 Hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	•
	3 Hour	•	•	0.5 ppm (1300 μg/m^3)
	1 Hour	0.25 ppm (655 μg/m^3)	•	•
Respirable Particulate Matter ≤ 10 Microns in Diameter (PM_{10})	Annual Arithmetic Mean	20 μg/m^3	•	Same as Primary Standards
	24 Hour	50 μg/m^3	150 μg/m^3	
Respirable Particulate Matter ≤ 2.5 Microns in Diameter ($PM_{2.5}$)	Annual Arithmetic Mean	12 μg/m^3	15.0 μg/m^3	Same as Primary Standards
	24 Hour	No Separate Standard	35 μg/m^3	
Sulfates	24 Hour	25 μg/m^3	•	•
Lead (Pb)	30 Day Average	1.5 μg/m^3	•	•
	Calendar Quarter	•	1.5 μg/m^3	Same as Primary Standard
	Rolling 3-Month Average	•	0.15 μg/m^3	
Hydrogen Sulfide (H_2S)	1 Hour	0.03 ppm (42 μg/m^3)	•	•
Vinyl Chloride (chloroethene)	24 Hour	0.01 ppm (26 μg/m^3)	•	•
Visibility Reducing Particles	8 Hour (10:00 A.M. to 6:00 P.M.)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent. Measurement in accordance with California Air Resources Board (CARB) Method V.	•	•

ppm – parts per million μg/m^3 – micrograms per cubic meter mg/m^3 – milligrams per cubic meter • – no standard established

(1) CO, SO_2 (1- and 24-hour), NO_2, O_3, PM_{10}, and visibility reducing particles standards are not to be exceeded. All other California Standards are not to be equaled or exceeded.

(2) Not to be exceeded more than once a year except for annual standards.

Source: CARB 2009a (updated 11/17/08).

Figure 3.4-1
California and National Ambient Air Quality Standards

Table 3.4-1 Applicable Criteria Pollutant de minimis Levels (tons/year)

VOCs[1]	*NO_x*[1]	*CO*[2]	*SO_x*[2]	*PM_{10}*[2,3]	*$PM_{2.5}$*[2,3]
100	100	100	NA	NA	NA

Notes: [1] San Diego Air Basin (SDAB) is a basic nonattainment area for the 8-hour federal and state O_3 standard; VOCs and NO_x are precursors to the formation of O_3.
[2] SDAB is considered a maintenance area for the federal CO standard and in attainment of the federal SO_x, PM_{10} and $PM_{2.5}$ standards.
[3] SDAB is in nonattainment of the state PM_{10} and $PM_{2.5}$ standards.
NA = not applicable since the SDAB is in attainment of the federal SO_x, PM_{10} and $PM_{2.5}$ standards.
Sources: CARB 2009b; USEPA 2009.

The USEPA conformity rule establishes a process that is intended to demonstrate that a proposed federal action would not: 1) cause or contribute to new violations of federal air quality standards; 2) increase the frequency or severity of existing violations of federal air quality standards; and 3) delay the timely attainment of federal air quality standards. Compliance is presumed if the net increase in direct and indirect emissions from a federal action would be less than the relevant *de minimis* level. However, if the increase in emissions for a nonattainment pollutant exceeds *de minimis* levels, a formal conformity determination process must be implemented. For the purposes of this air quality analysis, project emissions would be potentially significant if they exceed federal *de minimis* levels. If emissions exceed their respective *de minimis* levels, further analysis of the emissions and their consequences would be performed to assess whether there is a likelihood of a significant impact to air quality.

3.4.2.2 State Requirements

The CAA requires each state to develop, adopt, and implement a State Implementation Plan (SIP) to achieve, maintain, and enforce federal air quality standards throughout the state. SIPs are developed on a pollutant-by-pollutant basis whenever one or more air quality standards are being violated. State standards, established by the CARB, are termed the CAAQS. The air pollutants that are mainly considered in this analysis include VOCs, O_3, CO, NO_x, PM_{10}, and $PM_{2.5}$. Local governments and air pollution control districts have had the primary responsibility for developing and adopting the regional elements of the California SIP. In the San Diego region, the San Diego County Air Pollution Control District (SDCAPCD) is responsible for governing air quality and reports to CARB.

3.4.2.3 Local Regulations

The SDCAPCD is responsible for regulating stationary sources of air emissions in the SDAB. The SDCAPCD Rules and Regulations (SDCAPCD 2009) establish emission limitations and control requirements for stationary sources, based on their source type and magnitude. In addition, SDCAPCD Conformity Rule 1501 provides general conformity guidance to ensure that Federal actions are consistent with the efforts of the SDAPCD to achieve its NAAQS attainment goals.

The SDCAPCD and the San Diego Association of Governments are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis. The RAQS was updated in 1995, 1998, 2001, and most recently in 2004. The 2004 Triennial RAQS Revision is the most recent plan to bring the SDAB into compliance with the CAAQS. This plan includes all feasible control measures that can be implemented for the reduction of O_3 precursor emissions. To be consistent with the RAQS, a project must conform to emission growth factors outlined in this plan. Control measures for stationary sources proposed in the RAQS and adopted by the SDCAPCD are incorporated into the SDCAPCD Rules and Regulations. The SDCAPCD is in the process of updating the RAQS and has released the proposed 2008 Triennial revision of the RAQS for

public review and comment in September 2008. To date the proposed 2008 RAQS has not been formally adopted.

The SDCAPCD has also developed the air basin's input to the SIP. The SIP includes the SDCAPCD's plans and control measures for attaining the O_3 NAAQS. The SIP is also updated on a triennial basis. The CARB adopted its 2007 State Strategy for California's 2007 State Implementation Plan on 27 September 2007. The State Strategy was submitted to the USEPA on 16 November 2007 for their review and approval. As part of that State Strategy, the SDCAPCD developed its *Eight-Hour Ozone Attainment Plan for San Diego County*, which provides plans for attaining and maintaining the 8-hour NAAQS for O_3.

3.4.2.4 Greenhouse Gas Emissions

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

Recent observed changes due to global warming include shrinking glaciers, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges (Intergovernmental Panel on Climate Change 2007). Predictions of long-term environmental impacts due to global warming include sea level rise, changing weather patterns with increases in the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a significant reduction in winter snow pack. In California, predictions of these effects include exacerbation of air quality problems, a reduction in municipal water supply from the Sierra snowpack, a rise in sea level that would displace coastal businesses and residences, damage to marine and terrestrial ecosystems, and an increase in the incidence of infectious diseases, asthma, and other human health problems (California Environmental Protection Agency [CalEPA] 2006).

The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydro fluorocarbons and per fluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential (GWP) rating. The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a value of one. For example, CH_4 has a GWP of 21, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis. Total GHG emissions from a source are often reported as a CO_2 equivalent (CO_{2e}). The CO_{2e} is calculated by multiplying the emission of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs.

Federal agencies are, on a national scale, addressing emissions of GHGs by reductions mandated in federal laws and EOs, most recently, EO 13423. Several states have promulgated laws as a means to reduce statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020.

In an effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with the goals set by EO 13123 and the Energy Policy Act of 2005, the DON and USMC have implemented a number of renewable energy projects (NAVFAC SW 2006). The types of projects currently in operation within the NAVFAC SW region include thermal and photovoltaic solar systems, geothermal power plants, and wind generators. The military also purchases

one-half of the biodiesel fuel sold in California. The DON continues to promote and install new renewable energy projects within the NAVFAC SW region.

The potential effects of GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, the impact of GHG emissions to climate change is discussed in the context of cumulative impacts in Section 4.3 of this EA.

3.4.3 Existing Conditions

ROI for air quality includes the 4,260-square mile (11,033-square km) SDAB, which encompasses all of San Diego County.

3.4.3.1 Climate and Meteorology

The climate of the project region is classified as Mediterranean, characterized by dry summers and wet winters. The major influences on the regional climate are the Eastern Pacific high-pressure system, topography, and the moderating effects of the Pacific Ocean. Seasonal variations in the position and strength of the high-pressure system are a key factor in area weather changes.

The Eastern Pacific High is a persistent anticyclone that attains its greatest strength and most northerly position during summer, when it is centered west of northern California. In this position, the High effectively shelters southern California from the effects of polar storm systems. As winter approaches, the Eastern Pacific High weakens and shifts to the south, allowing polar storm systems to pass through the region. Subsiding air associated with the High warms the upper levels of the atmosphere and produces an elevated temperature inversion (temperature increases with height) along the west coast. The base of this temperature inversion is generally from 1,000 to 3,000 ft (305 to 914 m) above mean sea level during the summer. The subsidence inversion acts like a lid on the lower atmosphere and traps air pollutants near the surface of the earth by limiting vertical dispersion.

Mountain ranges in eastern San Diego County constrain the horizontal movement of air and also inhibit the ventilation of air pollutants out of the region. These two factors, combined with the emission sources of over three million people, help to create the high pollutant conditions sometimes experienced in San Diego County.

Concurrent with the presence of the Eastern Pacific High west of California, a thermal low pressure system persists in the interior desert region due to intense sunshine. The resulting pressure gradient between these two systems produces a southwest to west onshore air flow at MCB Camp Pendleton for most of the year. Sea breezes usually occur during the daytime and disperse air pollutants toward the interior regions. During the evening hours and colder months of the year, sea breezes are often replaced by land breezes that blow in the opposite direction towards the offshore areas. These weak offshore flows may continue until daytime heating reverses the flow back onshore.

During the colder months, the Eastern Pacific High can combine with high pressure over the continent to produce extended periods of light winds and low-level inversion conditions in the region. These atmospheric conditions can produce adverse air quality. Excessive build-up of high pressure over the continent can produce a “Santa Ana” condition, characterized by warm, dry, northeast winds. Santa Ana winds help to ventilate the air basin of locally generated emissions. However, Santa Ana conditions can also transport air pollutants from the Los Angeles metropolitan area into the project region. When stagnant atmospheric conditions occur during a weak Santa Ana, local emissions combined with pollutants transported from the Los Angeles area can lead to significant O_3 impacts in the project region.

Marine air trapped below the base of the subsidence inversion is often condensed into fog and stratus clouds by the cool Pacific Ocean. This is a typical weather condition of coastal San Diego County during the warmer months of the year. Marine stratus usually forms offshore and moves into the coastal plains and valleys during the evening hour. When the land heats up the following morning, the clouds burn off to the immediate coastline and reform the following evening.

3.4.3.2 Regional and Local Air Pollutant Sources

An emission rate represents the mass of a pollutant released into the atmosphere by a given source over a specified period of time. Emission rates can vary considerably depending on type of source, time of day, and schedule of operation. The SDCAPCD periodically updates emissions for the entire SDAB for purposes of forecasting future emissions, analyzing emission control measures, and for use in regional air quality modeling. The largest regional sources of air emissions are on-road vehicles. The 2008 inventory determined that on-road vehicles emitted 33% of the VOCs, 60% of the NO_x, and 65% of the CO emissions within the SDAB (CARB 2009c). Another large source of VOCs is the use of surface coatings and solvents. Combustion sources produce both primary fine particulate matter and fine particulate precursor pollutants, such as NO_x, which react in the atmosphere to produce secondary fine particulates. Coarser particles mainly occur from soil-disturbing activities, such as construction, mining, agriculture, and vehicular road dust.

3.4.3.3 Baseline Air Quality

Representative air quality data for MCB Camp Pendleton for the period 2006-2008 are shown in Table 3.4-2. The USEPA designates all areas of the U.S. as having air quality better than or equal to (attainment) or worse than (nonattainment), the NAAQS. The criteria for nonattainment designation varies by pollutant: (1) an area is in nonattainment for O_3 if its NAAQS has been exceeded more than three discontinuous times in 3 years and (2) an area is generally in nonattainment for any other pollutant if its NAAQS has been exceeded more than once per year. Former nonattainment areas that have attained the NAAQS are designated as maintenance areas. The SDAB is in basic nonattainment for the federal O_3 standard, is considered a maintenance area for the CO standard, and is in attainment of the federal SO_x, PM_{10} and $PM_{2.5}$ standards. The SDAB is in nonattainment of the state O_3, PM_{10} and $PM_{2.5}$ standards (CARB 2009b; USEPA 2009).

Ozone concentrations are generally the highest during the summer months and coincide with the period of maximum sunshine. Maximum O_3 concentrations tend to be regionally distributed, since precursor emissions become homogeneously dispersed in the atmosphere. Inert pollutants, such as CO, tend to have the highest concentrations during the colder months of the year, when light winds and nighttime/early morning surface-based temperature inversions inhibit atmospheric dispersion. Maximum inert pollutant concentrations are usually found near an emission source.

3.4.3.4 MCB Camp Pendleton Emissions

Emission sources associated with the existing use of MCB Camp Pendleton include civilian and military personal vehicles, commercial and military vehicles, aircraft engines, tactical support equipment, small stationary sources, and ongoing construction activities.

Table 3.4-2 Representative Air Quality Data for MCB Camp Pendleton (2006-2008)

Air Quality Indicator	2006	2007	2008
Ozone (O_3) [1]			
Peak 8-hour value (ppm)	0.073	0.074	**0.077**
Days above federal standard (0.075 ppm) [2, 7]	0[7]	0	**2**
Days above state standard (0.070 ppm)	5	4	**3**
Carbon monoxide (CO) [3]			
Peak 8-hour value (ppm)	3.27	3.01	2.60
Days above federal standard (9.0 ppm)	0	0	0
Days above state standard (9.0 ppm)	0	0	0
Particulate matter less than or equal to 10 microns in diameter (PM_{10}) [4]			
Peak 24-hour value ($\mu g/m^3$)	42.0	65.0	41.0
Days above federal standard (150 $\mu g/m^3$)	0	0	0
Days above state standard (50 $\mu g/m^3$)	0	1	0
Particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$) [4]			
Peak 24-hour value ($\mu g/m^3$)	26.3	30.6	27.2
Days above federal/state standard (35 $\mu g/m^3$) [5]	0	0	0
Sulfur Dioxide (SO_2) [3]			
Peak 24-hour value (ppm)	0.009	0.006	0.007
Days above federal standard (0.14 ppm)	0	0	0
Days above state standard (0.04 ppm)	0	0	0
Nitrogen Dioxide (NO_2) [1]			
Peak 1-hour value (ppm)	0.081	0.068	0.089
Days above state standard (0.18 ppm)	0	0	0

Notes: [1] Data from the Camp Pendleton Monitoring Station.
[2] The federal O_3 standard was revised downward in 2008 from 0.08 to 0.075 ppm.
[3] Data from the San Diego-1110 Beardsley Street Monitoring Station.
[4] Data from the San Diego-Overland Avenue Monitoring Station.
[5] The federal $PM_{2.5}$ standard was revised downward in 2007 from 65 to 35 $\mu g/m^3$.
[6] Data from the San Francisco-Arkansas Street Monitoring Station.
[7] The federal eight-hour ozone standard was previously defined as 0.08 ppm (1 significant digit). Measurements are rounded up or down to determine compliance with the standard; therefore, a measurement of 0.084 ppm is rounded to 0.08 ppm. The 8-hour ozone ambient air quality standards are met at an ambient air quality monitoring site when the average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to the standard.
ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter
Source: CARB 2009d.

3.4.4 Environmental Consequences

3.4.4.1 Approach to Analysis

Emission thresholds associated with federal CAA conformity requirements are the primary means of assessing the significance of potential air quality impacts associated with implementation of a Proposed Action under NEPA. A formal conformity determination is required for federal actions occurring in nonattainment or maintenance areas when the total direct and indirect stationary and mobile source emissions of nonattainment pollutants or their precursors exceed *de minimis* thresholds. In addition, a formal conformity determination is required for actions defined as regionally significant (i.e., if the total emissions from a federal action exceed 10% of a nonattainment area's emission inventory for that pollutant).

Significant air quality impacts would occur if implementation of any of the alternatives would directly or indirectly:

1) expose people to localized (as opposed to regional) air pollutant concentrations that violate state or federal ambient air quality standards;
2) cause a net increase in pollutant or pollutant precursor emissions that exceeds relevant emission significance thresholds (such as CAA conformity *de minimis* levels or the numerical values of major source thresholds for nonattainment pollutants); or
3) conflicts with adopted air quality management plans, policies, or programs.

Criteria to determine the significance of air quality impacts are based on federal, state, and local air pollution standards and regulations. The SDCAPCD has not established criteria for assessing the significance of air quality impacts for NEPA purposes. However, SDCAPCD Rule 20.3 defines a stationary source as "major" if annual emissions exceed 100 tons of CO, SO_x, or PM_{10} or 100 tons of VOCs or NO_x. For purposes of this air quality analysis, project emissions within the MCB Camp Pendleton region would be potentially significant if they exceed these thresholds. This is a conservative approach, as the analysis compares emissions from both project-related stationary and mobile sources to these thresholds. Impacts would also be potentially significant within the MCB Camp Pendleton region if (1) project emissions exceed the thresholds that trigger a conformity determination under Section 176(c) of the 1990 CAA (100 tons per year of VOC or NO_x).

If emissions exceed a significance threshold described above, further analysis of the emissions and their consequences would be performed to assess whether there was a likelihood of a significant impact to air quality. The nature and extent of such analysis would depend on the specific circumstances. The analysis could range from simply a more detailed and precise examination of the likely emitting activities and equipment, to air dispersion modeling analyses. If project emissions were determined to increase ambient pollutant levels from below to above a national or state ambient air quality standard, these emissions would be significant.

3.4.4.2 Preferred Alternative (Alternative 4)

Construction Assumptions

Air quality impacts from proposed construction activities would occur from the use of construction vehicles, heavy machinery, and worker vehicle trips. There are no anticipated demolition activities associated with the Proposed Action.

Total emissions resulting from construction activities have been estimated using data presented in Chapter 2, general air quality assumptions, and emission factors compiled from the following sources: *OFFROAD Emission Factors* (CARB 2007a); and *CARB EMFAC2007* Model (CARB 2007b).

After PM_{10} is estimated, the fraction of fugitive dust emitted as $PM_{2.5}$ is estimated, based on the South Coast Air Quality Management District (SCAQMD) Final Methodology to calculate $PM_{2.5}$ and $PM_{2.5}$ significance thresholds (SCAQMD 2006). This guidance document indicates that fugitive dust PM_{10} is 21% $PM_{2.5}$, heavy equipment PM_{10} is 89% $PM_{2.5}$, and vehicular emissions of PM_{10} are 99% $PM_{2.5}$ (SCAQMD 2006).

A list of estimated equipment required for construction activities, estimates of workforce requirements, and haul truck travel are provided in Appendix E, along with the emission calculations for all construction activities. It has been conservatively estimated that all construction activities would be completed within one year, and that construction of the project components would overlap.

The new pumps associated with the AWT facility would be run on electrical power. In the event of a power outage, backup power would be provided by diesel generators. Emissions from the Proposed

Action's operational activities (i.e., backup generator use) would essentially be the same as emissions associated with existing conditions; therefore, only emissions associated with construction activities have been estimated.

Construction Emissions

Estimated emissions as a result of implementation of the Proposed Action would be below *de minimis* levels (Table 3.4-3); therefore, a conformity analysis would not be necessary. Fugitive dust (PM_{10} and $PM_{2.5}$) emissions would be minimized by incorporating dust control measures (e.g., frequently applying water on surface grading areas). Therefore, implementation of the Proposed Action would not result in significant impacts to air quality within the ROI.

Fugitive dust generated from construction activities would temporarily impact local air quality. However, fugitive dust generated by proposed construction activities would be temporary and short-term; no long-term increases in fugitive dust would occur. Fugitive dust control measures, that are considered part of the Proposed Action, would be implemented as SCMs (refer to Section 2.3) to reduce emissions of particulate matter (PM_{10} and $PM_{2.5}$) to the extent possible. These measures include watering unpaved roads and actively graded surfaces three times daily, as well as reducing speeds on unpaved roads to 15 miles per hour (mph), suspending grading activities if wind speeds exceed 25 mph, and replacing ground cover in graded areas as soon as possible. These measures have been taken into account in the emission calculations for the Proposed Action.

Table 3.4-3 Estimated Emissions Resulting from Implementation of the Proposed Action (Alternative 4) at MCB Camp Pendleton

Component	*Emissions (tons/year)*					
	CO[2]	**VOCs[1]**	**NO_x[1]**	**SO_x[2]**	**PM_{10}[2]**	**$PM_{2.5}$[2]**
Heavy Equipment Emissions	5.21	1.39	13.57	0.64	0.89	0.79
Construction Truck Emissions	0.18	.002	0.12	0.00	0.00	0.00
Worker Commute Emissions	0.19	0.01	0.02	0.00	0.00	0.00
Fugitive Dust					0.19	0.02
Subtotal	**5.58**	**1.42**	**13.71**	**0.64**	**1.08**	**0.81**
de minimis threshold[3]	100	100	100	100	100	100
Exceeds *de minimis* threshold?	No	No	No	No	No	No
SDAB emissions forecast (2010)	270,794	63,036	57,451	1,460	43,472	14,746
Exceeds 10% of forecast?	No	No	No	No	No	No

Notes: [1] SDAB is a basic nonattainment area for the 8-hour O_3 NAAQS; VOCs and NO_x are precursors to the formation of O_3.
[2] SDAB is in considered a maintenance area for the CO NAAQS and is in attainment of the NAAQS for NO_2, SO_2, PM_{10}, and $PM_{2.5}$.
[3] *de minimis* thresholds are developed from SDCAPCD major source thresholds; *de minimis* thresholds are not applicable to NAAQS attainment areas (i.e., SO_2, PM_{10} and $PM_{2.5}$) but have been presented for planning purposes only.
Sources: CARB 2009b; CARB 2009d; USEPA 2009.

Conformity Applicability Analysis

The estimated construction emissions associated with the Proposed Action would be below the *de minimis* threshold levels for conformity. In addition, estimated emissions would not be regionally significant, as they would be substantially less than 10% of the VOC, NO_x, and CO emissions estimated for the SDAB (CARB 2008). Therefore, the Proposed Action would conform to the SDAB SIP and would not trigger a conformity determination under Section 176(c) of the CAA. The USMC has prepared a Record of Non-Applicability (RONA) for CAA conformity (refer to Appendix E).

3.4.4.3 Alternatives 1, 2, and 3

The discussion above for Alternative 4 (Section 3.4.4.2) is applicable to Alternatives 1, 2, and 3. Under each Alternative, construction of the AWT facility would be identical, and the pipeline routes would be similar in air quality impacts to that of Alternative 4. Therefore, emissions and air quality analysis for each alternative would be similar to those discussed above.

3.4.5 Mitigation Measures

Implementing the Proposed Action would not result in significant impacts to utilities; therefore, no mitigation measures would be required.

3.4.6 No-Action Alternative

Under the No-Action Alternative, construction of the P-113 pipelines and associated facilities would not occur; the USMC would not implement those additions and modifications to the MCB Camp Pendleton AWT facility and associated conveyance pipeline system discussed in this EA. Therefore, existing conditions (as described in Section 3.4.3) would remain unchanged, and impacts to air quality would not occur.

3.5 UTILITIES

3.5.1 Definition of Resource

This section discusses the utilities available on and in the vicinity of the locations identified in Chapter 2 to accommodate the P-113 components, including the potable water supply systems, solid waste collection and disposal, electrical power, natural gas, wastewater, and storm water.

3.5.2 Existing Conditions

3.5.2.1 Potable Water Supply

Unlike most other communities in southern California, MCB Camp Pendleton derives over 95% of its water supply from existing groundwater resources within its boundaries via a system of wells, water mains, booster pumps, and storage reservoirs located in the Lower Santa Margarita, Las Pulgas, San Onofre, and San Mateo groundwater basins (U.S. Navy 1998). This resource is divided into two water systems: the Northern Water System and the Southern Water System. The Southern Water System (where the project is located) has a total capacity of 20.54 mgd. The SMR Basin supports all but one of the service areas at the south end of MCB Camp Pendleton and supplies approximately 70% of MCB Camp Pendleton's water needs (NAVFAC SW 1996). A backup water supply is also available through two separate water lines that connect the SMR and the Las Flores systems in the south. A second backup water supply exists for the San Mateo and San Onofre systems in the north.

3.5.2.2 Solid Waste Collection and Disposal

The solid waste produced on MCB Camp Pendleton is collected by MCB Camp Pendleton personnel and disposed of on MCB Camp Pendleton at the Las Pulgas and San Onofre landfills. MCB Camp Pendleton landfills accept all eligible construction debris for disposal. The first phase of a five-phase expansion program was completed for both landfills in November 1999. A recycling program for paper, scrap metal, appliances, waste oil, solvents, rubber, canvas, and steel is currently operating on MCB Camp Pendleton and is managed by the Facilities Maintenance Division (FMD).

3.5.2.3 Electricity

The electrical power provided to MCB Camp Pendleton is purchased from San Diego Gas and Electric (SDG&E). Power is distributed to MCB Camp Pendleton via two major tower lines, which run from Oceanside north to the San Mateo Substation and from Fallbrook onto MCB Camp Pendleton. The MCB Camp Pendleton electrical system consists of mostly aboveground lines, with a limited number of underground lines that serve certain housing areas. The main MCB Camp Pendleton substation, the Haybarn Substation, is located near the junction of Basilone Road and Vandegrift Blvd. This substation is supplied 69 kilovolts (kV) from a branch of the Oceanside line and 69 kV from the Fallbrook alternative feed line.

Several SDG&E high voltage regional power lines (approximately 138 kV) also traverse MCB Camp Pendleton. SDG&E has obtained easements from MCB Camp Pendleton for these transmission lines and others throughout MCB Camp Pendleton (USMC 1997). In addition, SDG&E has acquired an easement of a 200-ft (61-m) right-of-way, and installed power lines adjacent to the north and northeastern MCB Camp Pendleton boundaries.

3.5.2.4 Natural Gas and Petroleum

Three regional pipelines run through MCB Camp Pendleton. These transport lines move gas and petroleum products from the refineries in Long Beach to the distribution center in Mission Valley, San Diego. The Southern California Gas Company pipeline is approximately 12 inches (30 cm) in diameter and runs through MCB Camp Pendleton along the coastline following the railroad easement. The other two pipelines, 16 inches (41 cm) and 10 inches (25 cm) in diameter, are operated by Kinder Morgan (also known as San Diego Pipeline Company) for the delivery of petroleum product. One of the two petroleum pipelines is currently not in use, but it is not considered abandoned. The pipelines run parallel to each other entering MCB Camp Pendleton in the Talega Area, following Basilone Road, and exiting MCB Camp Pendleton southwest of Chappo (USMC 1997). MCB Camp Pendleton purchases liquefied natural gas from SDG&E and the gas is distributed throughout MCB Camp Pendleton via various gas mains. Liquefied petroleum gas and heating fuel oil are purchased from sources in the San Diego area and obtained from tanker trucks that deliver to holding facilities throughout MCB Camp Pendleton (NAVFAC SW 1996).

3.5.2.5 Wastewater

MCB Camp Pendleton collects, performs secondary treatment of, and disposes treated wastewater through a system of STP, pump stations, and conveyance lines. Wastewater currently undergoes secondary treatment and secondary treated effluent is used for limited irrigation and landscaping purposes. The Base's southern wastewater system has recently been upgraded to provide tertiary treatment capabilities and MCB Camp Pendleton currently performs advanced wastewater treatment at STP 9. The tertiary treated wastewater is utilized for irrigation and landscaping. Existing STPs have been closed or are in the process of being closed, post completion of the tertiary treatment plant. In addition to the uses discussed above, excess wastewater that is not reused, is also discharged to the Pacific Ocean via the City of Oceanside's ocean outfall.

3.5.2.6 Storm Water

MCB Camp Pendleton operates under a general storm water permit issued by the SWRCB. Any construction projects involving ground disturbance greater than 1.0 acre (0.4 ha) require the preparation and implementation of a SWPPP in accordance with SWRCB regulations.

The existing storm water system within the project area is owned and maintained by Facilities Maintenance Division. The system consists of the following: reinforced concrete pipe, corrugated metal pipe, polyvinyl chloride pipe, gunite swales, trench drains, curb inlets, inlets (catch basins), culverts and earth swales. The storm water system crosses under Vandegrift Blvd. in several locations.

3.5.3 Environmental Consequences

Impacts to utilities are assessed according to capacity of available infrastructure and services. An impact to utilities would occur if an action would stress or exceed existing utility capacities.

3.5.3.1 Preferred Alternative (Alternative 4)

Potable Water Supply

MCB Camp Pendleton's potable water supply would not be impacted during construction since non potable water would be provided for grading activities (such as dust control and soil compaction) by the construction contractor. In addition, no potable water would be required for operation of the AWT facility and the associated conveyance pipeline. This project would improve the quality of the potable water and allow for the use of waters not previously deemed potable due to its current level of TDS and TOC. The facility would not increase the volume of water pumped from the facility on a daily bases. Therefore, the AWT facility and the associated conveyance pipeline would not result in a significant impact to the potable water supply.

Solid Waste Collection and Disposal

Solid waste (i.e., construction debris) generated by construction of the AWT facility and the associated conveyance pipelines would be recycled or disposed of properly by the contractor. Solid waste would continue to be disposed at either the San Onofre or Las Pulgas landfills. Therefore, construction of the AWT facility and the associated conveyance pipelines would not result in a significant impact to solid waste collection and disposal services.

Although the impacts are not significant, as part of the continuing commitment of the USMC to waste minimization, the contractor for project construction would be required to participate in MCB Camp Pendleton's reuse and recycling programs for solid waste, and to make the fullest use practicable of recovered construction materials.

Electricity

Implementing the Proposed Action would require the use of portable, fuel-powered generators to supply electricity for construction activities. Proposed construction activities would not require the use of MCB Camp Pendleton's electrical system. Long-term operation of the AWT facility and the associated conveyance pipelines would not result in a significant increase in electrical demands at MCB Camp Pendleton. Therefore, no significant impact on MCB Camp Pendleton's electrical system would occur as a result of implementation of the Proposed Action.

Natural Gas and Petroleum

Constructing and operating the proposed AWT facility and the associated conveyance pipelines would not require the use of natural gas. Therefore, no significant impact on the availability of natural gas sources would occur as a result of implementation of the Proposed Action.

Wastewater

Wastewater (brine) at the AWT facility would be collected and disposed via the proposed brine conveyance pipeline. Wastewaters released via the conveyance line would meet all requirements set out in the NPDES permit and meet the limits set in the California Ocean Plan. The use of the brine conveyance line would mean no additional wastewater would enter the existing wastewater system; therefore, operation of the AWT facility and brine conveyance line would not have a significant impact on wastewater quality.

Storm water

Construction activities for constructing the proposed AWT facility and the associated conveyance pipelines would disturb greater than 1.0 acre (0.4 ha); consequently, construction activities would be conducted in accordance with the State General Construction Permit (obtained from the RWQCB) and a site-specific SWPPP for the project. The SWPPP would include BMPs that would minimize storm water discharge intensities, pollutants, and erosion.

The Proposed Action would go down the center of Vandegrift Blvd. and therefore is not expected to impact any existing storm water drains or channels along the route, since these drains and channels are off the shoulder of Vandegrift Blvd. Additionally, during construction activities such as pipeline trenching, existing culverts may be encountered. In the event that a culvert is encountered during construction, the contractor would alter the route of the pipeline, placing it under or over the culvert. This alteration in the pipeline route would result in no impacts to existing culverts. Therefore, no significant storm water impacts would occur.

3.5.3.2 Alternatives 1, 2, and 3

The discussion above for Alternative 4 (Section 3.5.3.1) is applicable to Alternatives 1, 2, and 3. Utilities would neither be stressed nor would their capacity be exceeded by the implementation of either Alternative route 1, 2, or 3. Therefore, no significant impacts to utilities would occur with the implementation of Alternatives 1, 2, or 3.

3.5.4 Mitigation Measures

Implementing the Proposed Action would not result in significant impacts to utilities; therefore, no mitigation measures would be required.

3.5.5 No-Action Alternative

Under the No-Action Alternative, construction of the P-113 AWT facility and the associated conveyance pipelines would not occur; the USMC would not implement those additions and modifications to the MCB Camp Pendleton AWT facility and the associated conveyance pipelines discussed in this EA. MCB Camp Pendleton would continue to be in non-compliance with secondary drinking water standards for TDS and the disinfection byproducts rule for the removal of TOC in well water. The No-Action Alternative would also prevent MCB Camp Pendleton from meeting wastewater discharge and reuse requirements, by not allowing a reduction in the levels of dissolved copper, below that level which requires the wastewater sludge to be handled as hazardous waste. Therefore, adverse impacts to utilities would continue to occur with the implementation of the No-Action Alternative.

3.6 HYDROLOGY AND WATER QUALITY

3.6.1 Definition of Resource

Hydrology is the natural flow of water across the surface of the land, in surface water bodies and in groundwater. This section addresses surface water and groundwater as potentially affected by the installation and operation of project components on MCB Camp Pendleton and in the marine waters off the Del Mar jetty.

3.6.2 Existing Conditions

3.6.2.1 Hydrology

Santa Margarita River Watershed

Surface Water

The Proposed Action is located within the southwestern portion of the SMR watershed. Throughout the project area northeast of I-5, drainage flows northwest to the SMR. Proceeding south from Haybarn Canyon, Alternatives 1, 2, and 4 are within or closely bordering the SMR 100-year floodplain, whereas Alternative 3 crosses the hills east and south of Haybarn Canyon and follows Pueblitos Canyon back to the SMR valley. For the relatively small portion of the Proposed Action (same for all alternatives) southwest of I-5, drainage is to the Pacific Ocean via the DMBB. Except in the hills crossed by Alternative 3, the drop in elevation is very gradual, only about 100 ft (30 m) from Haybarn Canyon to the head of the SMR estuary at Stuart Mesa Road.

Annual precipitation in the SMR watershed averages approximately 14 inches (36 cm), but varies throughout the watershed in response to changes in topography (Figure 3.6-1). The majority of precipitation falls from November through April as rainfall; however, snowfall may occur in the higher mountain ranges located in the upper reaches of the watershed. Flow in the SMR is greatest during the winter months in response to winter rains and declines during the summer months in response to reduced precipitation. Flow within the SMR is subject to large seasonal and annual fluctuations, with approximately 90% of the yearly flow occurring between January and April. Between 1993 and 2003, annual flow varied from 4,480 acre-ft (1,460 million gallons) to 133,000 acre-ft (43,338 million gallons) (USMC 2007b).

Over the last 50 years, several damaging floods have occurred within the boundaries of MCB Camp Pendleton. Of particular note, the storms of 1978, 1980, 1992-1993, and 1998 caused major damage to structures, roads, railroads, STP 3, MCAS and other facilities in the lower SMR basin (NAVFAC SW 2004). MCAS is now protected from physical damage due to the construction of a levee that was completed in 2001 (USMC 2007b).

Groundwater

Sixty five percent of MCB Camp Pendleton's domestic, agricultural, and industrial water is produced from underground aquifers that are recharged by percolation from the SMR. The estimated annual safe yield of the SMR basin is 16,000 acre-ft/year (14.3 mgd) (USMC 2007b). Groundwater in the SMR basin is recharged primarily via a combination of the direct infiltration of rainfall, and SMR seepage. In addition, MCB Camp Pendleton diverts surface water from the Lower SMR into Lake O'Neill and spreading basins, whereupon it infiltrates into the alluvium.

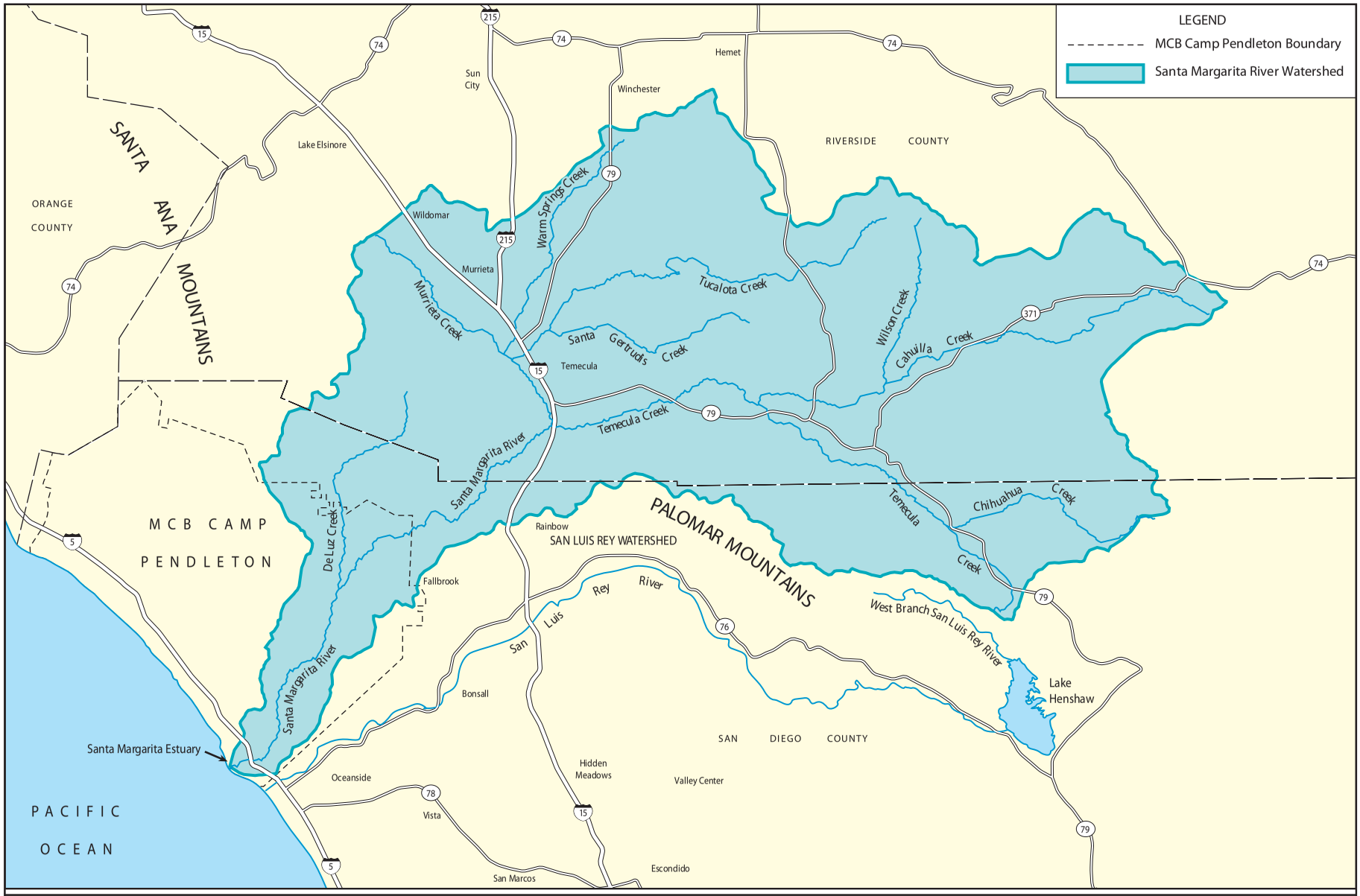

Figure 3.6-1
Santa Margarita River Watershed

Within MCB Camp Pendleton, the SMR basin contains three interconnected alluvial groundwater sub-basins. These sub-basins are characterized by large alluvial sand and gravel deposits overlaying an impervious rock layer.

Potable water pumped from the wells in the SMR basin is stored in a series of reservoirs and conveyed to the potable water treatment/distribution system. Well pumping is managed by the potable water production personnel so that pumping occurs at night to minimize peak electricity consumption for MCB Camp Pendleton.

Del Mar Jetty and Entrance Channel

The action area includes oceanic waters bordered by the jetty that protects the DMBB and Oceanside Harbor entrances. The DMBB is a large, 45.913 acre (18.581 ha), manmade, embayment that is composed of muddy sediments and a steep, rip rapped shoreline. The pipeline would extend along the jetty outside the DMBB and be extended into the ocean waters of the entrance channel. Hence, water quality characteristics will be discussed for these oceanic waters.

Circulation patterns in the waters surrounding the jetty are influenced by tides, currents, wave action, wind, and chemistry (thermohaline) conditions. Tides in the area are mixed, semi-diurnal (two high and two low tides per day), with approximate average and maximum tidal ranges of 3.85 ft (1.17 m) and 9.03 ft (2.75 m), respectively (Pentcheff 2008). Ocean current directions are highly variable in southern California, and are affected by season and wind direction. In the project area, current direction is primarily southeast, with strong southward movement along the coast (Southern California Coastal Ocean Observing System 2008a).

Similar to most areas of southern California, current speeds in the oceanic area of the project site are highly variable, but generally range from 0.02-0.62 knots (1-32 cm/second) (Southern California Coastal Ocean Observing System 2008a). Large shifts in currents do occasionally occur, but these shifts are less common.

Waves in the area surrounding the jetty are generated by ground swell and local winds, and are generally less than 3 ft (0.94 m) high, with occasional relatively higher wave action during local or remote storms that create large swells (National Oceanic and Atmospheric Administration [NOAA] 2008).

The 4,000-ft jetty located on the north side of the DMBB disrupts the natural north to south current-driven transport of sand in the immediate area. The disruption of flow results in deposition of sand at the DMBB entrance channel. To maintain an entrance channel depth that is suitable for use by vessels (20 ft [6] m) the USACE performs annual dredging. Further into the channel the bottom is composed of fine, mud sediments brought in by tidal circulation.

3.6.2.2 Water Quality

SMR Watershed

Surface Water

The SMR nutrient levels, particularly nitrogen, have increased in recent years due to intensive agricultural use of fertilizers in the upper watersheds. In addition, the dramatic expansion of residential, commercial, and industrial development during the past decade in the upper part of this drainage has produced more urban runoff and wastewater discharge.

In the past and continuing today, water samples are collected on MCB Camp Pendleton and upstream from the Base within the SMR. This data is used as part of MCB Camp Pendleton's water quality

monitoring program and supports the Base's efforts with outside organizations and regulatory agencies, and as part of cooperative agreements to reduce the levels of contaminants that reach Camp Pendleton's surface waters.

Excessive levels of sediment, particularly in the SMR, are another water quality problem confronting MCB Camp Pendleton. In January 1993, intensive rainfall in the headwaters, combined with over 5,000 acres of bare ground from unfinished and unprotected construction sites upstream, helped yield a river of "liquid sandpaper" which scoured channels and left four- to eight-foot (1.2 m to 2.4) deposits of sand and gravel in the Camp Pendleton floodplain and estuary, despite several upstream dams trapping sediment (RWQCB 1993; Bell 1993).

Groundwater

Water quality has always been a high priority on MCB Camp Pendleton since nearly all of the drinking water consumed on Camp Pendleton is drawn from local aquifers (USMC 2007b). The quality of MCB Camp Pendleton's drinking water generally meets or exceeds State of California and federal health-related drinking water standards (MCBCP 2007).

Del Mar Jetty and Entrance Channel

Temperature and Salinity

Water temperatures in the oceanic waters near San Clemente, California measured from 1965-2006 ranged from approximately 49.6 to 79.2 degrees Fahrenheit (°F), and salinities (salt content) in the same area and during the same time frame ranged from 28.0 to 34.3 practical salinity scale units (Scripps Institution of Oceanography 2008). Higher water temperatures and slightly higher salinities occur in summer and fall than in winter and spring, particularly due to seasonal differences in evaporation, heating, freshwater inputs to the area, and upwelling. Upwelling occurs in the area on regular and irregular bases, with regular seasonal occurrences highest in the spring months (March-June) (LaDochy et al. 2007).

Turbidity

Water clarity (Secchi depths) in nearshore coastal areas average 12 ft (4 m) (Prasad et al. 2005), and is highly influenced by oceanographic conditions. Seasonal decreases in water clarity may accompany Pacific Decadal Oscillation (PDO) events, which lead to decreased upwelling and productivity, warmer sea surface temperatures, and increased sea level heights. All of the aforementioned conditions can result in stream run-off, which increases turbidity, and are typically single-event, short-term conditions. Decreased water clarity also occurs during prolonged periods of upwelling (typically occurring in the spring months) that increase plankton biomass markedly (LaDochy et al. 2007). Due to protection from wave action by the jetty and the lack of freshwater inflow to the DMBB or Oceanside Harbor, the main sources of turbidity in the entrance channel are fine sediments brought in by tidal circulation and stirred up by vessel traffic.

Dissolved Oxygen

Dissolved oxygen (DO) is the concentration of oxygen present in water, which is important to the health of biological communities. Levels of DO that are too high (actual values vary depending on water temperature) can be extremely dangerous to aquatic life, and often result in fish kills or massive plankton blooms. Levels of DO that are too low can result in Hypoxia. Hypoxia affects the health of the living resources in the water and represents a loss of valuable habitat. Hypoxia reduces the abundance of fish and shellfish by reducing growth and reproduction, and at low enough concentrations causes mortality.

Dissolved oxygen concentrations in offshore southern California waters typically range from 5.3 to 11.01 mg/L (Southern California Coastal Ocean Observing System 2008b). Dissolved oxygen concentrations in the area decrease with depth, although differences are minimal in shallow, nearshore areas. No measurements are available for the entrance channel, but DO levels are expected to be similar to the adjacent open ocean as the water column is well mixed by tidal circulation, wave action, and water motion caused by vessels.

Contaminants

Because water quality parameters have not been measured within the immediate vicinity of the project area, water quality conditions are characterized using existing information from adjacent areas. Water quality measurements for bacteria have been recorded weekly since 1999 at Camp Del Mar, which is located in the southern tip of MCB Camp Pendleton. During 9 years of sampling, only on one occasion were levels of any of the water quality parameters measured in excess of the maximum allowable levels (< 1,000 organisms/100 milliliters (mL) for Total Coliforms, < 400 organisms/100 mL for Fecal Coliforms, and < 104 organisms/100 mL for Enterococci). Thus, water quality near the project area is generally good in terms of standard bacteria counts (Southern California Coastal Ocean Observing System 2008b).

3.6.3 Environmental Consequences

3.6.3.1 Preferred Alternative (Alternative 4)

SMR Watershed

The construction contractor would be required to prepare and implement a SWPPP for the project and follow BMPs to minimize erosion and impacts to surface water resulting from construction activities. Site grading and drainage would be designed in accordance with all federal, state and MCB Camp Pendleton requirements for proper drainage and sedimentation control. The Proposed Action would have some potential impacts from erosion and sedimentation due to construction; however, these impacts would be minimized with implementation of BMPs.

Under the Proposed Action, the proposed AWT facility would be located outside of the identified 100-year floodplain. The proposed brine conveyance pipeline along Vandegrift Blvd. is within the SMR floodplain but would not have any effects on topography, drainage, downstream flooding, or on groundwater recharge or use. The pipeline would be buried under four feet of dirt, and constructed with a seamless design to prevent weak areas in the pipeline. This construction would present a uniformed surface to any floodwaters should they penetrate the 4 ft (1.2 m) of dirt over the piping, preventing water from causing the pipe to dislocate. During trenching activities groundwater may be encountered. If groundwater is encountered, the contractor would follow all SMC's as they relate to groundwater to minimize impacts. Therefore, no significant impacts would occur to the floodplain or to groundwater supply and quality.

Under the Proposed Action no piping is expected to intersect with any channel crossings; therefore, there are no impacts anticipated. If during the design of the pipeline it is discovered that there are impacts to channel crossings, horizontal drilling would be implemented to minimize impacts to these crossings.

Pacific Ocean

As part of this EA, the USMC consulted with the CCC to request concurrence with its Coastal Consistency Negative Determination. The CCC provided a letter to the USMC concurring with the determination that the Proposed Action would not adversely affect coastal resources (Appendix F).

Installation of the pipelines, via directional drilling, would have minimal to no effect on ocean current patterns in the ocean waters of the project site, since the pipes would be installed under the ocean floor. Installation activities related to placement of the pipelines would generate minimal to no effect on turbulence in the vicinity of the pipe outlets. Additionally installation activities related to placement of the pipelines would have minimal impacts to currents and not result in a significant alteration of current patterns in the vicinity of the outlets. Implementation of BMPs would minimize any contamination of the Pacific Ocean during installation and construction. Brine discharge from the proposed pipelines would be in accordance with the terms and conditions of the NPDES permit (to be obtained), which would ensure that the brine discharge does not adversely affect water quality or its beneficial uses under the California Ocean Plan (SWRCB 2005). The estimated trace metal concentrations of the brine are listed in Table 3.6-1 and would be part of the NPDES permit application.

Table 3.6-1 Estimated RO Brine Trace Metal Concentrations and Ocean Plan Water Quality Objectives for Alternative 4 Brine Disposal Method

Parameter	*Units*[6]	*RO Feed Average Quality*[1]	*Brine Concentrate Average Quality*[2]	*Brine Concentrate Maximum Quality (30% Higher)*[2]	*Projected Brine Concentration due to Mixing and Dilution 1 ft (0.35m) off the Seafloor*[3]	*Projected Brine Concentration due to Mixing and Dilution 10 ft (2.6m) off the Seafloor*[4]	*Table B State of California Ocean Plan Limit*[5]
Arsenic	µg/L (ppb)	1.11	7.39	9.6	3.69	3.10	8
Cadmium	µg/L (ppb)	0.25	1.7	2.2	0.15	0.02	1
Chromium	µg/L (ppb)	0.25	1.7	2.2	0.15	0.02	2
Copper	µg/L (ppb)	9.31	62.0	80.7	7.76	2.81	3
Lead	µg/L (ppb)	2.46	16.4	21.4	1.52	0.22	2
Mercury	µg/L (ppb)	0.05	0.33	0.43	0.03	0.00	0.04
Nickel	µg/L (ppb)	0.57	3.8	5.0	0.35	0.05	5
Selenium	µg/L (ppb)	0.49	3.3	4.3	0.30	0.04	15
Silver	µg/L (ppb)	0.25	1.7	2.2	0.31	0.18	0.7
Zinc	µg/L (ppb)	17.39	115.9	150.7	18.76	9.52	20

Notes: [1] The averages assume that a sample results found to be non-detect has a concentration of 50% of the method detection limit. The Regional Water Quality Control Board indicated that permits have been issued with this assumption but that the actual value assumed for the permit evaluation would be determined at the time of the permit (pers. comm. with Tom Birmingham, July 16, 2009).
[2] These projections assume 100% metal removal from feed water by the RO membranes and 85% permeate recovery. The trace metals in the RO Feed water would be concentrated in the Brine Concentration (a.k.a., RO reject) by the following factor: RO reject = 1/(1 - 0.85) = 6.67.
[3] Projected Mixing and Dilution is 14:1.
[4] Projected Mixing and Dilution is 99:1.
[5] 6-Month Median.
[6] µg/L = 1/1000 mg/L
Source: CDM 2009.

These levels are based upon preliminary water quality data and the effects the anticipated RO system would have on removal of those constituents from the water. MCB Camp Pendleton is currently in consultation with the RWQCB regarding dilution, percolation and mixing factors associated with the proposed dispersion method (14:1 at 1 ft [0.35 m] above the seafloor and 99:1 at 10 ft [2.6 m] above the seafloor); however, these factors have not been finalized. If the agreed upon dilution, percolation, and mixing factors do not bring the chemical constituents to levels acceptable as outlined in the Ocean Plan and NPDES permit, additional engineering design would be required. This would occur during the design-build process for the AWT facility, and may include methods such as a less efficient RO system, the addition of an electrolysis system, or another form of chemical precipitation before the brine is discharged. Before any brine discharge, all requirements outlined with the NPDES permit for the AWT facility, and all Ocean Plan limits would be met, and any additional monitoring required under the NPDES permit would be implemented.

The following potential impacts would occur as a result of brine discharge:

- There would be a small-scale, if any, alteration of water circulation, temperature, salinity, DO, and other water quality parameters. Effects would occur within a very short distance of the point of discharge. Dilution of brine constituents would occur in the water column, and no exceedences of state water quality standards or objectives, or the USEPA National Ambient Water Quality Criteria, outside of the permit-specified discharge mixing zone would be anticipated. The discharge would result in very minor localized increases in turbidity in the immediate vicinity of the points of discharge. The localized increase in turbidity would result from an increased turbidity in the discharge (associated with the potential for sloughing of solids from the RO system). As the pipeline would include well screen material at the area of discharge, there would be no increase in current velocities due to the discharge. Where the discharge trickles up through the unconsolidated silty clay and sands, it is expected that the silty clay and sands would potentially be re-suspended by the movement of the discharge and would be dispersed with the ambient currents. The extent of such a plume is expected to be localized. Because the plume velocity at the point of contact with the seafloor is less than the ambient current velocities experienced in this area, any turbidity plume generated by the discharge is expected to be consistent with, or have less impact than, sediment plumes naturally occurring in the entrance channel.
- The diffuser discharge also would contain small quantities of other chemicals/parameters. These chemicals would include minor quantities of neutralization chemicals associated with treatment process, high salinity brine associated with the potable water RO system discharge, and biological oxygen demand associated with the treatment unit discharge. The owner and operator of the AWT facility (MCB Camp Pendleton) would ensure that all brine discharges meet the limits outlined in the NPDES permit.

Therefore, operation of the brine discharge pipeline in accordance with the Ocean Plan and NPDES permit would not have a significant impact on hydrology and water quality.

3.6.3.2 Alternatives 1, 2, and 3

The discussion above for Alternative 4 (Section 3.6.3.1 *SMR Watershed*) is applicable to Alternatives 1, 2, and 3. The construction contractor would be required to prepare and implement a SWPPP for the project and follow BMPs to minimize erosion and impacts to surface water resulting from construction activities. The pipeline route associated with Alternative 3 would have greater potential impacts from

erosion and sedimentation due to construction across steep slopes. However, these impacts would be minimized through the use of BMPs.

For the alternative brine discharge method, installation of the pipeline would have minimal to no effect on ocean current patterns in the ocean waters of the project site. Installation activities related to placement of the pipeline would generate short-term turbulence in the vicinity of the jetty and would have minimal impacts to currents, and not result in a significant alteration of current patterns in the vicinity. Implementation of BMPs would minimize any contamination of the water way during installation and construction. Temporary increases in turbidity would occur, but these would be similar to what occurs with passing boat traffic and not expected to increase background levels of turbidity.

Brine discharge from Alternatives 1, 2, and 3 would be in accordance with the terms and conditions of the NPDES permit (to be obtained), which would ensure that the brine discharge does not adversely affect water quality or its beneficial uses under the State's Ocean Plan (SWRCB 2005). The anticipated specific mineral composition of the brine and operating parameters of the pipeline are listed in Table 3.6-2. The estimated trace metal concentrations of the brine are listed in Table 3.6-3 and would be part of the NPDES permit application.

Table 3.6-2 Estimated RO Brine Trace Metal Concentrations and Ocean Plan Water Quality Objectives for Alternatives 1, 2, and 3 Brine Disposal Method

Parameter	*Units*[5]	*RO Feed Average Quality*[1]	*Brine Concentrate Average Quality*[2]	*Brine Concentrate Maximum Quality (30% Higher)*[2]	*Projected Brine Concentration Due to Mixing and Dilution at DMBB Surf Zone*[3]	*Table B State of California Ocean Plan Limit*[4]
Arsenic	µg/L (ppb)	1.11	7.39	9.6	3.53	8
Cadmium	µg/L (ppb)	0.25	1.7	2.2	0.12	1
Chromium	µg/L (ppb)	0.25	1.7	2.2	0.12	2
Copper	µg/L (ppb)	9.31	62.0	80.7	6.48	3
Lead	µg/L (ppb)	2.46	16.4	21.4	1.19	2
Mercury	µg/L (ppb)	0.05	0.33	0.43	0.02	0.04
Nickel	µg/L (ppb)	0.57	3.8	5.0	0.28	5
Selenium	µg/L (ppb)	0.49	3.3	4.3	0.24	15
Silver	µg/L (ppb)	0.25	1.7	2.2	0.28	0.7
Zinc	µg/L (ppb)	17.39	115.9	150.7	16.37	20

Notes: [1] The averages assume that a sample results found to be non-detect has a concentration of 50% of the method detection limit. The Regional Water Quality Control Board indicated that permits have been issued with this assumption but that the actual value assumed for the permit evaluation would be determined at the time of the permit (pers. comm. with Tom Birmingham, July 16, 2009).
[2] These projections assume 100% metal removal from feed water by the RO membranes and 85% permeate recovery. The trace metals in the RO Feed water would be concentrated in the Brine Concentration (a.k.a., RO reject) by the following factor: RO reject = 1/(1 - 0.85) = 6.67.
[3] Projected Mixing and Dilution is 18:1.
[4] 6-Month Median.
[5] µg/L = 1/1000 mg/L
Source: CDM 2009.

Table 3.6-3 Estimated RO Brine Mineral Concentrations and Ocean Plan Water Quality Objectives for All Alternatives

Name	*Symbol*	*Unit*[4]	*RO Feed Average Quality*	*Brine Concentrate Average Quality*[1]	*Brine Concentrate Maximum Quality (30% Higher)*[1]	*Typical Seawater*	*Ocean Plan Table A Water Quality Objectives*			*Ocean Plan Table B Water Quality Objectives*		
							Limiting Concentrations (μg/L)			*Limiting Concentrations (μg/L)*		
							Monthly Average	**Weekly Average**	**Maximum at anytime**	**6-Month Median**	**Daily Maximum**	**Instantaneous Maximum**
Calcium	Ca^{2+}	mg/L	87	578	751	418	None	None	None	None	None	None
Magnesium	Mg^{2+}	mg/L	34.2	227	295	1328	None	None	None	None	None	None
Sodium	Na^{+}	mg/L	115	751	936	11031	None	None	None	None	None	None
Potassium	K^{+}	mg/L	15	97.4	127	397	None	None	None	None	None	None
Barium	Ba^{2+}	mg/L	0.06	0.4	0.52	0.02	None	None	None	None	None	None
Bicarbonate	HCO_3^{-}	mg/L	250	1630	2119	146	None	None	None	None	None	None
Sulfate	SO_4^{2-}	mg/L	185	1231	1600	2765	None	None	None	None	None	None
Chloride	Cl^{-}	mg/L	160	1056	1373	19820	None	None	None	None	None	None
Nitrate	NO_3^{-}	mg/L	4.05	25.7	33.4	<0.1	None	None	None	None	None	None
Fluoride	F^{-}	mg/L	0.41	2.72	3.54	13	None	None	None	None	None	None
Silicon dioxide	SiO_2	mg/L	24.9	164	213	2.9	None	None	None	None	None	None
Carbon dioxide	CO_2	mg/L	18.7	18.7	18.6	4.6	None	None	None	None	None	None
Arsenic	As	μg/L	<1	<6	<8	2.6	None	None	None	8	32	80
Selenium	Se	μg/L	0	0	0	0.9	None	None	None	15	60	150
Sum of ions[2, 3]	Sum of ions[2, 3]	mg/L	876	5767	7497	35905	None	None	None	None	None	None
Total Dissolved Solids[2, 3]	TDS (180 deg C)[2, 3]	mg/L	748.6	4937	6100	35830	None	None	None	None	None	None
Hardness (as $CaCO_3$)	Hardness (as $CaCO_3$)	mg/L	358.1	2379	3093	6513	None	None	None	None	None	None
pH	pH	pH units	7.4	8.22	8.9	7.8	Within limit of 6.0 to 9.0 at all times			May not vary more than 0.2 units from that which occurs naturally		
Ammonia	NH_4^{+}	μg/L	0	0	0	<0.1	None	None	None	600	2400	6000

Notes: [1] These projections are based on using Koch Membrane RO elements operating at a certain pressure without acid feed. The concentrate quality can be slightly different with other vendors' elements operating at a different pressure and with acid feed.
[2] The sum of ions may not be exactly the sum of the constituents sown in the table due to cation-anion balancing by the program used to estimate the RO.
[3] The sum of ions and TDS analyzed at 180 deg. C are not the same because of the partial conversion of bicarbonate to carbon dioxide.
[4] μg/L = 1/1000 mg/L

Sources: B&C 2009; CalEPA 2005, CDM 2009.

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These levels are based upon preliminary water quality data and the effects the anticipated RO system would have on removal of those constituents from the water. MCB Camp Pendleton is currently in consultation with the RWQCB regarding dilution and mixing factors associated with brine discharge into high surf zones; however, these factors have not been finalized. If the agreed upon dilution and mixing factors do not bring the chemical constituents to levels acceptable to the Ocean Plan and the NPDES permit, additional engineering would be required. This engineering would take place during the design-build process for the AWT facility and may include methods such as a less efficient RO system, the addition of an electrolysis system or some form of chemical precipitation before the brine being discharged. Before any brine discharge all requirements set under the NPDES permit for this facility and all Ocean Plan limits would be met and any additional monitoring required under the NPDES permit would be implemented.

The impacts of brine discharge would be similar to those of the preferred method. Therefore, operation of the brine discharge pipeline in accordance with the NPDES permit would not have a significant impact on water quality.

Brine discharge from the proposed pipeline would be the same for Alternatives 1, 2, and 3 and in accordance with the terms and conditions of the NPDES permit (to be obtained), which would assure that the brine discharge does not adversely affect water quality or its beneficial uses under the California Ocean Plan (SWRCB 2005). Therefore, no impacts to hydrology or water quality would occur from the implementation of Alternatives 1, 2, or 3.

3.6.4 Mitigation Measures

Implementing the Proposed Action would not result in a significant impact to water quality; therefore, no mitigation measures would be required.

3.6.5 No-Action Alternative

Under the No-Action Alternative, construction of the P-113 AWT facility and the associated conveyance pipelines would not occur; the USMC would not implement those additions and modifications to the MCB Camp Pendleton AWT facility and the associated conveyance pipelines discussed in this EA. Therefore, existing conditions (as described in Section 3.6.2) would remain unchanged, and impacts to hydrology and water quality would not occur.

CHAPTER 4
CUMULATIVE IMPACTS

According to CEQ regulations, the analysis of cumulative impacts in an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7).

4.1 DEFINITION OF CUMULATIVE IMPACTS

Cumulative impacts may occur when there is a relationship between a proposed action and other actions expected to occur in a similar location or during a similar time period. This relationship may or may not be obvious. Actions overlapping, or in close proximity to, the Proposed Action can have more potential for cumulative impacts on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide temporally would tend to offer a higher potential for cumulative impacts. To the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action outlined in this EA, these actions are included in the cumulative analysis.

4.2 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

This EA applies a stepped approach to provide decision-makers with not only the cumulative impacts of the Proposed Action, but also the incremental contribution of past, present, and reasonably foreseeable actions. Past, present, and reasonably foreseeable actions relevant to the Proposed Action are described below.

4.2.1 Grow the Force

NEPA documentation is currently under preparation to address the Marine Corps 202k Plus Up, also known as "Grow the Force." Grow the Force would include an increase of approximately 3,000 personnel at MCB Camp Pendleton and the placement and use of temporary and permanent facilities. At present, the Grow the Force project includes approximately 60 construction projects at MCB Camp Pendleton. Individual Grow the Force construction projects within the cumulative effects region are addressed below in the discussions of specific geographic areas. The USMC is in the process of evaluating the potential effects of Grow the Force projects at MCB Camp Pendleton pursuant to NEPA requirements. That effort is underway, and the specific effects of this action have not been assessed.

4.2.2 Expeditionary Fighting Vehicle

A private contractor has partnered with a construction company to produce a high-bay facility to examine and test new expeditionary fighting vehicles before USMC acceptance. New facilities are being established to accommodate these vehicles, which are expected to begin arriving in 2014. The exclusive-use facility would revert to MCB Camp Pendleton after a 10-year production run. The testing area would re-occupy the site of Del Mar Building 21576, previously scheduled for demolition. An EA was prepared for the expeditionary fighting vehicle project in 2004, and no significant impacts were identified. The Finding of No Significant Impact (FONSI) was signed 1 September 2004.

4.2.3 Santa Margarita River Conjunctive Use Project

This project addresses the proposed conjunctive use of surface and groundwater in the lower Santa Margarita River basin. The project would perfect the water rights permits that were assigned to the Bureaus of Reclamation in 1974 (Permits 15000, 8511, and 11357), provide a physical solution to long-

standing litigation, reduce dependence on imported water (primarily for the Fallbrook Public Utility District [FPUD]), maintain watershed resources, and improve water supply reliability by managing the yield of the lower Santa Margarita River basin. The Department of the Interior, Bureau of Reclamation, DON, MCB Camp Pendleton, and FPUD are preparing an EIS/Environmental Impact Report (EIR) for this proposed project.

4.2.4 Repair of 24 Access Roads

The purpose of this project is to repair and stabilize 24 existing dirt roads throughout MCB Camp Pendleton. The roads are used to provide access to ranges in support of amphibious and inland training activities. An estimated 54 miles (87 km) of roads are involved in the project. The roads proposed for repair are located on sloping coastal terraces, hillsides, and valleys dissected by gullies, ravines, and swales. The soils underlying the roads are susceptible to erosion. A signed FONSI is anticipated by summer 2010.

4.2.5 Basewide Utilities Infrastructure Improvements

The DON has prepared a Draft EIS for the proposed installation and operation of six utility infrastructure improvements throughout MCB Camp Pendleton. The proposed improvements would facilitate the mission of MCB Camp Pendleton by improving water, wastewater, natural gas, electrical and communication systems where they are deteriorating, insufficient or nonexistent. Three of the infrastructure improvements are proposed, in part, within the vicinity of the Proposed Action and are discussed below:

- P-1048 Upgrade to Electrical Systems and Associated Facilities
- P-1093 Communication Systems Upgrade
- P-1094 Upgrade and Expand 12 kV Electrical Distribution Systems

The EIS will discuss alternative alignments, alternatives involving various technologies, as well as the No-Action Alternative. The DON anticipates that the Final EIS will be issued in June of 2010, following the publication of a Notice of Availability (NOA) and a 90-day public comment period. A 30-day public comment period will follow the publication of the NOA for the Final EIS before preparation of the ROD.

4.2.5.1 Upgrade to Electrical Systems and Associated Facilities (P-1048)

P-1048 would construct a 69 kV electrical system. The project would construct four new 69 kV substations located (1) at the existing Haybarn Canyon location, (2) near the intersection of Pulgas Road and Stuart Mesa Road, (3) in the vicinity of San Onofre Nuclear Generating Station (SONGS), and (4) at the intersection of Cristianitos Road and San Mateo Road. The first three substations would connect to existing SDG&E 69 kV lines. The fourth substation would convert the proposed MCB Camp Pendleton 69 kV line to the existing MCB Camp Pendleton 12 kV system. The project would provide distribution of electrical power through four different connecting segments.

4.2.5.2 Communication Systems Upgrade (P-1093)

P-1093 would provide both intercamp and intracamp fiber-optic cable and telephone cable connections. This project would provide a redundant communications network to resist single point failures by providing a minimum of two separate communication line paths to each area on the Base.

4.2.5.3 Upgrade and Expand 12 kV Electrical Distribution Systems (P-1094)

P-1094 would replace the existing 12 kV electrical distribution systems currently fed from the Haybarn substation, and the 4.16 kV subsystems fed from the 12 kV distribution system. The project would

construct a total of 8 new 12 kV circuits, which would be fed from the new 69 kV substation (P-1048), to provide approximately 60% of the electrical power for MCB Camp Pendleton.

4.2.6 Connection of North and South Water Systems (P-1045)

P-1045 would construct approximately 90,000 linear ft (27,000 m) of potable waterlines sized approximately 36 inches (91 cm) in diameter to connect the northern and southern water systems of MCB Camp Pendleton. A water line would begin at the proposed northern AWT Facility (P-1044), extend past the SONGS Mesa facility, and then continue along the east side of I-5 before passing under San Onofre Creek. The line would travel south along Stuart Mesa Road, continue under the Santa Margarita River, and then would connect to the southern water system at the intersection of Stuart Mesa Road and Vandegrift Blvd. The project would include approximately 7,000 linear ft (2,100 m) of horizontal directional drilling beneath San Onofre Creek and the Santa Margarita River. The project also would include three pump stations at the north, central, and south portions of the Base to connect Las Pulgas, Las Flores, and the Stuart Mesa areas to the South Water System.

An alternative alignment would begin at the proposed northern AWT Facility (P-1044) and extend east along Basilone Road (instead of El Camino Real) to Las Pulgas Road and then south on Las Pulgas Road to Stuart Mesa Road. At Stuart Mesa Road the alignment would follow the same alignment identified above to the connection of the southern system at the corner of Stuart Mesa Road and Vandegrift Blvd.

4.2.7 Actions at MCAS Camp Pendleton

One project associated with MCAS Camp Pendleton is a warehouse replacement (P-1037). Specific plans for this warehouse replacement have not been finalized. Actions that could affect aircraft operations at MCAS Camp Pendleton include proposed upgrades to the existing helicopter fleet. Upgrades would include newer, more powerful engines and increased number of blades (i.e., from two to four). Potential noise and air quality impacts were anticipated from Cobra and Huey engines. Noise testing occurred in late July 2006, and the EA was submitted in late November 2006. A FONSI was signed June 2007, and the NOA was published 13-15 July 2007.

A program to base the MV-22 Osprey tilt-rotor aircraft in the Western U.S. is currently under environmental analysis, with MCAS Camp Pendleton listed as a potential MV-22 basing facility for two squadrons. Basing the MV-22 aircraft on the West Coast would modernize the medium lift fleet, support I Marine Expeditionary Force, and improve operational capabilities for the Third and Fourth Marine Air Craft Wing squadrons. An EIS has been prepared for the MV-22 West Coast Program and is currently being finalized and a ROD is expected before the end of 2009.

4.2.8 Actions at Oscar One/Edson Range Impact Area

MCB Camp Pendleton is implementing a project to repair existing dirt roads at the Edson Range Impact Area. Pacific pocket mouse, vernal pool, and archaeological resources surveys are required for the project. A FONSI was signed in fall 2009. Other planned actions in the area (associated with Grow the Force) include recruit field barracks, an ammunition magazine, a marksmanship trainer facility, and Weapons & Field Training Battalion support facilities (P-1086). These proposed facilities have not yet been evaluated under NEPA.

4.2.9 Basewide Fuel Optimization Program

MCB Camp Pendleton proposes to construct new fuel stations or modernize or replace existing fuel stations, resulting in an optimized fuel distribution system consisting of a maximum of six contractor owned, contractor operated fuel stations (two master service stations and four satellite service stations).

The six fuel stations would be strategically located throughout the MCB Camp Pendleton within six areas: 12 or 14, 21, 22, 41, 43, and 52 Areas. No significant impacts were identified in an EA prepared by MCB Camp Pendleton in 2005. The FONSI was signed on 9 December 2005.

4.2.10 North County Transit District (NCTD) Santa Margarita River Bridge Replacement and Second Track Project

The Proposed Action for this project includes the replacement of the existing single-track Santa Margarita River Railroad Bridge with a new two-track bridge, construction of a 0.8-mile (1.3-km) second rail track, and an upgrade and realignment of the existing Fallbrook Junction Passing Track (1.7 miles [2.7 km]) for higher speed. Completion of the new double-track segment portion of the project would connect the Stuart Mesa Passing Track with the Fallbrook Junction Passing Track to provide a 4.5-mile (7.2-km) segment of continuous double-track with maximum speeds between 75 and 90 miles per hour (121 and 145 km per hour). An EA is being prepared to analyze potential environmental impacts of the project.

4.2.11 Improvements to Basilone Road

Assorted road improvements are planned for Basilone Road. They include recently completed in-kind asphalt repairs within existing disturbed areas for which MCB Camp Pendleton issued a categorical exclusion (CATEX) in 2000; a Basewide utility easement to Kinder Morgan Pipeline, buried adjacent to Basilone Road, for which a FONSI was signed in 1999; and the Conjunctive Use Project associated with the Santa Margarita River Utilization Strategy to address well and buried pipe improvements for which eventual effects are not "reasonably foreseeable" and that an EIR/EIS is in progress to evaluate. Additionally, MCB Camp Pendleton proposes to realign a segment of the road that is, based on the current configuration, considered unsafe for vehicular travel. The EA was finalized in August of 2006 and identified no significant environmental impacts. The FONSI was signed on 25 August 2006.

4.2.12 San Jacinto Street Extension and Temporary Lodging Facility

The extension of San Jacinto Street (a dead end street in the Wire Mountain Housing Complex) to an intersection with Vandegrift Blvd. at Pacific Plaza (20 Area Commissary/Exchange Complex) would increase the level of service for vehicles traveling from Wire Mountain Housing Complex to Pacific Plaza and other base destinations to the east of the shopping complex. Additionally, the extension would provide enhanced and safer pedestrian routes to and from the shopping area for residents of the Wire Mountain Housing Complex and patrons of related community services in the housing area. A temporary lodging facility in proximity to the Staff Non-Commissioned Officers Club was also addressed in the EA. A FONSI was signed on 18 January 2008. Construction of the temporary lodging facility was completed in June 2009.

4.2.13 Installation of Pump Station and Force Mains

MCB Camp Pendleton has completed the installation of a new pump station and force mains, involving the installation of overflow tanks and the relocation, replacement, and improvement of existing pipelines. The project allowed increased protection against sewage overflows from three existing pump stations into the SMR. No significant impacts were identified in an EA prepared by MCB Camp Pendleton and the FONSI was signed in September 2004.

4.2.14 New Naval Hospital

A new Naval Hospital to replace the existing facility in the 27 Area is proposed for the 20 Area, just north of the MCB Camp Pendleton Main Gate. The hospital is planned as a four-story facility with up to three parking structures that are each not to exceed five-stories. The hospital would provide emergency

services, in-patient services, out-patient clinics, ancillary services, surgical services, logistics, and meet other medical needs. An EA for this project is being prepared.

4.2.15 New Main Exchange and Service Mall

A new Main Exchange and Service Mall is proposed for the 20 Area, just north of the MCB Camp Pendleton Main Gate (north of the proposed site for the new Naval Hospital). The Exchange and Service Mall would include a large one story "big box" retail building and up to four smaller buildings to support the following potential services: a military clothing store; service vendors; a restaurant; a credit union; a warehouse, administration and support; an outdoor lawn and garden shop; and surface parking for approximately 580 vehicles. The EA prepared for this action identified less than significant environmental impacts and the FONSI was signed on 8 Jan 2010.

4.3 POTENTIAL CUMULATIVE IMPACTS BY ENVIRONMENTAL RESOURCE AREA

This section addresses the potential cumulative impacts of the Proposed Action in conjunction with the projects identified above. These projects represent past, present, and reasonably foreseeable actions with the potential for resulting in cumulative impacts when considered in conjunction with potential impacts associated with construction and implementation of the P-113 project.

4.3.1 Biological Resources

The biological resources ROI encompasses all areas that may be subject to alteration or physical disturbance from project implementation, including construction and future operation of the facilities.

Implementation of the Proposed Action would result in temporary construction impacts including removal of vegetation and construction noise disturbance of wildlife. These impacts would be substantial in terms of acreage but not significant due to timely restoration of the affected areas following construction and measures taken during construction to minimize impacts on sensitive species. Relatively small areas would be permanently altered. Future operations would have minimal if any impacts, although localized temporary disturbances associated with maintenance or repairs are possible. Special conservation measures built into the Proposed Action have minimized adverse effects on the most sensitive species and habitats to the greatest extent practicable.

Potential cumulative effects of federal actions on federally listed endangered species are addressed project-by-project by USFWS, through the terms and conditions developed through Section 7 Endangered Species Act consultations and associated BOs. Through Section 7 consultations, the Base and USFWS jointly assess each action's potential effects and develop and implement appropriate measures that reflect changing conditions associated with multiple actions and the current status of the species. As a result, potential cumulative impacts on threatened and endangered species are effectively reduced through avoidance, minimization, and/or compensation as required. As presented in the BO prepared by the USFWS for the P-113 project, with the implementation of all required terms and conditions, significant cumulative impacts on these species would be avoided (Appendix F).

In other respects, there are potential cumulative impacts on the Base's biological resources associated with the magnitude of habitat disturbance and the associated disruption of wildlife. As each Proposed Action is implemented, these impacts are minimized as mentioned previously, but each project contributes incrementally to the cumulative disruption of habitats and species on the Base as a whole. Several mechanisms ensure that these impacts do not become significant. First, as noted above, potential cumulative impacts on the species of greatest vulnerability and their habitats are addressed through the Section 7 process. Protection of these species and their habitats, including riparian, coastal sage scrub,

and estuarine-beach habitats, provides umbrella protection for diverse plants and wildlife that occur in the same habitats but are not otherwise protected. Second, through the INRMP, the Base monitors the status of species and habitats on the Base, and implements long-term, Basewide conservation measures to maintain these resources, including proactive measures to monitor and protect species that are not currently listed as threatened or endangered, but could be considered for listing in the future. MCB Camp Pendleton also collaborates with other biological resource interest groups and agencies on regional conservation efforts. The Base's GIS is continually updated, enabling new project impacts on habitats and species to be more accurately assessed in a Basewide context. Finally, oversight and monitoring by AC/S ES of each project's construction and mitigation measures ensures the incorporation of lessons learned on each project and contributes to more efficient and effective mitigation. These mechanisms collectively ensure that the incremental effects of individual projects do not result in significant cumulative impacts to biological resources.

4.3.2 Cultural Resources

The cultural resources APE encompasses all areas that may be subject to physical disturbance from project implementation, including construction within 100-ft (30-m) wide conveyance pipeline corridors and facility sites.

Implementation of the Proposed Action could potentially result in cumulative impacts on cultural resources. However, the cultural resources evaluation process is designed to ensure that, to the greatest extent practicable, cultural resources considered historically significant are preserved. All projects with potential for significant impacts to cultural resources would have undergone Section 106 review and would be mitigated as required. The SHPO provided a MOA to the USMC (Appendix F) concurring that a finding of No Adverse Effect with conditions is appropriate pursuant to 36 CFR § 800.5(b) for the Proposed Action and that the documentation supporting this finding has been provided pursuant to 36 CFR § 800.11 (d). Therefore, implementation of the Proposed Action, in conjunction with other similar actions in the APE, would not result in significant cumulative impacts to cultural resources.

4.3.3 Air Quality

4.3.4 Criteria Pollutants

The ROI considered in this air quality cumulative analysis includes the SDAB. The main impacts to air quality from the Proposed Action that could contribute to cumulative impacts would be construction of the components associated with the Proposed Action. Other construction projects listed in Section 4.2 would produce air emissions from construction equipment in compliance with the air basin requirements.

Proposed construction activities would produce emissions that would remain below applicable NEPA and conformity emission significance thresholds. Any concurrent emissions-generating action that occurs in the vicinity of proposed construction activities would potentially contribute to the ambient impacts of these emissions. Since proposed construction would produce a nominal amount of emissions, the combination of proposed construction and future project air quality impacts would not contribute to an exceedance of an ambient air quality standard. As a result, proposed construction activities would produce less than cumulatively considerable air quality impacts. Implementation of recommended fugitive dust control measures would ensure that air emissions from proposed construction activities would produce less than significant cumulative impacts.

4.3.5 Greenhouse Gases

The potential effects of proposed GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact on global climate change would only occur when proposed GHG emissions are combined with GHG emissions from other man-made activities on a global scale.

Based upon the GHG emissions analysis of other larger projects listed in Section 4.2 such as the Santa Margarita River Conjunctive Use Project, GHG emissions associated with implementation of the Proposed Action and emissions generated from all sources in the U.S. in 2006 (approximately 7,054 million metric tons for construction [USEPA 2008]) the CO_{2e} construction emissions associated with the Proposed Action would amount to less than 0.00010% of the total CO_{2e} emissions generated by the United States. Therefore, implementation of the Proposed Action, in conjunction with other similar actions in the ROI, would not result in significant cumulative impacts to global climate change.

In response to Department of Defense (DOD) directives such as EO 13221, *Energy Efficient Standby Power Devices* and EO 13423, *Strengthening Federal Environment, Energy, and Transportation Management*, DON and USMC have taken a number of steps to reduce GHG emissions from their activities. These actions include developing technologies and improving weapons systems, improving military and civilian truck efficiency, utilizing alternative fuel vehicles and electric vehicles, improving energy efficiency at DON facilities, and installing solar and other renewable energy sources at DON facilities.

As an example of MCB Camp Pendleton's continued commitment to improving air quality through the reduction of GHG emissions and utilization of renewable energy, in 2007 MCB Camp Pendleton implemented solar thermal and photovoltaic systems at its 53 and 62 training area pools (U.S. Department of Energy 2009). The base has also installed numerous photovoltaic powered street lights and traffic beacons. In addition, as part of a superfund cleanup project at MCB Camp Pendleton, construction equipment using clean diesel technologies, retrofitted equipment, ultra-low sulfur diesel fuel, and biofuels were used on-site. MCB Camp Pendleton received special recognition and commendation from the USEPA for this effort (California Green Solutions 2008). These examples demonstrate MCB Camp Pendleton s continued commitment to energy conservation while helping to meet DOD energy reduction requirements.

4.3.6 Utilities

The ROI for utilities includes the southern portion of MCB Camp Pendleton, NWS Seal Beach, Detachment Fallbrook, and the community of Fallbrook. Implementation of the Proposed Action would result in beneficial impacts to potable water supplies for MCB Camp Pendleton resulting in reduced reliance on imported water. Increased electrical power demands under operation of the Proposed Action would be accommodated by the Basewide Utilities Infrastructure Improvements Project or SDG&E.

The Basewide Utility Infrastructure Improvements Project is designed to upgrade MCB Camp Pendleton's existing utilities infrastructure and will be able to accommodate the demands from the Proposed Action or other projects within MCB Camp Pendleton. Therefore, implementation of the Proposed Action, in conjunction with other similar actions in the ROI, would not result in significant cumulative impacts to utilities.

4.3.7 Hydrology and Water Quality

The ROI for hydrology and water quality includes those areas that contain surface water or groundwater features within the SMR watershed that may be impacted by the Proposed Action. The main impacts to water resources associated with the Proposed Action that could contribute to cumulative impacts would be to surface water quality resulting from simultaneous construction activities and to surface and groundwater supplies resulting from other water development projects. The Proposed Action and other construction projects in the ROI that disturb greater than one acre of land would be required to obtain and comply with the SWRCB General Permit for Construction Activities. The General Permit would require that construction contractors prepare and implement a SWPPP, and implement all applicable BMPs in accordance with the General Permit from initiation through completion of construction activities as well as post construction BMPs. Implementation of a SWPPP and BMPs would further minimize the potential for pollutants to enter receiving waters during construction.

The water development projects listed in Section 4.2 and the Proposed Action would utilize water resources within the Santa Margarita Basin. In consideration of cumulative impacts to water resources, the Bureau of Reclamation and Stetson Engineering have conducted several technical studies and reports to determine the sustainable groundwater yield while minimizing environmental impacts within the lower Santa Margarita River basin (Reclamation 2004, 2005, 2007a,b; Stetson 2008). These studies take into account the natural variations of the hydrologic condition and changes to the hydrologic regime resulting from other projects in the ROI when determining sustainable groundwater yield for the basin.

The water discharge projects listed in Section 4.2 and the Proposed Action would discharge waters into the Pacific Ocean. These projects would be required to meet the requirements of the California Ocean Plan and any limitations set out in their respective NPDES permits before discharging any waste waters. Marine vessel traffic, dredging, and amphibious assault vehicle operations in the nearby area are not anticipated to have a cumulative effect when combined with the Proposed Action because the location of the brine dispersion system is underground on the north side of the jetty. It is anticipated that the percolation and dispersion of the brine would be such that it would have little to no interaction with these activities.

Therefore, implementation of the Proposed Action, in conjunction with other similar actions in the ROI, would not result in significant cumulative impacts to hydrology and water quality.

4.4 CONCLUSIONS

Implementation of the Proposed Action would not result in significant cumulative impacts to any environmental resource area. The Proposed Action as well as the other projects listed in Section 4.2 would comply with established policies, regulations, and directives to ensure that project-specific impacts are minimized or avoided. Therefore, cumulative impacts from the Proposed Action, in conjunction with other past, present, and reasonably foreseeable future actions, would not be significant.

CHAPTER 5
OTHER CONSIDERATIONS REQUIRED BY NEPA

5.1. IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF NATURAL OR FINITE RESOURCES

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and other natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Under the Proposed Action, construction would require the consumption of limited amounts of materials typically associated with construction (e.g., concrete, etc.). In addition, the use of construction vehicles at the locations would result in the consumption of additional fuel, oil, and lubricants. However, this is not considered a significant irreversible or irretrievable commitment of resources.

5.2. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE HUMAN ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM NATURAL RESOURCE PRODUCTIVITY

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development option reduces future flexibility in pursuing other options, or that giving over a parcel of land or other resource to a certain use often eliminates the possibility of other uses being performed at that site.

The Proposed Action would, reversibly, dedicate land and a small amount of other resources to a particular use for the life of the project. That land and those resources would not be available for other productive uses. For example, a portion of the proposed Santa Margarita River Conjunctive Use Project would involve a similar facility in Haybarn Canyon and an associated brine discharge line. The exact design of the Proposed Action would directly affect the design choices for this portion of the Santa Margarita River Conjunctive Use Project. However, these impacts are not considered to be significant. Therefore, the Proposed Action would not result in impacts that would significantly reduce environmental productivity, permanently narrow the range of beneficial uses of the environment, or pose long-term risks to health, safety or the general welfare of the public.

5.3. MEANS TO MITIGATE AND/OR MONITOR ADVERSE ENVIRONMENTAL IMPACTS

The Proposed Action would not result in any significant adverse environmental impacts. Therefore, no mitigation and/or monitoring measures would be implemented, other than what has already been described in this EA.

5.4. ANY PROBABLE ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED AND ARE NOT AMENABLE TO MITIGATION

This EA has determined that the Proposed Action would not result in any significant impacts; therefore, there are no probable adverse environmental effects that cannot be avoided or are not amenable to mitigation.

CHAPTER 6
ACRONYMS AND ABBREVIATIONS

AC/S ES	Assistant Chief of Staff, Environmental Security
APE	Area of Potential Effects
AT	arroyo toad
AWT	advanced water treatment
Blvd.	Boulevard
BMPs	Best Management Practices
BO	Biological Opinion
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAGN	coastal California gnatcatcher
CAM	cismontane alkali marsh
CARB	California Air Resources Board
CATEX	Categorical Exclusion
CBP	California brown pelican
CCC	California Coastal Commission
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CLT	California least tern
cm	centimeter(s)
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	CO_2 equivalent
CNPS	California Native Plant Society
CS-CS	coastal sage-chaparral scrub
CSS	Diegan coastal sage scrub
CSS(P)	coastal sage scrub (pilularis*)*
CVFM	coastal and valley freshwater marsh
CWA	Clean Water Act
D	disturbed
DEV	developed
DIST	disturbed habitat
DMBB	Del Mar Boat Basin
DO	dissolved oxygen
DON	Department of the Navy
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
EUC	eucalyptus woodland
EX-ARU	exotic-arundo
FMD	Facilities Maintenance Division
FMP	Fishery Management Plans
FONSI	Finding of No Significant Impact
FPUD	Fallbrook Public Utility District
ft	foot/feet
GAC	granular activated carbon
GHG	greenhouse gas
GIS	Geographic Information System
GWP	global warming potential
ha	hectares
HAPC	habitat areas of particular concern
I	Interstate
I/M Plant	Iron/Manganese Removal Treatment Facility
INRMP	Integrated Natural Resources Management Plan
IR	Installation Restoration
IRP	Installation Restoration Program
km	kilometer(s)
kV	kilovolts
LBV	least Bell's vireo
LGAC	Liquid Granulated Activated Carbon
m	meter(s)
mgd	million gallons per day
mg/L	milligrams per liter
mL	milliliters
µg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corp Air Station
MCB	Marine Corps Base
MCBCP	Marine Corps Base Camp Pendleton
MCO	Marine Corps Order
MFS	mulefat scrub
MMPA	Marine Mammal Protection Act
MOA	Memorandum of Agreement
mph	miles per hour
NAAQS	National Ambient Air Quality Standards
NAVFAC SW	Naval Facilities Engineering Command Southwest
NCTD	North County Transit District
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NG	native grassland
NMFS	National Marine Fisheries Service
NNG	non-native grassland
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWS	Naval Weapons Station
O_3	ozone
O&M	operations and maintenance
OU	operable unit
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
PDO	Pacific Decadal Oscillation
PFMC	Pacific Fishery Management Council
pH	measurement of acidity
ppb	parts per billion
ppm	parts per million
RAQS	Regional Air Quality Strategy

RCRA	Resource Conservation and Recovery Act
RIP SCRUB	Riparian Scrub
RO	reverse osmosis
ROD	Record of Decision
ROI	region of influence
ROICC	Resident Officer In Charge of Construction
RONA	Record of Non-Applicability
RWQCB	Regional Water Quality Control Board
SAS	Special Aquatic Sites
SCADA	supervisory control and data acquisition
SCAQMD	South Coast Air Quality Management District
SCMs	Special Conservation Measures
SDAB	San Diego Air Basin
SDCAPCD	San Diego County Air Pollution Control District
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas & Electric
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SLR	San Luis Rey
SMP	Soil Management Plan
SMR	Santa Margarita River
SO_2	sulfur dioxide
SO_x	sulfur oxides
SONGS	San Onofre Nuclear Generating Station
SR	State Route
SRTTP	Southern Region Tertiary Treatment Plant
STP	Sewage Treatment Plant
su	Scientific Unit
SWF	southwestern willow flycatcher
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWRF	southern arroyo willow riparian forest
SWS	Southern Willow Scrub
TDS	Total Dissolved Solids
TLB	thread-leaved brodiaea
TOC	Total Organic Carbon
TTHM	total trihalomethane
TTP	Tertiary Treatment Plant
UIC	Underground Injection Control
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	United States Fish and Wildlife Services
USMC	United State Marine Corps
USEPA	Unites States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WDID	Waste Discharge Identification
WSP	Western Snowy Plover

CHAPTER 7
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CHAPTER 8
AGENCIES AND PERSONNEL CONTACTED

This EA was prepared for the USMC by TEC. Agencies and personnel contacted to aid in its completion are listed below:

Agencies

Federal
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers
National Marine Fisheries Service

State
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California Department of Fish and Game
California State Historical Preservation Office
California State Water Resources Control Board

San Diego County
County of San Diego Air Pollution Control District

Regional
California Regional Water Quality Control Board

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M. Smirnov
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Carolyn Martus (Rare Plant Survey)

Appendix A

Plant and Aquatic Figures

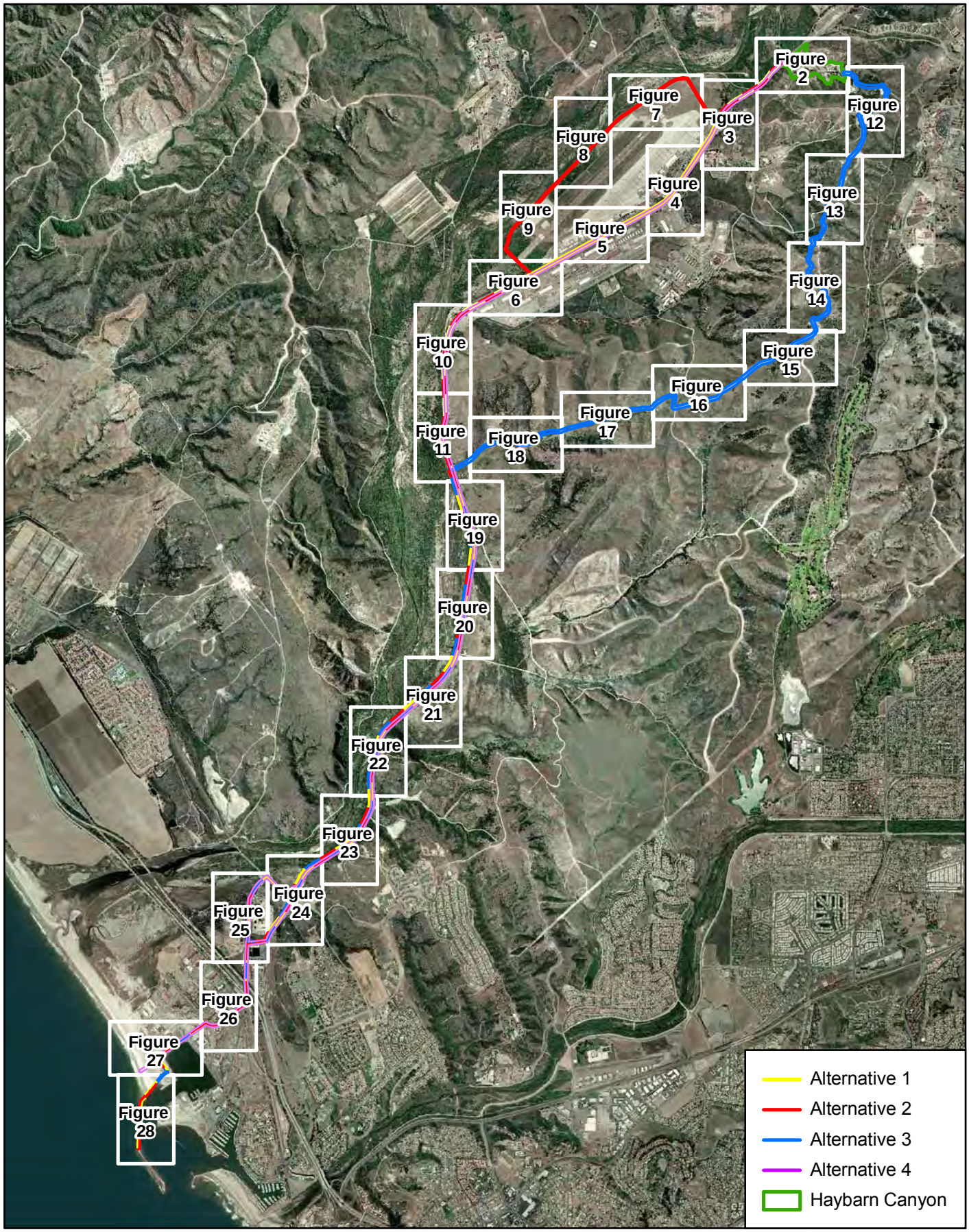

Figure 1. Plant Communities Figure Index

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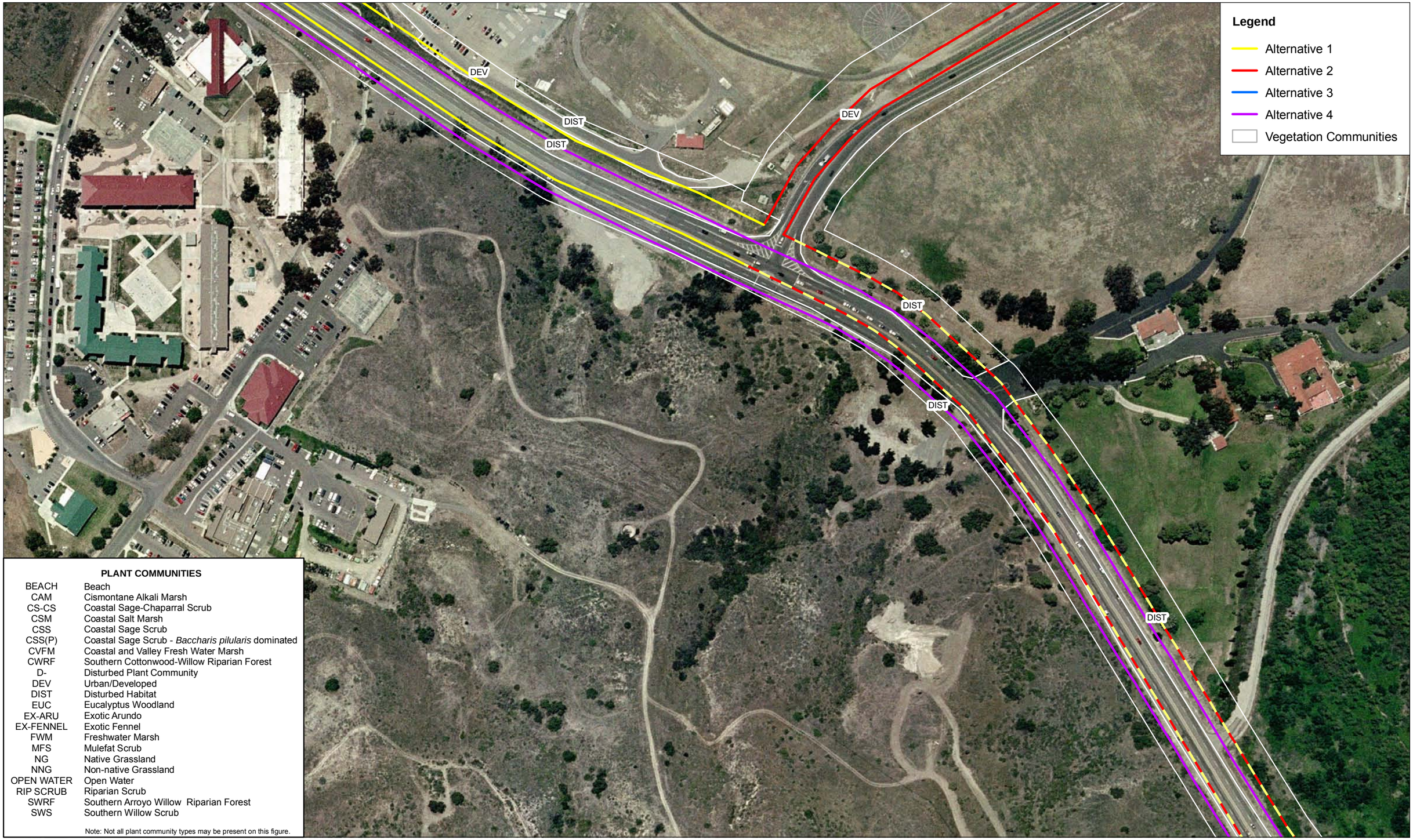
Figure 2. Plant Communities for Alternatives 1, 2, 3, and 4.



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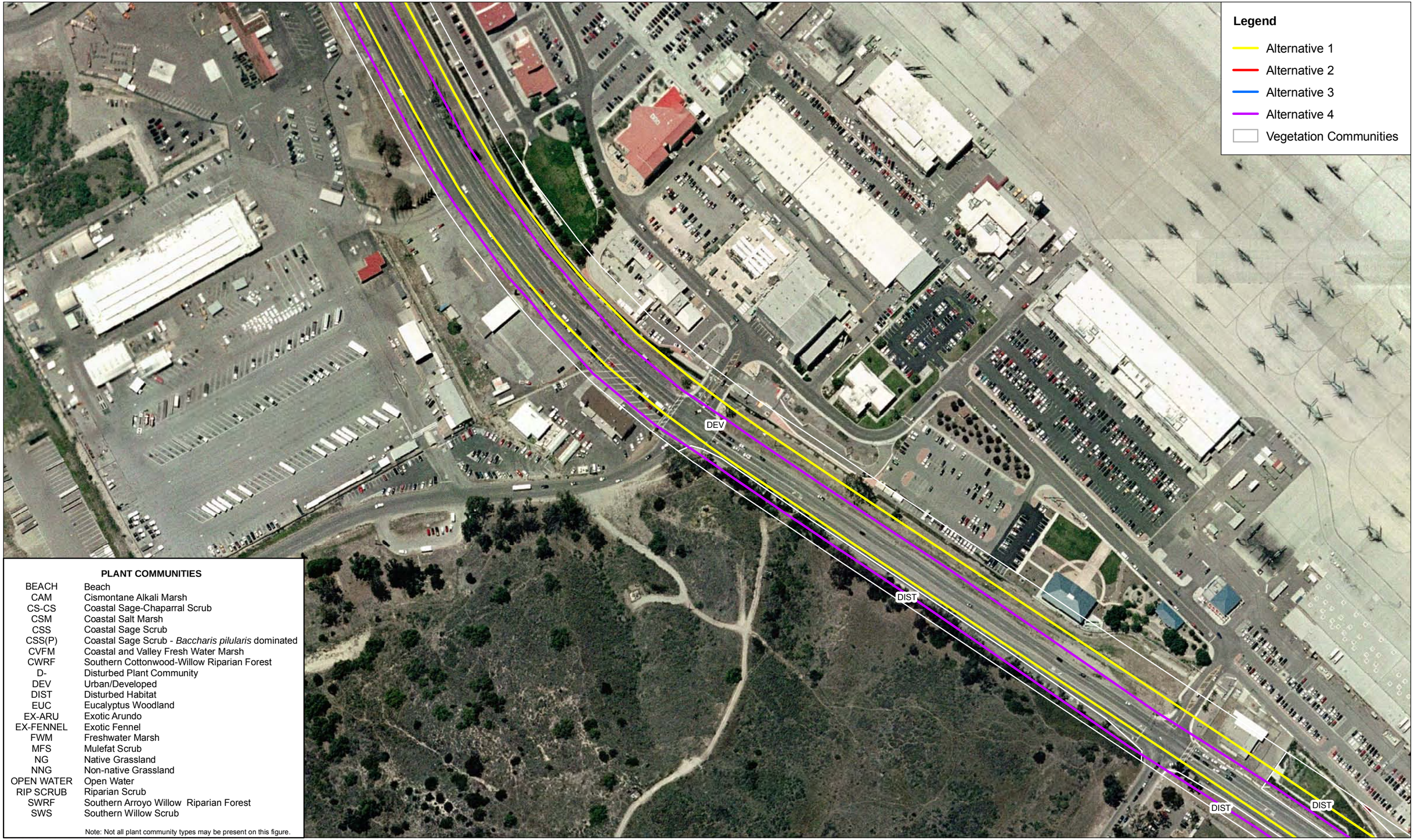

Figure 4. Plant Communities for Alternatives 1, 2, 3, and 4.

Figure 5. Plant Communities for Alternatives 1, 2, 3, and 4.

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Figure 6. Plant Communities for Alternatives 1, 2, 3, and 4.

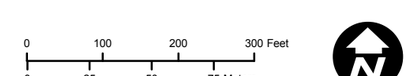

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Figure 8. Plant Communities for Alternatives 1, 2, 3, and 4.

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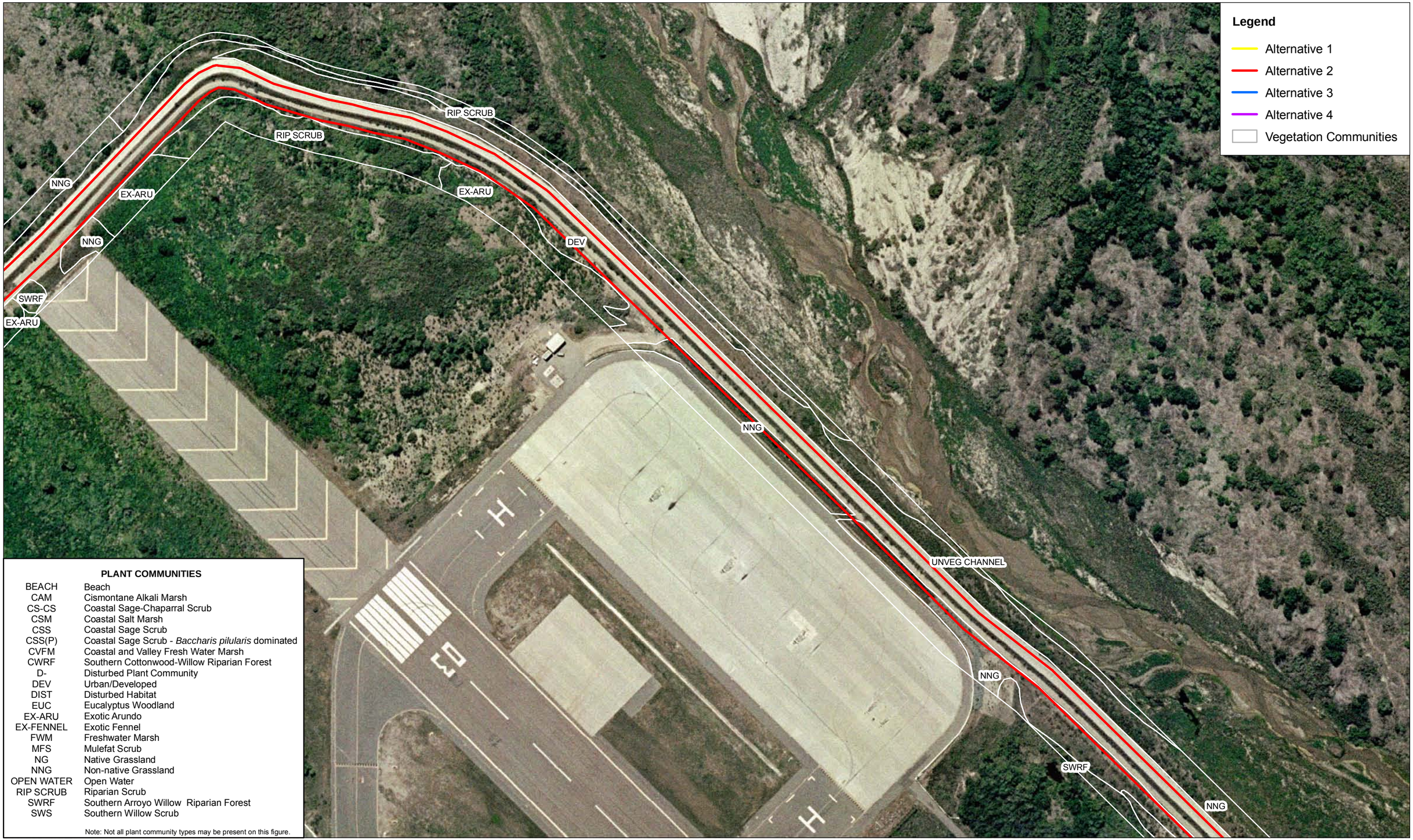

Figure 9. Plant Communities for Alternatives 1, 2, 3, and 4.

Figure 10. Plant Communities for Alternatives 1, 2, 3, and 4.

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Figure 11. Plant Communities for Alternatives 1, 2, 3, and 4.

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Figure 12. Plant Communities for Alternatives 1, 2, 3, and 4.

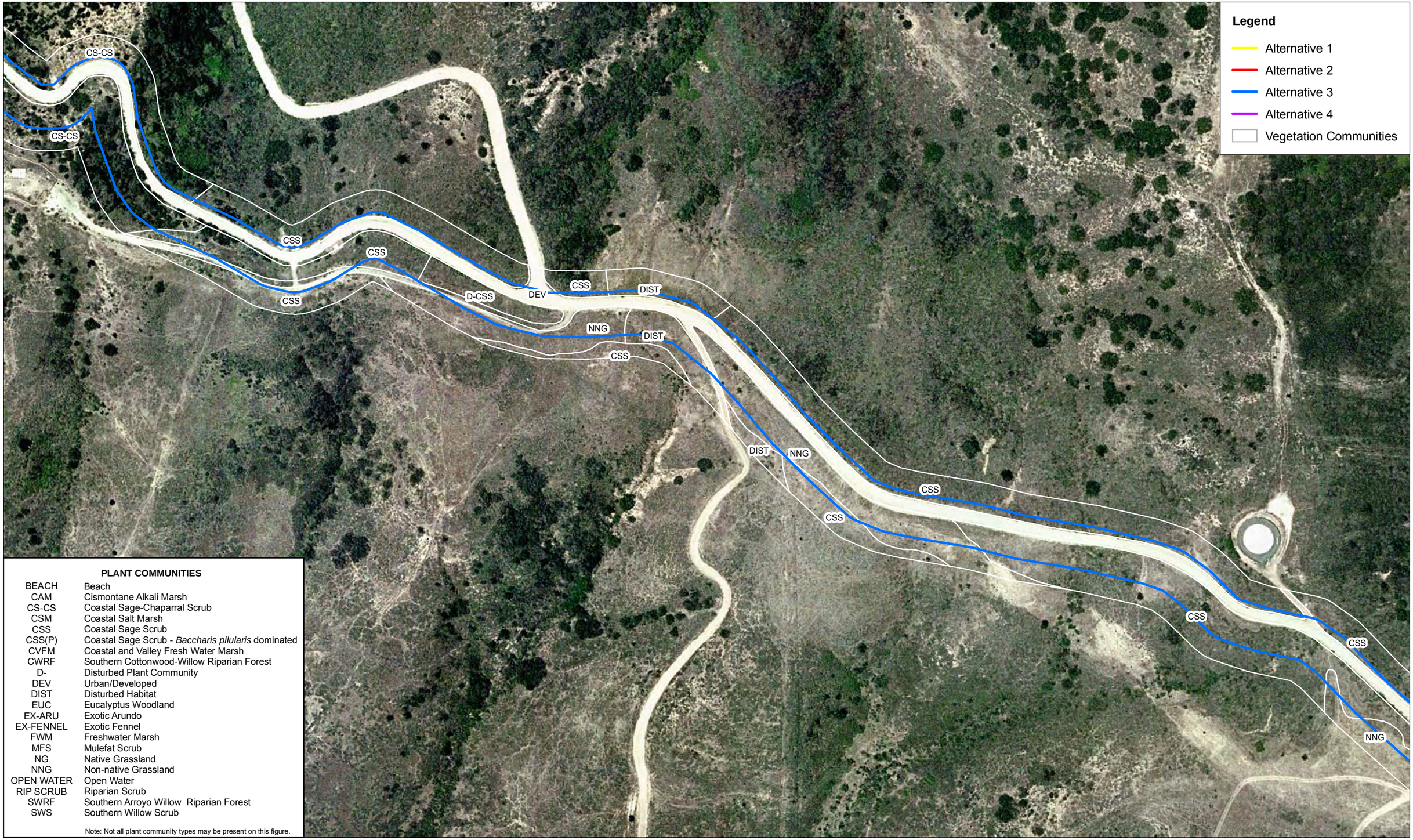

Figure 13. Plant Communities for Alternatives 1, 2, 3, and 4.

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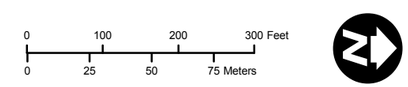
Figure 14. Plant Communities for Alternatives 1, 2, 3, and 4.



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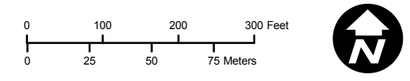

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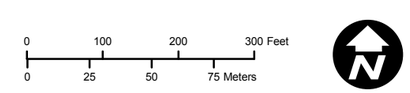

Figure 17. Plant Communities for Alternatives 1, 2, 3, and 4.

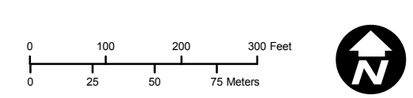

Figure 18. Plant Communities for Alternatives 1, 2, 3, and 4.

PLANT COMMUNITIES

BEACH	Beach
CAM	Cismontane Alkali Marsh
CS-CS	Coastal Sage-Chaparral Scrub
CSM	Coastal Salt Marsh
CSS	Coastal Sage Scrub
CSS(P)	Coastal Sage Scrub - *Baccharis pilularis* dominated
CVFM	Coastal and Valley Fresh Water Marsh
CWRF	Southern Cottonwood-Willow Riparian Forest
D-	Disturbed Plant Community
DEV	Urban/Developed
DIST	Disturbed Habitat
EUC	Eucalyptus Woodland
EX-ARU	Exotic Arundo
EX-FENNEL	Exotic Fennel
FWM	Freshwater Marsh
MFS	Mulefat Scrub
NG	Native Grassland
NNG	Non-native Grassland
OPEN WATER	Open Water
RIP SCRUB	Riparian Scrub
SWRF	Southern Arroyo Willow Riparian Forest
SWS	Southern Willow Scrub

Note: Not all plant community types may be present on this figure.

Figure 19. Plant Communities for Alternatives 1, 2, 3, and 4.

Figure 20. Plant Communities for Alternatives 1, 2, 3, and 4.

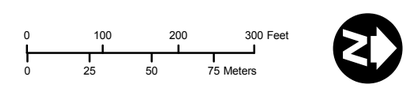

Figure 21. Plant Communities for Alternatives 1, 2, 3, and 4.

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Figure 22. Plant Communities for Alternatives 1, 2, 3, and 4.

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Figure 23. Plant Communities for Alternatives 1, 2, 3, and 4.

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Figure 24. Plant Communities for Alternatives 1, 2, 3, and 4.

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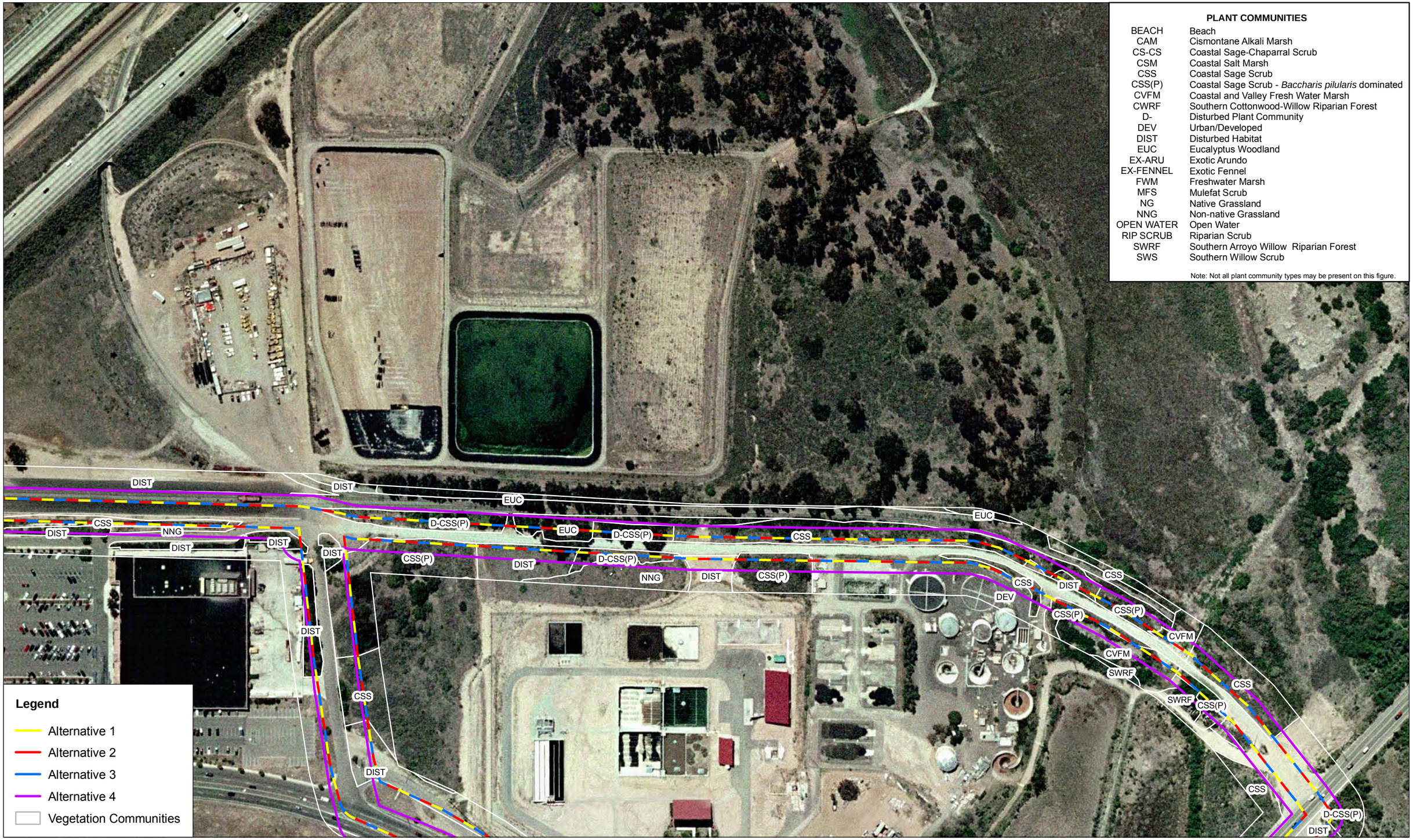

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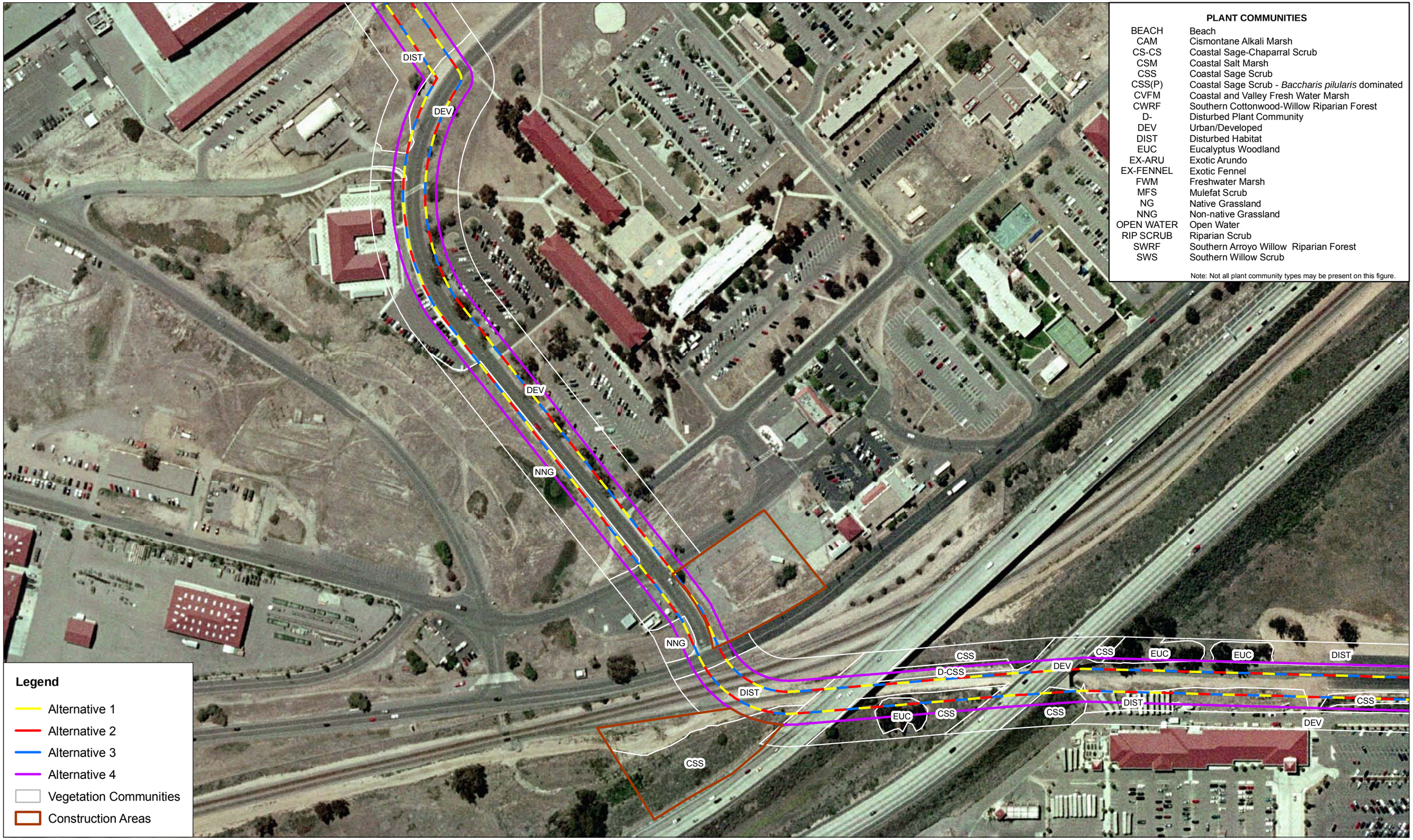

Figure 26. Plant Communities for Alternatives 1, 2, 3, and 4.

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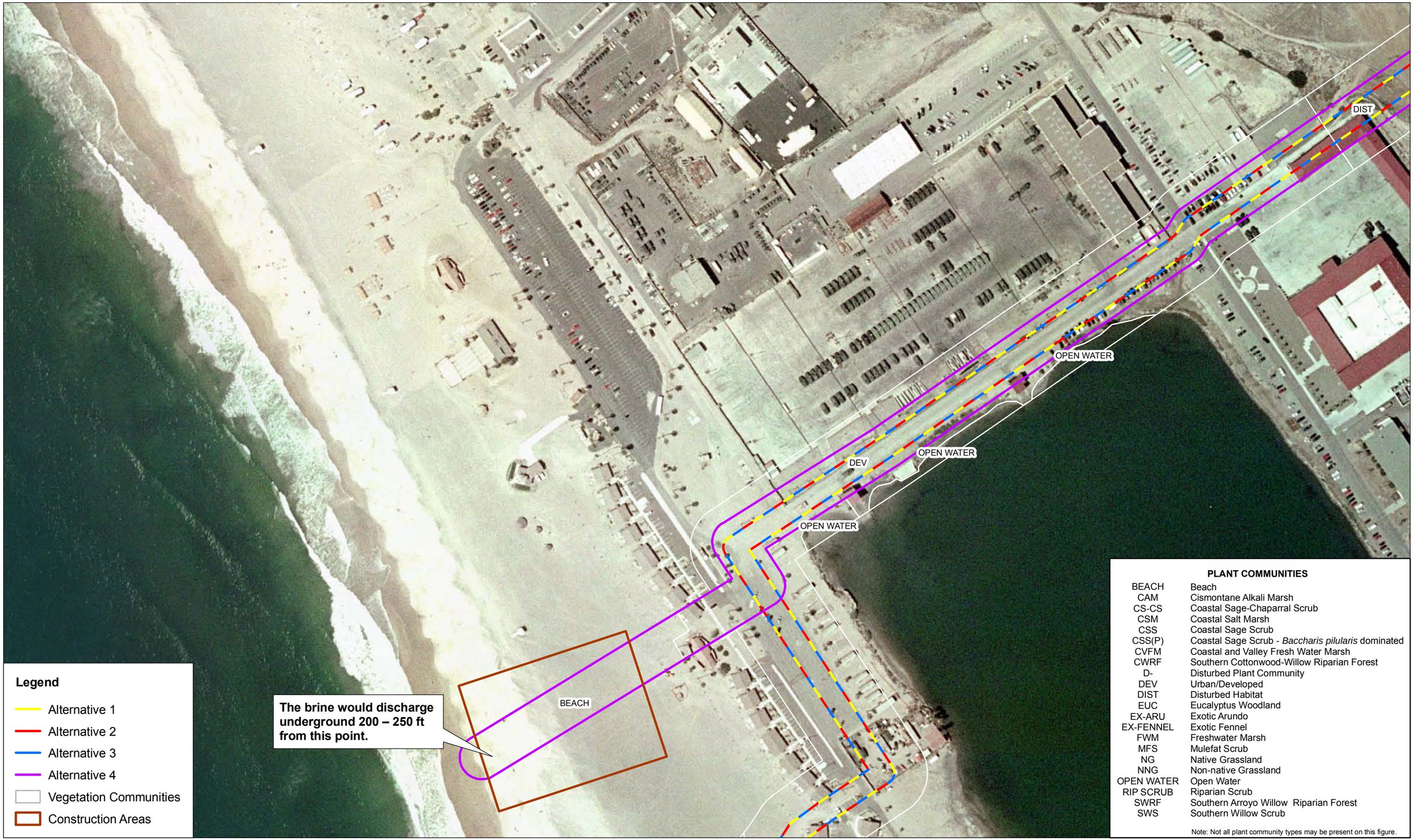

Figure 27. Plant Communities for Alternatives 1, 2, 3, and 4.

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Figure 28. Plant Communities for Alternatives 1, 2, 3, and 4.

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Appendix B

Wetland Report and Figures

Delineation of Wetlands and Other Waters of the U.S. for the Advanced Water Treatment Facilities and Utility Corridor (P-113)

Marine Corps Base Camp Pendleton
San Diego County, California

Prepared by:
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514 Via De La Valle, Suite 308
Solana Beach, CA 92075

Final August 2009

DELINEATION OF WETLANDS AND OTHER WATERS OF THE U.S.
for the
ADVANCED WATER TREATMENT FACILITIES AND UTILITY CORRIDOR (P-113)
at
MARINE CORPS BASE CAMP PENDLETON
SAN DIEGO COUNTY, CALIFORNIA

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APPENDIX B-2: SUPPORTING PHOTOGRAPHS
APPENDIX B-3: WETLAND DATA FORMS
APPENDIX B-4: APPROVED JURISDICTIONAL DETERMINATION FORM

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1 Introduction

The purpose of this report is to document the occurrence of wetlands and other potential waters of the United States (U.S.) that may be subject to the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE) under section 404 of the Clean Water Act (CWA) (33 Code of Federal Regulations [CFR], parts 320-330), in areas that may be affected by the Proposed Action.

The Proposed Action is to construct advanced water treatment (AWT) facilities and associated conveyance pipelines (P-113) at Marine Corps Base (MCB) Camp Pendleton, California. The project consists of an AWT in the vicinity of the Paintball Park in Haybarn Canyon off of Vandegrift Blvd and conveyance pipelines from the AWT south to the Pacific Ocean. This report summarizes data collection and analysis at the Haybarn Canyon AWT Site and along the P-113 conveyance pipelines proposed project area footprint. The determinations herein are subject to verification by the Land Management Branch of MCB Camp Pendleton, by Naval Facilities Engineering Command Southwest (NAVFAC SW), and ultimately by the Los Angeles District of the USACE.

Under section 404 of the CWA, wetlands are defined as 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." Wetlands are recognized as a special aquatic site under the section 404(b)(1) guidelines, and a "no net loss" policy continues to guide federal regulatory actions affecting wetlands under Section 404.

A CWA Section 404/401 permit would be required for the discharge of excavated or fill material into waters of the U.S., including wetlands. Additional authorization under Section 10 of the Rivers and Harbors Act would be required if the brine discharge pipeline were to be placed below the high-tide line (33 United States Code [USC] 403), in which case the Section 10 and 404 processes would be combined in a single permit. Meeting Section 401 requirements requires a Water Quality Certification from the Regional Water Quality Control Board, which is a separate application and review process. Under the CWA National Permit Discharge Elimination System (NPDES), construction would also require the implementation of a Stormwater Pollution Prevention Plan incorporating Best Management Practices to minimize the discharge of sediment and other pollutants in runoff from construction sites. Finally, the project would require an NPDES permit for brine discharge to the ocean.

Potential Section 404 wetlands are identified and delineated according to the USACE's (1987) Wetlands Delineation Manual, which requires that, under normal conditions, positive indicators of wetland hydrology, soil, and vegetation are all present. In 2006, USACE released the Interim Arid West Regional Supplement (USACE 2006), which was used in the initial 2007 sampling of the study area. The Supplement was revised and finalized in 2008 (USACE 2008); the final version has been used in the preparation of this report. The Regional Supplement provides additional technical guidance for identifying and delineating wetlands, while accounting for regional climate, geology, soils, and hydrology in the southwestern states and southern California. Use of the Regional Supplement is required by the Los Angeles District of the USACE.

In December 2008, in response to the Supreme Court's decision in the combined cases of Rapanos v. U.S. and Carabell v. U.S. (126 S. Ct. 2208; 2006), the U.S. Environmental Protection Agency (USEPA) and USACE issued final guidance on the scope of regulatory jurisdiction under the CWA, including Section

404 (USEPA and USACE 2008). The guidance specifies that USEPA and USACE will assert jurisdiction over the following waters:

- **Traditional Navigable Waters (TNWs).** TNWs are all waters subject to the ebb and flow of the tides, and waters that are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce (33 CFR 328.3(a)(1)).
- **Wetlands adjacent to TNWs.** Wetlands are defined as cited above (see also Methodology below). The term "adjacent" means bordering, contiguous, or neighboring, meeting one of the following criteria: 1) there is an unbroken surface or shallow sub-surface connection to the TNW; 2) the wetland is physically separated from the TNW artificially by a man-made dike, or by natural barrier such as a berm or dune; or 3) the wetland is reasonably close to the TNW, such that direct ecological interconnections are present.
- **Non-navigable, but relatively permanent waters (RPWs) that are tributaries to TNWs.** These are waters that typically flow year-round or continuously for at least three months. The boundaries of such waters are determined by the limits of ordinary high water (33 CFR part 328.3).
- **Wetlands adjacent to RPWs.** The guidance stipulates that a continuous surface connection must be present between the wetland and RPW. If such connection is not present, additional criteria must be satisfied (see next bullet).
- **Non-RPWs and adjacent wetlands with a significant nexus to TNWs.** To establish (or rule out) a significant nexus requires an assessment of the flow characteristics and functions of the tributary and any adjacent wetland to determine if they significantly affect the chemical, physical, and biological integrity of downstream navigable waters.

The guidance states that swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent or short-duration flow) and ditches excavated in uplands are generally not jurisdictional because they are not tributaries or do not have a significant nexus to downstream TNWs. The same reasoning would indicate that isolated bodies of water and isolated wetlands without a demonstrated relationship to interstate commerce would generally not be considered jurisdictional. The Supreme Court ruling in SWANCC v. U.S. (121 S. Ct. 751; 2001) indicated that the movement of migratory birds to/from an isolated body of water was not sufficient evidence of interstate commerce.

2 Methodology

The potential project area for the AWT facilities and P-113 conveyance pipelines was plotted over aerial photos of the Haybarn Canyon Paintball Park, along Pueblitos Canyon Road, along the pipeline portions adjacent to Vandegrift Blvd and the Santa Margarita River (SMR), and in the vicinity of the southern regional tertiary treatment plant (SRTTP). The project area was delineated to capture the development footprint and surrounding areas to accommodate for design flexibility and incidental effects. The actual limits of construction and disturbance may be smaller based on topography, geology, hydrologic conditions, or vegetation surrounding the project sites.

In addition to field evaluations by TEC staff, wetland determinations for the P-113 conveyance pipeline also referenced other delineation reports that included the 1) Investigation and Delineation of Waters of the U.S. in support of the Environmental Impact Statement (EIS) for the Tertiary Treatment Plant (TTP) and the Associated Facilities (December 2003), 2) the P-110 Supplemental Environmental Assessment (EA) (January 2007), and 3) SMR Conjunctive Use Project, Draft Delineation of Waters of the U.S. (September 2006) (NAVFAC SW 2004; USMC 2007, U.S. Bureau of Reclamation [USBR] 2006).

Initial inspection was conducted at the Haybarn Canyon site in summer 2007. Site visitation indicated the potential presence of wetlands or other potential jurisdictional waters of the U.S. at several areas along the existing gravel roadways in the project area. A full wetland delineation of the Haybarn Canyon site was performed in September 2007 by TEC Biologists. Drainage features in the project area were evaluated for proximity to other RPW bodies, potential to carry floodwaters and/or pollutants downstream, and relative continuity of aquatic and/or riparian habitat. Follow-up site visits to Haybarn Canyon were conducted in November 2008 by TEC Biologists.

In 2008, existing data from the Investigation and Delineation of Waters of the U.S. for the TTP EIS (also known as: TTP EIS wetland report), SMR Conjunctive Use Project, Draft Delineation of Waters of the U.S. and the waters of the U.S. determinations for the P-110 Supplemental EA were used for the P-113 conveyance lines waters of the U.S. and wetland determinations (NAVFAC SW 2004; USBR 2006; USMC 2007). This data was used since it was fairly recent and overlapped certain areas of the P-113 project. However, due to the updated 2008 USACOE Arid West manual for wetland determination (USACE 2008), a full wetland delineation of the P-113 conveyance pipelines, along Pueblitos Canyon Road, and along Vandegrift Blvd and the SMR from Pueblitos Canyon Road south to SRTTP was conducted in May 2009 by TEC Biologists to supplement previous data and to fill in data gaps.

For the entire project, each drainage area constituting a potential water of the U.S. overlapped by the Proposed Action was evaluated as a potential wetland or other water of the U.S. Jurisdictional wetlands were identified using the 3-parameter approach of the USACE (1987) Wetlands Delineation Manual and additional technical guidance provided in the Arid West Regional Supplement (USACE 2008), which may be consulted for additional details on specific criteria. Jurisdictional wetlands have, under normal conditions, positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation. Each criterion is explained briefly below.

- Wetland vegetation is defined as the prevalence of hydrophytic vegetation, meaning that the dominant species comprising the plant community within the area under consideration are adapted to life in saturated soil conditions. Meeting this criterion requires that more than 50% of the dominant plant species have at least facultative (FAC, FACW, or OBL) wetland indicator status, based on the National List of Plant Species that Occur in Wetlands (Reed 1988). The updated plant list (USFWS 1996) is not formally approved, but was consulted for species that are

insufficiently described in the 1988 list. Dominant species were identified with tree, shrub, herb, and vine layers according to the "50/20 Rule" (USACE 1987, 2008).

- Wetland hydrology is present when a site has a continuing hydrologic regime that provides periods of inundation or soil saturation during the growing season. Observations can include direct observation of inundation/saturation within 20 inches of the surface during the growing season, or other indicators of inundation/saturation such as flow lines, sediment deposits, drainage patterns, water-stained leaves, and oxidized root channels (see USACE 1987, 2008 for further discussion). In the Arid West region, climatic variability throughout the year and among years may make wetland hydrology difficult to identify. On MCB Camp Pendleton, the growing season is 365 days. Therefore, the indicators of wetland hydrology may be observable throughout the year. However, observations during or shortly after the rainy season provide stronger indicators of the presence or absence or recent inundation/saturation events.
- The presence of hydric soils is determined by excavating a soil pit 20-inches deep (prior to the Arid West Regional Supplement [USACE 2008], the recommended depth was 12 inches) and evaluating the soil for indicators of persistent saturated conditions. Such indicators include high organic content or organic streaking in sandy soils, and gleyed or low chroma colors and mottling in the soil due to reduced iron and/or magnesium. Regional guidance for the Arid West allows some flexibility in soil criteria, especially in sandy soils which often do not exhibit redoximorphic features even when inundated (see USACE 1987, 2008 for further discussion).

Vegetation is the most obvious indicator of potential jurisdictional wetlands. Coastal sage (*Artemesia californica*) scrub, coyote brush (*Baccharis pilularis*) scrub, chaparral, and upland grassland communities found within the study area are dominated by non-wetland plants; therefore, they are not jurisdictional wetlands. No further evaluation of potential wetlands was conducted in areas dominated by non-wetland plant species. Such areas may include unvegetated, non-wetland waters of the U.S., but they are not wetlands. These areas were inspected for evidence of drainage channels or pooling water to determine if they are jurisdictional waters of the U.S.

The study area also contains areas of mixed willow scrub, mulefat scrub, exotics and landscape species, and mixed grasslands. These plant communities were inspected for drainage channels, standing water, or evidence of prolonged saturation. At points within potential wetlands, based on vegetation and proximity to a source of inundation or saturation such as a channel for flowing water, USACE Arid West Wetland Determination data forms were completed to determine whether the plant community in question was or was not a jurisdictional wetland (USACE 2008). Consistent with the protocol, 1) vegetation was evaluated as described above using the 50/20 rule to determine the dominance and prevalence of hydrophytic vegetation; 2) hydrology was evaluated by visual observations and soils characteristics; and 3) soil characteristics were evaluated by digging a pit 12-20 inches (31-51 cm) deep (the rooting zone of vegetation) and carefully evaluating soil texture, color (by reference to color charts), and other features.

Using the above criteria, wetlands and other potential waters of the U.S. were identified and delineated within or in the vicinity of the project area.

As discussed in the introduction, the jurisdictional status of seasonally ponded depressions hinges on whether they are important to interstate commerce, or have a significant nexus with a TNW. To make this determination, each wetland was inspected to assess its potential connection downstream to a water of the U.S. and its potential impact on the water of the U.S.

For a non-wetland area to be confirmed as a water of the U.S., it has to have a significant nexus with a TNW and both of the following two indicators had to be observable (33CFR 328):

- Evidence of flow in a defined channel, including actual surface water flow and bed-and-bank topography, an ordinary high-water mark, differences in substrate or vegetation associated with scouring, and deposits of sediment or vegetative debris associated with flowing water.
- Evidence of a direct connection, either by way of a continuing channel down-gradient, or a connecting jurisdictional wetland, to another water body that is clearly a water of the U.S. by virtue of its connection to navigable waters.

Note that these criteria can be indicative of wetland hydrology, but they relate to only one of three parameters defining wetlands.

The SMR is not a TNW, and as noted in the Introduction, additional criteria reflecting a significant nexus to a TNW must be met before a non-TNW and associated wetlands are considered jurisdictional under Section 404. Accordingly, Jurisdictional Determination (JD) forms were completed for the SMR and its adjacent wetlands. The JD forms were filled out according to guidance provided by the USACE (2008), consistent with the changes in regulatory jurisdiction described in the Introduction.

A sub-meter geographic positioning system (GPS) handheld unit was used to map potential jurisdictional features. Areas which were inaccessible due to steep slope or dense vegetation were mapped using visual observation combined with topographic maps, existing GIS data, digital aerial photographs taken in 2003 and 2007, and other natural resource data provided by MCB Camp Pendleton. Representative points and line segments were collected in the field and extrapolated to inaccessible areas. Topographic maps and existing hydrologic data from MCB Camp Pendleton were used in tandem with the field evaluation to determine connectivity with downstream water bodies.

Areas with potential jurisdictional features, together with the project footprint and a plant community map prepared for the project site by TEC, were plotted onto the 2007 aerial photographic base map at a scale of 1 inch equals 200 feet (ft) (Appendix B-1 Figures 2 thru 11). Areas not displayed in the figures are those portions of the project without potential jurisdictional features from Haybarn Canyon to Pueblitos Canyon Road and from SRTTP to Del Mar Boat Basin (Appendix B-1, Figure 1).

3 Results

Supporting figures, photographs, data forms, and JD forms are attached in Appendices A through D. Observations and data in support of the delineation are summarized below. Haybarn Canyon was originally delineated in 2007 and re-evaluated during the winter of 2008-2009. Existing data was originally evaluated for the portion of the P-113 convenyance lines along Vandegrift Blvd and the SMR. During May 2009, a full wetland delineation was conducted along Vandegrift Blvd and the SMR, and Pueblitos Canyon Road. The SMR is the primary aquatic feature in the vicinity of the project area. The main channel of the SMR is west of the project area. Jurisdictional wetlands and waters of the U.S. and two isolated wetlands were found within the P-113 project footprint. Potential temporary impact acreages are shown in Tables 1 & 2. Below is a detailed description of jurisdictional and non-jurisdictional areas within Haybarn Canyon, Pueblitos Canyon, along Vandegrift Blvd/SMR, and in the vicinity of the SRTTP.

Table 1: Potential Temporary Impacts to Jurisdictional Waters of the U.S and Wetlands in the P-113 Project Footprint

Location	*Name of Water Feature*	*Figure Reference*[1]	*Data Sheet*	*Linear Ft*	*Wetland Acreage*	*Waters of U.S. Acreage*	*Total*
Haybarn Canyon	Channel A	Figure 2	-	705	0	0.05	0.05
	Channel B (Main)	Figure 2	-	2,320	0	0.16	0.16
	Channel B (Side)	Figure 2	-	307	0	0.01	0.01
	HC WET	Figure 2	1,3	150	0.03	0	0.03
Pueblitos Canyon	B	Figure 5	B1	1,360	2.04	0	2.04
	PC-WUS-5	Figure 4	-	420	0	0.12	0.12
Vandegrift Blvd/SMR	C	Figures 5 & 6	E1&2	2,700	3.73	0	3.73
	D	Figures 6 & 7	D1&2	910	0.87	0	0.87
	E	Figure 7	E1&3	2,140	2.38	0	2.38
	F	Figures 7-9	F1-5	3,800	4.70	0	4.70
	G	Figure 9	G1-2	590	0.37	0	0.37
	H	Figures 10 & 11	H1-2	610	0.21	0	0.21
	I	Figure 10	I1-2	1,400	1.50	0	1.50
	WUS1	Figure 10	-	61	0	0.01	0.01
	J	Figure 10	J1-2	1,430	1.50	0	1.50
SRTTP	STP13-WUS-1a	Figure 11	-	275	0	0.02	0.02
	STP13-WET-3	Figure 11	-	80	0.01	0	0.01
	STP13-WET-6	Figure 11	-	80	0.03	0	0.03
Total				**19,289**	**17.37**	**0.37**	**17.74**

[1] Refer to Figures in Appendix B-1

Table 2: Potential Temporary Impacts to Isolated Non-Jurisdictional Wetlands in the P-113 Project Footprint

Location	*Name of Water Feature*	*Figure Reference*[1]	*Data Sheet*	*Linear Ft*	*Wetland Acreage*
Pueblitos Canyon	A	Figure 3	A1	315	0.50
Vandegrift Blvd/Stuart Mesa	K	Figure 11	K1	110	0.05
Total				**425**	**0.55**

[1] Refer to Figures in Appendix B-1

Haybarn Canyon

Drainage across the project area runs generally from east to west. Several small, intertwining drainage channels collect through culverts and unite into a single drainage ditch near Vandegrift Blvd. The combined channel flows under Vandegrift Blvd through a culvert, where the channel flows into the floodplain of the SMR, a relatively permanent water (RPW), which is connected to a TNW, the Pacific Ocean. Two channels, A and B, a side channel, and a wetland were determined to be connected to the SMR; thus, they were determined to be jurisdictional. The drainages are ephemeral channels in which runoff from the highly disturbed Paintball Park in Haybarn Canyon flows to the SMR. The drainage channels are over 5 miles (8 km) from a TNW, the Pacific Ocean (See Approved JD Form Appendix B-4). Below is a detailed description of the Haybarn Canyon jurisdictional wetland and jurisdictional waters of the U.S.

In September 2007, standing water was present in a drainage ditch at Vandegrift Blvd, although the upper drainage channels were all dry with no evidence of recent saturation. Several storm water and sewer facilities (e.g., a sewer manhole, pipe vents, and monitoring well heads) were noted in the vicinity of the drainage ditch. At the existing water treatment facilities in Haybarn Canyon (Paintball Park), a pipeline was discharging water into a parking lot storm drain. Field investigators could not determine the exact source of the water in the drainage ditch; however, based on the dry conditions in the surrounding watershed, it seems likely that the water is flowing from one or more of the manmade facilities. A hydrophytic plant community was dominant at the wet drainage ditch by Vandegrift Blvd. Wetland species such as willows (*Salix* spp.), cat-tails (*Typha* spp.), and crab grass (*Digitaria sanguinalis*) were vigorous in the trough of the ditch, while exotic common hottentot fig (*Carpobrotus edulis)* covered the adjacent ditch banks. The ditch captures runoff from two drainages and conveys the water under Vandegrift Blvd. As noted above, an undetermined source of water appears to be discharging water to the ditch as well.

Because standing water was present in the ditch, a soil excavation was not conducted. Based on standing water and evidence of hydrophytic vegetation and wetland hydrology, it is presumed that the soil is hydric and that the drainage ditch satisfies all three wetland parameters (See Wetland Delineation Form #3). The wetland channel is manmade with culverts on both sides and the wetland vegetation is regularly cleared by MCB Camp Pendleton personnel. The unknown water source appears to be a significant factor in promoting wetland vegetation and hydric soils.

The ditch is directly connected with a tributary to the SMR through a culvert under Vandegrift Blvd; therefore, the area is a jurisdictional wetland. Upstream of the wet drainage ditch, the channel splits into two. The first channel (Channel A) is well-defined, approximately 3-ft (0.91-m) wide and 3-ft (0.91-m) deep. The second channel (Channel B) is a weakly defined, wide sandy wash with dense vegetation and

intertwined flow lines downstream (west) of the culvert, and upstream (east) of the culvert a well-defined channel runs along the south side of the dirt road (Figure 2).

Channel A was determined to be jurisdictional based on hydrology and connectivity to the SMR and ultimately to the Pacific Ocean, a TNW. The well-defined channel runs to the north, through a culvert, and up through the southern boundary of the Paintball Park (Figure 2). The channel is mostly unvegetated with patches of mulefat (*Baccharis salicifolia*), coyote brush *(Baccharis pilularis)*, laurel sumac (*Malosma laurina)*, and *Eucalyptus* sp. sprouts. No wetland indicators were detected and wetland soil excavation was not performed. The bed-and-bank structure is evident through the entire project area with the exception of the culvert openings. At the culvert opening, soil debris and plant litter from a mature eucalyptus canopy have obscured the structure of the channel, but it is inferred that the channel continues through the debris pile.

Channel B was determined to be jurisdictional because it connects to the SMR and ultimately to the Pacific Ocean, a TNW. Channel B carries runoff from the highly disturbed Paintball Park and the steep slope east of Haybarn Canyon to the manmade channel next to Vandegrift Blvd. The majority of Channel B is a roadside ditch along the dirt road through the Paintball Park. The drainage, a shallow sandy floodplain, leads upstream to a culvert, at which the channel reforms with stronger channelization due to runoff from the gravel roadway. A wetland delineation pit was excavated in the sandy wash west of the culvert dominated by mulefat, giant wildrye (*Leymus condensatus*), and willows (*Salix* spp.) (see Wetland Delineation Form #2). These species are facultative wetland plants. The hydrologic structure showed weak evidence of previous flow, although scouring and drift lines were minimal. The soil pit showed platy layers of sand, indicating several cycles of flow and subsequent dry down. The entire soil profile was dry, with no streaking, organic matter collection, or redoximorphic features. No evidence of prolonged saturation was detected. It appears that the area does convey water during storms, but that the soil is well drained and the area does not function as a wetland.

The soil in Channel B west of the culvert is sandy and vegetation is disturbed in places. The existing gravel roadways in the project area bisect the drainages and washes, obscuring the defined channel at several points. Leading further upstream into the Paintball Park, the bed-and-bank structure is lost at several places and the channels widen into sandy washes. The well-defined drainage channel reconvenes in the upper watershed, forming a scoured ditch approximately 3-ft (0.91-m) wide and 3-ft (0.91-m) deep. At the headwaters of this drainage feature, several concrete runoff channels have been constructed. The concrete channels lead into a single ditch which forms the uppermost end of the drainage pathway. In the disturbed zones and washed out areas, the non-jurisdictional width is inferred to be roughly equal to the width of the same channel immediately upstream and downstream. Figure 2 shows the washout areas with a dashed line and the defined channel with a solid line, as marked in the field using sub-meter GPS.

At the Arizona crossing on the east side of Haybarn Canyon, Channel B splits into the well-defined 3-ft (0.91-m) wide channel described above and a small roadside channel. In November 2008, the small 1-ft (0.30-m) wide jurisdictional roadside channel was mapped and is shown in Figure 1. The roadside channel flows through the CSS(P) along the edge of the southeastern dirt road near the Arizona crossing.

Per the direction of MCB Camp Pendleton Assistant Chief of Staff (AC/S) Environmental Security (ES) Land Management Branch additional wetland delineations were performed in 2009. Two wetland delineation pits were excavated on the eastern edge of Haybarn Canyon in the coyote brush (*Baccharis pilularis*) dominated coastal sage scrub (CSS[P]) near the Arizona crossing. The first pit was excavated on the east side of the CSS(P) and did not have hydrophytic vegetation; it was dominated by coyote brush, an upland species (see Wetland Delineation Form #4). The second pit was excavated on the west

side of the CSS(P) near the Arizona crossing. This area was dominated by hydrophytic vegetation (Mexican elderberry [*Sambucus mexicanus*], mulefat [*Baccharis salicifolia*], and poison hemlock [*Conium maculatum*]); however, neither wetland hydrology nor hydric soils were present (see Wetland Delineation Form #5). Therefore, neither of the pits in the CSS(P) met the criteria for a wetland.

An additional wetland delineation pit was excavated under the large arroyo willow (*Salix lasiolepis*) on the northwest side of the mulefat scrub (MFS) near Vandegrift Blvd (See Wetland Delineation Form #6). Hydrophytic vegetation was present; however, wetland hydrology and hydric soil were not present. Therefore, this area did not meet the criteria for a wetland.

Pueblitos Canyon

The proposed P-113 conveyance lines footprint is along the south side of the dirt road through Pueblitos Canyon. Wetlands and waters of the U.S. were delineated in Pueblitos Canyon in 2003 for the TTP EIS (NAVFAC SW 2004). In May of 2009 TEC biologists re-examined this area and dug one soil pit. Using existing data from the 2003 TTP EIS wetland report, TEC biologists established the western boundary of the jurisdictional wetland, labeled wetland B (Appendix B-1 Figure 5). Approximately 2.04 acres (0.83 ha) of wetland B is within the project footprint. The wetland does extend south outside the project footprint. The area is a jurisdictional wetland because it is dominated by hydrophytic vegetation including alkali heath (*Frankenia salina*) and mulefat, has hydric soil and wetland hydrology, and is connected to the SMR through a culvert south of the area (Appendix B-1 Figure 5). The 2009 wetland delineation form is included in Appendix B-3 (Data Sheet B1).

A non-wetland waters of the U.S., PC-WUS-5, occurs along the south side of Pueblitos Canyon; 0.12 acre (0.05 ha) of PC-WUS-5 is within the project footprint (Appendix B-1 Figure 4) (NAVFAC SW 2004). PC-WUS-5 continues downstream but is south of the project footprint. PC-WUS-5 continues upstream for a short distance then the bed and bank is lost and it turns into a vegetated subtle drainage swale that is non-jurisdictional.

A non-jurisdictional isolated wetland (A) occurs in Pueblitos Canyon upstream of PC-WUS-5 (Appendix B-3 Data Sheet A1) (Appendix B-1 Figure 3). This wetland has an earthen dam on the west side, which allows the water to pool during precipitation events (Appendix B-2 Photo 16). This pond dries up during the summer months, and was dry during the May 2009 wetland survey.

Vandegrift Blvd/Santa Margarita River

The majority of the jurisdictional wetlands on the west side of Vandegrift Blvd were dominated by willows (*Salix* spp.). Some areas had an herb layer and other areas were covered with leaf litter. The most common wetland hydrology indicators were drift and sediment deposits, water-stained leaves, and drainage patterns in wetlands. Some of the hydrology along Vandegrift Blvd could partially be supplied by roadside drainage. For the majority of the wetland pits the soil was moist but not saturated at a depth of 20 inches (51 cm). The majority of hydric soils were low chroma depleted matrix with mottles. Wetland boundaries were primarily determined by slope on the edge of Vandegrift Blvd. There is a flat upland area along the west edge of Vandegrift Blvd with hard compacted soil. Then the area slopes down into the SMR floodplain. The majority of the slope along Vandegrift Blvd contains large rock rip rap, probably installed when Vandegrift Blvd was constructed. Along portions of the floodplain there is an upland berm on the west side of project footprint. The berm is from old railroad tracks. The jurisdictional wetlands and waters of the U.S. are described below from north to south along the west side of Vandegrift Blvd.

Jurisdictional wetland C, a large 3.73 acres (1.51 ha) wetland, occurs just west of Pueblitos Canyon along the west side of Vandegrift Blvd (Appendix B-1 Figures 5 and 6). The western boundary is the old railroad berm and the eastern boundary is the slope to Vandegrift Blvd. Wetland C is just north of wetland D. They are separated by a small section of upland plant species, primarily black mustard (*Brassica nigra*) and California sagebrush (*Artemisia californica*). Two wetland delineations forms were completed for this area (Appendix B-3 Data Sheets C1 and C2). The dominant vegetation in this wetland is arroyo willow, mulefat and yerba mansa (*Anemopsis californica*). The hydric soil had a depleted matrix and wetland hydrology was present.

Jurisdictional wetland D is a 0.87 acre (0.35 ha) wetland (Appendix B-1 Figure 7). The western boundary is the old railroad berm, the eastern boundary is the slope to Vandegrift Blvd, and the southern boundary is a dirt road that crosses the wetland, creating access to the SMR area on the other side of the berm (Photo 22, Appendix B-2). A culvert under the dirt road connects wetlands D and E. It appears that the dirt road periodically is inundated with water during high water events, due to the presence of dried mud vehicle tire tracks. These two wetlands were probably connected at a time prior to the creation of the dirt road. Wetland D is dominated by arroyo willow, salt cedar (*Tamarix ramosissima*), mulefat, yerba mansa, salt grass (*Distichlis spicata*), pickleweed (*Salicornia virginia*), and salt heliotrope (*Heliotropium curassavium*). Hydric soil and wetland hydrology were present (Appendix B-3 Data Sheets D1 and D2).

Jurisdictional wetland E, a 2.38 acres (0.96 ha) wetland, occurs south of wetland D (Appendix B-1 Figure 7). The western boundary is the old railroad berm, the eastern boundary is the slope to Vandegrift Blvd, and the northern boundary is a dirt road that crosses the wetland, creating access to the SMR area on the other side of the berm (Appendix B-2 Photo 22). A culvert under the dirt road connects wetlands D and E. It appears that the dirt road periodically is inundated with water during high water events, due to the presence of dried mud vehicle tire tracks. These two wetlands were probably connected at a time prior to the creation of the dirt road. The dominant vegetation is arroyo willow, mulefat, poison hemlock, pickleweed, and salt grass. Hydric soil and wetland hydrology were present (Appendix B-3 Data Sheet E1 and E3).

Jurisdictional wetland F, a 4.70 acres (1.90 ha) wetland, occurs south of wetland E (Appendix B-1 Figures 7-9). The western boundary extends outside the project footprint and the eastern boundary is the slope to Vandegrift Blvd. This wetland is dominated by willows (*Salix lasiolepsis*, *S. exigua*, *S. gooddingii*), California bulrush (*Schoenplectus californicus*), and whorled dock (*Rumex conglomeratus*), has hydric soil and wetland hydrology including saturation, water stained leaves and biotic crust. The water table was present at 18 inches (46 cm) (Appendix B-3 Data Sheet F4). An upland soil pit (F5) was excavated on the eastern edge of the wetland. The southern end of wetland F connects to the SMR channel. South of wetland F, the project footprint west of Vandegrift Blvd follows along a flat upland area above the SMR floodplain (Appendix B-1 Figure 9). There were not any jurisdictional features in this area.

Jurisdictional wetland G, a 0.37 acre (0.15 ha) wetland, is created from a drainage east of Vandegrift Blvd (Appendix B-1 Figure 9). A culvert under Vandegrift Blvd connects the drainage to the SMR. The dominant wetland vegetation includes arroyo willow, Mexican elderberry, and a sedge species (*Cyperus* sp.). Hydric soil and wetland hydrology were present (Appendix B-3 Data Sheet G2). An upland soil pit (G1) was excavated on the north edge of the wetland and was dominated by coyote brush (Appendix B-3 Data Sheet G1).

Jurisdictional wetland H, a 0.21 acre (0.08 ha) wetland, occurs along the west edge of Vandegrift Blvd. A low area occurs below Vandegrift Blvd and east of the railroad berm. This area probably receives some

roadside runoff (Appendix B-1 Figures 9 and 10). This wetland is dominated by arroyo willow, mulefat, and poison hemlock, has hydric soil, and has wetland hydrology including drift deposits and positive FAC-Neutral test (Appendix B-3 Data Sheet H2). An upland soil pit (H1) was excavated on the railroad berm and was dominated with coyote brush, arroyo willow, and poison hemlock. Although wetland vegetation was dominant, the soil was not hydric and there was no wetland hydrology; therefore, this area was not a wetland (Appendix B-3 Data Sheet H1).

Jurisdictional wetland I, a 1.50 acres (0.61 ha) wetland, occurs at the base of the slope west of Vandegrift Blvd and extends to beyond the western edge of the project footprint (Appendix B-1 Figure 10). The wetland is dominated by California sycamore (*Platanus racemosa*), arroyo willow, Mexican fan palm (*Washingtonia robusta*), and California blackberry (*Rubus ursinus*), hydric soil, and wetland hydrology including sediment and drift deposits, and water stained leaves (Appendix B-3 Data Sheet I1). The eastern edge of the wetland boundary is determined by slope on the edge of Vandegrift Blvd. There is large rip rap rock on the slope between the wetland and the edge of Vandegrift Blvd. An upland soil pit (I2) was excavated; even through arroyo willow was a dominant species, other vegetation was comprised of upland species and the area did not have hydric soil or wetland hydrology (Appendix B-3 Data Sheet I2). This wetland flows into a jurisdictional waters of the U.S. which connects to the SMR channel (Appendix B-1 Figure 10).

Jurisdictional wetland J, a 1.50 acres (0.61 ha) wetland, occurs south of the waters of the U.S. (HC WUS Channel A) (Appendix B-1 Figure 10). The wetland is dominated by arroyo willow and yerba mansa (Appendix B-2 Figure 6), has hydric soil based on a depleted matrix and redox dark surface, and wetland hydrology including drainage patterns in wetlands and positive FAC-Neutral test (Appendix B-3 Data Sheet J1). The eastern boundary of the wetland was determined by the slope on the edge of Vandegrift Blvd. There is large rip rap rock on the slope between the wetland and the edge of Vandegrift Blvd. An upland soil pit could not be dug due to heavily compacted soils along the edge of Vandegrift Blvd. The vegetated upland area along Vandegrift Blvd is dominated by laurel sumac (*Malosma laurina*) and California sagebrush (*Artemisia californica*). The western edge of the wetland extends beyond the western edge of the project footprint.

A non-jurisdictional isolated wetland (K) dominated by pickleweed and hottentot fig (*Carpobrotus edulis*), has soil with a depleted matrix and surface soil cracks, indicating wetland hydrology. This wetland is hydrologically isolated from the SMR, is functionally distinct (saline soil, remnant pickleweed and hottentot fig), and does not significantly affect the physical, chemical, or biological integrity of the ocean**.** Therefore, the wetland does not meet the significant nexus criteria. This wetland occurs north of Stuart Mesa (see Data Sheet K1) (Appendix B-1 Figure 11).

Southern Regional Tertiary Treatment Plant

Using existing data from the 2003 TTP EIS wetland report and the 2007 P-110 Supplemental EA, in May 2009 TEC biologists confirmed the jurisdictional wetland and waters of the U.S. boundary along the P-113 footprint at SRTTP (Appendix B-1 Figure 11). No new data forms were completed for this area. Jurisdictional wetlands occur within and in the vicinity of Twin Ponds. The northeast side, STP13-WET-6, and west side, STP13-WET-3, of Twin Ponds are on the edge of the project footprint. The majority of the wetland STP13-WET-3 is outside the project footprint. A small drainage, STP13-WUS-1a, along the west side of Vandegrift Blvd south of Twin Ponds, flows through the project footprint into Twin Ponds (Appendix B-1 Figure 11) (NAVFAC SW 2004; USMC 2007).

4 Conclusions and Recommendations

CWA Section 404 jurisdictional wetlands and other waters of the U.S. occur within the P-113 footprint at Haybarn Canyon, Pueblitos Canyon, along Vandegrift Blvd/SMR, and in the vicinity of SRTTP. None exist in the project footprint west of the SRTTP site. The AWT Facility footprint in Haybarn Canyon is shown on Figure 2 in Appendix B-1. No jurisdictional wetlands or drainage channels are within the footprint of the AWT Facility. Impacts to wetlands and drainages would be avoided to the maximum extent possible and any impacts to jurisdictional lands that do occur would be temporary. Traffic would remain on existing roads and staging areas would occur in disturbed areas away from drainages and the wetlands to the maximum extent possible. The entire project footprint would not be developed; therefore, the actual impacts to jurisdictional drainages and the wetland would be lower than presented in Table 1 (Section 3 page 5). Table 1 represents maximum impacts if the entire project limit is built out. The footprint was laid out in this fashion to give designers and the contractor flexibility with the placement of the utility structures.

The mapped locations of jurisdictional drainages and wetlands should be used during project planning and development of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP, as well as utility placement, should include best management practices to avoid and minimize sedimentation and erosion of downstream aquatic features. The Proposed Action would be subject to review by the Regional Water Quality Control Board, USACE, and the U.S Fish and Wildlife Service.

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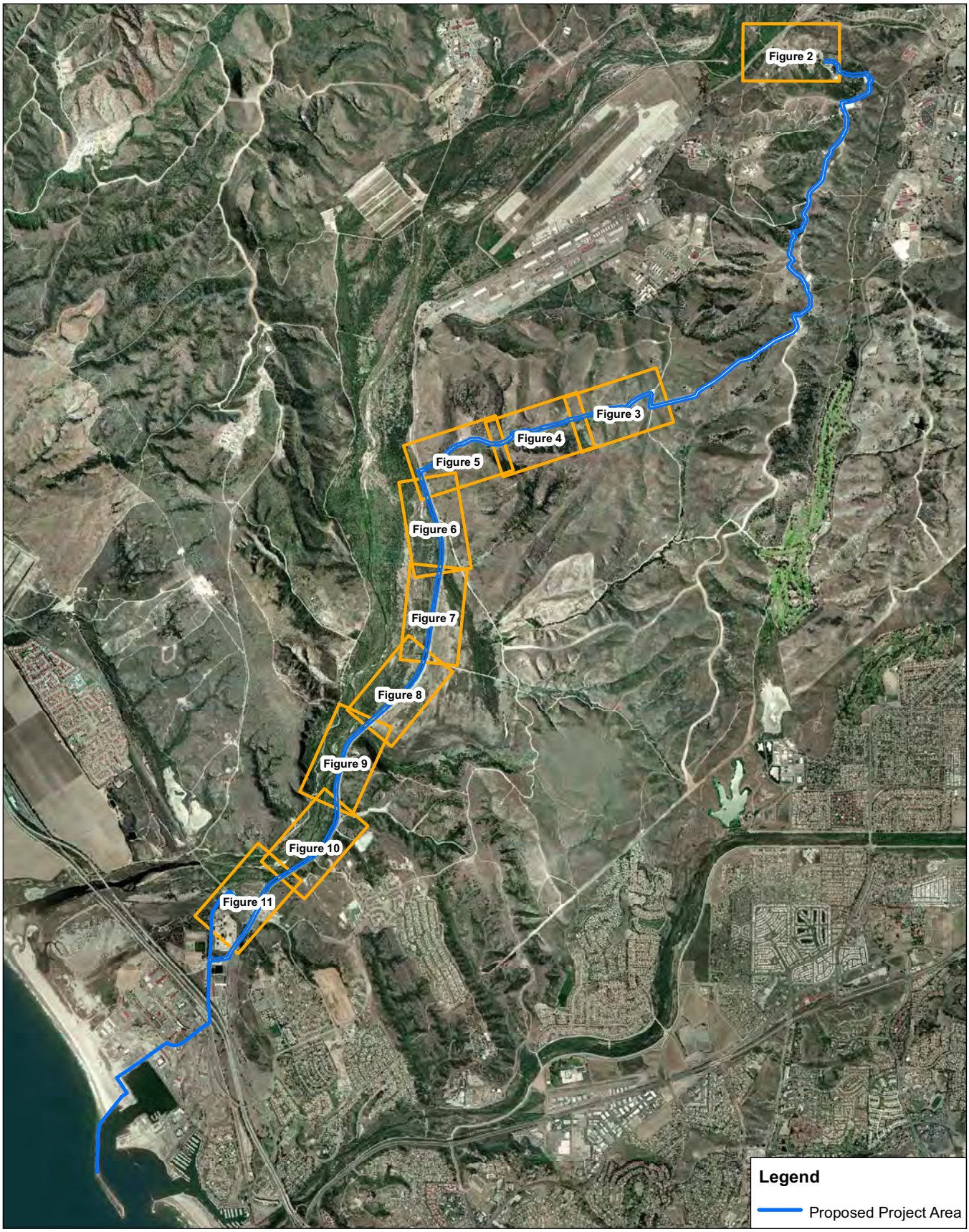
Appendix B-1: Figures



Miles
0 1
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Figure 1
Jurisdictional Wetlands and Waters of the U.S.
Figure Index

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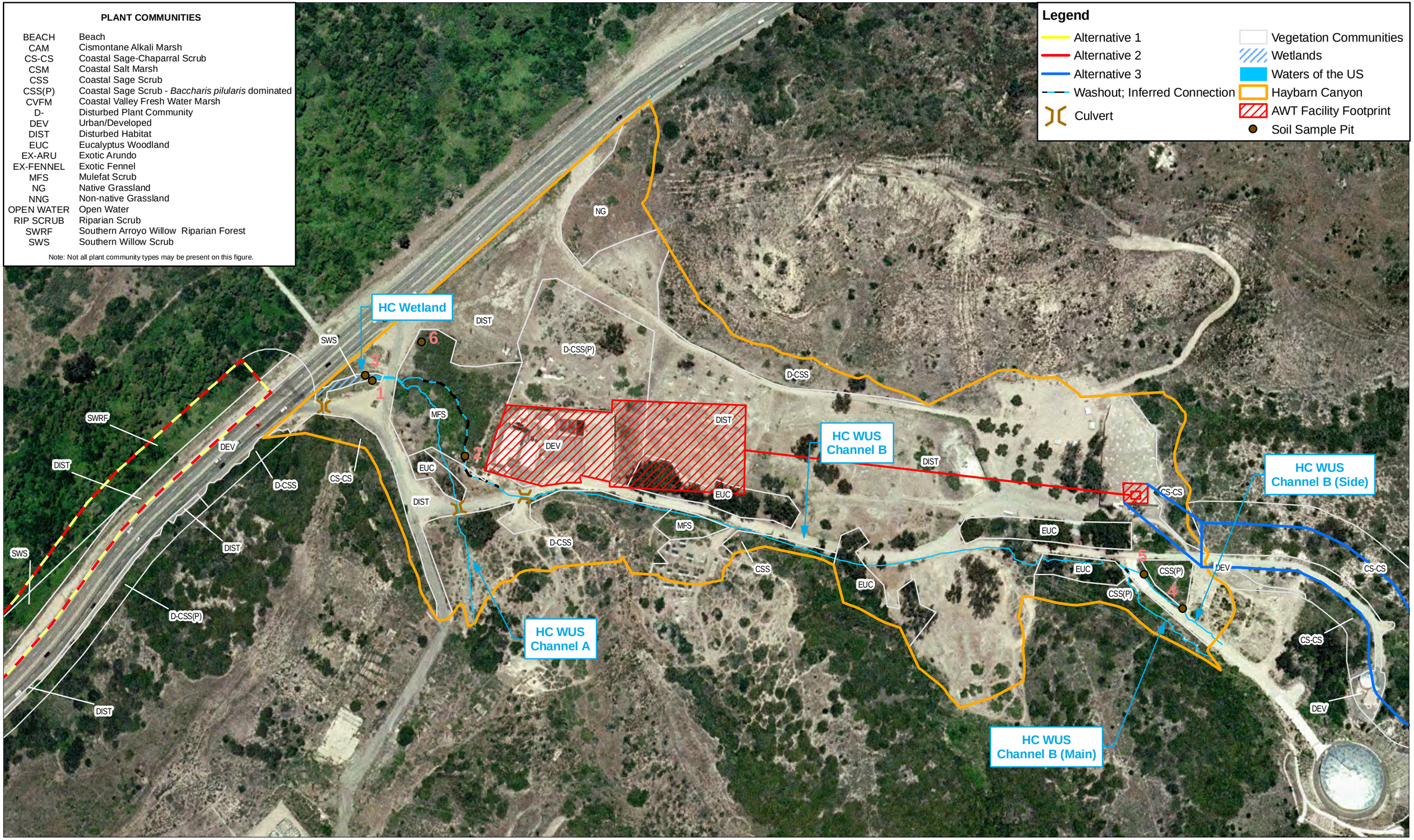

Figure 2. Jurisdictional Wetlands and Waters of the U.S.

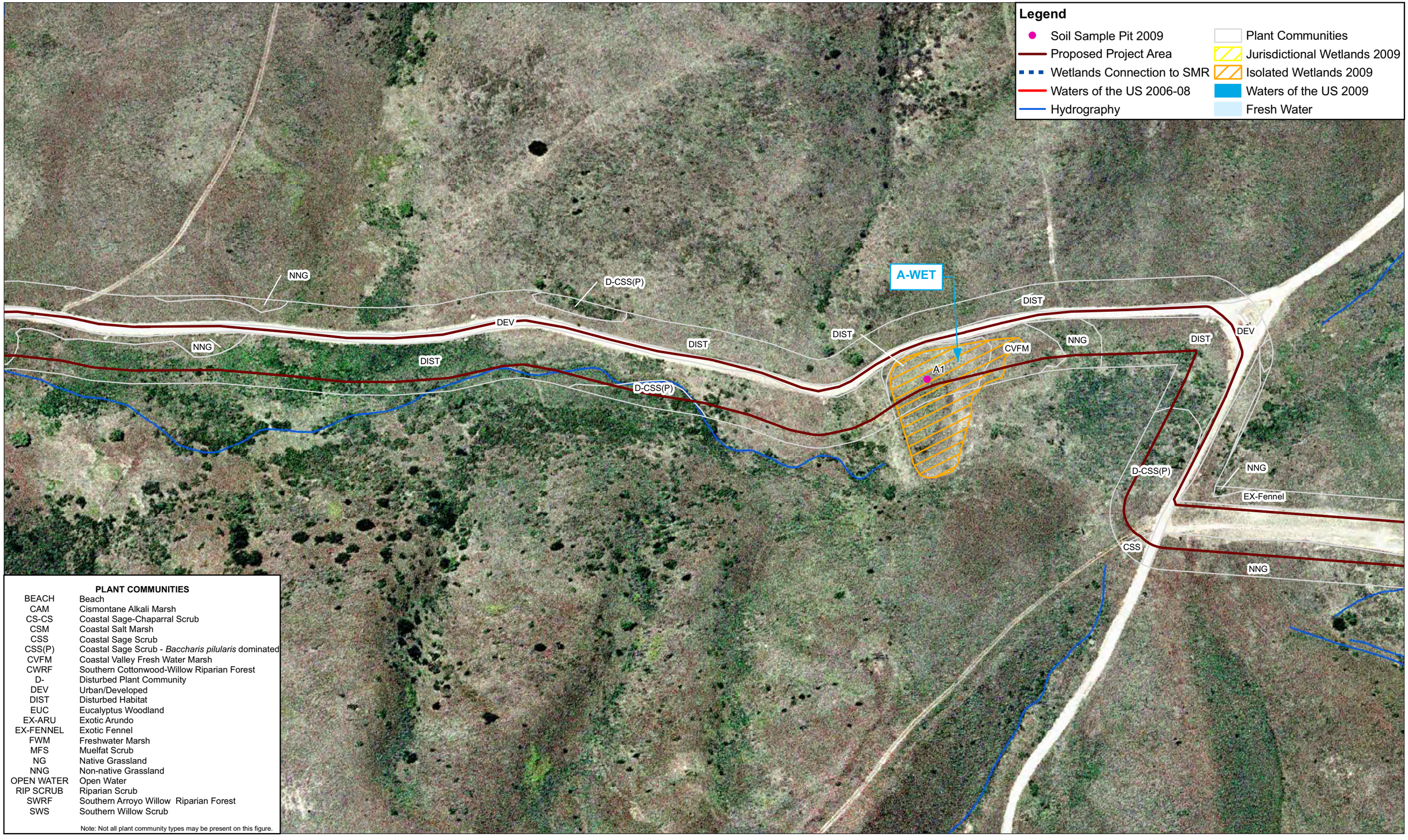

Figure 3. Jurisdictional Wetlands and Waters of the U.S.

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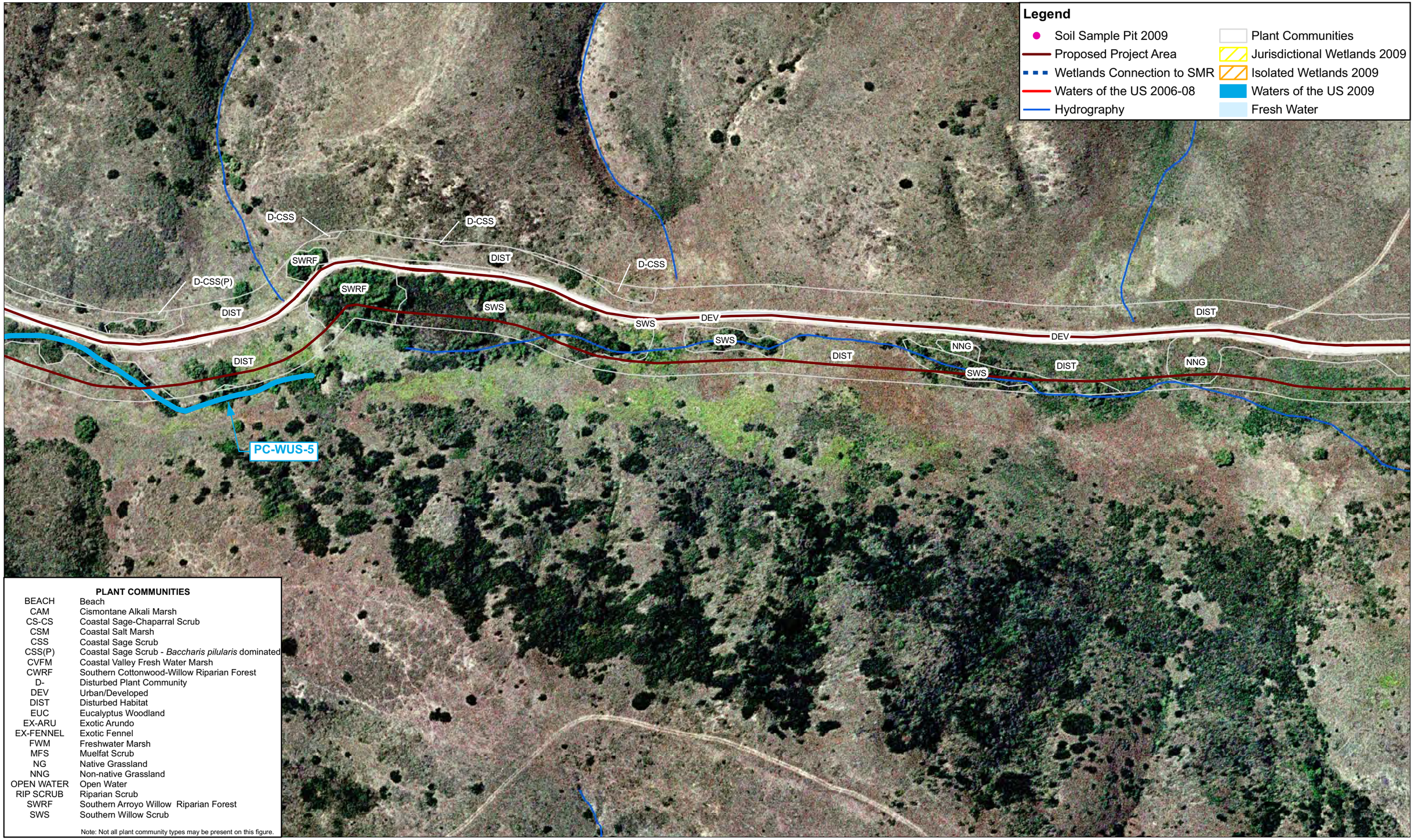

Figure 4. Jurisdictional Wetlands and Waters of the U.S.

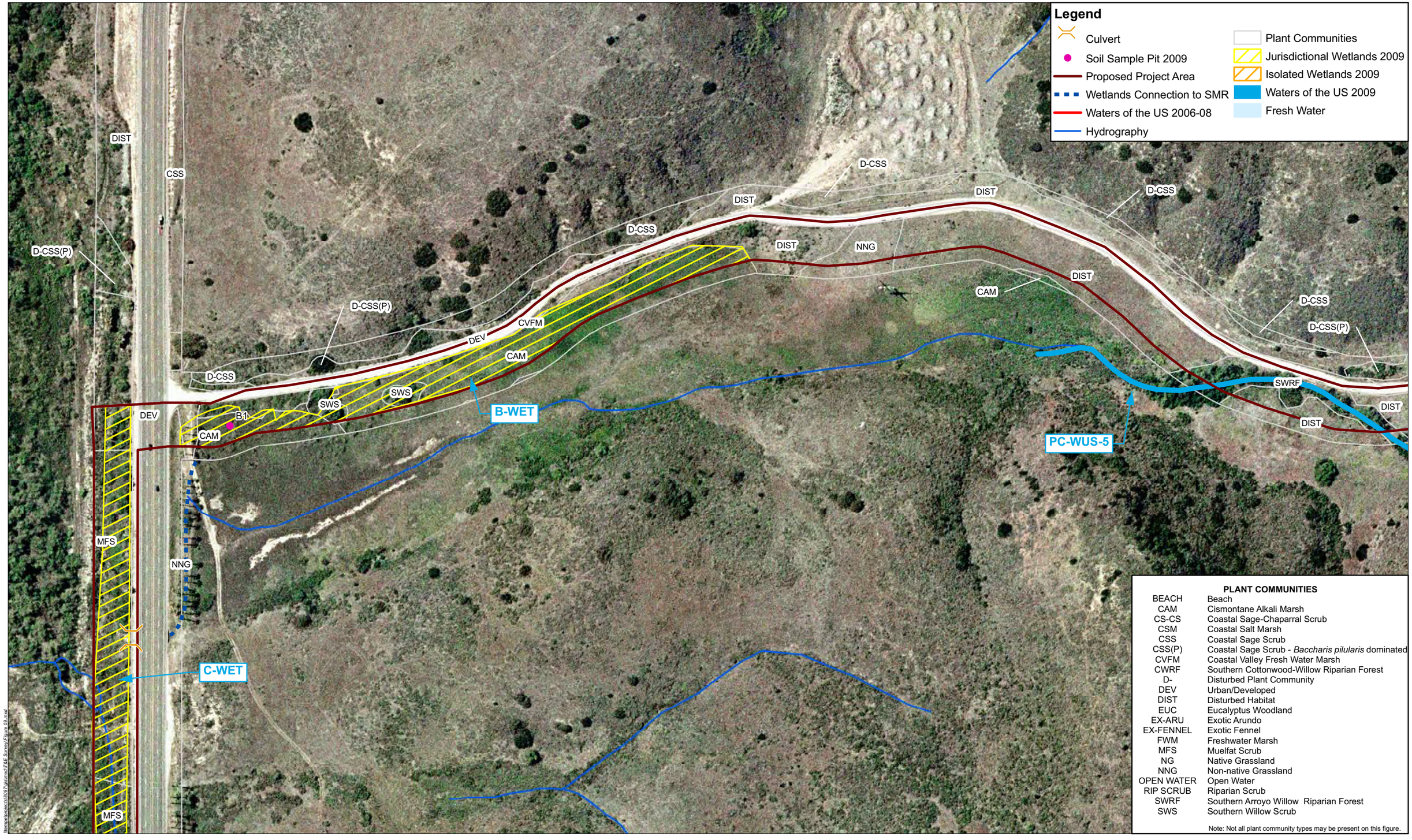

Figure 5. Jurisdictional Wetlands and Waters of the U.S.

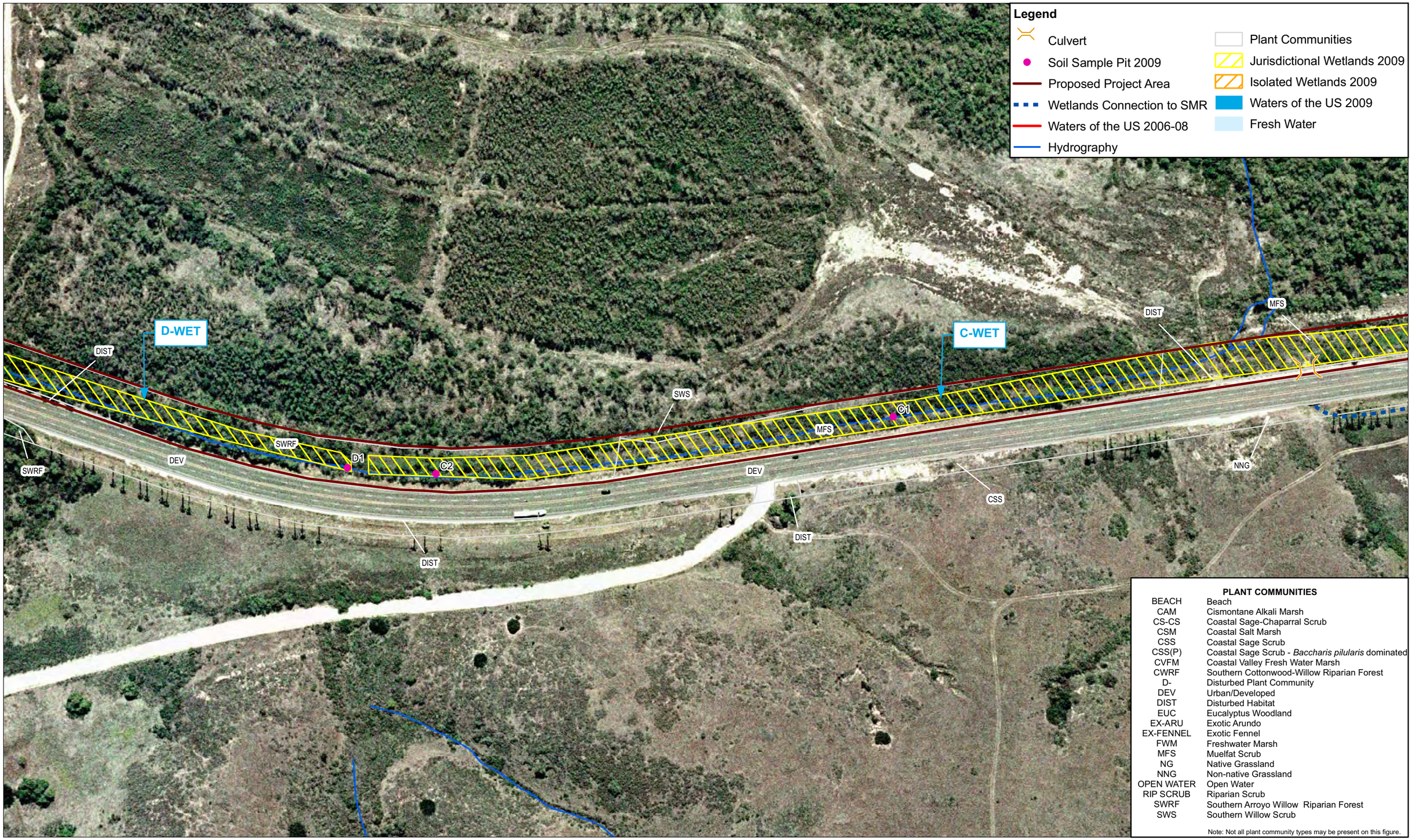

Figure 6. Jurisdictional Wetlands and Waters of the U.S.

Figure 7. Jurisdictional Wetlands and Waters of the U.S.

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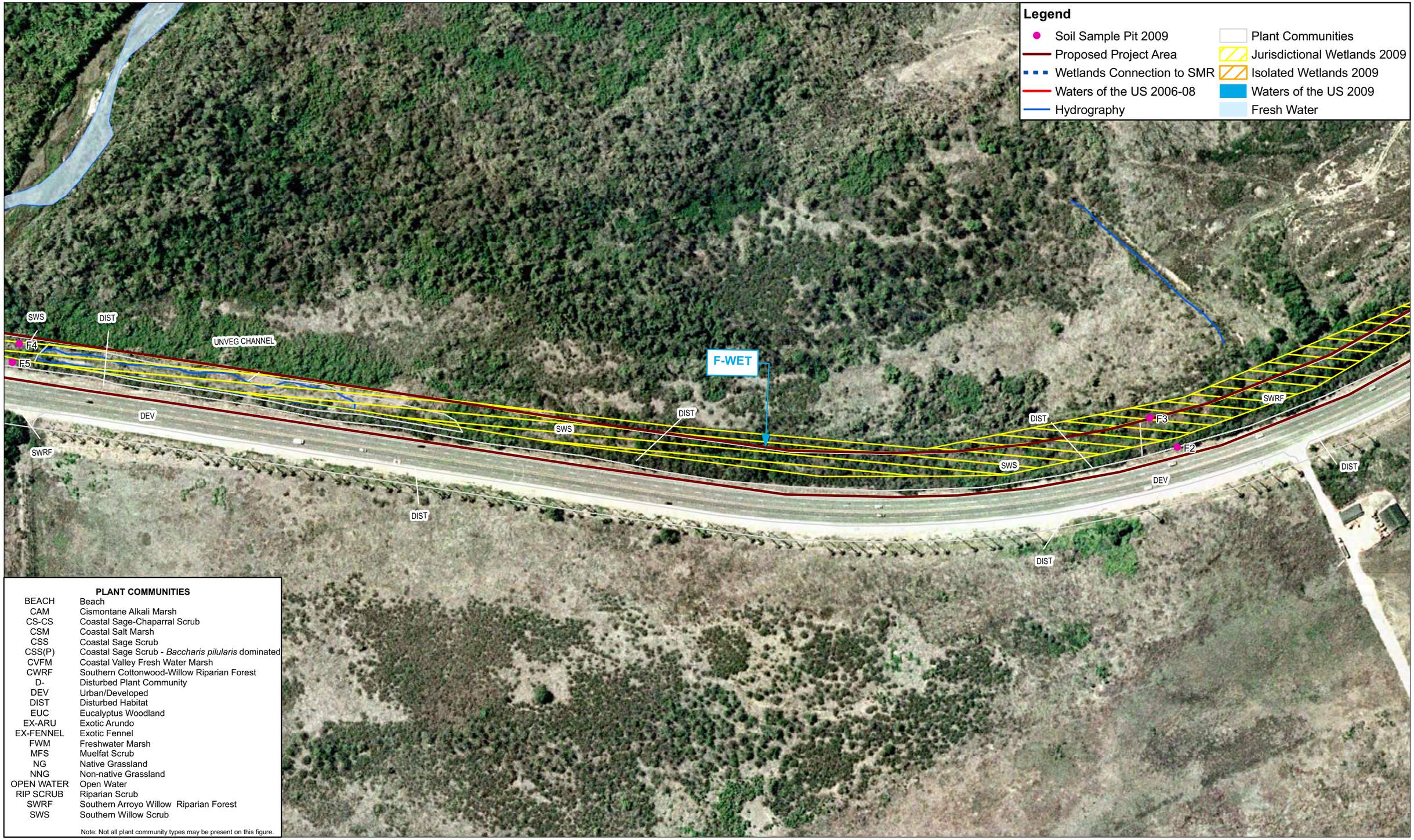

Figure 8. Jurisdictional Wetlands and Waters of the U.S.

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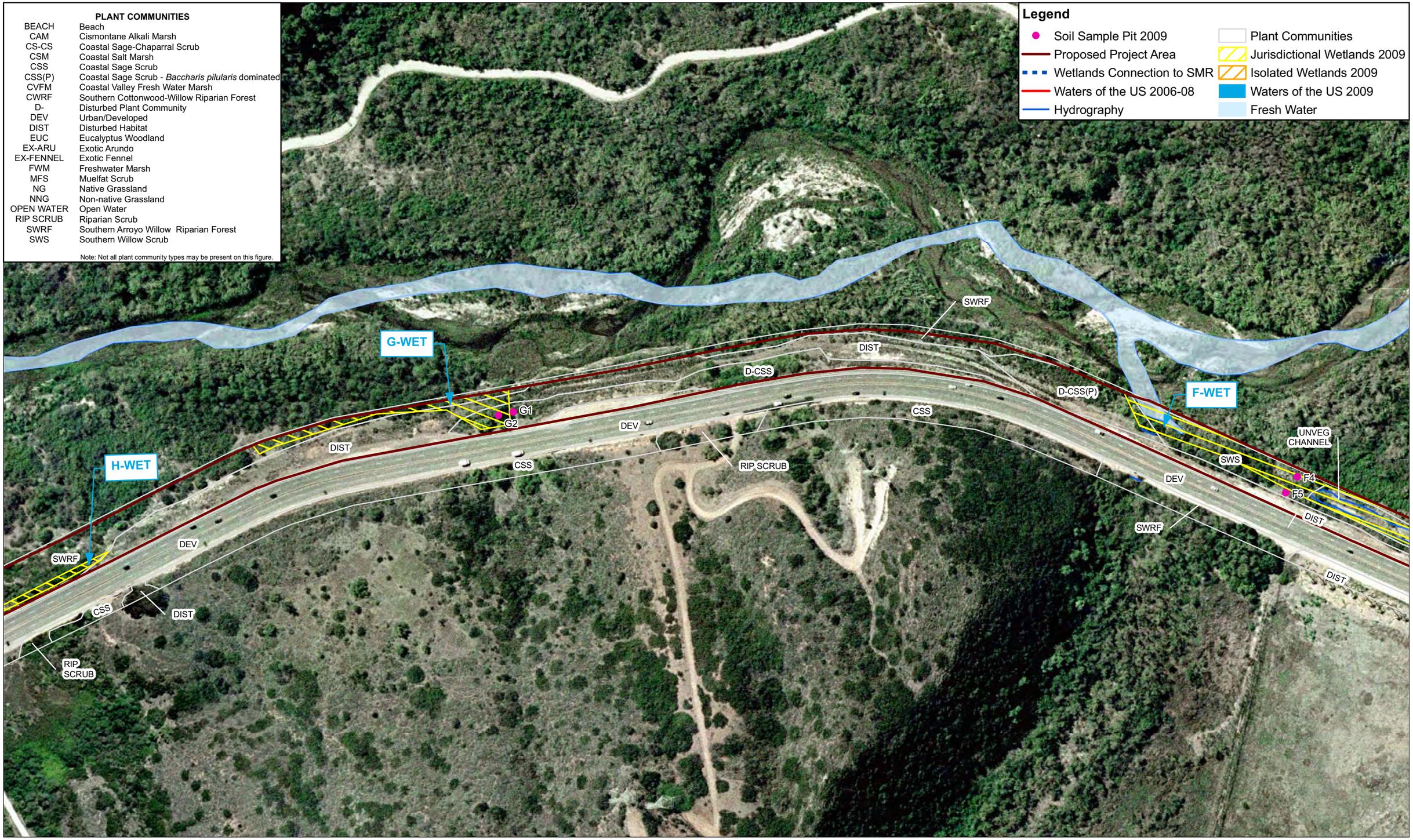

Figure 9. Jurisdictional Wetlands and Waters of the U.S.

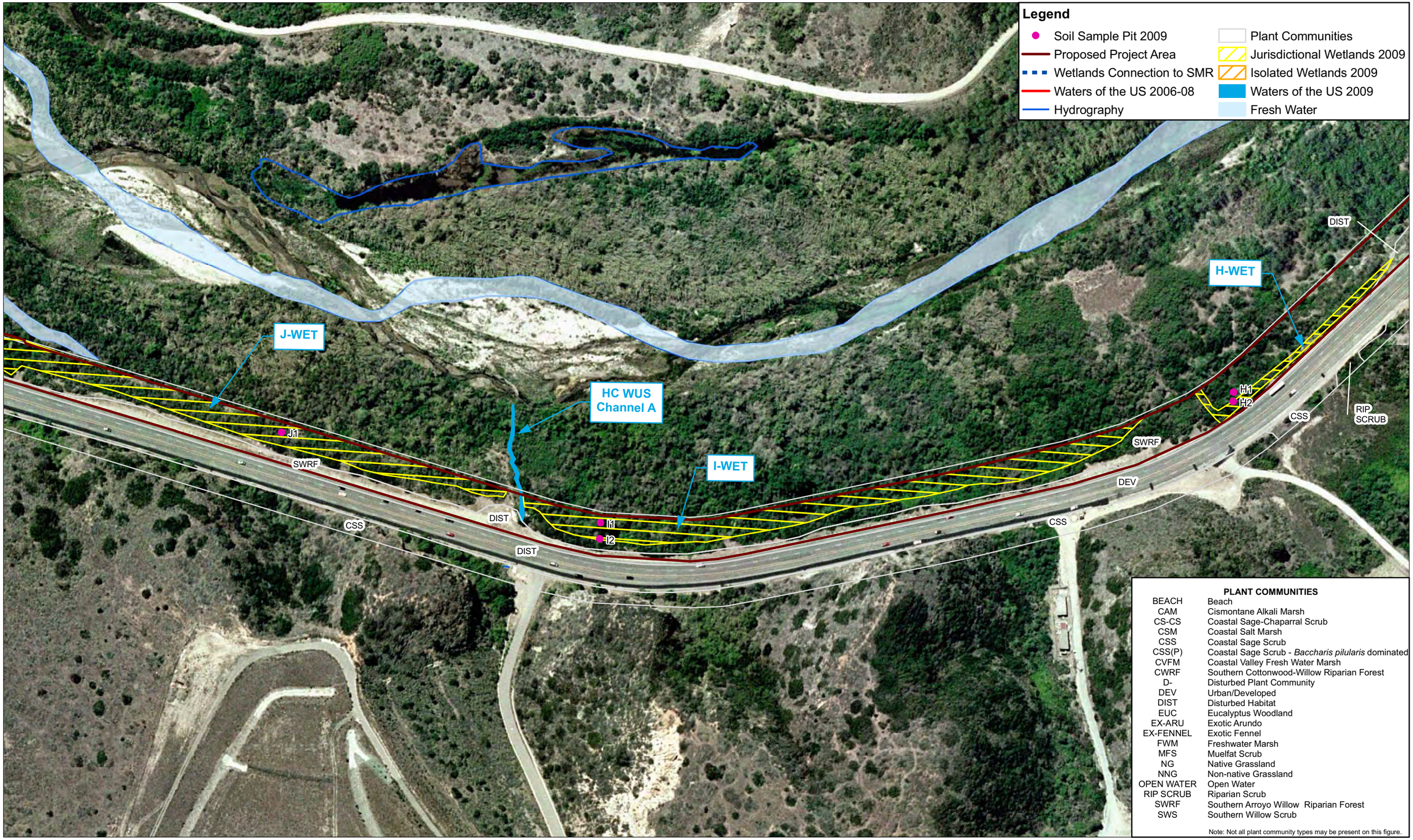

Figure 10. Jurisdictional Wetlands and Waters of the U.S.

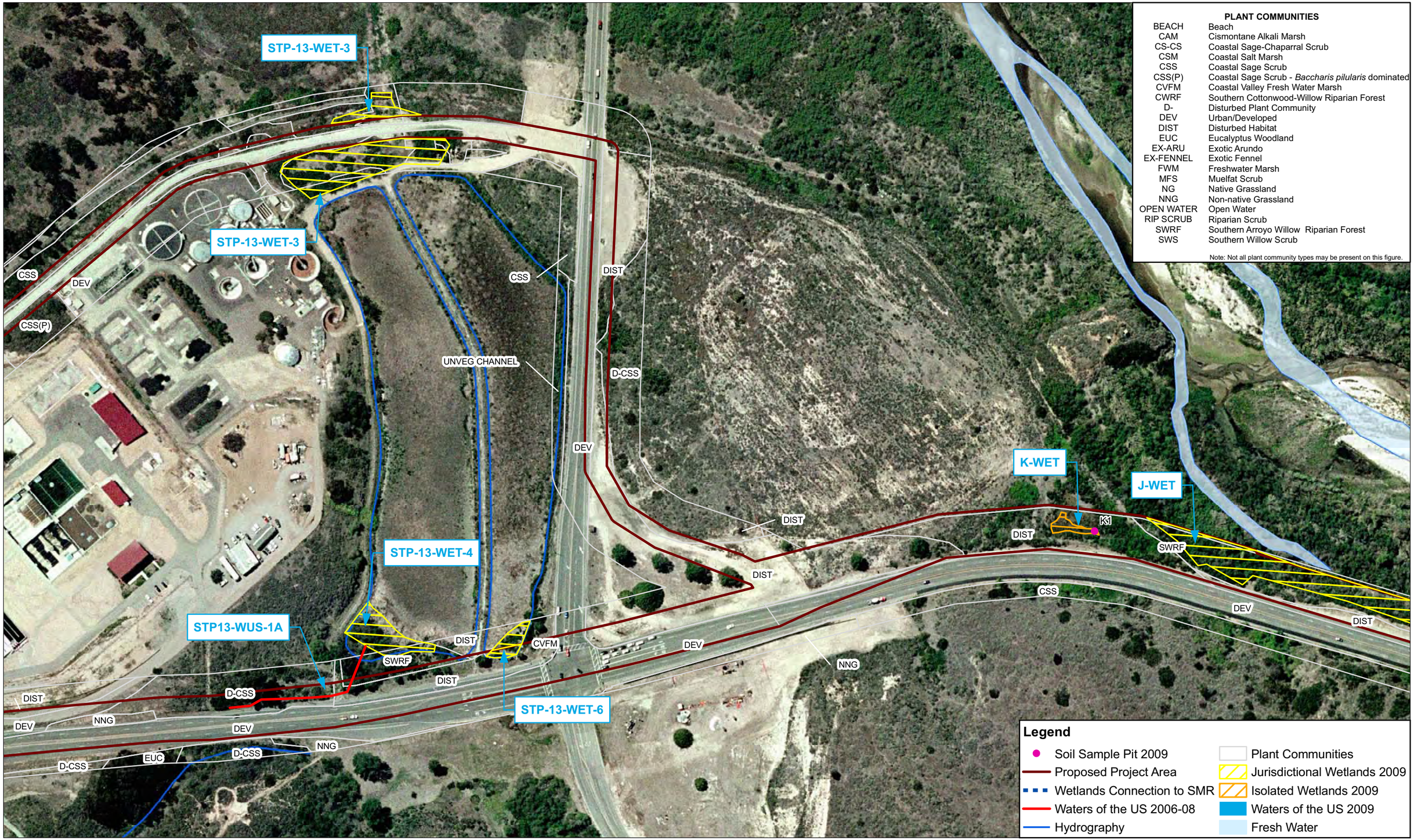

Figure 11. Jurisdictional Wetlands and Waters of the U.S.

Appendix B-2: Supporting Photographs

HAYBARN CANYON WETLANDS ALONG VANDEGRIFT BLVD-PHOTOS
SEPTEMBER 2007, NOVEMBER 2008, & JANUARY 2009

PHOTO 1. Wetland ditch at Vandegrift Blvd., September 2007.

PHOTO 2. Wetland ditch at Vandegrift Blvd., September 2007.

PHOTO 3. Sewer system manhole near wetland ditch.

PHOTO 4. Undetermined discharge to wetland ditch.

PHOTO 5. Discharge and drainage from water treatment facility.

PHOTO 6. Culvert and washout along Channel B.

PHOTO 7. Soil excavation in sandy wash with no hydric soil indicators, September 2007 (Wetland delineation soil sample pit 2).

PHOTO 8. Storm water conveyances at headwaters of Channel B.

PHOTO 9. Wetland ditch at Vandegrift Blvd., November 20, 2008.

PHOTO 10. Vegetation cleared from wetland ditch at Vandegrift Blvd., November 28, 2008.

PHOTO 11. Wetland delineation site 4.

PHOTO 12. Soil excavation in wetland delineation site 4 with no hydric soil indicators, January 2009.

PHOTO 13. Wetland delineation site 5.

PHOTO 14. Soil excavation in wetland delineation site 5 with no hydric soil indicators, January 2009.

PHOTO 15. Wetland delineation site 6.

PHOTO 16. Soil excavation in wetland delineation site 6 with no hydric soil indicators, January 2009

WETLANDS AND WATERS OF THE US ALONG PUEBLITOS CANYON ROAD-PHOTOS
MAY 2009

PHOTO 17: Isolated Wetland A at Pueblitos Canyon Road and Vandegrift Blvd.

PHOTO 18: Jurisdictional Wetland B soil sample at PueblitosCanyon Road.

PHOTO 19: Jurisdictional Wetland B at Pueblitos Canyon Road and Vandegrift Blvd.

PHOTO 20: Water of the U.S. , PC-WUS-5, at Pueblitos Canyon Road.

SANTA MARGARITA RIVER WETLANDS ALONG VANDEGRIFT BLVD-PHOTOS
MAY 2009

PHOTO 21: Wetland along Santa Margarita River (SMR).

PHOTO 22: Hydric soil indicators: Mottles in soil sample.

PHOTO 23: Dirt road between Jurisdictional Wetlands D and E.

PHOTO 24: Wetland along SMR.

PHOTO 25: Jurisdictional wetland along the SMR.

PHOTO 26: Hydrology Indicator: Drift lines within a jurisdictional wetland along the SMR.

PHOTO 27: Hydrology Indicator: Standing water in wetland.

PHOTO 28: Hydrology Indicator: SMR standing water with filamentous algae on the bank, left side of photo.

PHOTO 29: Hydrology Indicator: Salt crusts in the wetland.

PHOTO 30: Jurisdictional wetland along the SMR.

PHOTO 31: Hydrology Indicator: Jurisdictional wetland with low flowing clear water.

PHOTO 32: Hydrology Indicator: Mud/water deposits and water stained leaves.

PHOTO 33: Hydrology Indicator: SMR mud deposits, drift line, and water stained leaves.

PHOTO 34: Hydrology Indicator: Water stained leaves.

PHOTO 35: SMR wetland.

PHOTO 36: Hydric Soil Indicator: Mottles-iron redox reaction, from soil sample.

PHOTO 37: Hydrology Indicator: Soil cracks and water deposits.

PHOTO 38: Hydrology Indicator: Soil cracks and water deposits.

PHOTO 39: SMR wetland.

PHOTO 40: Water of the US - WUS1, channel along the SMR.

PHOTO 41: Wetland soil sample.

PHOTO 42: SMR jurisdictional wetland with standing water.

Appendix B-3: Wetland Data Forms

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113 Paintball Park Ditch (Adjacent)	City/County:	San Diego	Date:	10 September 2007
Applicant/Owner:	MCB Camp Pendleton	State: CA		Sampling Point:	Wetland #1
Investigator(s):	AR, MT	Section, Township, Range:	San Bernardino, T9S, R7W sec 24		
Landform (hillslope, terrace, etc.):	terrace adjacent to a ditch	Local relief (concave, convex, none):	Slope	Slope (%):	5
Subregion (LRR):	LRR-C	Lat:		Long:		Datum:	NAD 1983
Soil Map Unit Name:	TuB-Tujunga sand, 0-5% slopes	NWI classification:			

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? (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		No	x
Wetland Hydrology Present?	Yes		No	x

Is the Sampled Area within a wetland? Yes ____ No x

Remarks: Adjacent to wetland ditch for comparison. The changes on the 2008 Arid West data form do not affect the data on this form.

VEGETATION

Tree Stratum (Use scientific names) woody plan	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum (woody plants <3"dbh)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (non-woody plants, regardless of size)			
1. ice plant (Carpobrotus edulis)	50	Y	UPL
2. Lepidospartum squamatum	10	N	NI
3. black mustard (Brassica nigra)	10	N	UPL
4.			
5.			
6.			
7.			
8.			
Total Cover:	60		
Woody Vine Stratum (regardless of size)			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species	60	x 5 =	300
Column Totals:	60 (A)		300 (B)

Prevalence Index = B/A = 5 (must be ≤3.0)

Hydrophytic vegetation indicators

____ Dominance test is >50%

____ Prevalence index is ≤ 3.0[1]

____ Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks:

SOIL

Sampling point: Wetland #1

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]	Redox Features Loc[2]	Texture	Remarks
0-8	10 YR 2/2					CL	
8-							Rock

[1]Type: C=Concretion, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ Depleted Below Dark Surface (A11)
- ___ Thin Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Material (F1)
- ___ Loamy Gleyed Matrix (F3)
- ___ Depleted Matrix (F6)
- ___ Redox Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A 10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

___ Listed on National/Local Hydric Soils List

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ___ No x

Remarks: Dry at all depths. Little soil development. Low organic matter.

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___
Water Table Present? Yes ___ No ___ Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___ (12 inch determination)

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

Texture and Rock Fragment Content

Texture

- cos - coarse sand
- s - sand
- fs - fine sand
- vfs - very fine sand
- lcos - loamy coarse sand
- ls - loamy sand
- lfs - loamy fine sand
- lvfs - loamy very fine sand
- cosl - coarse sandy loam
- sl - sandy loam
- fsl - fine sandy loam
- vfsl - very fine sandy loam
- l - loam
- sil - silt loam
- si - silt
- scl - sandy clay loam
- cl - clay loam
- sicl - silty clay loam
- sc - sandy clay
- sic - silty clay
- c - clay

Rock Fragments

- gr - gravelly
- vgr - very gravelly
- xgr - extremely gravelly
- cb - cobbly
- vcb - very cobbly
- xcb - extremely cobbly
- st - stony
- vst - very stony
- xst - extremely stony

Redoximorphic Feature Morphology

Abundance

- f - few
- c - common
- m - many

Size

- 1 - fine (<2mm)
- 2 - medium 2–5mm)
- 3 - coarse (5–20mm)
- 4 - very coarse (20–76mm)
- 5 - extremely coarse (>76mm)

Type

- Fe-x - iron concentration (soft mass)
- Fe-nc - iron nodule or concretion
- Mn-x - manganese concentration (soft mass)
- Mn-nc - manganese nodule or concretion
- d - depletion

Contrast

- f - faint
- d - distinct
- p - prominent

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113 Paintball Culvert Outwash	City/County:	San Diego	Date:	10 September 2007
Applicant/Owner:	MCB Camp Pendleton	State: CA		Sampling Point:	Wetland #2
Investigator(s):	AR, MT	Section, Township, Range:	San Bernardino, T9S, R7W sec 24		
Landform (hillslope, terrace, etc.):	floodplain	Local relief (concave, convex, none):	flat	Slope (%):	0-1
Subregion (LRR):	LRR-C	Lat:		Long:	Datum: NAD 1983
Soil Map Unit Name:	TuB-Tujunga sand, 0-5% slopes			NWI classification:	

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? (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		No	x
Wetland Hydrology Present?	Yes		No	x

Is the Sampled Area within a wetland? Yes ____ No x

Remarks: Sandy wash at culvert outflow. The changes on the 2008 Arid West data form do not affect the data on this form.

VEGETATION

Tree Stratum (Use scientific names) woody plan	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum (woody plants <3"dbh)			
1. mulefat (Baccharis salicifolia)	30	Y	FACW
2. cotote bush (Baccharis pilularis)	30	Y	UPL
3.			
4.			
5.			
Total Cover:	60		
Herb Stratum (non-woody plants, regardless of size)			
1. poison hemlock (Conium maculatum)	20	Y	FAC
2. giant wildrye (Leymus condensatus)	15	Y	FACU
3. shortpod mustard (Hirschfeldia incana)	10	N	UPL
4.			
5.			
6.			
7.			
8.			
Total Cover:	60		
Woody Vine Stratum (regardless of size)			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 40 % Cover of Biotic Crust 0

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 0.50 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species		x 1 =	0
FACW species	30	x 2 =	60
FAC species	20	x 3 =	60
FACU species	15	x 4 =	60
UPL species	40	x 5 =	200
Column Totals:	105 (A)		380 (B)

Prevalence Index = B/A = 3.6190476 (must be ≤3.0)

Hydrophytic vegetation indicators

____ Dominance test is >50%

____ Prevalence index is ≤ 3.0[1]

____ Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks:

SOIL

Sampling point: Wetland #2

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]	Redox Features Loc[2]	Texture	Remarks
0-16	10 YR 4/4					S	pockets of gravel

[1]Type: C=Concretion, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ Depleted Below Dark Surface (A11)
- ___ Thin Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Material (F1)
- ___ Loamy Gleyed Matrix (F3)
- ___ Depleted Matrix (F6)
- ___ Redox Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A 10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

___ Listed on National/Local Hydric Soils List

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ___ No x

Remarks: Patches of gravel. One dark lens of ashy or dark sand, but does not appear organic. Platy layers throughout

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- x Water Marks (B1) (Riverine)
- x Sediment Deposits (B2) (Riverine)
- x Drift Deposits (B3) (Riverine)
- x Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

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): ___ (12 inch determination)

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Contrast

f - faint
d - distinct
p - prominent

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113 Paintball Park Ditch	City/County:	San Diego	Date:	10 September 2007
Applicant/Owner:	MCB Camp Pendleton	State: CA		Sampling Point:	Wetland #3
Investigator(s):	AR, MT	Section, Township, Range:	San Bernardino, T9S, R7W sec 24		
Landform (hillslope, terrace, etc.):	ditch	Local relief (concave, convex, none):	concave	Slope (%):	5
Subregion (LRR):	LRR-C	Lat:		Long:	Datum: NAD 1983
Soil Map Unit Name:	TuB-Tujunga sand, 0-5% slopes			NWI classification:	

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? (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: No pit because possible sewer input. No point data but whole feature in GPS polygon. This wetland is 0.03 acre.

VEGETATION

Tree Stratum (Use scientific names) woody plan	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum (woody plants <3"dbh)			
1. arroyo willow (Salix lasiolepis)	10	Y	FACW
2. narrow leaf willow (Salix exigua)	8	Y	FACW
3. black willow (Salix gooddingii)	8	Y	FACW
4.			
5.			
Total Cover:	26		
Herb Stratum (non-woody plants, regardless of size)			
1. ice plant (Carpobrotus edulis)	15	Y	UPL
2. cocklebur (Xanthium strumarium)	15	Y	FAC
3. crabgrass (Digitaria sanguinalis)	15	Y	FACU
4. western ragweed (Ambrosia psilostachya)	15	Y	FAC
5. Willow-dock (Rumex salicifolius)	10	N	OBL
	5	N	UPL
	5	N	NI
8. Cyperus esculentus	5	N	FACW
	15	N	N/A
Total Cover:	100		
Woody Vine Stratum (regardless of size)			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0.71 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:

OBL species	10	x 1 =	10
FACW species	31	x 2 =	62
FAC species	30	x 3 =	90
FACU species	15	x 4 =	60
UPL species	5	x 5 =	25
Column Totals:	91 (A)		247 (B)

2.7142857 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

____ Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Also cattail (Typha sp.) and tamarisk, but not dominant. The plot size is 0.03 acre. Plot size is included on the 2008 Arid West data form but was not on this form.

SOIL

Sampling point: Wetland #3

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]	Redox Features Loc[2]	Texture	Remarks

[1]Type: C=Concretion, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ Depleted Below Dark Surface (A11)
- ___ Thin Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Material (F1)
- ___ Loamy Gleyed Matrix (F3)
- ___ Depleted Matrix (F6)
- ___ Redox Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A 10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

___ Listed on National/Local Hydric Soils List

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes x* No ___

Remarks: *No pit dug because of possible sewer discharge. Soil was saturated, stading water present. Vigorous wetland vegetation during September of dry year. Hyrdic soil inferred based on other evidence.

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (any one indicator is sufficient)

- x Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- x Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- x Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- x Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes x	No ___	Depth (inches): 10		
Water Table Present?	Yes x	No ___	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes x	No ___	Depth (inches): ___ (12 inch determination)	**Wetland Hydrology Present?**	Yes x No ___

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

Remarks:
Wetland boundary distinguished by diverse plant community within the trough, surrounded by iceplant on adjacent berms.

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113 Paintball Park (Haybarn Canyon)	City/County:	San Diego	Date:	22 January 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	Wetland #4
Investigator(s):	MT	Section, Township, Range:	San Bernardino, T9S, R7W, sec 24		
Landform (hillslope, terrace, etc.):	gentle slope	Local relief (concave, convex, none):	none	Slope (%):	5
Subregion (LRR):	LRR-C	Lat:	33º 18' 38.89"	Long: 117º 19' 41.91"	Datum: NAD 1983
Soil Map Unit Name:	TuB-Tujunga, 0-5% slopes			NWI classification:	

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ significanly disturbed? (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		No	x
Wetland Hydrology Presnt?	Yes		No	x

Is the Sampled Area within a wetland? Yes ____ No x

Remarks: Sample location is within the vegetated (CSS[P])drainage area just downstream of the disturbed eastern portion of the Paintball Park.

VEGETATION

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum ((Plot size: 50m2)			
1. Coyote brush (Bacharis pilularis)	30	Yes	UPL
2. Mulefat (Bacharis salicifolia)	7	No	FACW
3. Tree Tobacco (Nicotiana glauca)	3	No	FAC
Total Cover:	40		
Herb Stratum (Plot size: 50m2)			
1. Poison Hemlock (Conium maculatum)	20	Yes	FACW
2. Giant wildrye (Leymus condensatus)	20	Yes	FACU
3. Black mustard (Brassica nigra)	5	No	UPL
Total Cover:	45		
Woody Vine Stratum ((Plot size: ____)			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 55 % Cover of Biotic Crust ____

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 0.33 (A/B) (must be >0.5)

Prevalence index worksheet

Total % Cover (absolute) of:			Multiply by:
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Coumn Totals:	0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0! (must be ≤3.0)

Hydrophytic vegetation indicators

____ Dominance test is >50%

____ Prevalence index is ≤ 3.0[1]

____ Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ____ **No** x

Remarks: CSS(P) dominated by coyote brush with patches of giant wildrye, mulefat, and a few mexican elderberry trees and tree tobacco. Herb layer dominated by poison hemlock.

SOIL

Sampling point: Wetland #4

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]	Redox Features Loc[2]	Texture	Remarks
0-12	10 YR 4/2	100	None			scl	uniform

[1]Type: C=Concretion, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ Depleted Below Dark Surface (A11)
- ___ Thin Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Material (F1)
- ___ Loamy Gleyed Matrix (F3)
- ___ Depleted Matrix (F6)
- ___ Redox Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A 10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ 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: The soil was too hard to dig further than 12 inches. The soil was uniform with no signs of being hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

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): >12	

Wetland Hydrology Present? Yes ___ No x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Most recent substantial rain was in late December 2008.

Remarks: Drainage area downslope from disturbed portion of the paintball park. Roadside channel runs into CSS(P) vegetation and forms a channel through the vegetation.

Texture and Rock Fragment Content

Texture

- cos - coarse sand
- s - sand
- fs - fine sand
- vfs - very fine sand
- lcos - loamy coarse sand
- ls - loamy sand
- lfs - loamy fine sand
- lvfs - loamy very fine sand
- cosl - coarse sandy loam
- sl - sandy loam
- fsl - fine sandy loam
- vfsl - very fine sandy loam
- l - loam
- sil - silt loam
- si - silt
- scl - sandy clay loam
- cl - clay loam
- sicl - silty clay loam
- sc - sandy clay
- sic - silty clay
- c - clay

Rock Fragments

- gr - gravelly
- vgr - very gravelly
- xgr - extremely gravelly
- cb - cobbly
- vcb - very cobbly
- xcb - extremely cobbly
- st - stony
- vst - very stony
- xst - extremely stony

Redoximorphic Feature Morphology

Abundance

- f - few
- c - common
- m - many

Size

- 1 - fine (<2mm)
- 2 - medium 2–5mm)
- 3 - coarse (5–20mm)
- 4 - very coarse (20–76mm)
- 5 - extremely coarse (>76mm)

Type

- Fe-x - iron concentration (soft mass)
- Fe-nc - iron nodule or concretion
- Mn-x - manganese concentration (soft mass)
- Mn-nc - manganese nodule or concretion
- d - depletion

Contrast

- f - faint
- d - distinct
- p - prominent

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113 Paintball Park (Haybarn Canyon)	City/County:	San Diego	Date:	22 January 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	Wetland #5
Investigator(s):	MT	Section, Township, Range:	San Bernardino, T9S, R7W, sec 24		
Landform (hillslope, terrace, etc.):	Gentle slope	Local relief (concave, convex, none):	slight concave	Slope (%):	<5
Subregion (LRR):	LRR-C	Lat:	33º 18' 39.27"	Long: 117º 19' 43.13"	Datum: NAD 1983
Soil Map Unit Name:	TuB-Tujunga, 0-5% slopes			NWI classification:	

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ significanly disturbed? (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 ____ No x
Hydric Soil Present?	Yes	No x		
Wetland Hydrology Presnt?	Yes	No x		

Remarks: Sample location is the vegetated drainage area downstream of the disturbed eastern portion of the Paintball Park and just upstream of the Arizona crossing. The vegetation for the wetland delineation is a pocket of riparian vegetation within the CSS(P).

VEGETATION

Tree Stratum (Plot size: 50m2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Mexican elderberry (Sambucus mexicanus)	60	Yes	FAC
2.			
3.			
4.			
Total Cover:	60		
Sapling/Shrub Stratum (Plot size: 50m2)			
1. Mulefat (Bacharis salicifolia)	15	Yes	FACW
2. Coyote brush (Bacharis pilularis)	7	Yes	UPL
3. Arroyo willow (Salix lasiolepis)	5	No	FACW
4. California sagebrush (Artemisia californica)	1	No	UPL
Total Cover:	28		
Herb Stratum (Plot size: 50m2)			
1. Poison Hemlock (Conium maculatum)	50	Yes	FACW
2. Black mustard (Brassica nigra)	10	No	UPL
3. Giant wildrye (Leymus condensatus)	7	No	FACU
Total Cover:	67		
Woody Vine Stratum (Plot size: 50m2)			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 33 % Cover of Biotic Crust ____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0.75 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:		Multiply by:	
OBL species	____	x 1 =	0
FACW species	____	x 2 =	0
FAC species	____	x 3 =	0
FACU species	____	x 4 =	0
UPL species	____	x 5 =	0
Coumn Totals:	0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0! (must be ≤3.0)

Hydrophytic vegetation indicators

____ Dominance test is >50%

____ Prevalence index is ≤ 3.0[1]

____ Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** x **No** ____

Remarks: The vegetation for the wetland delineation is a pocket of riparian vegetation within the CSS(P).

SOIL

Sampling point: Wetland #5

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]	Redox Features Loc[2]	Texture	Remarks
0-12	2.5Y 5/2	100	None			sl	uniform

[1]Type: C=Concretion, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ Depleted Below Dark Surface (A11)
- ___ Thin Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Material (F1)
- ___ Loamy Gleyed Matrix (F3)
- ___ Depleted Matrix (F6)
- ___ Redox Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A 10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Ind Listed on National/Local Hydric Soils List
wetland hydrology must be present
unless disturbed or problematic

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ___ No x

Remarks: Soil is uniform with no signs of being hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C6)
- ___ Other (Explain in Remarks)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

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): >12	

Wetland Hydrology Present? Yes ___ No x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Most recent substantial rain was in late December 2008.

Remarks: A weak channel from the east side of the paintball park runs through the CSS(P) across the Arizona crossing. Dry leaf litter in area, no water stained leaves.

Texture and Rock Fragment Content

Texture

- cos - coarse sand
- s - sand
- fs - fine sand
- vfs - very fine sand
- lcos - loamy coarse sand
- ls - loamy sand
- lfs - loamy fine sand
- lvfs - loamy very fine sand
- cosl - coarse sandy loam
- sl - sandy loam
- fsl - fine sandy loam
- vfsl - very fine sandy loam
- l - loam
- sil - silt loam
- si - silt
- scl - sandy clay loam
- cl - clay loam
- sicl - silty clay loam
- sc - sandy clay
- sic - silty clay
- c - clay

Rock Fragments

- gr - gravelly
- vgr - very gravelly
- xgr - extremely gravelly
- cb - cobbly
- vcb - very cobbly
- xcb - extremely cobbly
- st - stony
- vst - very stony
- xst - extremely stony

Redoximorphic Feature Morphology

Abundance

- f - few
- c - common
- m - many

Size

- 1 - fine (<2mm)
- 2 - medium 2–5mm)
- 3 - coarse (5–20mm)
- 4 - very coarse (20–76mm)
- 5 - extremely coarse (>76mm)

Type

- Fe-x - iron concentration (soft mass)
- Fe-nc - iron nodule or concretion
- Mn-x - manganese concentration (soft mass)
- Mn-nc - manganese nodule or concretion
- d - depletion

Contrast

- f - faint
- d - distinct
- p - prominent

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113 Paintball Park (Haybarn Canyon)	City/County: San Diego		Date:	22 & 30 January 2009
Applicant/Owner:	MCB Camp Pendleton	State: CA		Sampling Point:	Wetland #6
Investigator(s):	MT, MD	Section, Township, Range:	San Bernardino, T9S, R7W, sec 24		
Landform (hillslope, terrace, etc.):	Flat area next to Vandegrift Blvd.	Local relief (concave, convex, none):	none	Slope (%):	0-1
Subregion (LRR):	LRR-C	Lat: 33º 18' 44.54"	Long: 117º 20' 02.97"	Datum:	NAD 1983
Soil Map Unit Name:	TuB-Tujunga, 0-5% slopes			NWI classification:	

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ significanly disturbed? (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 ____ No x
Hydric Soil Present?	Yes ____	No x		
Wetland Hydrology Presnt?	Yes ____	No x		

Remarks: Open area on the northwest edge of the mulefat scrub (MFS).

VEGETATION

Tree Stratum (Plot size: 50m2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Arroyo willow (Salix lasiolepis)	50	Yes	FACW
2.			
3.			
4.			
Total Cover:	50		
Sapling/Shrub Stratum (Plot size: 50m2)			
1. Mulefat (Bacharis salicifolia)	25	Yes	FACW
Total Cover:	25		
Herb Stratum (Plot size: 50m2)			
1. Poison Hemlock (Conium maculatum)	59	Yes	FACW
2. Black mustard (Brassica nigra)	1	No	UPL
Total Cover:	60		
Woody Vine Stratum (Plot size:)			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 40 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:		Multiply by:	
OBL species	____	x 1 =	0
FACW species	____	x 2 =	0
FAC species	____	x 3 =	0
FACU species	____	x 4 =	0
UPL species	____	x 5 =	0
Coumn Totals:	0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0! (must be ≤3.0)

Hydrophytic vegetation indicators

____ Dominance test is >50%

____ Prevalence index is ≤ 3.0[1]

____ Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** x **No** ____

Remarks: Open area dominated by poison hemlock on the northwest edge of mature mulefat scrub (MFS). Large old stressed Arroyo willow.

SOIL

Sampling point: Wetland #6

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]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR4/2	100	None			sl	uniform
6 - 20	10YR3/2	100	None			scl	uniform

[1]Type: C=Concretion, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ Depleted Below Dark Surface (A11)
- ___ Thin Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Material (F1)
- ___ Loamy Gleyed Matrix (F3)
- ___ Depleted Matrix (F6)
- ___ Redox Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A 10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Ind Listed on National/Local Hydric Soils List
wetland hydrology must be present
unless disturbed or problematic

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? **Yes** ___ **No** x

Remarks: Well-drained, no hardpan or aquitard. Reddish-brown roots/organic matter; no oxidation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soil (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

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): >20	

Wetland Hydrology Present? **Yes** ___ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Most recent substantial rain was in late December 2008.

Remarks: The area probably historically had wetland hydrology. There is a large stressed arroyo willow in the area and large stand of mulefat surrounding the area. The majority of the current flow and runoff follows Channel A & B into the culvert that flows under Vandegrift Blvd (Figure 1).

Texture and Rock Fragment Content

Texture

- cos - coarse sand
- s - sand
- fs - fine sand
- vfs - very fine sand
- lcos - loamy coarse sand
- ls - loamy sand
- lfs - loamy fine sand
- lvfs - loamy very fine sand
- cosl - coarse sandy loam
- sl - sandy loam
- fsl - fine sandy loam
- vfsl - very fine sandy loam
- l - loam
- sil - silt loam
- si - silt
- scl - sandy clay loam
- cl - clay loam
- sicl - silty clay loam
- sc - sandy clay
- sic - silty clay
- c - clay

Rock Fragments

- gr - gravelly
- vgr - very gravelly
- xgr - extremely gravelly
- cb - cobbly
- vcb - very cobbly
- xcb - extremely cobbly
- st - stony
- vst - very stony
- xst - extremely stony

Redoximorphic Feature Morphology

Abundance

- f - few
- c - common
- m - many

Size

- 1 - fine (<2mm)
- 2 - medium 2–5mm)
- 3 - coarse (5–20mm)
- 4 - very coarse (20–76mm)
- 5 - extremely coarse (>76mm)

Type

- Fe-x - iron concentration (soft mass)
- Fe-nc - iron nodule or concretion
- Mn-x - manganese concentration (soft mass)
- Mn-nc - manganese nodule or concretion
- d - depletion

Contrast

- f - faint
- d - distinct
- p - prominent

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	14 May 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	A1
Investigator(s):	RK, MT	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	TERRACE	Local relief (concave, convex, none):	NONE	Slope (%):	0
Subregion (LRR):	LRR C	Lat: 33.27994615060	Long: -117.34866406800	Datum:	NAD 1983
Soil Map Unit Name:	GAVIOTA FINE SANDY LOAM			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____	

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum (Plot Size: 10)			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot Size: 3.28)			
MALVELLA LEPROSA	40	YES	FAC
POLYPOGON MONSPELIENSIS	5	NO	FACW
RUMEX CRISPUS	15	NO	FACW
BRASSICA NIGRA	8	NO	UPL
VERBENA LASIOSTACHYS	30	YES	FAC
SCHISMUS ARABICUS	50	YES	UPL
LOLIUM MULTIFLORUM	4	NO	FAC
8.			
Total Cover:	148		
Woody Vine Stratum (Plot Size: 10)			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 40 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0.67 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	74	x 3 =	222
FACU species	0	x 4 =	0
UPL species	58	x 5 =	290
Coumn Totals:	152 (A)		552 (B)

Prevalence Index = B/A = 3.631579 (must be ≤3.0)

Hydrophytic vegetation indicators

- X Dominance test is >50%
- 0 Prevalence index is ≤ 3.0[1]
- 0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: A1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/1	50	2.5Y 5/6	50	RM	PL	LOAMY CLAY	
6-10	2.5Y 2.5/1	85	2.5Y 6/8	15	RM	M	CLAY	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)	X	Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)	X	Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)	X	Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

Restrictive Layer (if present):

Type: CLAY PAN

Depth (inches): 10

Hydric Soil Present? **Yes** X **No** ____

Remarks: SHALLOW AQUITARD STARTS AT 6".

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	X	Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
X	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)	X	Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
X	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)	X	Shallow Aquitard (D3)
	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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** X **No** ____

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

Remarks: PONDED WATER DURING RAINY SEASON DUE TO AQUITARD. FEATURE APPEARS TO BE ISOLATED.

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	14 May 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	B1
Investigator(s):	RK, MT	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	FLOODPLAIN	Local relief (concave, convex, none):	NONE	Slope (%):	0
Subregion (LRR):	LRR C	Lat: 33.27371780480	Long: -117.37089941300	Datum:	NAD 1983
Soil Map Unit Name:	GREENFIELD SANDY LOAM			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____		

Remarks: ##

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum (Plot Size: 10')			
BACCHARIS SALICIFOLIA	15	YES	FACW
2.			
3.			
4.			
5.			
Total Cover:	15		
Herb Stratum (Plot Size: 3.28')			
FRANKENIA SALINA	60	YES	FACW
POLYPOGON MONSPELIENSIS	10	NO	FACW
CONIUM MACULATUM	7	NO	FACW
CONYZA CANADENSIS	10	NO	FAC
SONCHUS OLERACEUS	15	NO	UPL
SALICORNIA VIRGINICA	5	NO	OBL
PICRIS ECHIOIDES	3	NO	FAC
8.			
Total Cover:	110		
Woody Vine Stratum (Plot Size: 10')			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 45 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	5	x 1 =	5
FACW species	92	x 2 =	184
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	15	x 5 =	75
Coumn Totals:	122 (A)		294 (B)

Prevalence Index = B/A = 2.409836 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: B1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-1.5	2.5Y 3/3	80	7.5YR 6/8	20	RM	PL	SAND	COMPRESSED
1.5-3.5	2.5Y 2.5/1	70	2.5Y 4/3	30	D	M	SA-LOAM	
3.5-20	2.5Y 3/2	90	2.5Y 5/3	10	D	M	SA- LOAM	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)	X	Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)	X	Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and
	Sandy Gleyed Matrix (S4)				wetland hydrology must be present

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks: MOIST SOIL. REFUSAL AT 15" DUE TO COBBLE (FILL).

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)	X	Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)	X	Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
X	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
X	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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** X **No**

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

Remarks:

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	14 May 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	C1
Investigator(s):	RK, MT	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	FLOODPLAIN	Local relief (concave, convex, none):	CONVEX	Slope (%):	0
Subregion (LRR):	LRR C	Lat: 33.26976151000	Long: -117.37019185100	Datum:	NAD 1983
Soil Map Unit Name:	GREENFIELD SANDY LOAM			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	30	YES	FACW
2.			
3.			
4.			
Total Cover:	30		
Sapling/Shrub Stratum (Plot Size: 10')			
BACCHARIS SALICIFOLIA	20	YES	FACW
2.			
3.			
4.			
5.			
Total Cover:	20		
Herb Stratum (Plot Size: 3.28')			
ANEMOPSIS CALIFORNICA	60	YES	OBL
POLYPOGON MONSPELIENSIS	10	NO	FACW
TYPHA DOMINGENSIS	10	NO	OBL
HELIOTROPIUM CURASSARIUM	8	NO	OBL
SCHOENOPLECTUS PUNGENS	7	NO	OBL
JUNCUS SPP	5		
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 10')			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 60 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	85	x 1 =	85
FACW species	60	x 2 =	120
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Coumn Totals:	145 (A)		205 (B)

Prevalence Index = B/A = 1.413793 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: C1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 3/1	90	10YR 5/8	10	RM	M	SANDY LOAM	
4-15	2.5Y 3/2	85	7.5YR 5/8	1	RM	M	SANDY LOAM	
			5YR 3/4	3	CS	M		

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)	X	Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks: MOIST SOIL. REFUSAL AT 15" DUE TO COBBLE (FILL).

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)	X	Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
X	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
X	Drift Deposits (B3) (Nonriverine)	X	Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
X	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
X	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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** X **No**

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

Remarks:

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	13 May 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	C2
Investigator(s):	RK, MT	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	FLOODPLAIN	Local relief (concave, convex, none):	CONVEX	Slope (%):	0
Subregion (LRR):	LRR C	Lat: 33.26700519120	Long: -117.36917607000	Datum:	NAD 1983
Soil Map Unit Name:	GREENFIELD SANDY LOAM			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	80	YES	FACW
2.			
3.			
4.			
Total Cover:	80		
Sapling/Shrub Stratum (Plot Size: 10')			
TAMARIX RAMOSISSIMA	2	YES	FAC
2.			
3.			
4.			
5.			
Total Cover:	2		
Herb Stratum (Plot Size: 3.28')			
ANEMOPSIS CALIFORNICA	YES	20	OBL
POLYPOGON MONSPELIENSIS	NO	1	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	21		
Woody Vine Stratum (Plot Size: 10')			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 80 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

	Total % Cover (absolute) of:		Multiply by:
OBL species	20	x 1 =	20
FACW species	81	x 2 =	162
FAC species	2	x 3 =	6
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Coumn Totals:	103 (A)		188 (B)

Prevalence Index = B/A = 1.825243 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: C2

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 %	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 3/3	100					CLAY	
2-6	2.5Y 3/2	85	10YR 5/8	15	RM	M	SILT	
6-18	2.5Y 3/2	95	2.5Y 5/6	5	CS	M	CLAY LOAM	WITH FINE SAND

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks: MOIST SOIL

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)
	Surface Water (A1)	X	Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)	X	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
X	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
X	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
X	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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** X **No**

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

Remarks:

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	13 May 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	D1
Investigator(s):	RK, MT	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	FLOODPLAIN	Local relief (concave, convex, none):	CONCAVE	Slope (%):	2
Subregion (LRR):	LRR C	Lat: 33.26645318180	Long: -117.36910389000	Datum:	NAD 1983
Soil Map Unit Name:	GREENFIELD SANDY LOAM			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	40	YES	FACW
2.			
3.			
4.			
Total Cover:	40		
Sapling/Shrub Stratum (Plot Size: 10')			
TAMARIX RAMOSISSIMA	10	YES	FAC
BACCHARIS SALICIFOLIA	8	YES	FACW
3.			
4.			
5.			
Total Cover:	18		
Herb Stratum (Plot Size: 3.28')			
HELIOTROPIUM CURASSAVICUM	15	YES	OBL
DISTICHLIS SPICATA	30	YES	FACW
SALICORNIA VIRGINICA	25	YES	OBL
5.			
6.			
7.			
8.			
Total Cover:	70		
Woody Vine Stratum (Plot Size: 10')			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 40 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)

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

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	40	x 1 =	40
FACW species	78	x 2 =	156
FAC species	10	x 3 =	30
FACU species		x 4 =	0
UPL species		x 5 =	0
Coumn Totals:	128 (A)		226 (B)

Prevalence Index = B/A = 1.765625 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: D1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 2.5/1	100					SILTY LOAM	
2-6	10YR 4/6	70	2.5Y 3/2	30	RM	M	SANDY LOAM	
6-20	2.5Y 3/2	95	5YR 5/8	5	RM	M	LOAMY SAND	

[1]Type: C=Concretion, 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)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ 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)
- ____ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ____ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A 10) (LRR B)
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soil Present? **Yes** X **No** ____

Remarks: MOIST SOIL.

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) (Nonriverine)
- X Sediment Deposits (B2) (Nonriverine)
- X Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soil (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- X Sediment Deposits (B2) (Riverine)
- X Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

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** X **No** ____

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

Remarks:

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	13 May 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	D2
Investigator(s):	RK, MT	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	FLOODPLAIN	Local relief (concave, convex, none):	CONVEX	Slope (%):	0
Subregion (LRR):	LRR C	Lat: 33.26398495350	Long: -117.36944105600	Datum:	NAD 1983
Soil Map Unit Name:	GREENFIELD SANY LOAM			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	90	YES	FACW
2.			
3.			
4.			
Total Cover:	90		
Sapling/Shrub Stratum (Plot Size: 10')			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot Size: 3.28')			
ANEMOPSIS CALIFORNICA	20	YES	OBL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	20		
Woody Vine Stratum (Plot Size: 10')			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 80 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	20	x 1 =	20
FACW species	90	x 2 =	180
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Coumn Totals:	110 (A)		200 (B)

Prevalence Index = B/A = 1.818182 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: D2

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 %	Type[1]	Loc[2]	Texture	Remarks
0-1	2.5Y 2.5/1	100						
1-6	2.5Y 3/2	55	10YR 4/6	30	RM	M	SI-LO-CL	
			2.5Y 3/2	15	RM	M		
6-9	2.5Y 2.5/1	90	10YR 4/6	10	RM	M	SI-CL-LO	
9-18	2.5Y 2.5/1	70	7.5YR 3/4	30	RM	PL	CLAY	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)	X	Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks: FREQUENT PORE SPACES BETWEEN 6" AND 18".

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
X	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
X	Drift Deposits (B3) (Nonriverine)	X	Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)	X	Shallow Aquitard (D3)
X	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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** X **No**

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

Remarks:

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	13 May 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	E1
Investigator(s):	RK, MT	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	TERRACE	Local relief (concave, convex, none):	CONVEX	Slope (%):	0
Subregion (LRR):	LRR C	Lat: 33.26177468710	Long: -117.36997825600	Datum:	NAD 1983
Soil Map Unit Name:	GREENFIELD SANDY LOAM			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
ISOCOMA MENZEISII	20	YES	FACW
2.			
3.			
4.			
Total Cover:	20		
Sapling/Shrub Stratum (Plot Size: 10)			
ISOCOMA MENZEISII	20	YES	FACW
2.			
3.			
4.			
5.			
Total Cover:	20		
Herb Stratum (Plot Size: 3.28)			
BRASSICA NIGRA	40	YES	UPL
SALICORNIA VIRGINICA	23	YES	OBL
CONIUM MACULATUM	10	NO	FACW
POLYPOGON MONSPELIENSIS	2	NO	FACW
CONIUM MACULATUM	30	YES	FACW
6.			
7.			
8.			
Total Cover:	105		
Woody Vine Stratum (Plot Size: 10)			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 0 % Cover of Biotic Crust ____

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 0.80 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	23	x 1 =	23
FACW species	62	x 2 =	124
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	40	x 5 =	200
Coumn Totals:	125 (A)		347 (B)

Prevalence Index = B/A = 2.776 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: E1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5Y 3/2	92	2.5Y 5/6	8	RM	PL	SILT	
3-8	2.5Y 3/2	85	GLEY 8/10Y	15	D	M	SILTY LOAM	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)	X	Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)	X	Redox Depressions (F8)	30	
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks: REFUSAL AT 8" DUE TO COBBLE (FILL).

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)			Secondary Indicators (2 or more required)
	Surface Water (A1)	X	Salt Crust (B11)	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)	Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)	Crayfish Burrows (C8)
X	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)	Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)	Shallow Aquitard (D3)
X	Water-Stained Leaves (B9)		Other (Explain in Remarks)	FAC-Neutral Test (D5)

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** X **No**

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

Remarks:

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	13 May 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	E2
Investigator(s):	RK, RS	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	FLOODPLAIN	Local relief (concave, convex, none):	NONE	Slope (%):	2
Subregion (LRR):	LRR C	Lat: 33.25981586830	Long: -117.37028968500	Datum:	NAD 1983
Soil Map Unit Name:	GREENFIELD SANDY LOAM			NWI classification:	

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

Are Vegetation NO, Soil NO or Hydrology NO significanly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ___		

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum (Plot Size: 10')			
ISOCOMA MENZIESII	5	YES	FACW
2.			
3.			
4.			
5.			
Total Cover:	5		
Herb Stratum (Plot Size: 3.28')			
SALICORNIA VIRGINICA	23	NO	OBL
POLYPOGON MONSPELIENSIS	2	NO	FACW
DISTICHLIS SPICATA	90	YES	FACW
CONIUM MACULATUM	20	NO	FACW
BRASSICA NIGRA	5	NO	UPL
6.			
7.			
8.			
Total Cover:	140		
Woody Vine Stratum (Plot Size: 10')			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 0 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	23	x 1 =	23
FACW species	117	x 2 =	234
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	5	x 5 =	25
Coumn Totals:	145 (A)		282 (B)

Prevalence Index = B/A = 1.944828 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling point: E2

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5YR 3/2	80	10YR 3/6	15	RM	M	SILTY CLAY	
			7.5YR 6/8	5	RM	PL		
4-13	2.5YR 3/2	60	10YR 5/6	40	RM	M	FI-SA-LOAM	MOIST AT 4"
13-16	2.5YR 3/2	40	7.5YR 5/8	5	RM	PL	FI-SA-LOAM	
			2.5YR 2.5/1	45	C	M		
			GLEY 6/5 G	10	D	M		
16-20	2.5yr 3/3	100					FI-SA-LOAM	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)	X	Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)	X	Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and
	Sandy Gleyed Matrix (S4)				wetland hydrology must be present

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks: MOIST SOIL.

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)	X	Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)	X	Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
X	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
X	Water-Stained Leaves (B9)		Other (Explain in Remarks)		FAC-Neutral Test (D5)

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** X **No**

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

Remarks:

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	8 May 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	E3
Investigator(s):	RK, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	FLOODPLAIN	Local relief (concave, convex, none):	CONCAVE	Slope (%):	3
Subregion (LRR):	LRR C	Lat: 33.25807725900	Long: -117.37054774200	Datum:	NAD 1983
Soil Map Unit Name:	GREENFIELD SANDY LOAM			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	60	YES	FACW
2.			
3.			
4.			
Total Cover:	60		
Sapling/Shrub Stratum (Plot Size: 10')			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot Size: 3.28')			
SALICORNIA VIRGINICA	3	YES	OBL
BACCHARIS SALICIFOLIA	3	YES	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	6		
Woody Vine Stratum (Plot Size: 10')			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 90 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	3	x 1 =	3
FACW species	63	x 2 =	126
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	66 (A)		129 (B)

Prevalence Index = B/A = 1.954545 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: E3

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 %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/1	88	2.5Y 6/6	2	C	PL	SILTY CLAY	
			2.5Y 5/3	10	D	M		
6-18	2.5Y 4/2	80	2.5Y 3/2	20	RM	M	FINE SANDY SILT	
18-20	5Y 4/2	90	2.5Y 3/1	10	RM	M	FINE SANDY SILT	

[1]Type: C=Concretion, 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)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- X 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)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A 10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: SOIL MOIST ABOVE 20".

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- X Drift Deposits (B3) (Nonriverine)
- X Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- X Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soil (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- X Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

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** X **No** ___

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

Remarks: A SIGNIFICANT DISTANCE FROM THE SANTA MARGARITA, SOME QUESTION AS TO WHETHER THE "NONRIVERINE" INDICATORS APPLY.

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	8 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	F1
Investigator(s):	RK, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	TOP OF BERM	Local relief (concave, convex, none):	NONE	Slope (%):	10
Subregion (LRR):	LRR C	Lat: 33.25797649710	Long: -117.37054209000	Datum:	NAD 1983
Soil Map Unit Name:	GREENFIELD SANDY LOAM			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 ____ No X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Presnt?	Yes ____	No X		

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPUS	40	YES	FACW
2.			
3.			
4.			
Total Cover:	40		
Sapling/Shrub Stratum (Plot Size: 10')			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot Size: 3.28')			
CONIUM MACULATUM	30	YES	FACW
BACCHARIS PILULARIS	10	NO	UPL
PICRIS ECHOIDES	3	NO	FAC
BACCHARIS SALICIFOLIA	35	YES	FACW
URTICA DIOICA	5	NO	FACW
6.			
7.			
8.			
Total Cover:	83		
Woody Vine Stratum (Plot Size: 10')			
1.			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	110	x 2 =	220
FAC species	3	x 3 =	9
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Coumn Totals:	123 (A)		279 (B)

Prevalence Index = B/A = 2.268293 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** **X** **No** **0**

Remarks:

SOIL

Sampling point: F1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/1	85	2.5Y 4/4	15	RM	M	SILTY CLAY	
1-16	2.5 Y 4/3	60	10YR 4/4	20	C	M	SANDY SILT	
			2.5Y 4/3	20	D	M		
16-20	2.5Y 4/2	70	10YR 5/6	30	C	M	SANDY SILT	

[1]Type: C=Concretion, 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)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ 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)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A 10) (LRR B)
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

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)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soil (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? **Yes** ____ **No** **X**

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

Remarks: POSSIBLE RELICT BEAVER DAM. NO EVIDNCE OF FINE OR COURSE WOODY DEBRIS REMAINS IN DAM.

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	8 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	F2
Investigator(s):	RK, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	HILLSLOPE	Local relief (concave, convex, none):	NONE	Slope (%):	35
Subregion (LRR):	LRR C	Lat: 33.25568221650	Long: -117.37115304200	Datum:	NAD 1983
Soil Map Unit Name:	SALINAS CLAY			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 ____ No X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Presnt?	Yes ____	No X		

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	40	YES	FACW
3.			
4.			
Total Cover:	40		
Sapling/Shrub Stratum (Plot Size: 10')			
BACCHARIS PILULARIS	55	YES	UPL
ISOCOMA MENZIESII	5	NO	UPL
5.			
Total Cover:	60		
Herb Stratum (Plot Size: 3.28')			
LOLIUM MULTIFLORUM	20	YES	FAC
BROMUS SPP.	40	YES	
6.			
7.			
8.			
Total Cover:	60		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 25 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0.67 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	60	x 5 =	300
Coumn Totals:	60 (A)		440 (B)

Prevalence Index = B/A = 7.333333 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

0 Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** X

Remarks:

SOIL

Sampling point: F2

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 4/3	100					SILTY LOAM	

[1]Type: C=Concretion, 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)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ 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)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A 10) (LRR B)
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soil Present? **Yes** ____ **No** X

Remarks: REFUSAL AT 4" DUE TO COBBLE/GRAVEL FILL FOR VANDERGRIFT BOULEVARD. THE DEPTH OF SAMPLING IS NOT SUFFICIENT TO RULE OUT HYDRIC SOILS, HOWEVER, DUE TO THE LOCATION OF THE DATA POINT ALONG VANDERGRIFT BOULEVARD IT IS UNLIKELY THAT SOILS AT A GREATER DEPTH WOULD BE HYDRIC.

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) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soil (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

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 FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	8 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	F3
Investigator(s):	RK, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	SWALE	Local relief (concave, convex, none):	CONCAVE	Slope (%):	2
Subregion (LRR):	LRR C	Lat: 33.25566496410	Long: -117.37145085200	Datum:	NAD 1983
Soil Map Unit Name:	SALINAS CLAY			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	30	YES	FACW
3.			
4.			
Total Cover:	30		
Sapling/Shrub Stratum (Plot Size: 10')			
BACCHARIS SALICIFOLIA	35	YES	FACW
TAMARIX RAMOSSISMA	20	YES	FAC
SALIX LAEVIGATA	10	YES	UPL
5.			
Total Cover:	65		
Herb Stratum (Plot Size: 3.28')			
SCHOENOPLECTUS CALIFORNICUS	80	YES	OBL
URTICA DIOICA	15	NO	FACW
CONIUM MACULATUM	10	NO	FACW
6.			
7.			
8.			
Total Cover:	105		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0.57 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	80	x 1 =	80
FACW species	90	x 2 =	180
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Coumn Totals:	200 (A)		370 (B)

Prevalence Index = B/A = 1.85 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: F3

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 %	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 4/2	90	10YR 4/4	10	C	PL	SILTY CLAY	
8-18	5Y 3/1	65	5YR 3/4	15	C	PL	CLAY SILT	
			2.5Y 3/3	20	D	M		
18-20	2.5Y 4/2	80	10YR 4/4	20	C	M	SILTY SAND	MOIST

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

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)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)	X	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
X	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
X	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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 X No

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

Remarks: SOIL MOIST BELOW 18".

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	8 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	F4
Investigator(s):	RK, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	UPLAND TERRACE	Local relief (concave, convex, none):	NONE	Slope (%):	2
Subregion (LRR):	LRR C	Lat: 33.25045932690	Long: -117.37717250800	Datum:	NAD 1983
Soil Map Unit Name:	TUJUNGA SAND			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	40	YES	FACW
3.			
4.			
Total Cover:	40		
Sapling/Shrub Stratum (Plot Size: 10')			
SALIX EXIGUA	35	YES	OBL
SALIX GOODDINGII	10	YES	OBL
5.			
Total Cover:	45		
Herb Stratum (Plot Size: 3.28')			
XANTHIUM STRUMARIUM	5	NO	FAC
SCHOENOPLECTUS CALIFORNICUS	18	YES	OBL
RUMEX CONGLOMERATUS	8	YES	FACW
6.			
7.			
8.			
Total Cover:	31		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 70 % Cover of Biotic Crust 75

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

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

Percent of Dominant Species That are OBL, FACW, or FAC 0.83 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	63	x 1 =	63
FACW species	48	x 2 =	96
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Coumn Totals:	116 (A)		174 (B)

Prevalence Index = B/A = 1.5 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: FILAMENTOUS ALGAE IS PREVALENT ON SOIL SURFACE.

SOIL

Sampling point: F4

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 %	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 3/1	100					SILTY CLAY	
2-20	2.5Y 3/1	78	2.5Y 4/2	10	RM	M	SILTY CLAY	
			2.5Y 4/4	2	C	M		

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

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)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)	X	Biotic Crust (B12)	X	Sediment Deposits (B2) (Riverine)
X	Saturation (A3)		Aquatic Invertebrates (B13)	X	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
X	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 18
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No**

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

Remarks:

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	8 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	F5
Investigator(s):	RK, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	HILLSLOPE	Local relief (concave, convex, none):	NONE	Slope (%):	15
Subregion (LRR):	LRR C	Lat: 33.25035298410	Long: -117.37709804700	Datum:	NAD 1983
Soil Map Unit Name:	TUJUNGA SAND			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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 ____ No X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Presnt?	Yes ____	No X		

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	20	YES	FACW
3.			
4.			
Total Cover:	20		
Sapling/Shrub Stratum (Plot Size: 10')			
ISOCOMA MENZIESII	11	YES	FACW
5.			
Total Cover:	11		
Herb Stratum (Plot Size: 3.28')			
FOENICULUM VULGARE	15	NO	FACU
BROMUS DIANDRUS	20	NO	UPL
BROMUS MADRITENSIS	80	YES	UPL
6.			
7.			
8.			
Total Cover:	115		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0.67 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	31	x 2 =	62
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	100	x 5 =	500
Coumn Totals:	146 (A)		622 (B)

Prevalence Index = B/A = 4.260274 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

0 Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: F5

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 %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/3	100					SILTY LOAM	

[1]Type: C=Concretion, 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.)

				Indicators for Problematic Hydric Soils:[3]	
	Histosol (A1)		Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
	Histic Epipedon (A2)		Stripped Matrix (S6)		2 cm Muck (A 10) (LRR B)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		Reduced Vertic (F18)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Red Parent Material (TF2)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Other (Explain in Remarks)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and
	Sandy Gleyed Matrix (S4)				wetland hydrology must be present

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** **No** X

Remarks: REFUSAL AT 2" DUE TO COBBLE/GRAVEL FILL FOR VANDERGRIFT BOULEVARD. THE DEPTH OF SAMPLING IS NOT SUFFICIENT TO RULE OUT HYDRIC SOILS, HOWEVER, DUE TO THE LOCATION OF THE DATA POINT ALONG VANDERGRIFT BOULEVARD IT IS UNLIKELY THAT SOILS AT A GREATER DEPTH WOULD BE HYDRIC.

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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: THIS UPLAND DATA POINT CORRESPONDS TO WETLAND DATA POINT B1.

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	7 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	G1
Investigator(s):	MT, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	HILLSLOPE	Local relief (concave, convex, none):	CONCAVE	Slope (%):	25
Subregion (LRR):	LRR C	Lat: 33.24612293230	Long: -117.37994388000	Datum:	NAD 1983
Soil Map Unit Name:	TUJUNGA SAND			NWI classification:	

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

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

Are Vegetation NO, Soil NO or Hydrology NO 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	
Wetland Hydrology Presnt?	Yes		No	X

Is the Sampled Area within a wetland? Yes ____ No X

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum (Plot Size: 10')			
BACCHARIS PILULARIS	60	YES	UPL
5.			
Total Cover:	60		
Herb Stratum (Plot Size: 3.28')			
CONIUM MACULATUM	15	YES	FACW
BRASSICA NIGRA	20	YES	UPL
6.			
7.			
8.			
Total Cover:	35		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 20 % Cover of Biotic Crust 0

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 0.33 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	80	x 5 =	400
Coumn Totals:	95 (A)		430 (B)

Prevalence Index = B/A = 4.526316 (must be ≤3.0)

Hydrophytic vegetation indicators

0 Dominance test is >50%

0 Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks:

SOIL

Sampling point: G1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-1	2.5Y 3/2	70	2.5Y 5/3	30	C	M	SILTY CLAY	
1-20	2.5Y 4/2	98	10YR 4/4	2	C	M	SA-SI-CL	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
X	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

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)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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 FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	7 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	G2
Investigator(s):	MT, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	HILLSOPE	Local relief (concave, convex, none):	CONVCAVE	Slope (%):	5
Subregion (LRR):	LRR C	Lat: 33.24602943230	Long: -117.37996509400	Datum:	NAD 1983
Soil Map Unit Name:	TUJUNGA SAND			NWI classification:	

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

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

Are Vegetation No, Soil No or Hydrology No 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 Presnt?	Yes X	No ____	

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	45	YES	FACW
SAMBUCUS MEXICANA	10	YES	FAC
3.			
4.			
Total Cover:	55		
Sapling/Shrub Stratum (Plot Size: 10')			
BACCHARIS PILULARIS	35	YES	UPL
BACCHARIS SALICIFOLIA	5	YES	FACW
5.			
Total Cover:	40		
Herb Stratum (Plot Size: 3.28')			
CYPERUS SQUARROSUS	20	YES	OBL
CONIUM MACULATUM	3	NO	FACW
6.			
7.			
8.			
Total Cover:	23		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 35 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

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

Percent of Dominant Species That are OBL, FACW, or FAC 0.83 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	20	x 1 =	20
FACW species	53	x 2 =	106
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	35	x 5 =	175
Coumn Totals:	118 (A)		331 (B)

Prevalence Index = B/A = 2.805085 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: LARGE AMOUNTS OF ARUNDO DONAX ARE LOCATED SOUTHWEST OF SAMPLE PLOT.

SOIL

Sampling point: G2

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 %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/1	65	10YR 4/2	35	C	M	LOAM	
1-20	10YR 4/2	95	10YR 4/4	5	C	M	LOAM	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
X	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

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)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	X	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
X	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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** X **No**

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

Remarks: WETLAND IS LOCATED IN A LOW AREA THAT MAY HAVE HISTORICALLY BEEN A ROAD BED.

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	7 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	H1
Investigator(s):	MT, LD, RK	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	TOP OF BERM	Local relief (concave, convex, none):	CONVEX	Slope (%):	20
Subregion (LRR):	LRR C	Lat: 33.24215368520	Long: -117.38019845100	Datum:	NAD 1983
Soil Map Unit Name:	TUJUNGA SAND			NWI classification:	

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

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

Are Vegetation No, Soil No or Hydrology No 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 ____ No X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Presnt?	Yes ____	No X		

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	25	YES	FACW
3.			
4.			
Total Cover:	25		
Sapling/Shrub Stratum (Plot Size: 10')			
BACCHARIS PILULARIS	40	YES	UPL
5.			
Total Cover:	40		
Herb Stratum (Plot Size: 3.28')			
CONIUM MACULATUM	30	YES	FACW
6.			
7.			
8.			
Total Cover:	30		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 70 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0.67 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	55	x 2 =	110
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	40	x 5 =	200
Coumn Totals:	95 (A)		310 (B)

Prevalence Index = B/A = 3.263158 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

0 Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: H1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					LOAM	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and
	Sandy Gleyed Matrix (S4)				wetland hydrology must be present

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** **No** **X**

Remarks: REFUSAL AT 2" BECAUSE OF COBBLE/GRAVEL SUBSTRATE. SOILS SAMPLE NOT SUFFICENT TO DETECT HYDRIC INDICATORS IN SOIL. BERM MAY BE REMNANT OF RAILROAD.

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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: DATA POINT CONDUCTED AT THE TOP OF THE BERM.

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	7 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	H2
Investigator(s):	MT, RK, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	LOW AREA	Local relief (concave, convex, none):	CONCAVE	Slope (%):	5
Subregion (LRR):	LRR C	Lat: 33.24211369950	Long: -117.38014713700	Datum:	NAD 1983
Soil Map Unit Name:	TUJUNGA SAND			NWI classification:	

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

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

Are Vegetation No, Soil No or Hydrology No 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 Presnt?	Yes X	No ____	

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	60	YES	FACW
3.			
4.			
Total Cover:	60		
Sapling/Shrub Stratum (Plot Size: 10')			
BACCHARIS SALICICFOLIA	20	YES	FACW
5.			
Total Cover:	20		
Herb Stratum (Plot Size: 3.28')			
CONIUM MACULATUM	10	YES	FACW
6.			
7.			
8.			
Total Cover:	10		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 90 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 1.00 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

	Total % Cover (absolute) of:		Multiply by:
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Coumn Totals:	90 (A)		180 (B)

Prevalence Index = B/A = 2 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: H2

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 %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					SANDY	
10-20	10YR 3/2	98	7.5YR 4/6	2	C	M	SANDY	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

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)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)	X	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
X	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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** X **No**

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

Remarks:

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	7 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	I1
Investigator(s):	MT, RK, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	TOE OF SLOPE	Local relief (concave, convex, none):	CONCAVE	Slope (%):	3
Subregion (LRR):	LRR C	Lat: 33.23860525720	Long: -117.38250727500	Datum:	NAD 1983
Soil Map Unit Name:	RIVERWASH			NWI classification:	

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

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

Are Vegetation No, Soil No or Hydrology No 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX, SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
PLATANUS RACEMOSA	45	YES	FACW
WASHINGTONIA ROBUSTA	20	YES	FACW
3.			
4.			
Total Cover:	65		
Sapling/Shrub Stratum (Plot Size: 10')			
SALIX LASIOLEPIS	40	YES	FACW
RUBUS URSINUS	15	YES	FAC
3.			
4.			
5.			
Total Cover:	55		
Herb Stratum (Plot Size: 3.28')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum (Plot Size: 10')			
TOXICODENDRON DIVERSILOBUM	85	YES	UPL
2.			
Total Cover:	85		

% Bare gourd in Herb Stratum 32 % Cover of Biotic Crust 0

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 0.80 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	105	x 2 =	210
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	85	x 5 =	425
Coumn Totals:	205 (A)		680 (B)

Prevalence Index = B/A = 3.317073 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

0 Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: ABUNDANCE OF LEAFLITTER AND COURSE WOODY DEBRIS.

SOIL

Sampling point: I1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					SILTY CLAY	
3-12	2.5Y 4/2	80	10YR 4/4	20	C	M	SILTY CLAY	
12-20	2.5Y 5/3	90	2.5Y 3/1	10	D	M	SILTY CLAY	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
X	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

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)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)	X	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	X	Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)	X	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
X	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
X	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
X	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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** X **No**

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

Remarks: WETLAND BOUNDARY IS TOE OF SLOPE. SOIL IS MOIST ABOVE 20".

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	7 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	I2
Investigator(s):	MT, RK, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	TOP OF BERM	Local relief (concave, convex, none):	CONVEX	Slope (%):	0
Subregion (LRR):	LRR C	Lat: 33.23853651910	Long: -117.38241920800	Datum:	NAD 1983
Soil Map Unit Name:	RIVERWASH			NWI classification:	

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

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

Are Vegetation No, Soil No or Hydrology No 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 Presnt?	Yes ____	No X		

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPUS	35	YES	FACW
2.			
3.			
4.			
Total Cover:	35		
Sapling/Shrub Stratum (Plot Size: 10')			
MALOSMA LAURINA	25	YES	UPL
2.			
3.			
4.			
5.			
Total Cover:	25		
Herb Stratum (Plot Size: 3.28')			
CONIUM MACULATUM	5	YES	FACW
GALIUM (SPP)	20		
6.			
7.			
8.			
Total Cover:	25		
Woody Vine Stratum (Plot Size: 10')			
TOXICDENDRON DIVERSILOBUM	60	YES	UPL
2.			
Total Cover:	60		

% Bare gourd in Herb Stratum 40 % Cover of Biotic Crust 0

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 0.50 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	85	x 5 =	425
Coumn Totals:	40 (A)		505 (B)

Prevalence Index = B/A = 12.625 (must be ≤3.0)

Hydrophytic vegetation indicators

0 Dominance test is >50%

0 Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks:

SOIL

Sampling point: I2

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 %	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 4/3	100					SANDY LOAM	

[1]Type: C=Concretion, 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)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ 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)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pool (F9)

Indicators for Problematic Hydric Soils:[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A 10) (LRR B)
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soil Present? **Yes** ____ **No** X

Remarks: REFUSAL AT 10" DUE TO COBBLE/GRAVEL FILL FOR VANDERGRIFT BOULEVARD. THE DEPTH OF SAMPLING IS NOT SUFFICIENT TO RULE OUT HYDRIC SOILS, HOWEVER, DUE TO THE LOCATION OF THE DATA POINT ALONG VANDERGRIFT BOULEVARD IT IS UNLIKELY THAT SOILS AT A GREATER DEPTH WOULD BE HYDRIC.

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) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soil (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

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: LEVEL WITH VANDERGRIFT ROAD.

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	5 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	J1
Investigator(s):	MT, LD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	FLOODPLAIN, TOE OF SLOPE	Local relief (concave, convex, none):	CONCAVE	Slope (%):	2
Subregion (LRR):	LRR C	Lat: 33.23744989550	Long: -117.38455654600	Datum:	NAD 1983
Soil Map Unit Name:	RIVERWASH			NWI classification:	

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

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

Are Vegetation No, Soil No or Hydrology No 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
SALIX LASIOLEPIS	50	YES	FACW
3.			
4.			
Total Cover:	50		
Sapling/Shrub Stratum (Plot Size: 10')			
ARUNDO DONAX	5	YES	FACW
2.			
3.			
4.			
5.			
Total Cover:	5		
Herb Stratum (Plot Size: 3.28')			
ANEMOPSIS CALIFORNICA	65	YES	OBL
JUNCUS MEXICANUS	5	NO	FACW
6.			
7.			
8.			
Total Cover:	70		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0.75 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	65	x 1 =	65
FACW species	60	x 2 =	120
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Coumn Totals:	125 (A)		185 (B)

Prevalence Index = B/A = 1.48 (must be ≤3.0)

Hydrophytic vegetation indicators

X Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: J1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	90	10YR 5/4	10	C	M	CLAY LOAM	
4-10	10YR 3/2						CLAY LOAM	
10-16	10YR 4/2	95	GL 6/ 5GY	5	RM	M	CLAY LOAM	
16-20	10YR 3/2	50	10YR 5/4	40	C	M	CLAY	MOIST

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)	X	Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

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)				Secondary Indicators (2 or more required)	
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	X	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
	Water-Stained Leaves (B9)		Other (Explain in Remarks)	X	FAC-Neutral Test (D5)

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** X **No**

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

Remarks: SOIL MOIST BELOW 16", HYDROLOGY MAY BE PARTIALLY SUPPLIED BY ROADSIDE DRAINAGE.

WETLAND DETERMINATION FORM - Arid West Region

Project/Site:	P-113	City/County:	San Diego	Sampling Date:	5 MAY 2009
Applicant/Owner:	MCB Camp Pendleton	State:	CA	Sampling Point:	K1
Investigator(s):	MT, LD, MD	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	FLOODPLAIN	Local relief (concave, convex, none):	NONE	Slope (%):	2
Subregion (LRR):	LRR C	Lat: 33.23590559110	Long: -117.38720173600	Datum:	NAD 1983
Soil Map Unit Name:	TUJUNGA SAND			NWI classification:	

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

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

Are Vegetation No, Soil No or Hydrology No 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 Presnt?	Yes X	No ____		

Remarks: ACCORDING TO THE PALMER INDEX SOUTHERN CALIFORNIA IS IN A SEVERE DROUGHT (-3.0 TO -3.99 ON THE PALMER INDEX SCALE).

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum (Plot Size: 10')			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot Size: 3.28')			
SALICORNIA VIRGINICA	55	YES	OBL
CARPOBROTUS EDULIS	45	YES	UPL
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 10')			
2.			
Total Cover:			

% Bare gourd in Herb Stratum 10 % Cover of Biotic Crust 0

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 0.50 (A/B) (must be >0.5)

Prevalence index worksheet (test when Hydro and Soils indicate wetlands)

Total % Cover (absolute) of:			Multiply by:
OBL species	55	x 1 =	55
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species	45	x 5 =	225
Coumn Totals:	100 (A)		280 (B)

Prevalence Index = B/A = 2.8 (must be ≤3.0)

Hydrophytic vegetation indicators

0 Dominance test is >50%

X Prevalence index is ≤ 3.0[1]

0 Morphological adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

0 Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling point: K1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/1	100					SANDY SILT	

[1]Type: C=Concretion, 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)		Sandy Redox (S5)		Indicators for Problematic Hydric Soils:[3]
	Histic Epipedon (A2)		Stripped Matrix (S6)		1 cm Muck (A9) (LRR C)
	Black Histic (A3)		Loamy Mucky Mineral (F1)		2 cm Muck (A 10) (LRR B)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)		Reduced Vertic (F18)
	Stratified Layers (A5) (LRR C)	X	Depleted Matrix (F3)		Red Parent Material (TF2)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		Other (Explain in Remarks)
	Depleted Below Dark Surface (A11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pool (F9)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present
	Sandy Gleyed Matrix (S4)				

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks: WHITE CHANNELS VISIBLE IN SOIL, POSSIBLY REMNANT SALT CONCENTRATIONS.

HYDROLOGY

Wetland Hydrology Indicators:

	Primary indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)
	Surface Water (A1)		Salt Crust (B11)		Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)		Sediment Deposits (B2) (Riverine)
	Saturation (A3)		Aquatic Invertebrates (B13)		Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
X	Surface Soil Cracks (B6)		Recent Iron Reduction in Tilled Soil (C6)		Saturation Visible on Aerial Imagery (C9)
	Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shallow Aquitard (D3)
	Water-Stained Leaves (B9)		Other (Explain in Remarks)		FAC-Neutral Test (D5)

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 X No

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

Remarks: FLAT TERRACE BELOW VANDERGRIFT BOULEVARD, COLLECTS RUNOFF FROM ROAD. THIS FEATURE APPEARS TO BE ISLOATED FROM THE RIVER.

Appendix B-4: Approved Jurisdictional Determination Form

Haybarn Canyon

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:CA County/parish/borough: San Diego City: Marine Corps Base Camp Pendleton
Center coordinates of site (lat/long in degree decimal format): Lat. 33 18'43.58° **N**, Long. 117 20'03.75° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Santa Margarita River (SMR)
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pacific Ocean
Name of watershed or Hydrologic Unit Code (HUC): Santa Margarita River

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☐ Office (Desk) Determination. Date:
- ☒ Field Determination. Date(s): September 2007, follow-up November 2008 and January 2009

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☒ Non-RPWs that flow directly or indirectly into TNWs
   - ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or 0.22 acres.
   Wetlands: 0.03 acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: .

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identif y TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: 742 **square miles**
Drainage area: **Pick List**
Average annual rainfall: 10 inches
Average annual snowfall: 0 inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.
☒ Tributary flows through **2** tributaries before entering TNW.

Project waters are **5-10** river miles from TNW.
Project waters are **1 (or less)** river miles from RPW.
Project waters are **5-10** aerial (straight) miles from TNW.
Project waters are **1 (or less)** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[5]: The runoff from the ephemeral drainages and wetland area flow through a culvert under Vandegrift Blvd. into the SMR flood plain, approximately 8 miles inland from the Pacific Ocean, the nearest TNW.

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☒ Natural
☒ Artificial (man-made). Explain: Roadside runoff channel next to a dirt road.
☒ Manipulated (man-altered). Explain: Channel that flows under Vandergrift Blvd. is man-made and has culverts on each side of it.

Tributary properties with respect to top of bank (estimate):
Average width: 1-3 feet
Average depth: 0-3 feet
Average side slopes: **Vertical (1:1 or less).**

Primary tributary substrate composition (check all that apply):

☒ Silts	☒ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: relatively stable.
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Relatively straight**
Tributary gradient (approximate average slope): 0-5 %

(c) Flow:
Tributary provides for: **Ephemeral flow**
Estimate average number of flow events in review area/year: **2-5**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Discrete and confined.** Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☒ Bed and banks
☒ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☒ shelving	☐ the presence of wrack line
☒ vegetation matted down, bent, or absent	☐ sediment sorting
☒ leaf litter disturbed or washed away	☐ scour
☒ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: N/A.

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☒ Riparian corridor. Characteristics (type, average width): Mulefat scrub along the channel on the west side of the project near Vandegrift Blvd..

☐ Wetland fringe. Characteristics: .

☐ Habitat for:

☐ Federally Listed species. Explain findings: .

☐ Fish/spawn areas. Explain findings: .

☐ Other environmentally-sensitive species. Explain findings: .

☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size:0.03acres

Wetland type. Explain: southern willow scrub.

Wetland quality. Explain:low-vegetation cleared by Base maintenance personnel.

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Intermittent flow**. Explain: .

Surface flow is**: Confined**

Characteristics: .

S ubsurface flow: **Unknown**. Explain findings: .

☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

☒ Directly abutting

☐ Not directly abutting

☐ Discrete wetland hydrologic connection. Explain: .

☐ Ecological connection. Explain: .

☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **5-10** river miles from TNW.

Project waters are **5-10** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters.**

Estimate approximate location of wetland as within the **20 - 50-year** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: unknown.

Identify specific pollutants, if known: Potential runoff from water treatment facility.

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .

☒ Vegetation type/percent cover. Explain:Southern willow scrub that is cleared by Base personnel .

☐ Habitat for:

☐ Federally Listed species. Explain findings: .

☐ Fish/spawn areas. Explain findings: .

☐ Other environmentally-sensitive species. Explain findings: .

☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **1**

Approximately (0.03) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Direct ly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N) S	ize (in acres)
Y	0.03		

Summarize overall biological, chemical and physical functions being performed: Wetland supports cattails and willows but is cleared annually for flood control.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: x linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☒ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☒ Tributary waters: **3,332** linear feet**1-3**width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **Roadside ephemeral drainage with manmade portions.**

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☒ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: **0.03**acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

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[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:. .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: 0 acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: .
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (N ational Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date):April 2007, on file with MCB Camp Pendleton.
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

Pueblitos Canyon

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:CA County/parish/borough: San Diego City: Marine Corps Base Camp Pendleton
Center coordinates of site (lat/long in degree decimal format): Lat. 33 23'79.88° **N**, Long. 117 38'36.27° **W**.
Universal Transverse Mercator: X=3677736.403789197, Y=535740.4229570527
Name of nearest waterbody: Santa Margarita River (SMR)
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pacific Ocean
Name of watershed or Hydrologic Unit Code (HUC): Aliso-San Onofre, 18070301

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☐ Office (Desk) Determination. Date: To be completed by Corps
- ☒ Field Determination. Date(s): To be completed by Corps

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☒ Non-RPWs that flow directly or indirectly into TNWs
   - ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or 0.12 acres.
   Wetlands: 2.04 acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: .

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: 742**square miles**
Drainage area: **Pick List**
Average annual rainfall: 10 inches
Average annual snowfall: 0 inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☒ Tributary flows through **2** tributaries before entering TNW.

Project waters are **2-5** river miles from TNW.
Project waters are **1 (or less)** river miles from RPW.
Project waters are **2-5** aerial (straight) miles from TNW.
Project waters are **1 (or less)** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[5]: The runoff from the ephemeral drainages and wetland area flow through a culvert under Vandegrift Blvd. into the SMR flood plain, approximately 8 miles inland from the Pacific Ocean, the nearest TNW.

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☒ Natural
☐ Artificial (man-made). Explain: .
☒ Manipulated (man-altered). Explain: Wetland is connected to the SMR floodplain through a culvert under Vandegrift Blvd.

Tributary properties with respect to top of bank (estimate):
Average width: 6-10 feet
Average depth: 3-6 feet
Average side slopes: **Vertical (1:1 or less).**

Primary tributary substrate composition (check all that apply):

☒ Silts	☒ Sands	☐ Concrete
☐ Cobbles	☒ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: relatively stable.
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Relatively straight**
Tributary gradient (approximate average slope): 0-5 %

(c) Flow:
Tributary provides for: **Ephemeral flow**
Estimate average number of flow events in review area/year: **2-5**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Discrete and confined.** Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☒ Bed and banks
☒ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☒ destruction of terrestrial vegetation
☒ shelving	☒ the presence of wrack line
☒ vegetation matted down, bent, or absent	☐ sediment sorting
☒ leaf litter disturbed or washed away	☐ scour
☒ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: N/A.

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☒ Riparian corridor. Characteristics (type, average width): Willow scrub along the channel on the west side of the project near Vandegrift Blvd..

☐ Wetland fringe. Characteristics: .

☐ Habitat for:

☐ Federally Listed species. Explain findings: .

☐ Fish/spawn areas. Explain findings: .

☐ Other environmentally-sensitive species. Explain findings: .

☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size:2.04acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Intermittent flow**. Explain: .

Surface flow is**: Confined**

Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .

☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

☒ Directly abutting

☐ Not directly abutting

☐ Discrete wetland hydrologic connection. Explain: .

☐ Ecological connection. Explain: .

☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **2-5** river miles from TNW.

Project waters are **2-5** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters.**

Estimate approximate location of wetland as within the **2 - 5-year** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: No surface water during evaluation.

Identify specific pollutants, if known: Potential runoff from water treatment facility and Vandergrift Boulevard.

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .

☐ Vegetation type/percent cover. Explain: .

☒ Habitat for:

☒ Federally Listed species. Explain findings: The federally endangered Least Bell's Vireo is found in the area.

☐ Fish/spawn areas. Explain findings: .

☐ Other environmentally-sensitive species. Explain findings: .

☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **1**

Approximately (2.04) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
Y	2.04		

Summarize overall biological, chemical and physical functions being performed: Wetland is east of Vandegrit Blvd.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The adjacent wetlands and non-RPWs have a biological, and hydrological connection to the Pacific Ocean.

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: x linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☒ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☒ Tributary waters: **0.12** linear feet**6**width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☒ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: **2.04**acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

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[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☒ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: .
☒ USDA Natural Resources Conservation Service Soil Survey. Citation:http://websoilsurvey.nrcs.usda.gov/app/.
☒ National wetlands inventory map(s). Cite name: http://www.fws.gov/wetlands/.
☐ State/Local wetland inventory map(s): .
☒ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date):April 2007, on file with MCB Camp Pendleton.
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD:
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Pueblitos Canyon Isolated Wetlands

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:CA County/parish/borough: San Diego City: Marine Corps Base Camp Pendleton
Center coordinates of site (lat/long in degree decimal format): Lat. 33 23'58.56° **N**, Long. 117 38'73.39° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Santa Margarita River (SMR)
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pacific Ocean
Name of watershed or Hydrologic Unit Code (HUC): Aliso-San Onofre, 18070301

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☐ Office (Desk) Determination. Date: To be completed by Corps
- ☐ Field Determination. Date(s): To be completed by Corps

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are no** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☐ Non-RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or acres.
   Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **This isolated wetland is a concave depression created on the top of a terrace on the southern side of the Santa Margarita River corridor. The terrace prevents a biological, physical, and hydrological connection**.

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY)**:**

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. **Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.**

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **Pick List**
Drainage area: **Pick List**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[5]: The runoff from the ephemeral drainages and wetland area flow through a culvert under Vandegrift Blvd. into the SMR flood plain, approximately 8 miles inland from the Pacific Ocean, the nearerst TNW.

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is:
- ☐ Natural
- ☐ Artificial (man-made). Explain: .
- ☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):

Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):

- ☐ Silts
- ☐ Sands
- ☐ Concrete
- ☐ Cobbles
- ☐ Gravel
- ☐ Muck
- ☐ Bedrock
- ☐ Vegetation. Type/% cover:
- ☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
- ☐ Dye (or other) test performed: .

Tributary has (check all that apply):
- ☐ Bed and banks
- ☐ OHWM[6] (check all indicators that apply):
  - ☐ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community
- ☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- ☐ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list):
- ☐ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: N/A.

[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width): .
☐ Wetland fringe. Characteristics: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: 0.05 acres
Wetland type. Explain: Saline flat with pickleweed, iceplant.
Wetland quality. Explain: Poor due to small size, isolation, abundance of non-native iceplant.
Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:
Flow is: **No Flow** . Explain: .

Surface flow is**: Not present**
Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .
☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
☐ Directly abutting
☒ Not directly abutting
  ☐ Discrete wetland hydrologic connection. Explain: .
  ☐ Ecological connection. Explain: .
  ☒ Separated by berm/barrier. Explain: Isolated from river by RR berm.

(d) Proximity (Relationship) to TNW
Project wetlands are **5-10** river miles from TNW.
Project waters are **5-10** aerial (straight) miles from TNW.
Flow is from: **No Flow.**
Estimate approximate location of wetland as within the **50 - 100-year** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Subject to inundation by runoff.
Identify specific pollutants, if known: No data.

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .
☒ Vegetation type/percent cover. Explain: Pickleweed-iceplant mix, 100%.
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **1**
Approximately (0.05) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
N	0.05		

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The adjacent wetlands and non-RPWs have a biological, and hydrological connection to the Pacific Ocean.

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: x linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

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[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☒ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:**. This isolated wetland is a concave depression isolated on the top of a terrace, which slopes down toward the Santa Margarita River floodplain. The vegetation surrounding the wetland is predominantly upland species. The terrace prevents a biological, physical, and hydrological connection.**
☐ Other: (explain, if not covered above): **.**

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: 0.05 acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☒ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: .
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☒ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☒ FEMA/FIRM maps:NA.
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): April 2007, on file with MCB Camp Pendleton.
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

Santa Margarita River/Vandegrift

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:CA County/parish/borough: San Diego City: Marine Corps Base Camp Pendleton
Center coordinates of site (lat/long in degree decimal format): Lat. 33 23'79.88° **N**, Long. 117 38'36.27° **W**.
Universal Transverse Mercator: X=3677736.403789197, Y=535740.4229570527
Name of nearest waterbody: Santa Margarita River (SMR)
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pacific Ocean
Name of watershed or Hydrologic Unit Code (HUC): Aliso-San Onofre, 18070301

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☐ Office (Desk) Determination. Date: To be completed by Corps
- ☒ Field Determination. Date(s): To be completed by Corps

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☒ Non-RPWs that flow directly or indirectly into TNWs
   - ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or 0.01 acres.
   Wetlands: 15.26 acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: .

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. **Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.**

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: 742**square miles**
Drainage area: **Pick List**
Average annual rainfall: 10 inches
Average annual snowfall: 0 inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☒ Tributary flows through **2** tributaries before entering TNW.

Project waters are **2-5** river miles from TNW.
Project waters are **1 (or less)** river miles from RPW.
Project waters are **2-5** aerial (straight) miles from TNW.
Project waters are **1 (or less)** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[5]: The runoff from the ephemeral drainages and wetland area flow through a culvert under Vandegrift Blvd. into the SMR flood plain, approximately 8 miles inland from the Pacific Ocean, the nearerst TNW.

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is:
- ☒ Natural
- ☐ Artificial (man-made). Explain: .
- ☒ Manipulated (man-altered). Explain: Railroad berm and rip/rap slope next to Vandegrift Blvd.

Tributary properties with respect to top of bank (estimate):
Average width: 6-10 feet
Average depth: 3-6 feet
Average side slopes: **Vertical (1:1 or less).**

Primary tributary substrate composition (check all that apply):

☒ Silts	☒ Sands	☐ Concrete
☐ Cobbles	☒ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: relatively stable.
Presence of run/riffle/pool complexes. Explain: Dry at the time of evaluation, however, due to low gradient predicted that there would be few riffles.
Tributary geometry: **Relatively straight**
Tributary gradient (approximate average slope): 0-5 %

(c) Flow:
Tributary provides for: **Ephemeral flow**
Estimate average number of flow events in review area/year: **2-5**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Discrete and confined.** Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☒ Bed and banks
☒ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☒ destruction of terrestrial vegetation
☒ shelving	☒ the presence of wrack line
☒ vegetation matted down, bent, or absent	☐ sediment sorting
☒ leaf litter disturbed or washed away	☐ scour
☒ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: N/A.

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☒ Riparian corridor. Characteristics (type, average width): Willow scrub along the channel on the west side of the project near Vandegrift Blvd..

☐ Wetland fringe. Characteristics: .

☐ Habitat for:

☐ Federally Listed species. Explain findings: .

☐ Fish/spawn areas. Explain findings: .

☐ Other environmentally-sensitive species. Explain findings: .

☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size:15.26acres

Wetland type. Explain: southern willow scrub.

Wetland quality. Explain:Good quality near the Santa Margarita River, some roadside runoff due to proximity to Vandegrift Blvd.

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Intermittent flow**. Explain: .

Surface flow is**: Confined**

Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .

☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

☒ Directly abutting

☐ Not directly abutting

☐ Discrete wetland hydrologic connection. Explain: .

☐ Ecological connection. Explain: .

☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **2-5** river miles from TNW.

Project waters are **1-2** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters.**

Estimate approximate location of wetland as within the **2 - 5-year** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: No surface water during evaluation.

Identify specific pollutants, if known: Potential runoff from water treatment facility and Vandergrift Boulevard.

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .

☒ Vegetation type/percent cover. Explain:Southern willow scrub.

☒ Habitat for:

☒ Federally Listed species. Explain findings: The federally endangered Least Bell's Vireo is found in the area.

☐ Fish/spawn areas. Explain findings: .

☐ Other environmentally-sensitive species. Explain findings: .

☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **8**

Approximately (15.26) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Y			
Name	Figure	Linear Feet	Acres
C	Figures 5& 6	2,700	3.73
D	Figures 7	910	0.87
E	Figure 7	2,140	2.38
F	Figures7-9	3,800	4.70
G	Figure 9	590	0.37
H	Figures 10 & 11	610	0.21
I	Figure 10	1,400	1.50
J	Figure 10	1,430	1.50
Total		13,580	15.26

Summarize overall biological, chemical and physical functions being performed: Wetland supports dense scrub/shrub species and endangered species. Toxicodendron diversilobum frequently marks the break between uplands and wetlands. The wetland appears to have historically been disturbed possibly as a result of flooding, which has allowed invasives such as Arundo donax and Tamarix ramosissima to move in. Wetland hydrology is likely provided by flooding of the Santa Margarita River, roadside drainage, and ephemerals that drain the uplands. Other disturbance in the area include an old railroad berm in the floodplain and the a rip/rap slope along the edge of Vandegrift Blvd.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The adjacent wetlands and non-RPWs have a biological, and hydrological connection to the Pacific Ocean.

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   ☐ TNWs: x linear feet width (ft), Or, acres.
   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   ☐ Tributary waters: linear feet width (ft).
   ☐ Other non-wetland waters: acres.
   Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☒ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   ☒ Tributary waters: **0.01** linear feet**12**width (ft).
   ☐ Other non-wetland waters: acres.
   Identify type(s) of waters: **.**

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

   ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☒ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: **15.26**acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   ☐ Demonstrate that impoundment was created from "waters of the U.S.," or

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[8]See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: **.**
☐ Other: (explain, if not covered above): **.**

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☒ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.

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[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

- ☐ U.S. Geological Survey map(s). Cite scale & quad name: .
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation:http://websoilsurvey.nrcs.usda.gov/app/.
- ☒ National wetlands inventory map(s). Cite name: http://www.fws.gov/wetlands/.
- ☐ State/Local wetland inventory map(s): .
- ☒ FEMA/FIRM maps: .
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date):April 2007, on file with MCB Camp Pendleton.
  or ☐ Other (Name & Date): .
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law: .
- ☐ Applicable/supporting scientific literature: .
- ☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD:

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Santa Margarita River/Vandegrift Isolated Wetlands

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:CA County/parish/borough: San Diego City: Marine Corps Base Camp Pendleton
Center coordinates of site (lat/long in degree decimal format): Lat. 33 23'58.56° **N**, Long. 117 38'73.39° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Santa Margarita River (SMR)
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pacific Ocean
Name of watershed or Hydrologic Unit Code (HUC): Aliso-San Onofre, 18070301

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☐ Office (Desk) Determination. Date: To be completed by Corps
- ☐ Field Determination. Date(s): To be completed by Corps

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☐ Non-RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or acres.
   Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **This isolated wetland is a concave depression created on the top of a terrace on the southern side of the Santa Margarita River corridor. The terrace prevents a biological, physical, and hydrological connection**.

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY)**:**

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. **Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.**

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **square miles**
Drainage area: **Pick List**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[5]: The runoff from the ephemeral drainages and wetland area flow through a culvert under Vandegrift Blvd. into the SMR flood plain, approximately 8 miles inland from the Pacific Ocean, the nearerst TNW.

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is:
- ☐ Natural
- ☐ Artificial (man-made). Explain: .
- ☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):

Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):

- ☐ Silts
- ☐ Sands
- ☐ Concrete
- ☐ Cobbles
- ☐ Gravel
- ☐ Muck
- ☐ Bedrock
- ☐ Vegetation. Type/% cover:
- ☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
- ☐ Dye (or other) test performed: .

Tributary has (check all that apply):
- ☐ Bed and banks
- ☐ OHWM[6] (check all indicators that apply):
  - ☐ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community
- ☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- ☐ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list):
- ☐ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: N/A.

[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width): .
☐ Wetland fringe. Characteristics: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
  Wetland size: acres
  Wetland type. Explain: .
  Wetland quality. Explain: .
Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:
Flow is: **Pick List**. Explain: .

Surface flow is**: Confined**
  Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .
  ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
☐ Directly abutting
☐ Not directly abutting
  ☐ Discrete wetland hydrologic connection. Explain: .
  ☐ Ecological connection. Explain: .
  ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW
Project wetlands are **Pick List** river miles from TNW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Flow is from: **Pick List.**
Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .
Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .
☐ Vegetation type/percent cover. Explain: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**
Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The adjacent wetlands and non-RPWs have a biological, and hydrological connection to the Pacific Ocean.

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: x linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

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[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☒ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:**. This isolated wetland is a concave depression isolated on the top of a terrace, which slopes down toward the Santa Margarita River floodplain. The vegetation surrounding the wetland is predominantly upland species. The terrace prevents a biological, physical, and hydrological connection.**
☐ Other: (explain, if not covered above): **.**

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: 0.05 acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☒ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: .
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☒ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☒ FEMA/FIRM maps:NA.
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): April 2007, on file with MCB Camp Pendleton.
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

SRTTP

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:CA County/parish/borough: San Diego City: Marine Corps Base Camp Pendleton
Center coordinates of site (lat/long in degree decimal format): Lat. 33 23'79.88° **N**, Long. 117 38'36.27° **W**.
Universal Transverse Mercator: X=3677736.403789197, Y=535740.4229570527
Name of nearest waterbody: Santa Margarita River (SMR)
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pacific Ocean
Name of watershed or Hydrologic Unit Code (HUC): Aliso-San Onofre, 18070301

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☐ Office (Desk) Determination. Date: To be completed by Corps
- ☒ Field Determination. Date(s): To be completed by Corps

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☒ Non-RPWs that flow directly or indirectly into TNWs
   - ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: 3width (ft) and/or 0.02 acres.
   Wetlands: 0.04 acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: .

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identif y TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: 742 **square miles**
Drainage area: **Pick List**
Average annual rainfall: 10 inches
Average annual snowfall: 0 inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.
☒ Tributary flows through **2** tributaries before entering TNW.

Project waters are **1-2** river miles from TNW.
Project waters are **1 (or less)** river miles from RPW.
Project waters are **1-2** aerial (straight) miles from TNW.
Project waters are **1 (or less)** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[5]: The runoff from the ephemeral drainages and wetland area flow through a culvert under Vandegrift Blvd. into the SMR flood plain, approximately 8 miles inland from the Pacific Ocean, the nearerst TNW.

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☒ Natural

☒ Artificial (man-made). Explain: The tributary flows through a culvert under Vandegrift Blvd into Twin Ponds which flows to the SMR.

☒ Manipulated (man-altered). Explain: Twin Ponds were excavated years ago for the original sewage treatment plant in the area.

Tributary properties with respect to top of bank (estimate):
Average width: 6-10 feet
Average depth: 3-6 feet
Average side slopes: **Vertical (1:1 or less).**

Primary tributary substrate composition (check all that apply):

☒ Silts ☒ Sands ☐ Concrete
☐ Cobbles ☒ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: relatively stable.
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Relatively straight**
Tributary gradient (approximate average slope): 0-5 %

(c) Flow:
Tributary provides for: **Ephemeral flow**
Estimate average number of flow events in review area/year: **2-5**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Discrete and confined.** Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☒ Bed and banks
☒ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☒ destruction of terrestrial vegetation
☒ shelving ☒ the presence of wrack line
☒ vegetation matted down, bent, or absent ☐ sediment sorting
☒ leaf litter disturbed or washed away ☐ scour
☒ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:

☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: N/A.

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☒ Riparian corridor. Characteristics (type, average width): Willow scrub along the channel on the edge of Twin Ponds..
☐ Wetland fringe. Characteristics: .
☐ Habitat for:
  ☐ Federally Listed species. Explain findings: .
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size:0.04 acres
Wetland type. Explain: .
Wetland quality. Explain: .
Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:
Flow is: **Intermittent flow**. Explain: .

Surface flow is**: Confined**
Characteristics: .

S ubsurface flow: **Unknown**. Explain findings: .
☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
☒ Directly abutting
☐ Not directly abutting
  ☐ Discrete wetland hydrologic connection. Explain: .
  ☐ Ecological connection. Explain: .
  ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW
Project wetlands are **1-2** river miles from TNW.
Project waters are **1-2** aerial (straight) miles from TNW.
Flow is from: **Wetland to navigable waters.**
Estimate approximate location of wetland as within the **2 - 5-year** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: No surface water during evaluation.
Identify specific pollutants, if known: Potential runoff from water treatment facility and Vandergrift Boulevard.

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .
☒ Vegetation type/percent cover. Explain:Southern willow scrub.
☒ Habitat for:
  ☒ Federally Listed species. Explain findings: The federally endangered Least Bell's Vireo is found in the area.
  ☐ Fish/spawn areas. Explain findings: .
  ☐ Other environmentally-sensitive species. Explain findings: .
  ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **2**
Approximately (0.04) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
Y	0.01		
Y	0.03		

Summarize overall biological, chemical and physical functions being performed: Wetlands are on the edge of Twin ponds near the SRTTP. Other wetlands on the edge of Twin Ponds area just outside the project footprint.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The adjacent wetlands and non-RPWs have a biological, and hydrological connection to the Pacific Ocean.

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   ☐ TNWs: x linear feet width (ft), Or, acres.
   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .

☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. Non-RPWs[8] that flow directly or indirectly into TNWs.
☒ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☒ Tributary waters: **0.02** linear feet**3**width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
☒ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: **2.04**acres.

7. Impoundments of jurisdictional waters.[9]
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

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[8]See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: **.**
☐ Other: (explain, if not covered above): **.**

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☒ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: .
☒ USDA Natural Resources Conservation Service Soil Survey. Citation:http://websoilsurvey.nrcs.usda.gov/app/.
☒ National wetlands inventory map(s). Cite name: http://www.fws.gov/wetlands/.
☐ State/Local wetland inventory map(s): .
☒ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (N ational Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date):April 2007, on file with MCB Camp Pendleton.
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD:

.

Appendix C

Rare Plant Report

Rare Plant Surveys for
Advanced Water Treatment Facilities and Utility Corridor (P-113)
Marine Corps Base Camp Pendleton

Prepared by:

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November 9, 2009

Introduction

This report describes the results of rare plant surveys conducted in support of the Advance Water Treatment Facilities and Utility Corridor (P-113) project at Marine Corps Base, Camp Pendleton (MCBCP).

Survey Methods

Surveys were conducted for all rare plants potentially occurring in the project areas by Carolyn Martus and Margie Mulligan. Maps of the areas surveyed follow this report. Field maps and directions regarding the surveys were provided by TEC Inc. and Colleen Eckenroad, AC/S ES, MCBCP. Field surveys were initiated as soon as possible following observations of thread-leaved brodiaea (TLB, *Brodiaea filifolia*) in flower on MCBCP. Access to the November and Mike Training areas was coordinated with MCBCP. Areas of potential TLB habitat were surveyed by investigators walking transects not more than 20 feet wide, repeated at approximately two-week intervals, consistent with MCBCP's survey protocol for TLB. Surveys were conducted on May 11, May 21, and June 4, 2007. Highly disturbed areas determined on the basis of the first survey to have no potential to contain rare plants were not surveyed again.

The west side of Vandegrift Blvd. was mowed after the first visit; therefore, only the first survey was performed. The developed segments in the 21 Area (including the marina) were also surveyed only once due to low habitat potential.

The Paintball Park was very disturbed but there was moderate *Brodiaea filifolia* potential on the northwest section of park along Vandegrift Blvd. This section has native grassland that is quickly becoming degraded by trampling via paintball participants. This section of the park was surveyed on all three visits.

As requested by Mike Dungan of TEC and Colleen Eckenroad, AC/S Environmental Security, the alternative utility corridor 2 on the Marine Corps Air Station was not surveyed due to lack of access, the availability of existing data, and low potential for rare plants, especially TLB in the disturbed floodplain area of the corridor.

A Trimble sub-meter global positioning system (GPS) was used to document survey transects. Since one botanist carried the GPS unit while surveying, areas surveyed concurrently by the other botanist were not documented with GPS, and technical problems resulted in a loss of some GPS data. Sections that were surveyed but not documented with the GPS unit include southern section of Vandegrift Blvd., one section in the Mike training area, Stuart Mesa Road section, and some sections in the 21 area. Maps of the transects recorded with the Trimble unit are included on the maps following this report.

Results

Table 1 below lists plant species encountered during the surveys. There were no rare plants found during the 2007 surveys. There was low potential for rare plants because much of the route was developed or highly disturbed roadside habitat. This year also was marked by unusually low rainfall therefore habitat conditions were very dry, especially for annuals.

The federally listed TLB was documented approximately 1,000 ft northeast of the P-113 project footprint at the Y junction in Pueblitos Canyon (Figure 5). This TLB population was first documented by Ogden in 1997, and verified and remapped by NSR in 2005 and TEC in 2008. Salinas Clay Loam, a soil known to support TLB, exists southwest of the TLB population along the pipeline route from the Y junction west down the pipeline footprint (Figure 5). The pipeline footprint west of the Y junction was surveyed by TEC in 2008 during the Santa Margarita Conjunctive Use rare plant surveys and no TLB was found.

Table 1. Species List for P-113 Project

	Family	Scientific Name	Common Name
		BLACK = LOCALLY NATIVE SPECIES	
		RED = NON-NATIVE SPECIES	
Monocots	Arecaceae	*Washingtonia robusta*[1]	Mexican Fan Palm
	Poaceae	*Avena barbata*	Slender Wild Oat
		Arundo donax	Giant Reed
		Bromus diandrus	Ripgut Grass
		Bromus hordeaceus	Soft Chess
		Bromus madritensis ssp. *rubens*	Red Brome
		Cynodon dactylon	Bermuda Grass
		Distichlis spicata	Saltgrass
		Hordeum murinum ssp. *glaucum*	Glaucous Barley
		Lamarckia aurea	Golden-top
		Lolium multiflorum	Italian Ryegrass
		Paspalum dilatatum	Dallis Grass
		Pennisetum setaceum	African Fountain Grass
		Piptatherum miliaceum	Smilo Grass
		Schismus barbatus	Mediterranean Beard Grass
Eudicots	Adoxaceae	*Sambucus mexicana*	Blue Elderberry
	Aizoaceae	*Carpobrotus edulis*	Hottentot-fig
	Amaranthaceae	*Atriplex semibaccata*	Australian Saltbush
		Salsola tragus	Prickly Russian-thistle
	Anacardiaceae	*Malosma laurina*	Laurel Sumac
		Rhus integrifolia	Lemonadeberry
		Toxicodendron diversilobum	Western Poison-oak
	Apiaceae	*Conium maculatum*	Common Poison Hemlock
		Foeniculum vulgare	Sweet Fennel
	Asteraceae	*Ambrosia psilostachya*	Western Ragweed
		Artemisia californica	Coastal Sagebrush
		Baccharis pilularis	Coyote Bush
		Baccharis salicifolia	Mulefat
		Centaurea melitensis	Tocalote
		Corethrogyne filaginifolia var. *filaginifolia*	Common Sand-aster
		Filago gallica	Narrow-leaf Filago
		Deinandra fasciculata	Fascicled Tarweed
		Gnaphalium californicum	California Everlasting
		Gnaphalium stramineum	Cotton-batting Plant
		Hedypnois cretica	Crete Hedypnois
		Heterotheca grandiflora	Telegraph Weed
		Hypochaeris glabra	Smooth Cat's Ear
		Isocoma menziesii	Goldenbush
		Picris echioides	Bristly Ox-tongue
		Sonchus asper ssp. *asper*	Prickly Sow-thistle
		Sonchus oleraceus	Common Sow-thistle
	Brassicaceae	*Hirschfeldia incana*	Short-pod Mustard
		Raphanus sativus	Wild Radish
	Capparaceae	*Isomeris arborea*	Bladderpod

Table 2. Special Status Plant Species Known to Occur or Potentially Occurring on MCB Camp Pendleton
(Page 1 of 7)
(**Bold** indicates known occurrence on Camp Pendleton)

I. Federally-Listed or Candidate Threatened or Endangered Species				
Species Name	**Common Name**	**Status Fed/CA/CNPS**	**Habitat**	**Life Form, Blooming Period**
Acanthomintha ilicifolia	San Diego thorn-mint	T/E/1B.1	chaparral, coastal scrub, grassland, vernal pools; clay	annual herb, Apr-Jun
Ambrosia pumila	San Diego ambrosia	E/-/1B.1	chaparral, coastal scrub, grassland, vernal pools; often in disturbed areas	perennial herb (rhizomatous), Apr-Oct
Arctostaphylos glandulosa ssp. *crassifolia*	Del Mar manzanita	E/-/1B.1	maritime chaparral; sandy	evergreen shrub, Dec-Apr
Baccharis vanessae	Encinitas baccharis	T/E/1B.1	maritime chaparral; sandstone	deciduous shrub, Aug-Nov
Brodiaea filifolia	**thread-leaved brodiaea**	**T/E/1B.1**	**chaparral (openings), cismontane woodland, coastal scrub, playas, grassland, vernal pools; often clay**	**bulbiferous herb, Mid-Apr-Jul**
Eryngium aristulatum* var. *parishii	**San Diego button-celery**	**E/E/1B.1**	**coastal scrub, grassland, vernal pools; mesic**	**annual/perennial herb, Apr-Jun**
Navarretia fossalis	**spreading navarretia**	**T/-/1B.1**	**chenopod scrub, marshes and swamps (assorted shallow freshwater), playas, vernal pools**	**annual herb, Apr-Jun**
Phacelia stellaris	**Brandt's phacelia**	**C/-/1B.1**	**coastal dunes, coastal scrub**	**annual herb, Mar-Jun**

Special Status Plant Species Known to Occur or Potentially Occurring on Camp Pendleton
(Page 2 of 7)
(**Bold** indicates known occurrence on Camp Pendleton)

CA-listed and Species included on CNPS Lists 1B and 2				
Species Name	**Common Name**	**Status Fed/CA/CNPS**	**Habitat**	**Life Form, Blooming Period**
Adolphia californica	California adolphia	-/-/2.1	chaparral, coastal scrub, grassland	deciduous shrub, Dec-May
Aphanisma blitoides	Aphanisma -/	-/1B.1	coastal bluffs, coastal dunes, coastal scrub (sandy)	annual herb, Mar-Jun
Arctostaphylos rainbowensis	**Rainbow manzanita**	**-/-/1B.1**	**chaparral**	**evergreen shrub, Jan-Feb**
Atragalus tener var. *titi*	coastal dunes milk-vetch	-/-/1B.1	coastal bluff scrub, coastal dunes, coastal prarie	perennial herb, Mar-May
Atriplex coulteri	**Coulter's saltbush**	**-/-/1B.1**	**coastal bluff scrub, coastal dunes, coastal scrub, grassland (clay)**	**perennial herb, Mar-Oct**
Atriplex pacifica	South Coast saltscale	-/-/1B.1	coastal bluff scrub, coastal dunes, coastal scrub, playas	annual herb, Mar-Oct
Atriplex serenana var. *davidsonii*	Davidson's saltscale	-/-/1B.2	coastal bluff scrub, coastal scrub; alkaline	annual herb, Apr-Oct
Brodiaea orcuttii	**Orcutt's brodiaea**	**-/-/1B.1**	**chaparral, woodland, meadows/seeps, grassland, vernal pools; clay, serpentinite**	**bulbiferous herb, May-Jul**
Ceanothus verrucosus	wart-stemmed ceanothus	-/-/ 2.2	chaparral	evergreen shrub, Dec-May
Centromadia parryi ssp. *australis*	southern tarplant	-/-/1B.1	marshes and swamps (margins), grassland (mesic), vernal pools	annual herb, May-Nov
Centromadia pungens ssp. *laevis*	smooth tarplant	-/-/1B.1	chenopod scrub, meadows and seeps, playas, riparian woodland, grassland; alkaline	annual herb, Apr-Sep
Chaenactis glabriuscula var. *orcuttiana*	Orcutt's pincushion	-/-/1B.1	coastal bluff scrub (sandy), coastal dunes	annual herb, Jan-Aug
Chorizanthe polygonoides var. *longispina*	long-spined spineflower	-/-/1B.2	chaparral, coastal scrub, meadows and seeps, grassland; often clay	annual herb, Apr-Jul
Comarostaphylis diversifolia* ssp. *diversifolia	**summer holly**	**-/-/1B.2**	**chaparral**	**evergreen shrub, Apr-Jun**
Coreopsis maritima	**sea dahlia**	**-/-/2.2**	**coastal bluff scrub, coastal scrub**	**perennial herb, Mar-May**
Dudleya blochmaniae* ssp. *blochmaniae	**Blochman's dudleya**	**-/-/1B.1**	**coastal bluff scrub, chaparral, coastal scrub, grassland; rocky, often clay or serpentinite**	**perennial herb, Apr-Jun**

Special Status Plant Species Known to Occur or Potentially Occurring on Camp Pendleton
(Page 3 of 7)
(**Bold** indicates known occurrence on Camp Pendleton)

CA-listed and Species included on CNPS Lists 1B and 2				
Species Name	**Common Name**	**Status Fed/CA/CNPS**	**Habitat**	**Life Form, Blooming Period**
Dudleya multicaulis	**many-stemmed dudleya**	**-/-/1B.2**	**chaparral, coastal scrub, grassland; often clay**	**perennial herb, Apr-Jul**
Dudleya variegata	variegated dudleya	-/-/1B.2	chaparral, cismontane woodland, coastal scrub, grassland, vernal pools/clay	perennial herb, May-Jun
Dudleya viscida	**sticky dudleya**	**-/-/1B.2**	**coastal bluff scrub, chaparral, coastal scrub; rocky**	**perennial herb, May-Jun**
Eryngium pendletonense	**Pendleton button-celery**	**-/-/1B.1**	**coastal bluff scrub, grassland, vernal pools; clay, vernally mesic**	**perennial herb, Apr-Jun**
Euphorbia misera	cliff spurge	-/-/2.2	coastal bluff scrub, coastal scrub; rocky	shrub, Dec-Aug
Horkelia cuneata* ssp. *puberula	**mesa horkelia**	**-/-/1B**	**chaparral, cismontane woodland, coastal scrub; sandy or gravelly. Believed extirpated from San Diego County.**	**perennial herb, Feb-Sep**
Horkelia truncata	**Ramona horkelia**	**-/-/1B.3**	**chaparral, cismontane woodland; clay**	**perennial herb, May-Jun**
Lasthenia glabrata* ssp. *coulteri	**Coulter's goldfields**	**-/-/1B.1**	**marshes and swamps (coastal salt), playas, vernal pools**	**annual herb, Feb-Jun**
Lotus nuttallianus	**Nuttall's lotus**	**-/-/1B.1**	**coastal dunes, coastal scrub; sandy**	**annual herb, Mar-Jun**
Monardella hypoleuca* ssp. *lanata	**felt-leaved monardella**	**-/-/1B.2**	**chaparral, cismontane woodland**	**perennial herb (rhizomatous), Jun-Aug**
Nama stenocarpum	mud nama	-/-/2.2	marshes and swamps; lake margins, riverbanks	annual/perennial herb, Jan-Jul
Navarretia prostrata	prostrate navarretia	-/-/1B.1	coastal scrub, meadows, grassland, vernal pools	annual herb, Apr-Jul
Nemacaulis denudata* var. *denudata	**coastal wooly heads**	**-/-/1B.2**	**coastal dunes**	**annual herb, Apr-Sep**
Nemacaulis denudata var. *gracilis*	slender wooly heads	-/-/2.2 coastal	dunes	annual herb, Mar-May
Quercus dumosa	**Nuttall's scrub oak**	**-/-/1B.1**	**closed-cone forest, chaparral, coastal scrub/sandy, clay loam**	**evergreen shrub, Feb-Apr**

Special Status Plant Species Known to Occur or Potentially Occurring on Camp Pendleton
(Page 4 of 7)
(**Bold** indicates known occurrence on Camp Pendleton)

CA-listed and Species included on CNPS Lists 1B and 2				
Species Name	**Common Name**	**Status Fed/CA/CNPS**	**Habitat**	**Life Form, Blooming Period**
Satureja chandleri	**San Miguel savory**	**-/-/1B.2**	**chaparral, cismontane woodland, coastal scrub, riparian woodland, grassland; rocky, gabbroic or metavolcanic**	**perennial herb, Mar-Jul**
Suaeda esteroa	estuary seablite	-/-/1B.2	marshes and swamps (coastal salt)	perennial herb, May-Jan
Tetracoccus dioicus	Parry's tetracoccus	-/-/1B.2	chaparral, coastal scrub	deciduous shrub, Apr-May

Special Status Plant Species Known to Occur or Potentially Occurring on Camp Pendleton
(Page 5 of 7)
(**Bold** indicates known occurrence on Camp Pendleton)

Species Included on CNPS Lists 3 and 4				
Species Name	**Common Name**	**Status Fed/CA/CNPS**	**Habitat**	**Life Form, Blooming Period**
Abronia maritima	**red sand-verbena**	**-/-/4.2**	**coastal Dunes**	**perennial herb Feb-Nov**
Artemisia palmeri	San Diego sagewort	-/-/4.2	chaparral, coastal scrub riparian scrub, riparian woodland; sandy, mesic	deciduous shrub, May-Sep
Asplenium vespertinum	western spleenwort	-/-/4.2	chaparral, cismontane woodland, coastal scrub; rocky	perennial herb (rhizomatous), fertile Feb-Jun.
Azolla mexicana	Mexican mosquito fern	-/-/4.2	marshes and swamps (ponds, slow water)	annual/perennial herb, fertile Aug
Calandrinia breweri	Brewer's calandrinia	-/-/4.2	chaparral, coastal scrub; sandy or loamy; disturbed sites and burns	annual herb, Mar-Jun
Calandrinia maritima	**seaside calandrinia**	**-/-/4.2**	**coastal bluff scrub, coastal scrub, grassland; sandy**	**annual herb, Feb-Aug**
Camissonia lewisii	**Lewis's evening primrose**	**-/-/3**	**coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, grassland; sandy or clay**	**annual herb, Mar-Jun**
Caulanthus simulans	**Payson's jewel-flower**	**-/-/4.2**	**chaparral, coastal scrub; sandy, granitic**	**annual herb, Feb-Jun**
Chamaebatia australis	**southern mountain misery**	**-/-/4.2**	**chaparral (gabbroic or metavolcanic)**	**evergreen shrub, Nov-May**
Convolvulus simulans	**small-flowered morning-glory**	**-/-/4.2**	**chaparral (openings) coastal scrub, grassland; clay, serpentine seeps**	**annual herb, Mar-Jun**
Deinandra paniculata	**paniculate tarplant**	**-/-/4.2**	**coastal scrub, grassland; usually vernally mesic**	**annual herb, Apr-Nov**
Dichondra occidentalis	**western dichondra**	**-/-/4.2**	**chaparral, cismontane woodland, coastal scrub, grassland**	**perennial herb (rhizomatous), Mar-Jun**
Harpagonella palmeri	**Palmer's grapplinghook**	**-/-/4.2**	**chaparral, coastal scrub, grassland,**	**annual herb, Mar-May**
Hordeum intercedens	**Vernal barley**	**-/-/3.2**	**coastal dunes, coastal scrub, saline flats and depressions in grassland, vernal pools**	**annual herb, Mar-Jun**

Special Status Plant Species Known to Occur or Potentially Occurring on Camp Pendleton
(Page 6 of 7)
(**Bold** indicates known occurrence on Camp Pendleton)

CNPS List 3 and List 4 Species				
Species Name	**Common Name**	**Status Fed/CA/CNPS**	**Habitat**	**Life Form, Blooming Period**
Juglans californica	**Southern California black walnut**	**-/-/4.2**	**chaparral, cismontane woodland, coastal scrub; alluvial**	**deciduous tree, Mar-Aug**
Juncus acutus* ssp. *leopoldii	**southwestern spiny rush**	**-/-/4.2**	**coastal dunes (mesic), meadows and seeps (alkaline seeps), marshes and swamps (coastal salt)**	**perennial herb (rhizomatous), May-Jun**
Lilium humboldtii* ssp. *ocellatum	**ocellated Humboldt lily**	**-/-/4.2**	**chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, riparian woodland; openings**	**perennial herb (bulbiferous), Mar-Jul**
Lycium californicum	**California box-thorn**	**-/-/4.2**	**coastal bluff scrub, coastal scrub**	**shrub, Mar-Aug**
Microseris douglasii var. *platycarpha*	small-flowered microseris	-/-/4.2	cismontane woodland, coastal scrub, grassland, vernal pools; clay	annual herb, Mar-May
Mucronea californica	California spineflower	-/-/4.2	chaparral, cismontane woodland, coastal dunes, coastal scrub, grassland; sandy	annual herb, Mar-Aug
Myosurus minimus* ssp. *apus	**little mousetail**	**-/-/3.1**	**grassland, vernal pools (alkaline)**	**annual herb, Mar-Jun**
Ophioglossum californicum	California adder's-tongue	-/-/4.2	chaparral, grassland, margins of vernal pools; mesic	perennial herb (rhizomatous), fertile Dec-Jun
Orobanche parishii* ssp. *brachyloba	**short-lobed broomrape**	**-/-/4.2**	**coastal bluff scrub, coastal dunes, coastal scrub; sandy**	**parasitic perennial herb, Apr-Oct**
Pentachaeta aurea	**golden-rayed pentachaeta**	**-/-/4.2**	**cismontane woodland, coastal scrub, lower montane coniferous forest, grassland**	**annual herb, Mar-Jul**
Piperia cooperi	chaparral rein orchid	-/-/4.2	chaparral, cismontane woodland, grassland	perennial herb, Mar-Jun
Polygala cornuta* var. *fishiae	**Fish's milkwort**	**-/-/4.3**	**chaparral, cismontane woodland, riparian woodland**	**deciduous shrub, May-Aug**
Quercus engelmannii	**Engelmann oak**	**-/-/4.2**	**chaparral, cismontane woodland, riparian woodland, grassland,**	**deciduous tree, Mar-Jun**
Romneya coulteri	**Coulter's matilija poppy**	**-/-/4.2**	**chaparral, coastal scrub; often in burns**	**perennial herb (rhizomatous), Mar-Jul**

Special Status Plant Species Known to Occur or Potentially Occurring on Camp Pendleton
(Page 7 of 7)

(**Bold** indicates known occurrence on Camp Pendleton)

CNPS Lists 3 and 4 Species				
Species Name	**Common Name**	**Status Fed/CA/CNPS**	**Habitat**	**Life Form, Blooming Period**
Suaeda taxifolia	**woolly seablite**	**-/-/4.2**	**coastal bluff scrub, coastal dunes, marshes and swamps; margins of coastal salt marshes**	**evergreen shrub, Jan-Dec**
Viguiera laciniata	**San Diego County viguiera**	**-/-/4.2**	**chaparral, coastal scrub**	**shrub, Feb-Jun**

Status:
Federal Status (determined by U. S. Fish and Wildlife Service):
E - Endangered. In danger of extinction throughout all or a significant portion of its range.
T - Threatened. Likely-become an endangered species within the foreseeable future throughout all or a significant portion of its range.
C – Candidate for listing as threatened or endangered.

CA Status (determined by California Department of Fish and Game):
E - CA listed as Endangered
T - CA listed as Threatened

California Native Plant Society List (CNPS) List:
1B - Plants considered rare or endangered in California and elsewhere
2 - Plants considered rare or endangered in California but more common elsewhere.
3 - Plants for which more information is needed.
4 - Plants of limited distribution – a watch list.
CNPS Threat Codes
1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
2 – Fairly endangered in California (20-80% occurrences threatened)
3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

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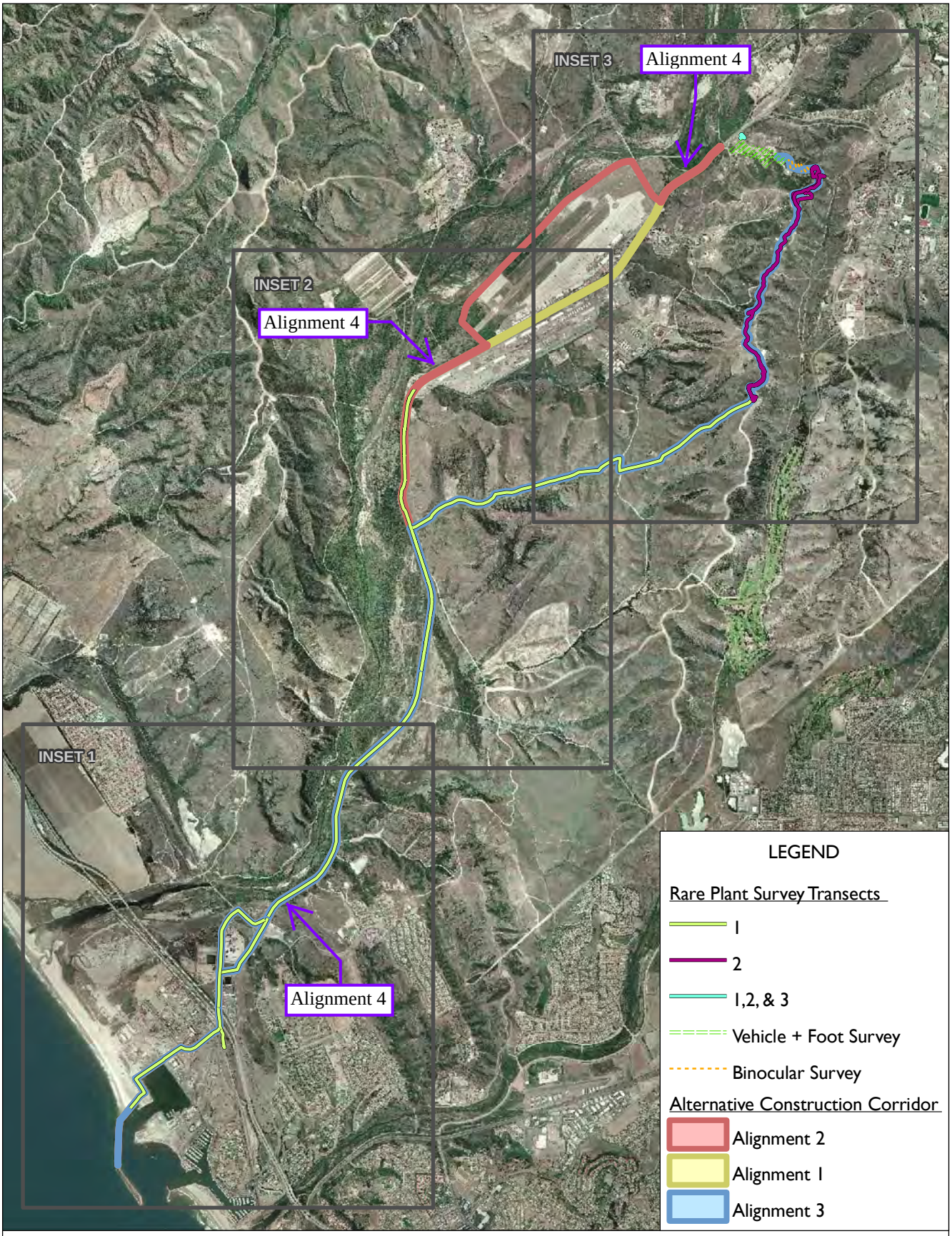
	Family	Scientific Name	Common Name
	Caryophyllaceae	*Spergularia bocconi*	Boccone's Sand-Spurry
	Convolvulaceae	*Cardionema ramosissima*	Tread Lightly
		Cressa truxillensis	Alkali Weed
		Convolvulus arvensis	Field Bindweed
	Euphorbiaceae	*Chamaesyce maculata*	Spotted Spurge
		Ricinus communis	Castor Bean
	Fabaceae	*Astragalus trichopodus* var. *lonchus*	Ocean Locoweed
		Lotus hamatus	Grab Lotus
		Lotus purshianus var. *purshianus*	Spanish-clover
		Lotus scoparius var. *scoparius*	Coastal Deerweed
		Lupinus sp.[2]	Lupine
		Medicago polymorpha	California Burclover
		Medicago sativa	Alfalfa
		Melilotus albus	White Sweetclover
		Melilotus indicus	Indian Sweetclover
	Geraniaceae	*Erodium botrys*	Long-beak Filaree
		Erodium cicutarium	Red-stem Filaree
		Erodium moschatum	White-stem Filaree
	Heliotropaceae	*Heliotropium curassavicum*	Salt Heliotrope
	Lamiaceae	*Salvia mellifera*	Black Sage
	Malvaceae	*Malacothamnus fasciculatus*	Chaparral Bushmallow
		Malva parviflora	Cheeseweed
	Onagraceae	*Oenothera elata* ssp. *hookeri*	Great Marsh Evening-Primrose
	Plantaginaceae	*Plantago coronopus*	Cut-leaf Plantain
		Plantago lanceolata	English Plantain
	Polygonaceae	*Eriogonum fasciculatum* var. *fasciculatum*	Coast California Buckwheat
		Rumex crispus	Curly Dock
	Primulaceae	*Anagallis arvensis*	Scarlet Pimpernel
	Rosaceae	*Heteromeles arbutifolia*	Toyon
		Rosa californica	California Rose
		Rubus ursinus	California Blackberry
	Salicaceae	*Populus fremontii* ssp. *fremontii*	Western Cottonwood
		Salix laevigata	Red Willow
	Solanaceae	*Nicotiana glauca*	Tree Tobacco
	Tamaricaceae	*Tamarix ramosissima*	Tamarisk
	Typhaceae	*Typha sp.*	Cattail
	Ulmaceae	*Ulmus parvifolia*	Chinese Elm
	Urticaceae	*Urtica dioica* ssp. *holosericea*	Hoary Nettle
	Verbenaceae	*Verbena lasiostachys var. lasiostachys*	Western Vervain
		Verbena menthifolia	Mint-leaf Vervain
		[1]Saplings [2]Vegetative	

References

Hickman, James C. 1993. *The Jepson Manual, Higher Plants of California*.

Lightner, James. 2006. *San Diego County Native Plants*.

Rebman J.R. and M.G. Simpson. 2006. *Checklist of the Vascular Plants of San Diego County, 4th edition*



0 Kilometers 1

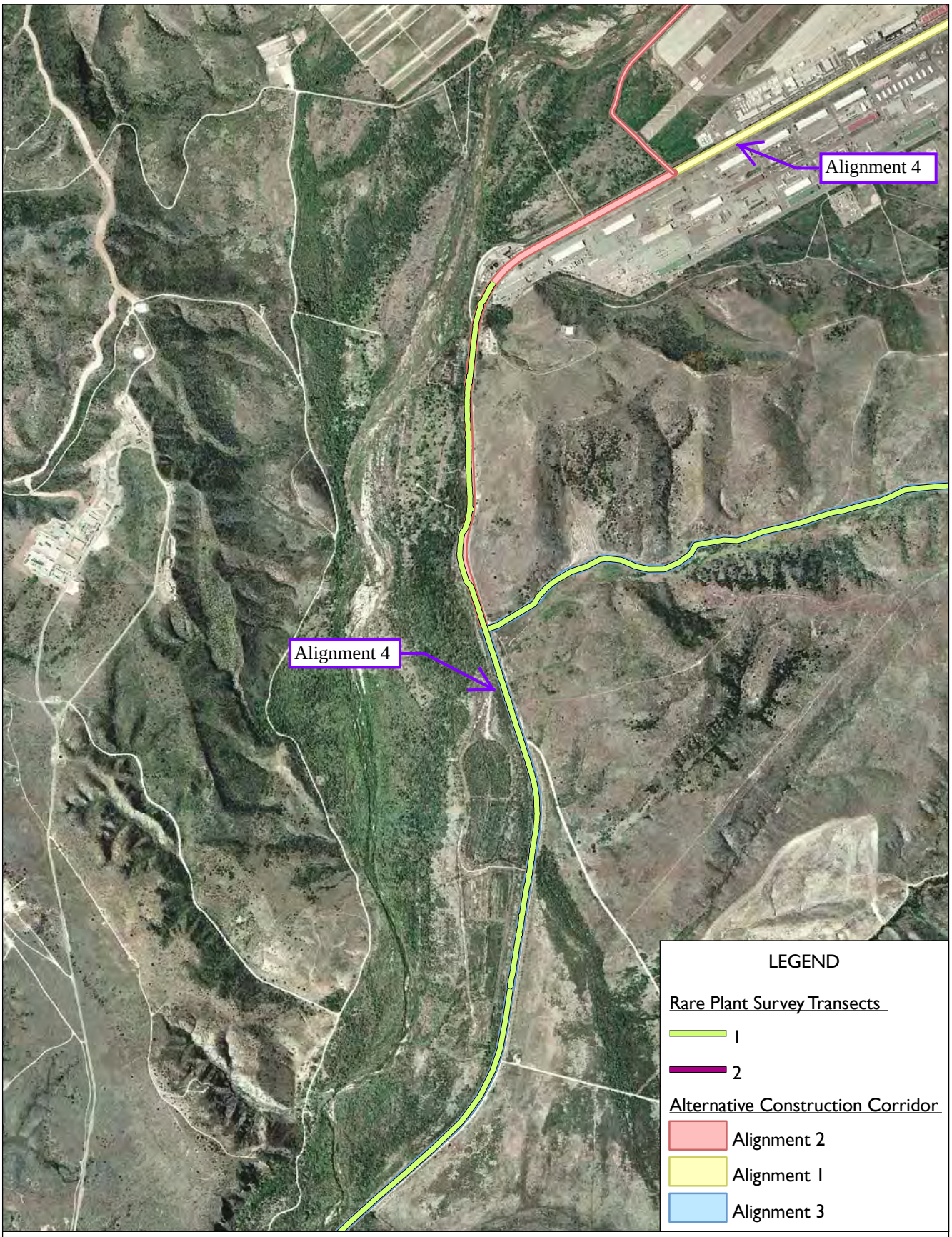
0 Miles 1

Figure 1. Overview
P-113 Project Location
And Rare Plant Survey Transects

0 Meters 500

0 Feet 2,000

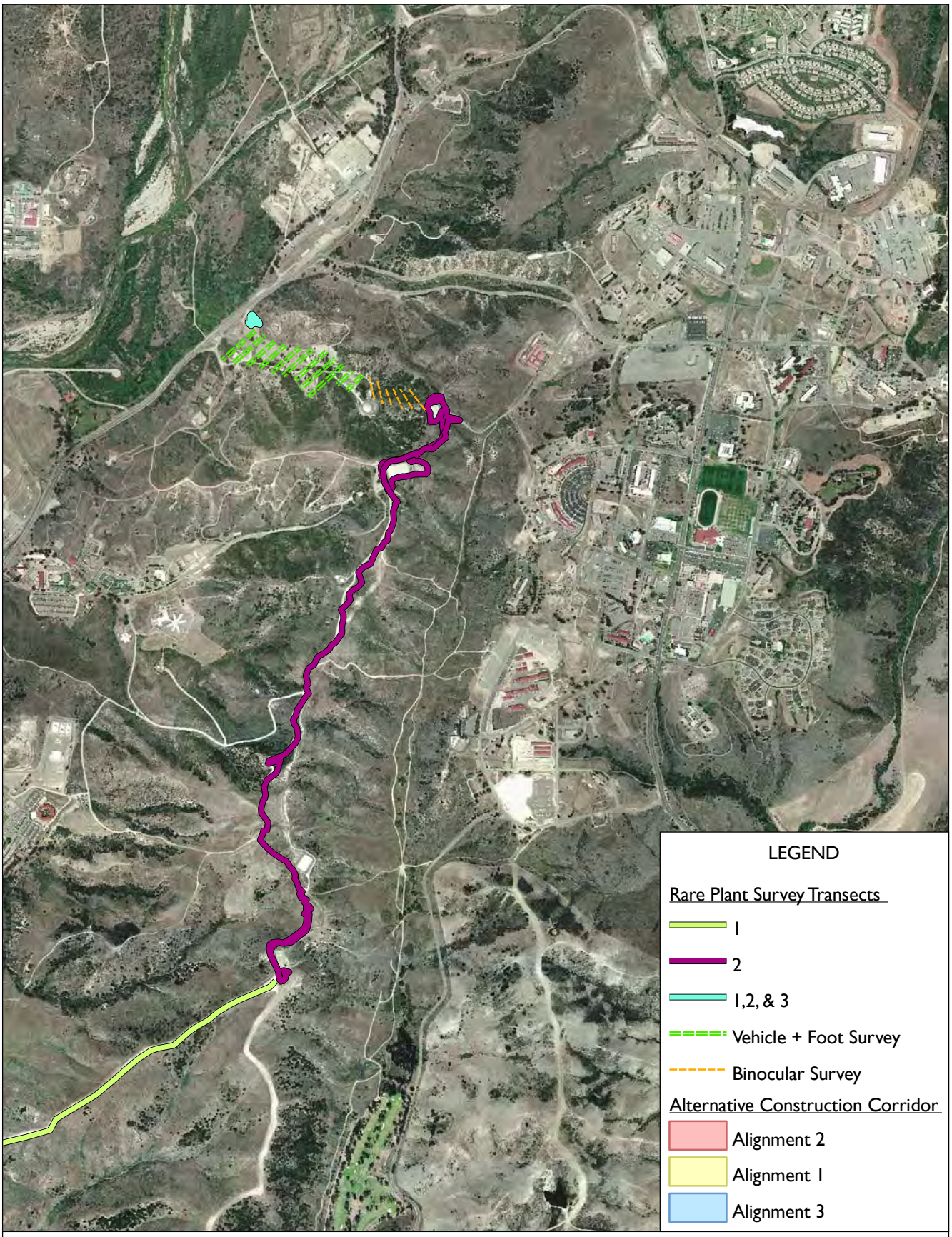
Figure 2.
P-113, Inset 1
Rare Plant Survey Transects



0 Meters 500

0 Feet 2,000

Figure 3.
P-113, Inset 2
Rare Plant Survey Transects



0 Meters 500

0 Feet 2,000

Figure 4.
P-113, Inset 3
Rare Plant Survey Transects

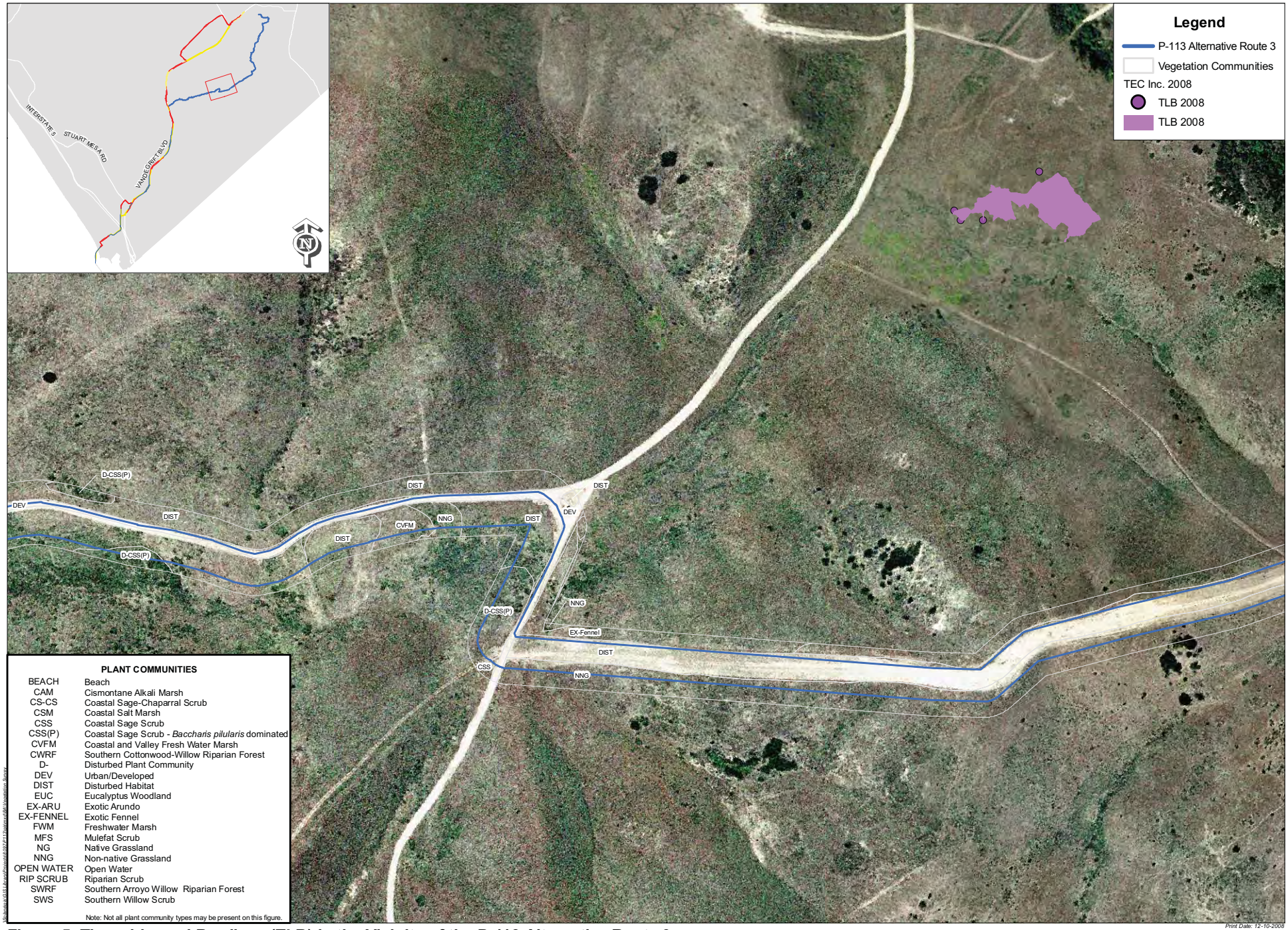


Figure 5. Thread-leaved Brodiaea (TLB) in the Vicinity of the P-113 Alternative Route 3

Appendix D

Fairy Shrimp Report

Sampling for Listed Fairy Shrimp along the three Advanced Water Treatment Facility and Utility Corridor (P113) Project Alignment Alternatives,

Marine Corps Base Camp Pendleton,
California

Subcontract 8097-51686

Final Report

Chuck Black 10(a)(1)(A) permit
Ecological Restoration Service TE835549-5
San Diego, CA Effective 5/27/07-7/5/11
September 30, 2008

Introduction

Ecological Restoration Service [ERS] was contracted by TEC in June 2007 to examine the three P-113 project brineline alignment alternatives (Figure 1) for the presence of vernal pools and potential listed fairy shrimp habitat presence. The presence of vernal pools or potential shrimp habitat in these areas necessitates U. S. Fish and Wildlife protocol sampling for the presence of listed fairy shrimp and for listed vernal pool plant species. ERS found two areas of potential ponding and fairy shrimp habitat outside of the Pendleton Air Station vicinity, which was removed from study by Camp Pendleton (Black 2007) based on communication with MCAS environmental staff stating there were no vernal pools within the air station.

Two basins in the Sewage Treatment Plant [STP] 13 Area (Figure 2) had been identified by RECON (1999) and sampled by ERS in 1991 (Black 1991). One of two basins in this area had hatched Lindahl's fairy shrimp, *Branchinecta lindahli*, and one had *Branchinecta* cysts in soil samples. These cysts were not cultured in that study. The two STP 13 basins and additional identified puddles, ruts, and impoundments were sampled by ERS in 2003 (Black 2003). All hatched shrimp in these studies were the non-listed Lindahl's fairy shrimp. An additional road rut on the shoulder of Wire Mountain Road approximately 50 meters north of STP 13 was identified as needing sampling by Camp Pendleton natural resources staff (Thomas Sabol, personal communication, Figure 2). A second area located within Pueblitos Canyon consisting of an extended marsh area with patches of rush (*Eleocharis* sp.) and other wetland vegetation was found by ERS approximately 1.5 miles south of the Pendleton Air Station, just off Vandergrift Rd. (Figure 3).

The three identified basins and the marsh area were examined for the presence of fairy shrimp cysts with U. S. Fish and Wildlife Service protocol dry season sampling in the summer of 2007 (Black 2007). Cysts were found in the two STP 13 basins, and on culturing produced the non-listed Lindahl's fairy shrimp (*Branchinecta lindahli*). No cysts were found in other areas. Protocol wet season sampling was conducted on these basins and areas during the 2007-08 wet season. The first monthly report was submitted December 31, 2007, the second on January 31, 2008, the third on February 29, 2008; the fourth on March 31; the fifth monthly report on April 30, 2008. This is the final comprehensive report on 2007-08 sampling, incorporating previous years' sampling results.

Methods

The basins and the marsh area were examined after major rainfall events (> .5"), and every 7-12 days thereafter while basins were ponding water (Table 1). Margins of ponded areas were observed for fairy shrimp presence, and then swept with a fine mesh aquarium net. Sexually mature fairy shrimp, if present, were collected, identified to species, and kept as voucher specimens.

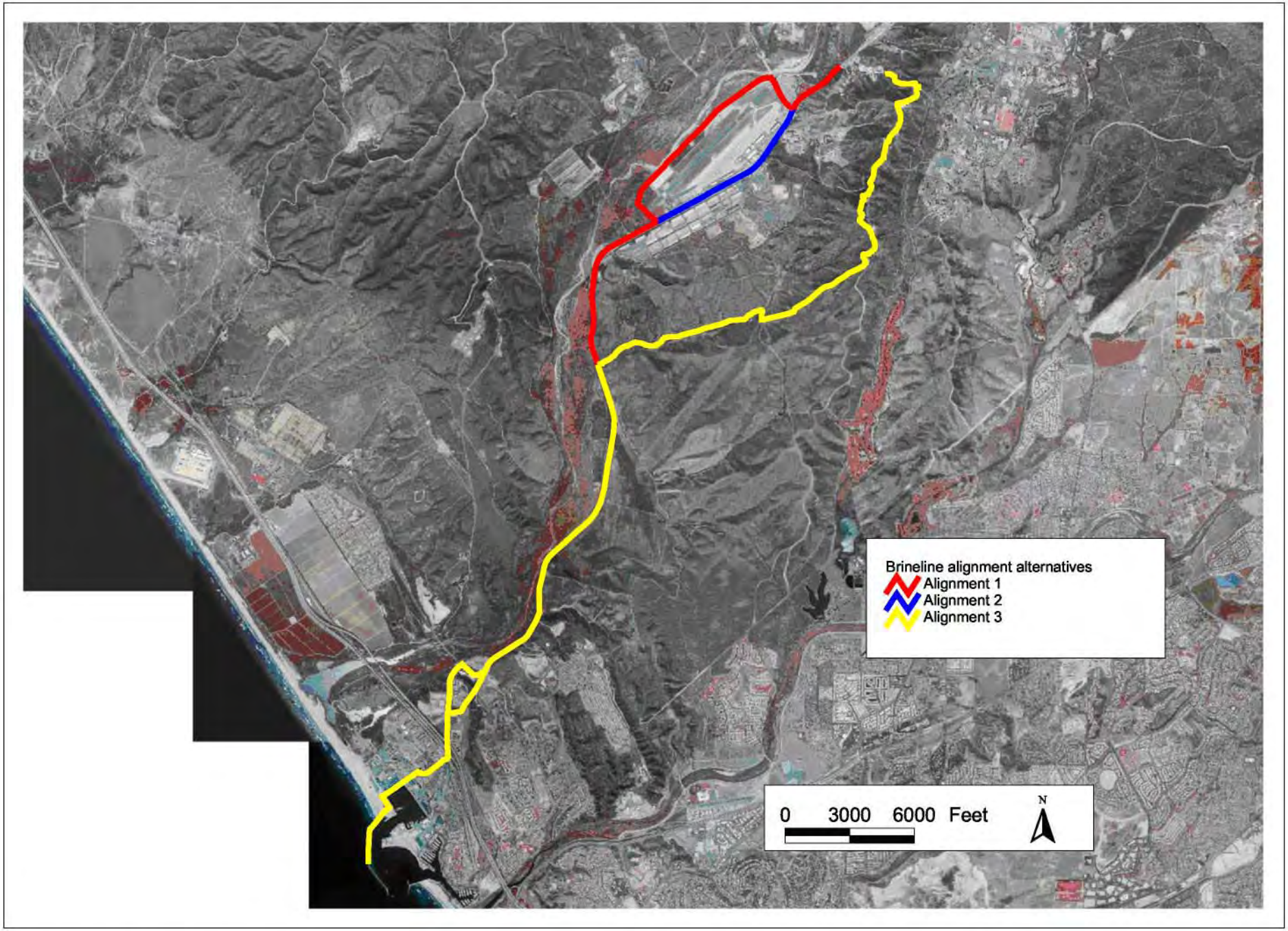


Figure 1 - The Camp Pendleton area with locations of the three brineline alignment alternatives.

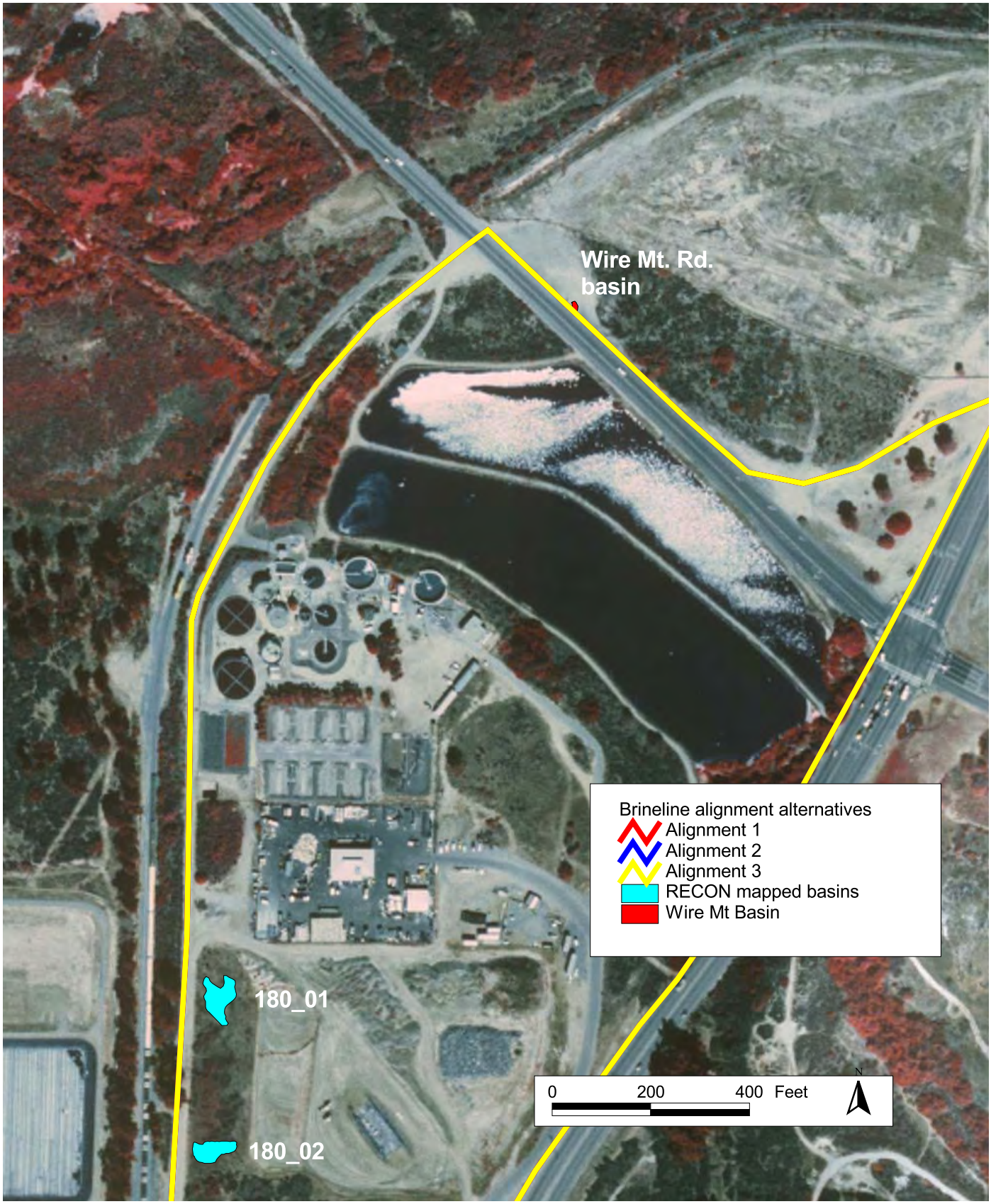


Figure 2 - STP 13 and Wire Mountain Rd. basins sampled for cyst presence.

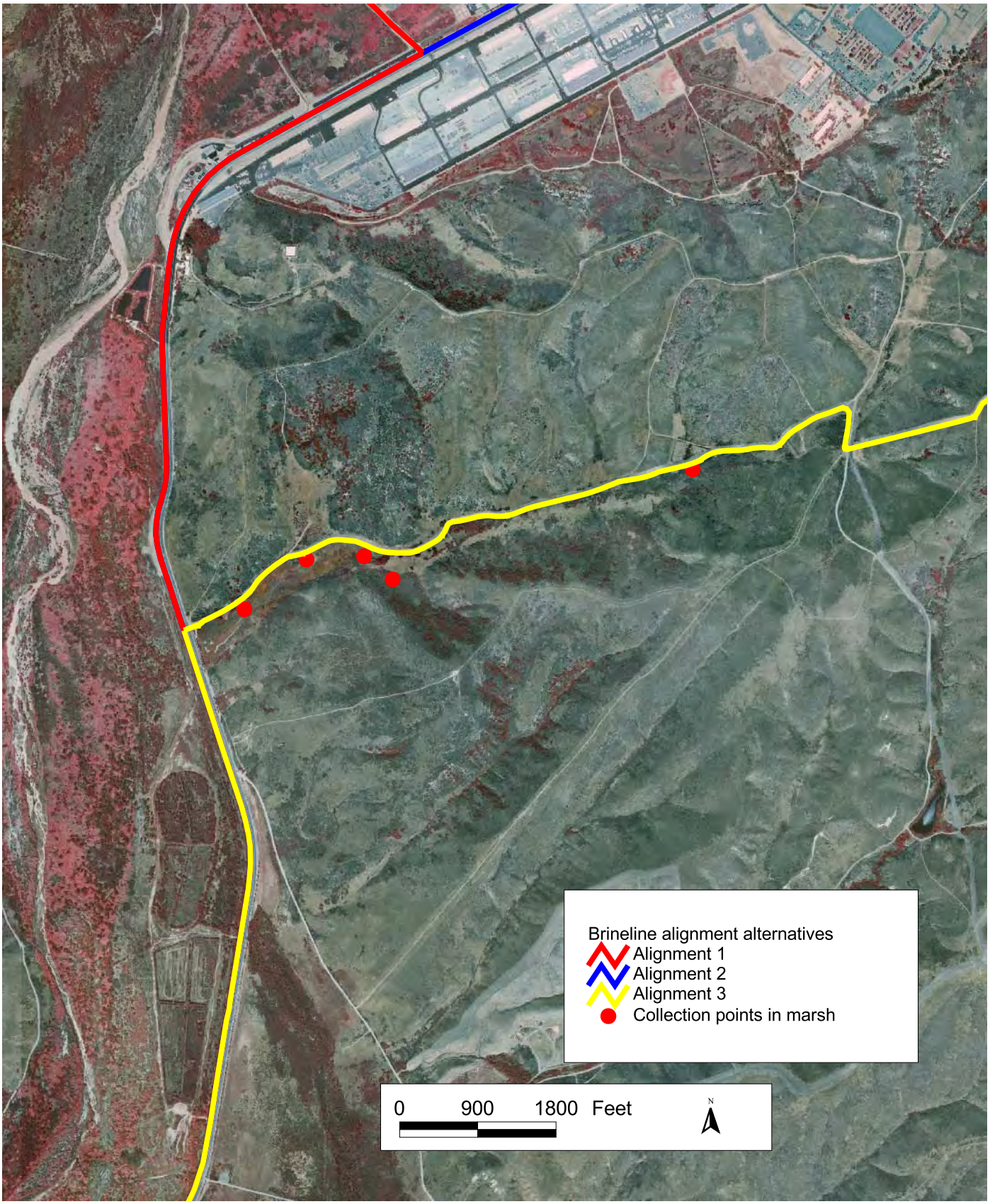


Figure 3 - The mashy area off Vandergrift Rd., approximately 1.5 miles south of the Camp Pendleton Air Station, with locations of soil collection for cyst presence determination.

Results

Rainfall and Basin Ponding

The first substantial rainfall event of the 2007-08 rainfall season occurred November 30-December 1, 2007. There were several additional small rainfall events during December 2007, and two major rainfall events in January (Figure 1). There were small rainfall events (< 1.1 cm) in early and mid February, and a large rainfall event (> 5 cm) February 20-24. There were two small rainfall events (.25 cm) in March, no rainfall in April, and two small rainfall events totaling 0.51 cm in May.

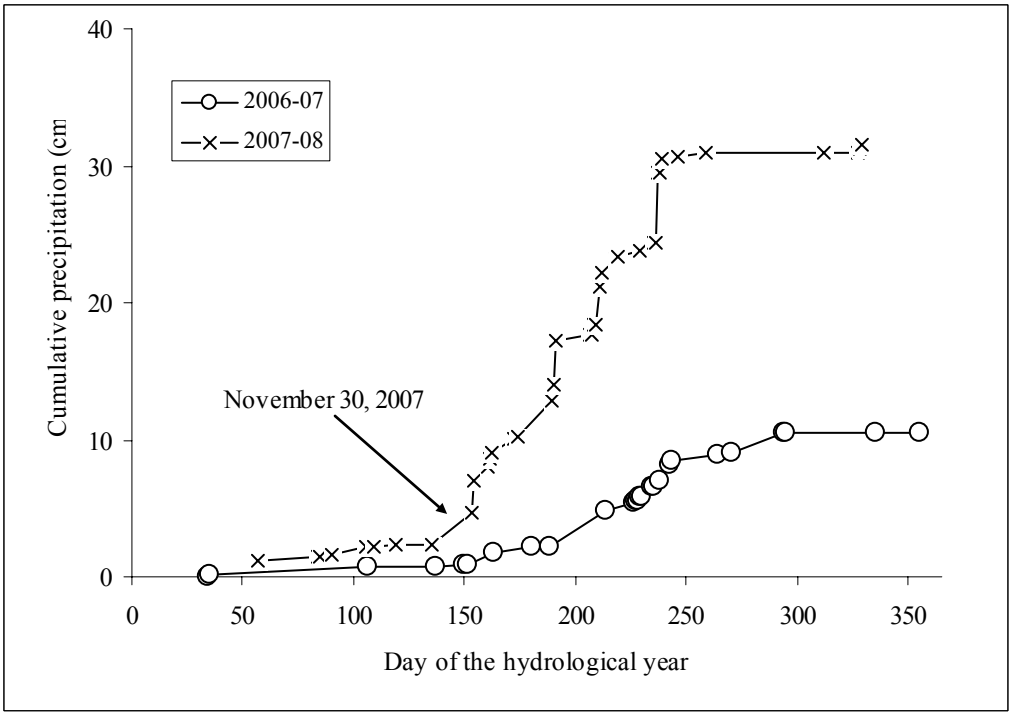


Figure 4 - Cumulative total daily rainfall recorded at the Oceanside Airport, 2006-07 and 2007-08 through June 30, 2008.

Although the 2007-08 rainfall total was greater than the drought 2006-07, it was still only in the 28th percentile of totals recorded at San Diego since 1850 (Figure 5).

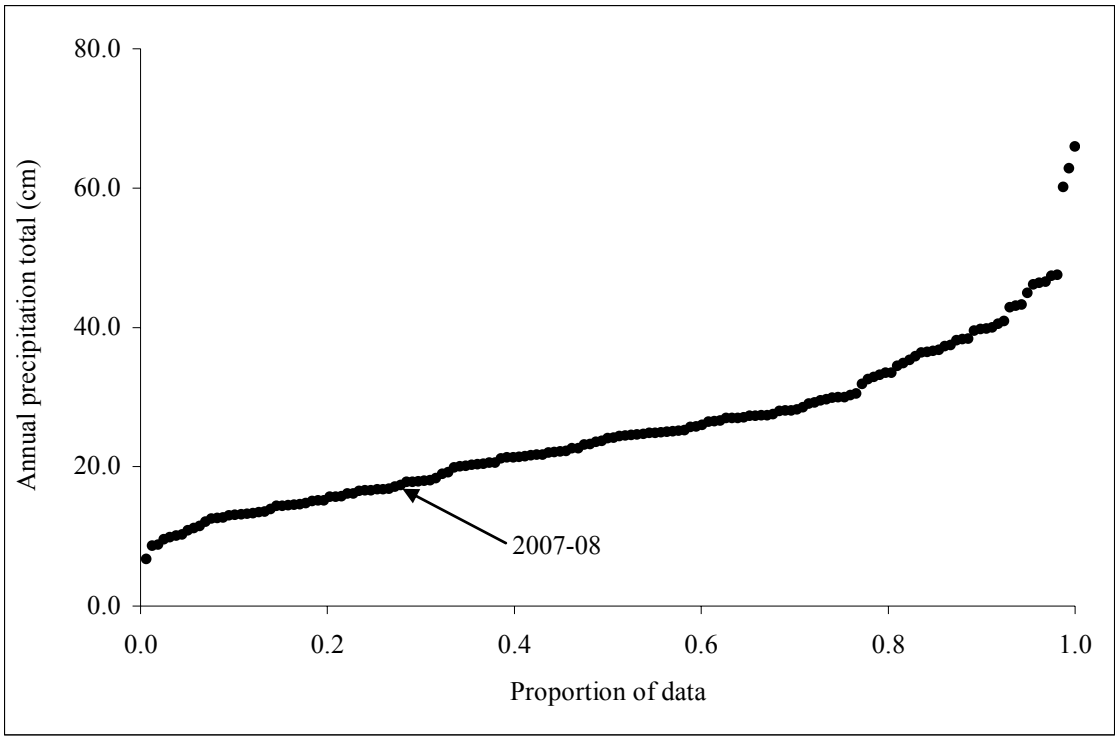


Figure 5 - Annual precipitation totals, 1850-51 through 2007-08 in San Diego, with proportional ranking of the 2007-08 rainfall season.

The road basin ponded with the November 30-December 1 event and retained water for approximately 1 week. No other areas ponded during December 2007. The road basin and basin 180_2 ponded during the January rainfall events, and during the February rainfall events. All basins were dry by the March 7 visit and did not pond with further rainfall events. Basin 180_1 and the marsh area did not pond in the 2007-08 rainfall season.

Fairy Shrimp Presence

Hatched Lindahl's fairy shrimp were found in Basin 180_02 on the January 19 visit, in numbers calculated in the 100's (Table 1). This basin was almost dry on this occasion, but was nearly full on the January 30 visit. No fairy shrimp were netted on the

latter visit. No fairy shrimp were found in basins in February visits, but Pool 180_2 had a large number of ostracodes on the February 29 visit. All pools were dry from the March 7 visit through the end of June.

Table 1 - Wet Season Fairy Shrimp Field Survey Results.

Date of Visit	Basins Ponding	Basins with hatched fairy shrimp present
12/05/07	road puddle	
12/21/07	road puddle	
01/06/08	road puddle, 180-2	
01/19/08	180-2	Lindahl's shrimp in 180-2
01/30/08	road puddle, 180-2	
02/09/08	180-2	
02/17/08	basins dry	
02/24/08	road puddle, 180-2	
02/29/08	180-2	[ostracodes in 180-2]
3/7/2008	no basins ponded	

Comprehensive Findings

Lindahl's fairy shrimp were found on two different sampling occasions from Basins 180_1 and 180_2 in the past five years: *Branchinecta* cysts from each of these two basins produced Lindahl's shrimp when cultured in the summer of 2007. Hatched Lindahl's shrimp were collected in 180_1 in the 2000-2001 wet season, and in 180_2 in 2008 as part of this study. No cysts or hatched shrimp were found in the Wire Mt. Road basin. No cysts were found in the marsh area, and no areas of this marsh that would potentially be impacted ponded in the 2007-08 rainfall year.

Discussion

The 2007-08 rainfall was wetter than the previous two drought seasons. The absence of hatched fairy shrimp during wet season surveys in the one ponded Wire Mt. Road basin was consistent with the lack of cysts found in this area in dry sampling. This basin is not near any pools with fairy shrimp, and has a gravel surface that appears of relatively recent origin, so it is not likely that this basin functions as habitat for any vernal pool flora or fauna.

It is somewhat surprising that Basin 180_1 did not pond with the large late February rainfall event. The bottom of this basin was an almost solid stand of blooming African brass buttons (*Cotula coronopifolia*), a common vernal pool weed typical of wet pools in San Diego County (personal observation), on the February 29 visit. Basin 180_2 was nearly full, with clear water on this visit, so the turbidity evident on the initial fillings that may have been due to the adjacent grading appears to have subsided. This adjacent grading does not appear to have negatively affected the role of this basin in supporting both vernal pool plant species and Lindahl's fairy shrimp.

The marsh area also monitored this year did not have any *Branchinecta* cysts present near the road, and no areas within the impact area ponded this year. This area is not typical habitat for Lindahl's and San Diego fairy shrimp, although these species can occasionally be found in atypical habitat.

References

Black. C. 2007. Sampling for Listed Fairy Shrimp along the three P-113 Project Brineline Alignment Alternatives, Marine Corps Base Camp Pendleton, California. Subcontract 8097-51686:*draft* dry sampling report. A report submitted to TEC Corp. 4 p.

Black, C. 2003. Dry Season (2002) and Wet Season (2002-2003) Fairy Shrimp Survey Report for 2 Sites at Marine Corps Base Camp Pendleton. A report prepared for The Environmental Company. 7 p.

Black, C. 2001. Sampling for Fairy Shrimp Presence at Wire Mountain Basins 180_01 and 180_02, Wet Season and Dry Season, 2001. Report to Southwest Division Naval Facilities Engineering Command, San Diego, CA. 7 p.

RECON. 1999. Final Fairy Shrimp Survey Report:Results of Two Consecutive Years of Wet Season Surveys on Camp Pendleton, California. 38 p.

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 1/19/2008 Time: 10:30 County: San Diego Quad: _____

Collector(s): Charles Mack Permit #: TE 835549-5

Site/Project Name: P113 util corridor - TEC Pool #: 180-2

Township: See Attached USGS map Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 14 °C Air: 18 °C

Pool Depth:
at time of sampling: 30 cm
estimated maximum: 40 cm

Surface Area:
at time of sampling: 20 m x 10 m
estimated maximum: 22 m x 15 m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing grading

- ungrazed grazed: cattle horses sheep other_____

light moderate heavy

- land use of habitat: buffer between road & Sewage treatment facility

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) low 100's, sexually mature ♀ ♂

Notostracans:
(note reproductive status)

Species Observations (Optional) :

Cladocerans:	yes	no	Insects: (adult or larvae)		
Conchostracans:	yes	no	Anisoptera:	yes	no
Copepods:	yes	no	Zygoptera:	yes	no
Ostracods	yes	no	Hydrophilidae:	yes	no
Fish	yes	no	Dytiscidae:	yes	no
Frogs	yes	no	Corixidae:	yes	no
Salamanders	yes	no	Notonectidae:	yes	no
Waterfowl	yes	no	Belostomatidae:	yes	no
Other (specify) _____			Other (specify) _____		

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #
Branchinecta lindahli	10		150-2

LA Museum of Natural History (Dec 2005)

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 1/19/2006 Time: 1045 County: San Diego Quad: _____

Collector(s): Charles Black Permit #: TE 835249-5

Site/Project Name: P113 utility corridor TEC Pool #: Wine Mt. Rd basin

Township: See Attached map Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 14 °C Air: 18 °C

Pool Depth:
at time of sampling: 10 cm
estimated maximum: 14 cm

Surface Area:
at time of sampling: 3 m x 2 m
estimated maximum: 3.5 m x 2.5 m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed): tire tracks garbage discing/plowing

- ungrazed grazed: cattle horses sheep other_____

light moderate (heavy)

- land use of habitat: road side, graded & gravel substrate

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: (note reproductive status) None present

Notostracans: (note reproductive status) None present

Species Observations (Optional) :

Cladocerans:	yes	no
Conchostracans:	yes	no
Copepods:	yes	no
Ostracods	yes	no
Fish	yes	no
Frogs	yes	no
Salamanders	yes	no
Waterfowl	yes	no
Other (specify) _____		

Insects: (adult or larvae)

Anisoptera:	yes	no
Zygoptera:	yes	no
Hydrophilidae:	yes	no
Dytiscidae:	yes	no
Corixidae:	yes	no
Notonectidae:	yes	no
Belostomatidae:	yes	no
Other (specify) _____		

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #
N/A			

Appendix E

Record of Non-Applicability (RONA) and Air Quality Calculations

RECORD OF NON-APPLICABILITY (RONA) FOR CLEAN AIR ACT CONFORMITY

ADVANCED WATER TREATMENT FACILITY/ UTILITY CORRIDOR PROJECT (P-113) SAN DIEGO AIR BASIN

INTRODUCTION

The U.S. Environmental Protection Agency (USEPA) published *Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule* in the 30 November 1993, Federal Register (40 Code of Federal Regulations [CFR] Parts 6, 51, and 93). The U.S. Navy published *Clean Air Act (CAA) General Conformity Guidance* in OPNAVINST 5090.1C (Appendix F) dated 30 October 2007, which has been used by the United States Marine Corps (USMC) as interim USMC Conformity guidance. These publications provide implementing guidance to document CAA Conformity Determination requirements.

Federal regulations state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the Federal agency to determine whether a Federal action conforms to the applicable implementation plan, before the action is taken (40 CFR § 51.850[a]).

The general conformity rule applies to federal actions proposed within areas which are designated as either nonattainment or maintenance areas for a National Ambient Air Quality Standards (NAAQS) for any of the criteria pollutants. Former nonattainment areas that have attained a NAAQS are designated as maintenance areas. Emissions of pollutants for which an area is in attainment are exempt from conformity analyses.

The Proposed Action would occur within the San Diego Air Basin (SDAB) at Marine Corps Base (MCB) Camp Pendleton. That portion of the SDAB is currently in nonattainment of the 8-hour ozone (O_3) NAAQS and is a maintenance area for carbon monoxide (CO). The SDAB attains the NAAQS for NO_2, SO_2, PM_{10}, and $PM_{2.5}$. Therefore, only project emissions of CO and O_3 (or its precursors, volatile organic compounds [VOCs] and oxides of nitrogen [NO_x]) are analyzed for conformity rule applicability.

The annual *de minimis* levels for this region are 100 tons of VOC, NO_x, and CO, as listed in Table 1. Federal actions may be exempt from conformity determinations if they do not exceed designated *de minimis* levels (40 CFR § 51.853[b]) and are not regionally significant (totals less than 10 percent of projected regional emissions for that pollutant) (40 CFR § 93.153).

Table 1. Conformity *de minimis* Levels for Criteria Pollutants in the San Diego Air Basin

Criteria Pollutant	*De minimis* Level (tons/year)
Carbon Monoxide (CO)	100
Volatile Organic Compounds (VOC)	100
Oxides of Nitrogen (NO_x)	100

PROPOSED ACTION

Action Proponent: USMC

Location: MCB Camp Pendleton, Haybarn Canyon Drinking Water Iron/Manganese Removal Treatment Facility in the 24 Area.

Proposed Action Name: P-113 Advanced Water Treatment Facility/Utility Corridor Project, MCB Camp Pendleton.

Proposed Action & Emissions Summary: The USMC proposes to construct and operate an Advanced Water Treatment (AWT) facility and associated pipeline at MCB Camp Pendleton, California. The Proposed Action is needed to ensure compliance with more stringent secondary drinking water standards for total dissolved solids (TDS) and to meet the disinfection byproducts rule by removing the total organic carbon (TOC) in well water. The Proposed Action would also provide TDS and corrosivity reduction by controlling the pH in the effluent, reduce the levels of dissolved copper below that level which requires the wastewater sludge to be handled as hazardous waste, and reduce the TDS and TOC levels in the water and wastewater allowing MCB Camp Pendleton to meet current wastewater standards necessary for the wastewater's reuse. The Proposed Action consists of the construction, operation, and maintenance of the AWT facility and brine pipeline.

Annual emissions were calculated by assuming that all construction activities would occur within one year. Estimated construction emissions due to implementation of the Proposed Action are shown in Table 2. Based on the air quality analysis for the Proposed Action, the maximum estimated emissions would be below conformity *de minimis* levels and would be less than 10 percent of projected regional emissions (Table 2). Laydown areas would be chosen to minimize fugitive dust emissions and would require approval from the MCB Camp Pendleton Assistant Chief of Staff, Environmental Security (AC/S ES) for use of those areas. All laydown areas would be returned to their previous or original condition once they were no longer being utilized.

The main operations of the AWT facility are enclosed chemical and physical processes that are not anticipated to produce off gassing to the surrounding environment. Components requiring power for the AWT facility would be electrical and no emissions from these components are anticipated.

Table 2. Estimated Emissions Resulting for Implementation of the Proposed Action

Component	Emissions (tons/year)					
	CO[2]	**VOCs[1]**	**NO_x[1]**	**SO_x[2]**	**PM_{10}[2]**	**$PM_{2.5}$[2]**
Heavy Equipment Emissions	5.21	1.39	13.57	0.64	0.89	0.79
Construction Truck Emissions	0.18	.002	0.12	0.00	0.00	0.00
Worker Commute Emissions	0.19	0.01	0.02	0.00	0.00	0.00
Fugitive Dust					0.19	0.02
Subtotal	**5.58**	**1.42**	**13.71**	**0.64**	**1.08**	**0.81**
de minimis threshold[3]	100	100	100	100	100	100
Exceeds *de minimis* threshold?	No	No	No	No	No	No
SDAB emissions forecast (2010)	270,794	63,036	57,451	1,460	43,472	14,746
Exceeds 10% of forecast?	No	No	No	No	No	No

Note: [1] SDAB is a basic nonattainment area for the 8-hour O_3 NAAQS; VOCs and NO_x are precursors to the formation of O_3.
[2] SDAB is in considered a maintenance area for the CO NAAQS and is in attainment of the NAAQS for NO_2, SO_2, PM_{10}, and $PM_{2.5}$.
[3] *de minimis* thresholds are developed from SDCAPCD major source thresholds; *de minimis* thresholds are not applicable to NAAQS attainment areas (i.e., SO_2, PM_{10} and $PM_{2.5}$) but have been presented for planning purposes only.

Sources: CARB 2009b; CARB 2009d, USEPA 2009.

Affected Air Basin: San Diego Air Basin

Date RONA Prepared: 30 October 2009.

RONA Prepared By: MCB Camp Pendleton with direct support from TEC Inc.

ATTAINMENT AREA STATUS AND EMISSIONS EVALUATION CONCLUSION

The SDAB is a basic nonattainment area for the 8-hour federal O_3 standard; VOCs and NO_x are precursors to the formation of O_3. The SDAB is considered a maintenance area for the federal CO standard. Emissions associated with the Proposed Action were calculated using data presented in Chapter 2 of the Environmental Assessment (EA), general air quality assumptions, and emission factors compiled from the following sources: *Compilation of Air Pollutant Emission Factors, AP-42, Volume I, Section 13.2.1 (USEPA 2006); OFFROAD Emission Factors* (California Air Resources Board [CARB] 2004); and *CARB EMFAC2007 Model* (CARB 2007d).

The USMC concludes that *de minimis* thresholds for applicable criteria pollutants would not be exceeded nor would the projected emissions be regionally significant (i.e., greater than 10 percent of the air basin's emission budgets) as a result of implementation of the Proposed Action. The emissions data supporting that conclusion is shown in Table 2, which is a summary of the calculations, methodology, and data included in Appendix E of the P-113 Advanced Water Treatment Facility/Utility Corridor EA. Therefore, the USMC concludes that further formal Conformity Determination procedures are not required, resulting in this RONA.

RONA APPROVAL

To the best of my knowledge, the information presented in this RONA is correct and accurate, and I concur in the finding that implementation of the Proposed Action does not require a formal CAA Conformity Determination.

20100604

N. F. MARANO
Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Base, Camp Pendleton

Date

Table E-1

Advanced Water Treatment Facility/Utility Corridor Project (P-113)
Total Emissions

	Emission (tons/yr)					
	CO	**VOC**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Heavy Equipment Emissions	5.21	1.39	13.57	0.64	0.89	0.79
Construction Truck Emissions	0.18	0.02	0.12	0.00	0.00	0.00
Worker Commute Emissions	0.19	0.01	0.02	0.00	0.00	0.00
Fugitive Dust					0.19	0.02
Subtotal	**5.58**	**1.42**	**13.71**	**0.64**	**1.08**	**0.81**

Table E-2

Advanced Water Treatment Facility/Utility Corridor Project (P-113)
Construction Heavy Equipment Emissions

				Emission Factors (g/hp-hr)								Emissions (lbs/day)						Emission (tons total)					
Equipment	**FUEL**	**HP**	**Load Factor**	**CO**	**VOC**	**NO_X**	**SO_X**	**PM_{10}**	**No of Equip**	**Hrs/Day**	**Days in Service**	**CO**	**VOC**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**VOC**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Dump Truck	DIESEL	250	41	0.005953	0.001499	0.018012	1.08E-05	0.000838	2	6	125	7.32	1.84	22.15	0.01	1.03	0.92	0.458	0.115	1.385	0.001	0.064	0.057
Roller	DIESEL	145	57.5	0.005953	0.001499	0.018012	1.08E-05	0.000838	2	6	90	5.96	1.50	18.02	0.01	0.84	0.75	0.268	0.067	0.811	0.000	0.038	0.034
Loader	DIESEL	170	54	0.005953	0.001499	0.018012	1.08E-05	0.000838	2	6	200	6.56	1.65	19.84	0.01	0.92	0.82	0.656	0.165	1.984	0.001	0.092	0.082
Scraper	DIESEL	265	66	0.005953	0.001499	0.018012	1.08E-05	0.000838	1	6	100	6.25	1.57	18.90	0.01	0.88	0.78	0.312	0.079	0.945	0.001	0.044	0.039
Dozer	DIESEL	90	0.59	3.49	0.990000	6.900000	9.30E-01	0.722	2	6	200	22.24	6.31	43.97	5.93	4.60	4.09	2.224	0.631	4.397	0.593	0.460	0.409
Crane	DIESEL	120	0.43	0.8667	0.3384	5.6523	0.93	0.2799	1	6	30	2.68	1.05	17.50	2.88	0.87	0.77	0.040	0.016	0.262	0.043	0.013	0.012
Backhoe	DIESEL	170	54	0.005953	0.001499	0.018012	1.08E-05	0.000838	2	6	200	6.56	1.65	19.84	0.01	0.92	0.82	0.656	0.165	1.984	0.001	0.092	0.082
Water Truck	DIESEL	250	50	0.005953	0.001499	0.018012	1.08E-05	0.000838	1	8	200	5.95	1.50	18.01	0.01	0.84	0.75	0.595	0.150	1.801	0.001	0.084	0.075
										TOTAL		**63.51**	**17.08**	**178.24**	**8.88**	**10.90**	**9.70**	**5.21**	**1.39**	**13.57**	**0.64**	**0.89**	**0.79**

Note: It has been conservatively estimated that construction would last for 1 year (252 days without weekends and holidays)

Fugitive Dust	**Emission Factor, lbs/VMT**	**k**	**a**	**c**	**d**	**Silt Content**	**Speed**	**Moisture Content**	**Days of Rain**	**C**
PM_{10}	6.55E-01	1.8	1	0.20	0.50	8.50	10.00	0.50	40	0.00047
$PM_{2.5}$	6.52E-02	0.18	1	0.20	0.50	8.50	10.00	0.50	40	0.00036
Mileage	44									
Vehicles	13									

Total	**lbs**	**Tons**
PM_{10}	374.6784	0.1873
$PM_{2.5}$	37.3084	0.0187

Table E-3

Advanced Water Treatment Facility/Utility Corridor Project (P-113)
Construction Truck Emissions

					CO		NO_X		VOCs						SOx		PM10				Emissions, lbs/day							Emissions, tons total					
Construction Phase	**Vehicle Class**	**No. of Trucks**	**Speed (mph)**	**VMT (mi/vehicle-day)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Hot-Soak (g/trip)**	**Resting Loss (g/hr)**	**Running Evaporative (g/mi)**	**Diurnal Evaporative (g/hr)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Tire Wear (g/mi)**	**Brake Wear (g/mi)**	**CO**	**NO_X**	**VOCs**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**	**Days in Service**	**CO**	**NO_X**	**VOCs**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Project Management Vehicle	Light-duty truck, catalyst	1	15	40	4.405	11.792	0.382	0.586	0.152	0.867	0.177	0.026	0.047	0.061	0.007	0.002	0.028	0.015	0.008	0.013	0.44	0.04	0.02	0.00	0.00	0.00	60	0.0132	0.0011	0.0007	0.0000	0.0001	0.0001
Crew Cab Trucks	Light-duty truck, catalyst	4	15	40	4.405	11.792	0.382	0.586	0.152	0.867	0.177	0.026	0.047	0.061	0.007	0.002	0.028	0.015	0.008	0.013	1.76	0.15	0.10	0.00	0.02	0.02	60	0.0529	0.0044	0.0029	0.0001	0.0005	0.0005
Flat-bed Trucks	Heavy-duty truck, diesel	2	15	80	11.383		21.608		3.438						0.025		0.141		0.036	0.028	4.02	7.62	1.21	0.01	0.07	0.07	30	0.0602	0.1143	0.0182	0.0001	0.0011	0.0011
Traffic Control Vehicles	Light-duty truck, catalyst	4	15	80	4.405	11.792	0.382	0.586	0.152	0.867	0.177	0.026	0.047	0.061	0.007	0.002	0.028	0.015	0.008	0.013	3.32	0.28	0.15	0.00	0.03	0.03	30	0.0497	0.0042	0.0001	0.0001	0.0005	0.0005
																				TOTAL	**9.53**	**8.08**	**1.48**	**0.02**	**0.13**	**0.13**		**0.1760**	**0.1240**	**0.0218**	**0.0003**	**0.0023**	**0.0022**

Assumptions:

* Assuming 40 miles/day per vehicle associated with construction activities
* Assume startup after 8 hours
* Assume 45 minutes run time total

Source: 2008 Emission Factors from EMFAC2007, average temp 60F

Table E-4

Advanced Water Treatment Facility/Utility Corridor Project (P-113)
Construction Worker Commute Emissions

					CO		NO_X		VOCs						SO_X		PM_{10}				Emissions, lbs/day						Emissions, tons total						
Construction	**Vehicle Class**	**No. of Workers**	**Speed (mph)**	**VMT (mi/vehicle-day)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Hot-Soak (g/trip)**	**Resting Loss (g/hr)**	**Running Evaporative (g/mi)**	**Diurnal Evaporative (g/hr)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Running Exhaust (g/mi)**	**Start-Up (g/start)**	**Tire Wear (g/mi)**	**Brake Wear (g/mi)**	**CO**	**NO_X**	**VOCs**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**	**Days in Service**	**CO**	**NO_X**	**VOCs**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
All	Light-duty truck, catalyst	20	35	40	3.019	11.792	0.27	0.586	0.056	0.867	0.177	0.026	0.047	0.061	0.004	0.002	0.01	0.015	0.008	0.013	6.36	0.53	0.31	0.01	0.06	0.06	60	0.19	0.02	0.01	0.00	0.00	0.00
TOTAL																				**TOTAL**	**6.36**	**0.53**	**0.31**	**0.01**	**0.06**	**0.06**		**0.19**	**1.6E-02**	**9.2E-03**	**2.2E-04**	**1.7E-03**	**1.7E-03**

Assumptions:

* Assuming 40 miles round trip per vehicle
* Assume startup after 8 hours
* Assume 45 minutes run time total

Source: 2008 Emission Factors from EMFAC2007, average temp 60F

Appendix F

Agency Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

MAY 0 5 2009

In Reply Refer To:
FWS-09B0249-09TA0721

Mr. William H. Berry
Assistant Chief of Staff, Environmental Security
United States Marine Corps
Box 555008
Camp Pendleton, California 92055-5008

Subject: Initiation of Formal Section 7 Consultation for the Advanced Water Treatment Facility and Utility Corridor Project (P-113), Marine Corps Base Camp Pendleton, San Diego County, California

Dear Mr. Berry:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of your letter (5090.17 ENVSEC/523) on March 23, 2009, requesting initiation of formal consultation pursuant to section 7 of the Endangered Species Act of 1973 (Act), as amended, regarding the proposed project for expansion of the Advanced Water Treatment Facility and installation of a utility corridor at Marine Corps Base Camp Pendleton (MCBCP), San Diego County, California. A final biological assessment describing the project and its potential effects on federally listed species was also received on March 23, 2009. This consultation will address the effects of the proposed project on the federally endangered arroyo toad (*Bufo californicus*), southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), and the federally threatened coastal California gnatcatcher (*Polioptila californica californica*). We have assigned project number FWS-MCBCP-09B0249 to this consultation. Please refer to this number in any future correspondence on this consultation.

In addition, the Service concurs with the determination that the project may affect, but is not likely to adversely affect, the federally endangered California brown pelican (*Pelecanus occidentalis californicus*, "pelican"), California least tern (*Sternula antillarum browni*, "tern"), tidewater goby (*Eucyclogobius newberryi*, "goby"), and the federally threatened western snowy plover (*Charadrius alexandrinus nivosus*, "plover"). Pipeline installation on the ocean jetty, where pelicans roost and forage, is not expected to disrupt pelican foraging or roosting behavior because of the pelican's relatively high tolerance of human activity, its wide-ranging habits, and the availability of similar foraging and roosting opportunities in the general area. There would also be no direct effects on tern nesting because the nearest nesting area is over 2,000 feet from the jetty. Further, utility pipeline operation is not expected to alter foraging waters for either

TAKE PRIDE IN AMERICA

pelican or tern, or habitat for goby, because discharge of the brine effluent would comply with regulations for ocean water quality objectives and the effluent would be quickly diluted by the mixing wave action that occurs near the jetty. Thus, there would be no impact upon fish communities (including goby and other fish that tern and pelican forage upon), or any change in turbidity that would reduce visibility for foraging birds. Because plover feed mostly on invertebrates found in wet intertidal zones and in dry sandy areas above the high tide line, operation of the utility pipeline is also not anticipated to affect plover foraging.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually agree to an extension). Therefore, we expect to provide you with our biological opinion no later than August 5, 2009. We look forward to working with you during the consultation process to ensure that impacts to listed species are avoided and minimized to the maximum extent practicable through alignment selection, project design, and proposed operation and maintenance activities.

As a reminder, the Act requires that after initiation of formal consultation, the Federal action agency make no irreversible or irretrievable commitment of resources that limits future options. This practice insures that agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats.

If you have any questions regarding this letter, please contact Fish and Wildlife Biologist Marci Koski at (760) 431-9440 extension 304.

Sincerely,

Jonathan Snyder

for Karen A. Goebel
Assistant Field Supervisor

UNITED STATES MARINE CORPS
MARINE CORPS BASE
BOX 55508
CAMP PENDLETON, CALIFORNIA 92055-5008

IN REPLY REFER TO:
5090.19B
ENVSEC/522

JUL 2 3 2009

M. Wayne Donaldson, A.I.A
State Historic Preservation Officer
Department of Parks and Recreation
1416 9th Street, Rm. 1442
Sacramento, CA 94296-0001

Dear Mr. Donaldson:

SUBJECT: ADVANCED WATER TREATMENT FACILITY AND UTILITY CORRIDOR (P113) PROJECT, MCB CAMP PENDLETON

Marine Corps Base (MCB) Camp Pendleton is proposing to authorize construction of the Advanced Water Treatment (AWT) to reduce Total Dissolved Solids (TDS) concentrations at the new Southern Region Tertiary Treatment Plant (SRTTP) in the southwestern portion of the Base (Enclosure 1). The SRTTP undertaking has been referred to as the as the Tertiary Treatment Plant (TTP) Project (P-002, P-110/A) in previous consultations with your office. MCB Camp Pendleton entered into a Memorandum of Agreement (MOA) for this undertaking in October 2004 (USMC031126A). Overall, the SRTTP project is part of the compliance strategy developed in response to a Consent Decree, approved by the U.S. District court for the Southern District of California, which stipulated that a solution for ceasing violations of wastewater discharge standards under the Clean Water Act must be obtained by the summer of 2004. In response to this decree, Camp Pendleton proposed the construction and operation of the SRTTP, associated wastewater conveyance pipelines, facilities, and reclaimed water reuse areas. The current project, AWT and utility corridor, is being review subject to an Environmental Assessment (EA) tiered on the SRTTP Environmental Impact Statement (EIS). This undertaking was not originally included in the MOA. We would like to modify the original APE per Stipulation I of the MOA and include this undertaking.

Undertaking and Area of Potential Effects

The MCB Camp Pendleton Southern (potable) Water System (SWS) is supplied by twelve groundwater wells in the Santa Margarita River Basin and three ground water wells in the Las Pulgas/Las Flores Basin. All groundwater wells produce water with TDS concentrations above the national secondary drinking water standard and have resulted in elevated TDS concentrations in sewage effluent from the MCB Camp Pendleton sewage treatment plants (STPs). TDS reduction in potable water distributed by

the SWS is therefore beneficial, not only for ensuring compliance with National Pollutant Discharge Elimination System (NPDES) permit limits, but for ensuring compliance with national secondary drinking water standards. These same groundwater wells also contain levels of Total Organic Compounds (TOC) in excess of the levels set by the Disinfection Byproduct Rule for drinking water and Title 22 for recycled wastewater. TOC reduction in potable water distributed by the SWS is beneficial, for it ensuring compliance with drinking water and wastewater standards. Finally, the pH of the wells water is such that it causes the copper from the plumbing to dissolve into the water. The dissolved copper is at such a high level that it is causing the sludge generated from the wastewater treatment center to be classified as hazardous waste under California regulations, requiring special handling and disposal. By reducing the pH of the water, corrosion of the pipes will be reduced. This reduction in corrosion of the pipes will reduce the dissolved copper in the water; therefore, reducing the copper in the waste sludge. This reduction will remove the threat of a hazardous waste and allow for the sludge to be handled in more conventional and economical means.

The undertaking is needed to ensure compliance with more stringent secondary drinking water standards for TDS and to meet the disinfection byproducts rule by removing the TOC in well water. As described above, it would also provide TDS and corrosivity reduction by controlling the pH in the effluent. Finally, the undertaking, once completed, would reduce the TDS and TOC levels in the water and wastewater allowing MCB Camp Pendleton to meet current wastewater standards necessary for the wastewater's reuse. The AWT and utility corridor for the associated brine conveyance pipeline, known collectively as P113 or the undertaking, will help reduce TDS, TOC, and pH levels and is part of the SWS which feeds into the SRTTP.

The undertaking includes modifying the existing Haybarn Canyon Drinking Water Iron/Manganese Removal Treatment Facility in the 24 Area including the additions of reserve osmosis, Micro Filtration, granular activated carbon treatment and pH control units to remove TDS and TOC from potable water and pH adjustments. The brine conveyance pipeline would exit the AWT facility at Haybarn Canyon and follow Vandegrift Boulevard from Haybarn Canyon down to Basilone Road. At the intersection of Basilone Road and Vandegrift Boulevard the pipeline would follow Basilone Road to the north on the west side of Basilone Road and follow the toe of the levee inside the Marine Corps Air Station until intersecting with Vandegrift Boulevard. The route would then follow Vandegrift Boulevard down to Pueblitos Canyon. Beyond this intersection the pipeline route is along Vandegrift Boulevard south until it would intersect with Stuart Mesa Road. Following Stuart Mesa Road northwest for approximately 1,200 feet (0.2 km) the pipeline would then turn south until intersecting with A Street and 8th Street within the 21 Area. From here, it would follow 8th Street, and then turn towards C Street until it is aligned with 9th Street. Following the southwesterly direction of 9th Street, the pipeline would then intersect with a paved road running along the beach. It would then follow this road southeasterly until aligned with the jetty, at which point the pipeline would run along the top half portion of the jetty and brine disposal would occur off of the jetty. This alignment (Alignment 3) is one of three considered and is the preferred alternative for this project because it avoids the most archaeological sites. The width of

the brine conveyance pipeline construction corridor varies from 50 feet wide to 100 feet wide including a buffer. This variation in width for the brine conveyance pipeline APE is shown on enclosure (2). The AWT facility APE is also indicated on this enclosure.

Identification of Historic Properties

Identification efforts within the APE include the following surveys: Schroth et al. 1996; Reddy and Pallette 2000; Cheever and Collett 2002; and Pigniolo and Cleland 1996. Previous survey areas and excerpts from survey reports are enclosed (Enclosures (3), (4), and (5)).

For the AWT and preferred alignment, there are six archaeological sites within the APE which are eligible for listing to the National Register of Historic Places (NRHP). These sites are CA-SDI-14748, CA-SDI-14749, CA-SDI-14750, CA-SDI-14751, CA-SDI-14752, and CA-SDI-14170. Limited data recovery excavations were conducted as a result of the P527B for sites CA-SDI-14748, CA-SDI-14749, CA-SDI-14750, CA-SDI-14751 CA-SDI-14752, and CA-SDI-14170. Data recovery was conducted at CA-SDI-14170 during the SRTTP undertaking and additional boundary testing was conducted at site CA-SDI-14748, 14749, and 14750. The report on the subsurface evaluations and data recovery investigation is enclosed (York and Wahoff 2009; Enclosure (6)).

Historic Properties Present

The sites are shown in relation to the current APE in Figure 1.4 of the enclosed report (Hale and Becker 2009; Enclosure (7)). This report provides summary of all previous documentation as well as a historic properties treatment plan and archaeological monitoring and discovery plan for the AWT facility and brine conveyance line (P113) undertaking.

Site CA-SDI-14748

Site CA-SDI-14748 is just south of SDI-14749 on a low terrace on the east bank of the Santa Margarita River (York et al. 2001). Controlled excavations during a sewage treatment project included backhoe excavation, five units, and column samples. Four 14C dates from *Argopecten, Chione,* and *Ostrea* shells produced a range of dates from 2020-700 B.P. Recovered artifacts include debitage, a biface, modified flakes, ground stone, cores, a shell bead, and a tarring pebble. A single hearth feature consisting of a cluster of fire-affected rock was noted. The faunal assemblage included mammals, birds, reptiles, fish, and shell.

Site CA-SDI-14749

Site CA-SDI-14749 is a relatively small, buried shell midden on the toe of the high ridge line above the Ysidora Basin, approximately 200 m southwest of SDI-14750, covered with up to 2 m of fill material. Data recovery at the site consisted of the excavation of three 1-x-1 m units and one backhoe trench. Three 14C dates from *Argopecten* shells produced similar dates between 1000 ±40 and 1050 ±90 B.P. A limited number of

debitage artifacts (dominated by quartz material), vertebrate remains (mainly mammal bone), and marine shell (primarily *Argopecten* and *Ostrea*) comprised the cultural material from the site.

CA-SDI-14750

Site CA-SDI-14750 is within 50 m of SDI-14170, and also represents a small, temporary camp site, similar in scope of excavation and size of assemblage to its northern counterparts. A 14C date of 900 ±40 B.P. was procured from a *Chione* shell, the dominant invertebrate species. In addition to shell, cultural materials recovered from the temporary camp sites included limited amounts of debitage, ground stone, ceramics, FAR, and animal bone.

CA-SDI-14751

Site CA-SDI-14751 is located approximately 900 m south of SDI-14572, and is similar to that site for its assemblage. A 14C date of 1300 ±60 B.P. was obtained from a *Chione* shell, although *Donax* was the predominate species of the inveterate assemblage.

CA-SDI-14752

Site CA-SDI-14752 consists of a small, temporary camp site. *Chione* dominated the invertebrate remains from the site, with one shell producing a date of 1310 ±70 B.P.

CA-SDI-14170

Site CA-SDI-14170 lies 300 m to the south of SDI-14751, and also represents a temporary, although relatively large, camp site. *Chione* and *Donax*, the site's two most numerous shell species, respectively, produced 14C dates ranging from 1160 ±90 to 1730 ±110 B.P. Although the site is comparatively extensive, measuring approximately 450 x 150 m, the artifact assemblage is not significantly more dense or diverse than the smaller camp sites. The site does have a moderately extensive faunal collection, including fish, mammal, bird, and reptile bone, as well as a relatively dense shell assemblage. The most recent data recovery resulted in the discovery of fragmented human remains in two locations within the site (York and Wahoff 2009:52).

Finding of Effect

MCB Camp Pendleton is requesting consultation with your office on this undertaking. The AWT and associated brine conveyance pipeline is part of a larger SRTTP project as described above and is subject to the conditions of the MOA. Pursuant to 36 CFR 800.4(b)(1), we have made a reasonable and good faith effort to carry out appropriate identification efforts for historic properties. Base on the results of identification, MCB Camp Pendleton has made a finding of "**Adverse Effect**" for this undertaking. We propose modifying the SRTTP APE to include this undertaking and take into account the adverse affects through the implementing the stipulations required in the MOA. Per the MOA (Stipulation II.B) and as a condition for this undertaking, archaeological and Native American monitoring will be required for the entire brine conveyance pipeline.

We request your agreement with this finding and use of the SRTTP MOA to resolve these effects.

Consultation

Based on the results of the identification efforts, conditions imposed, and application of the criteria of adverse effects, MCB Camp Pendleton has found that the undertaking will have an **"Adverse Effect"** on historic properties. In accordance with 36 CFR 800.6(a) and 36 CFR 800.6 (b), we are requesting your review and agreement with our finding and proposed resolution through the use of the SRTTP MOA.

As required by Stipulation II.B of the MOA, MCB Camp Pendleton has prepare the enclosed report which includes a historic properties treatment plan for the sites listed above and an archaeological monitoring and discovery plan for your review and comment (See Enclosure (4)).

In addition to contacting your office, the Base has initiated consultation with Federally and non-Federally recognized Luiseño tribal governments (Pauma Band of Mission Indians, Pechanga Band of Luiseno Indians, Pala Band of Mission Indians, Rincon Band of Luiseno Indians, La Jolla Band of Mission Indians, Soboba Band of Mission Indians, San Luis Rey Band of Mission Indians) and non-federally recognized Juaneno tribal governments (Juaneno Band of Mission Indians) as part of the MCB Camp Pendleton's established consultation process. It has notified the public through contacts with the San Diego Archaeological Society. Additional public involvement will be conducted through the National Environmental Policy Act (NEPA) process.

A list of reports referenced in this consultation letter is provided in enclosure (8). Archaeological site forms (DPR 523) are provided in enclosure (9). If you have any questions, please contact Danielle Page, Cultural Resources Branch Head, at (760) 725-9738 (email: danielle.page@usmc.mil).

Sincerely,

W.H. BERRY
Head, Resource Management Division
Assistant Chief of Staff, Environmental Security
By direction of the Commanding Officer

Enclosures:
1. Project Location
2. AWT and brine conveyance line APE
3. Survey area Reddy and Pallette 2000
4. Survey area Cheever and Collett 2002

5. Excerpts from Gallegos et al. 1996
6. Surbsurface Evaluation and Data Recovery Investigations in the Vicinity of Archaeological Sites CA-SDI-14,170, -14748, 14,749, -14750, and -14751 in Support of the Tertiary Treament Plant Project (York and Wahoff 2009)
7. Archaeological Documentation and Historic Properteis Treatment Plan for the Advance Water Treatment Facility and Utility Corridor Project (P-113), MCB Camp Pendleton (Hale and Becker 2009)
8. List of Reports Referenced
9. Site Forms

UNITED STATES MARINE CORPS
MARINE CORPS BASE
BOX 555008
CAMP PENDLETON CALIFORNIA 92055-5008

IN REPLY REFER TO:
5090.2A
ENVSEC/511
JUL 28 2009

Mr. Mark Delaplaine
State of California
California Coastal Commission
45 Fremont, Suite 2000
San Francisco, CA 94105-2219

SUBJECT: NEGATIVE DETERMINATION FOR CONSTRUCTION OF AN ADVANCED WATER TREATMENT (AWT) FACILITY AND ASSOCIATED PIPING, MARINE CORPS BASE, CAMP PENDLETON, CA

Introduction

In accordance with the Coastal Zone Management Act (Act) of 1972 as amended, Section 307c(1), the United States Marine Corps (USMC) has determined the proposed construction of an Advanced Water Treatment (AWT) facility and associated pipeline would not affect the coastal zone. Therefore, no Consistency Determination is required. We request your concurrence on a Coastal Consistency Negative Determination for this Proposed Action.

The USMC has prepared an Environmental Assessment (EA) for the Proposed Action in accordance with USMC regulations that implement the National Environmental Policy Act. The EA analyzed two project components, the AWT facility at Haybarn Canyon and associated pipeline for the brine discharge from the AWT facility. The EA contains a detailed analysis of the Proposed Action. The analysis determined the Proposed Action would not result in significant impacts to coastal or other environmental resources. The EA contains agency correspondence supporting this determination.

Project Purpose

The purpose of the Proposed Action is the reduction of (1) Total Dissolved Solids (TDS) to maximize Marine Corps Base (MCB) Camp Pendleton wastewater reuse options, and (2) Total Organic Carbon (TOC), Volatile Organic Carbon (VOC) and total trihalomethanes (TTHMs) to comply with primary and secondary drinking water requirements set by the California Department of Public Health (CDPH), as well as future requirements of the United States Environmental Protection Agency (USEPA) Stage 2 Disinfectants and Disinfection Byproducts Rule for TTHM in drinking water. The Proposed Action is also needed to ensure compliance with drinking water and wastewater standards for TDS.

The Proposed Action is needed to support the current and future operational requirements at MCB Camp Pendleton. The current MCB Camp Pendleton South Water System is supplied by several wells that exceed the national standard for TDS and TOC. Additionally, the pH of the well water is causing the copper from the plumbing system to dissolve into the water creating hazardous waste sludge at the Wastewater Treatment Plants, which requires special handling and disposal. Without improvements, the pipes will continue to dissolve and leach copper into the wastewater. It is expected that wastewater concentrations of TDS and TOC in the effluent from the new Southern Regional Tertiary Treatment Plant can be reduced with the implementation of the proposed AWT facility.

Project Description

The Proposed Action consists of two parts; construction of an AWT facility at Haybarn Canyon and the construction of piping to convey the brine for ocean discharge (Figure 1). Below is a detailed description of each of the components.

Advanced Water Treatment (AWT) Facility

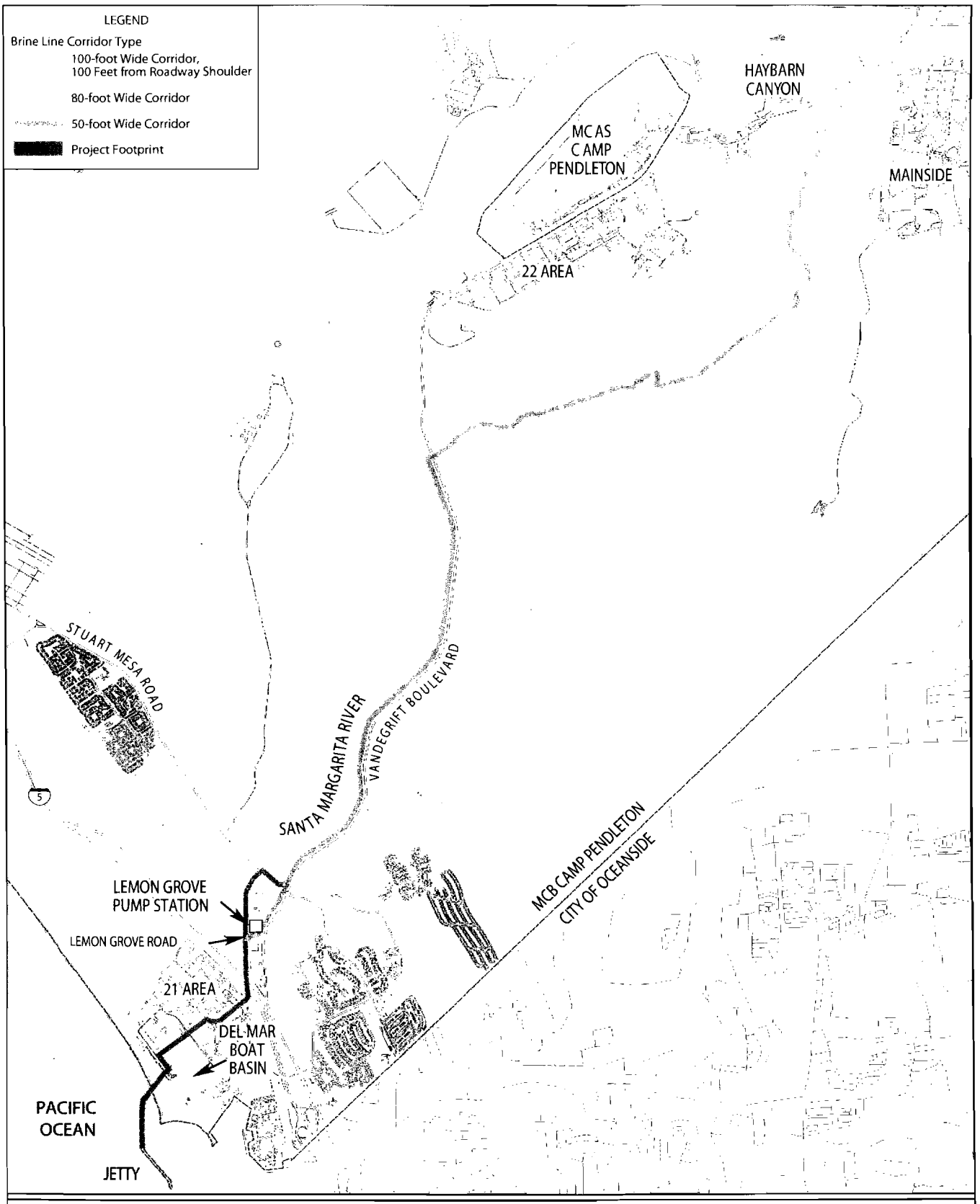
The existing Haybarn Canyon Iron/Manganese Water Treatment Plant in the 24 Area (24 Area I/M plant) is in the process of being upgraded to provide additional volumetric treatment (reduction) of Iron and Manganese to supply influent to the AWT. The upgraded I/M plant will be combined with the new AWT plant and be known as the AWT facility. The upgrades for the I/M plant consist of the installation of several modules, capable of expansion, control and Supervisory Control And Data Acquisition (SCADA) systems. The I/M plant expansion is not part of this determination. The AWT plant will be located adjacent to the existing 24 Area I/M plant. The AWT will consist of three primary components: Microfiltration, Liquid Granulated Activated Carbon (LGAC) and the Reverse Osmosis filtration (R/O), and two secondary components: pH stabilization (control) and disinfection units. Both the primary and secondary components are described below:

- The first module is microfiltration and it is used to remove those constituents and debris which would otherwise clog the LGAC and R/O components unnecessarily.
- The second module is a system containing granular activated carbon (GAC) also known as LGAC treatment. The process effluent from the microfiltration component will proceed through the LGAC component to remove dissolved organic constituents. The LGAC will reduce TOC, VOC, and the formation of trihalomethanes within the distribution system, as well as improve the color, taste, and odor of the water.
- The third module is an R/O module to remove/reduce the TDS and other entrainment constituents from the product water.
- Finally the secondary components of pH/corrosion control and disinfection adjust the AWT outflow water, so as to stabilize the pH for the product water and disinfect the distributed drinking water.

The modular design would allow for all modules to be assembled independently off-site and brought to Haybarn Canyon for installation. The installation period for the modules is not expected to exceed three months. When all components are operating at their individual design efficiencies, the total production capacity would be 7,500 acre-feet of potable water per year. More than half of the water will be treated by the R/O system to obtain the final product water TDS objective of 325 mg/L.

Brine Disposal Pipeline

The existing 24 Area IM Plant at Haybarn Canyon currently removes iron and manganese from the ground water. The proposed GAC module would remove TOC and the proposed R/O module would remove TDS, resulting in two output streams: clean water for the drinking water distribution system and concentrate (brine) from the R/O TDS reduction process.



Meters
0 1,200
0 Feet 4,500

Figure 1
P-113 Project Area
MCB Camp Pendleton

The estimated brine outflow at design production capacity would be approximately 1.2 million gallons per day (mgd). To process this discharge, the USMC proposes installing a pipeline to convey the brine from the AWT facility to the ocean (specifically, the ocean side of the Del Mar Boat Basin jetty) for disposal. The brine composition will consist of dissolved mineral salts.

MCB Camp Pendleton will only discharge brine from the R/O process; MCB Camp Pendleton would dispose of the used carbon filters (solid waste) associated with the GAC process in accordance with MCB Camp Pendleton disposal procedures. As part of the Proposed Action, the project includes constructing a force main and associated pump station to pump the brine from the AWT to the point of discharge. The installation method for the brine pipeline consists of attaching the pipeline to the outboard side of the jetty in the wave splash zone with metal brackets and perforations, beginning at the second bend in the jetty, with holes that increase in diameter with distance from shore. The end of the pipeline would be capped. The USMC selected the proposed pipeline location at the Del Mar Boat Basin jetty because it is located within MCB Camp Pendleton and it facilitates the discharge of brine in an offshore environment with the capability for dispersion. To install the brine pipeline, MCB Camp Pendleton would excavate a utility trench approximately 6 feet deep to accommodate the proposed 12-inch diameter brine disposal pipeline. Over a period of approximately 12 months, construction contractors would use a backhoe or pipe auger to excavate the trench for the pipeline from Haybarn Canyon to the Del Mar Boat Basin jetty.

Proposed Pipeline Route

The USMC evaluated three different pipeline configurations in the EA. The preferred pipeline route would extend from the AWT facility and traverse up the eastern end of Haybarn Canyon and follow existing fire roads and trails to the east and south into the Mike Training Area down to Pueblitos Canyon, where it would follow Pueblitos Canyon and intersect and cross Vandegrift Blvd. The pipeline would continue to follow Vandegrift Blvd., southward to Lemon Grove Road, a distance of approximately 3.4 miles. At Lemon Grove Road, the corridor would turn westward and parallel Lemon Grove Road for about 500 feet, then turn south, cross beneath Interstate 5, and align southwesterly to enter the 21 Area at the intersection of A Street and 8th Street. From there, it would follow 8th Street southwest and then turn northwest on C Street until aligned with 9th Street. Following the southwesterly direction of 9th Street, along the west side of the Del Mar Boat Basin, the pipeline corridor would then intersect with a paved road running along the beach. It would then follow this road southeasterly until aligned with the jetty. The pipeline would extend to the second bend in the jetty rather than the entire length of the jetty. The total length of pipe would be approximately 11.3 miles.

Determination

The Proposed Action would occur outside the coastal zone as defined in Section 304 of the Act, which does not include "lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal government." MCB Camp Pendleton is wholly owned and operated by the Department of the Navy and the USMC; however, the USMC recognizes that actions outside the coastal zone may affect land or water uses or natural resources of the coastal zone, and therefore, are subject to the provisions of the Act. Consequently, the USMC conducted an analysis of project related impacts to coastal resources within the coastal zone.

Based upon analysis in the EA, the USMC determined the construction of the AWT facility, associated pipeline, and brine discharge would have no effect on coastal zone resources, including public access, recreation, the marine environment, natural resources, cultural resources, or aesthetics.

Public Access and Recreation

The proposed AWT facility, associated pipeline, and brine discharge would not affect public access to, or commercial or recreational use of the coastal zone. The project area is located on a military installation with restricted access to the public. The AWT facility and associated pipeline would not affect traffic or

pedestrian routes leading directly to or from the coastal zone. The Proposed Action would not affect beach access points or otherwise affect recreation or transportation in the coastal zone.

Marine Environment

The proposed project would not affect the marine environment. During construction, contractors would control erosion and associated sedimentation by developing and implementing a Storm Water Pollution Prevention Plan (SWPPP). Following construction, MCB Camp Pendleton Assistant Chief of Staff (AC/S) Environmental Security would oversee the development and implementation of a plan for landscaping and re-vegetation to increase soil stability in the disturbed areas.

The estimated brine discharge concentrations indicate that several metal concentrations would be higher than the limits set in the California Ocean Plan. As is the case with all of the concentrations, the metal concentration is an estimate based on modeled conditions; actual concentrations may, and will likely, differ. Thus, as part of the Proposed Action, MCB Camp Pendleton will apply for and receive a National Pollutant Discharge Elimination System (NPDES) permit from the San Diego Regional Water Quality Control Board (RWQCB) for the brine discharge. MCB Camp Pendleton will follow the details of the monitoring and/or discharge requirements as specified in the NPDES permit. As part of the NPDES permit, MCB Camp Pendleton will conduct regular testing of the brine discharge. If monitoring indicates the brine discharge concentrations exceed any of the limits set out in the NPDES permit, MCB Camp Pendleton would perform additional treatment until concentrations are within the limits set out in the NPDES permit.

The projected small increase in urban runoff volume to the ocean would not affect marine waters. The construction contractors would minimize and manage runoff from construction areas according to the SWPPP and associated Best Management Practices (BMPs). BMPs would include bioswales, straw bales, erosion control mats, hydroseeding, and other site-specific measures to reduce the transport of pollutants and sediment in surface runoff from developed areas.

Land Resources

The proposed AWT facility and associated pipeline would not affect land resources in the coastal zone, as the project area is located on a semi-disturbed property outside of the coastal zone. MCB Camp Pendleton prepared and submitted a Biological Assessment (BA) to the U.S. Fish and Wildlife Service (USFWS) to initiate formal consultation regarding known threatened and endangered species in and adjacent to the project area. The Proposed Action would follow design measures, including construction restrictions, revegetation, storm water/erosion control management, habitat restoration, and exotic species control to reduce potential impacts to terrestrial species. The USFWS is currently reviewing the BA and MCB Camp Pendleton anticipates receiving a Biological Opinion (BO) in August 2009. MCB Camp Pendleton would incorporate the terms and conditions of the USFWS BO into the project to avoid, minimize, and compensate for any effect on protected species.

MCB Camp Pendleton AC/S Environmental Security (Land Management Branch) would review the landscaping plan to verify that appropriate native plants and acceptable landscape plant species are used in accordance with the Base Exterior Architecture Plan (BEAP) and the EPA's 1995 Guidance for the Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds.

Construction of the proposed pipeline would have an adverse affect to several known archaeological resources along the length of the pipeline. Additionally, archaeological investigations along this section of Vandegrift Blvd. indicate that additional buried sites may be present just beneath the existing roadbed. For this reason, archaeological monitoring will be necessary along the entire length of the brine line to identify any undocumented cultural deposits during construction. Archaeological data recovery will be conducted within the proposed construction corridor where archaeological sites are known to exist.

The California State Historic Preservation Officer (SHPO) is currently reviewing the cultural report. MCB Camp Pendleton anticipates SHPO concurrence with MCB Camp Pendleton's finding that although implementation of the Proposed Action would have an adverse affect to cultural resources, we would resolve our adverse affects via the Memorandum of Agreement with the SHPO that stipulates the following measures: 1) implementation of Historic Properties Treatment Plan, 2) conducting data recovery, and 3) archaeological monitoring along the entire length of the brine line.

Aesthetics

The project would not affect aesthetics or visual resources of the coastal zone. The AWT facility and associated piping would be constructed in an existing developed region of MCB Camp Pendleton. Adjacent development includes the existing Haybarn Canyon Water Treatment facility, sewage treatment plant, and Vandegrift Blvd. The surrounding region includes Interstate-5, access ramps, and the Del Mar Boat Basin. The overall visual quality of the location is moderate.

The proposed AWT facility and associated pipeline would have a profile, color scheme, and construction plan consistent with existing adjacent development and commercial facilities. Exterior architecture and landscaping would follow approved guidelines in the BEAP.

Conclusion

Per 15 Code of Federal Regulations § 930.35(d) of the regulations implementing the Coastal Zone Management Act, the USMC believes that this Negative Determination demonstrates that a Consistency Determination is not required for the proposed AWT facility, associated pipeline, and brine discharge as the proposed action would not affect land use, water uses or quality, or natural resources within the coastal zone.

Thank you for your prompt consideration of this matter. For future correspondence, your point of contact is Ms. Colleen Eckenroad, at the AC/S Environmental Security Office, (760) 725-9739.

Sincerely,

M. J. BONSAVAGE
Head, Environmental Planning Division
AC/S Environmental Security
By direction of the Commanding Officer

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

In response refer to:
I/SWR/2009/04483: SCG

SEP 15 2009

William H. Berry
Resource Management Division Head
Camp Pendleton Marine Corps Base
P.O. Box 555008
Camp Pendleton, California 92055-5008

Dear Mr. Berry:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the U.S. Marine Corps Base Camp Pendleton's (Base) August 12, 2009, informal Section 7 consultation request letter and Preliminary Final Environmental Assessment (PFEA) for the Base's Advanced Water Treatment Facility/Utility Corridor Project (project). The project involves upgrading the southern Base's water treatment facility to meet new water quality standards, and constructing an 11-mile-long subterranean pipeline along the southern border of the Base that would carry dissolved salts from the water treatment facility to an outflow point in the Pacific Ocean. The project occurs near the Santa Margarita River, which is within the endangered Southern California Distinct Population Segment of steelhead (*Oncorhynchus mykiss*). The Santa Margarita River is not currently designated as critical habitat for this species. The Base determined that the project is not likely to adversely affect endangered steelhead in the Santa Margarita River, and requested NMFS' concurrence with this determination.

After carefully reviewing the project plans and the PFEA, NMFS concurs with the Base's determination for the following reasons:

1. The project is entirely land-based and does not require any water diversion. Thus, direct effects to steelhead within the Santa Margarita River are not expected.

2. The pipeline construction route is several hundred to several thousand feet away from the river channel and is designed to avoid the riparian corridor. Additionally, all disturbed areas and soils used to bury the pipeline will be immediately stabilized and replanted with native riparian, shrub and grass species following placement of the pipeline. Thus, indirect effects to steelhead and aquatic habitat within the Santa Margarita River are not expected.

3. The discharge point for the dissolved salts solution resulting from water treatment is 1.5 miles away from the Santa Margarita River Estuary. Thus, direct and indirect effects to steelhead within the Santa Margarita River Estuary resulting from water treatment discharge are not expected

4. Best management practices will be put into operation during implementation of the project to minimize impacts to steelhead and aquatic habitat. These practices include sedimentation and turbidity-control measures, a Stormwater Pollution Prevention Plan, implementation of containment and spillage measures during mixing and pouring of concrete, storage of toxic materials offsite, and fueling and maintenance of heavy machinery in areas outside of the river channel.

This concludes section 7 consultation for this proposed action. Consultation must be reinitiated where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and: (1) if new information becomes available revealing effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) if project plans change; (3) if the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered; or (4) if a new species or critical habitat is designated that may be affected by this action. Please contact Stan Glowacki at (562) 980-4061 or via email at Stan.Glowacki@noaa.gov if you have any questions concerning this letter, or if you require additional information.

Sincerely,

FOR Rodney R. McInnis
Regional Administrator

cc: Jill Terp, U.S. Fish and Wildlife Service
Copy to File 151422SWR2009PR00448

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

In Reply Refer To:
FWS-MCBCP-09B0249-10F0421

MAR 09 2010

Mr. Jeffery Paull
Assistant Chief of Staff, Environmental Security
United States Marine Corps
Box 555008
Camp Pendleton, California 92055-5008

Subject: Formal Section 7 Consultation for the Advanced Water Treatment Facility and Utility Corridor Project (P-113), Marine Corps Base Camp Pendleton, San Diego County, California

Dear Mr. Paull:

This document transmits the biological opinion of the U.S. Fish and Wildlife Service (Service) based on our review of the proposed Advanced Water Treatment Facility and Utility Corridor Project located on Marine Corps Base Camp Pendleton (MCBCP), San Diego County, California. This biological opinion concerns the potential effects of the proposed project on the federally endangered arroyo toad [*Anaxyrus* (=*Bufo*) *californicus*, "arroyo toad"] in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). Your request for formal consultation was received on March 23, 2009.

This biological opinion is based on information provided in the *Final Biological Assessment for the Advanced Water Treatment Facility / Utility Corridor Project (P-113) at Marine Corps Base Camp Pendleton, San Diego County, California* (Biological Assessment) dated November 2009 and other correspondence, meetings, notes and information compiled during the course of our consultation with the United States Marine Corps (Marine Corps) on the proposed project. This information and other references cited in this biological opinion constitute the best available scientific information on the status and biology of the species considered. The complete project file for this consultation is maintained at the Carlsbad Fish and Wildlife Office (CFWO).

Consultation History

On March 23, 2009, the CFWO received a letter dated March 20, 2009, requesting formal consultation under the Act. Based on the project description at the time consultation was initiated, the Marine Corps requested consultation on the federally threatened coastal California gnatcatcher (*Polioptila californica californica*, "gnatcatcher") and the federally endangered least Bell's vireo (*Vireo bellii pusillus*, "vireo"), southwestern willow flycatcher (*Empidomax traillii*

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extimus, "flycatcher"), and arroyo toad. In addition, the Marine Corps requested concurrence with the determination that the proposed project is not likely to adversely affect the federally endangered California brown pelican (*Pelecanus occidentalis californicus*, "pelican"), California least tern (*Sternula antillarum browni*, "tern"), tidewater goby (*Eucyclogobius newberryi*, "goby"), and the federally threatened western snowy plover (*Charadrius alexandrinus nivosus*, "plover").

We responded to your March 20, 2009, request with a letter dated May 5, 2009, documenting initiation of formal consultation under the Act and concurring that the proposed project may affect, but is not likely to adversely affect, the pelican, tern, goby, and plover.

Formal consultation was suspended on September 23, 2009, at the request of the Marine Corps due to substantial changes in the project. Consultation was resumed on November 30, 2009, with receipt of a modified project description and the final Biological Assessment dated November 2009. From July of 2009 through February of 2010, staff from the Marine Corps and the Service communicated by telephone and exchanged electronic mail correspondence to finalize details regarding project-associated impacts and proposed conservation measures. Under the modified project, impacts to vireo and flycatcher will be addressed as a Class III activity as defined in the Programmatic Riparian and Estuarine / Beach Ecosystems Biological Opinion (1-6-95-F-02, "Riparian BO") (Service 1995). Class III activities do not require concurrence or additional consultation with the Service. Adverse effects to the arroyo toad within riparian habitat will also be addressed as a Class III activity under the Riparian BO, but adverse effects to the arroyo toad within upland habitat are addressed within this biological opinion. The Riparian BO includes measures that will be implemented to avoid, minimize, and offset project-related impacts to vireos, flycatchers, and arroyo toads in riparian habitat. These conservation measures include restoration of temporary impacts and offsetting permanent impacts by deducting credits from the Marine Corps' pool of credits, accumulated as a result of removing non-native invasive riparian plant species on MCBCP.

With the modified project and the implementation of proposed avoidance and minimization measures from the revised project description, we concur that the project is not likely to adversely affect the gnatcatcher. For convenience, conservation measures specifically addressing gnatcatcher are repeated here.

- The biological monitor[s] (described in more detail below) responsible for overseeing construction and ensuring that conservation measures are implemented will be familiar with the gnatcatcher and its habitat.

- Clearing of coastal sage scrub (CSS) will take place outside of the gnatcatcher breeding season (February 15 to August 31) to the maximum extent practicable. After the initial site clearing, ongoing construction activities in or adjacent to CSS will also occur outside of the breeding season when practicable. If breeding season avoidance is not practicable, the following additional measures will be applied for gnatcatcher:

- Within 7 days prior to clearing habitat, a biological monitor will conduct pre-construction surveys for gnatcatchers and their nests in all suitable habitat within 91 meters (m) [300 feet (ft)] of the proposed construction area.

- If an active gnatcatcher nest occurs within 91 m (300 ft) of proposed construction activities, the biological monitor will report the nest to the Assistant Chief of Staff/Environmental Security (AC/S ES) wildlife management branch. A weekly nest status report will be sent to the branch as well.

- Construction activities other than use of existing roads will not be conducted within 91 m (300 ft) of an active gnatcatcher nest. The area within 91 m (300 ft) will be avoided until the nest fails or until at least 10 days after young fledge from the nest, unless the Marine Corps and Service mutually agree that disturbance is not likely.

- Removal of CSS in occupied gnatcatcher habitat will be avoided to the greatest extent possible.

- Temporary impacts to CSS will be restored immediately following project completion. Restoration will be conducted consistent with a restoration plan reviewed and approved by the AC/S ES and the Service prior to initiating the project.

- To offset permanent impacts to CSS, CSS will be restored at a location approved by AC/S ES and the Service. Based on the estimated permanent impacts to 0.12 hectares (ha) [0.29 (ac)] of disturbed CSS, 0.12 ha (0.29 ac) of CSS will be restored.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Project Description

The proposed action includes the construction of an Advanced Water Treatment Facility (AWTF) and utility corridor on MCBCP in northern San Diego County (Figure 1). The AWTF and utility corridor will process water for the drinking water distribution system and carry brine effluent to a discharge point in the Pacific Ocean.

The AWTF will receive effluent from the existing 24 Area (Haybarn Canyon) iron/manganese removal plant (Figure 2) and, following iron/manganese removal, will treat the water to reduce total dissolved solids, total organic carbon, and total trihalomethanes, thereby maximizing wastewater reuse options on MCBCP. The proposed project will not increase groundwater use since it will process existing effluent.

Two water output streams will result from operating the AWTF: (1) clean water for the drinking water distribution system and (2) concentrate (brine) from the reverse osmosis total dissolved solids reduction process. A pipeline will be installed to pump the brine to the Pacific Ocean, where it will be discharged. The brine will consist of dissolved mineral salts in concentrations that meet applicable Federal, State, and local regulatory marine water quality objectives.

The proposed action includes construction of a force main and associated pump station to pump the brine from the AWTF to the discharge location. The new pipeline will be installed in a utility trench up to 1.8 m (6 ft) below grade and will extend from the AWTF to the ocean on the southern coast of MCBCP (Figure 1). A back hoe or pipe auger will be used to excavate a trench for the pipeline. The project will take about 12 months to complete with construction occurring during both daytime and nighttime hours.

The pipeline corridor route will run from the AWTF at the western end of Haybarn Canyon and then be aligned within the existing developed footprint along Vandegrift Boulevard southward to Lemon Grove Road (Figure 1). At Lemon Grove Road, the corridor will turn westward and parallel Lemon Grove Road for about 152 m (500 ft), then turn south, cross beneath the I-5 freeway, and run along existing surface streets and out into the Pacific Ocean at a point 61 m to 76 m (200 to 250 ft) offshore of the Del Mar Recreation Beach.

The total length of pipeline will be about 14.5 kilometers (km) [9 miles (mi)]. For the entire length of the pipeline, construction will take place within a 15-m (50-ft) wide construction corridor within the 30-m (100-ft) wide project footprint. Not all of the habitat within the project footprint will be impacted, but because engineering for the project is still in its early stages, it is not possible to estimate project-related impacts precisely. Thus, all habitat within the project footprint is assumed to be subject to impacts. Including both permanent and temporary impacts, the project will impact up to 59.74 ha (147.63 ac), although much of this impact will be to developed areas along the roadway, and impacts to riparian habitat will be addressed under the Riparian BO. The great majority of project-related impacts will be temporary impacts associated with installation of the pipeline, and temporarily impacted habitat will be restored following project completion.

Twelve permanent air release valve access stations will be located along the utility corridor for maintenance activities. Each access station will impact an area about 3.3 m^2 (36 ft^2) within previously disturbed areas. The length and width of access paths to these stations will vary depending on the location and will be designed to minimize impacts to sensitive habitats. Vegetation removal and mowing are not anticipated to be necessary along the pipeline for future routine maintenance activities, so future vegetation removal associated with maintenance activities was not addressed during the consultation nor by this biological opinion.

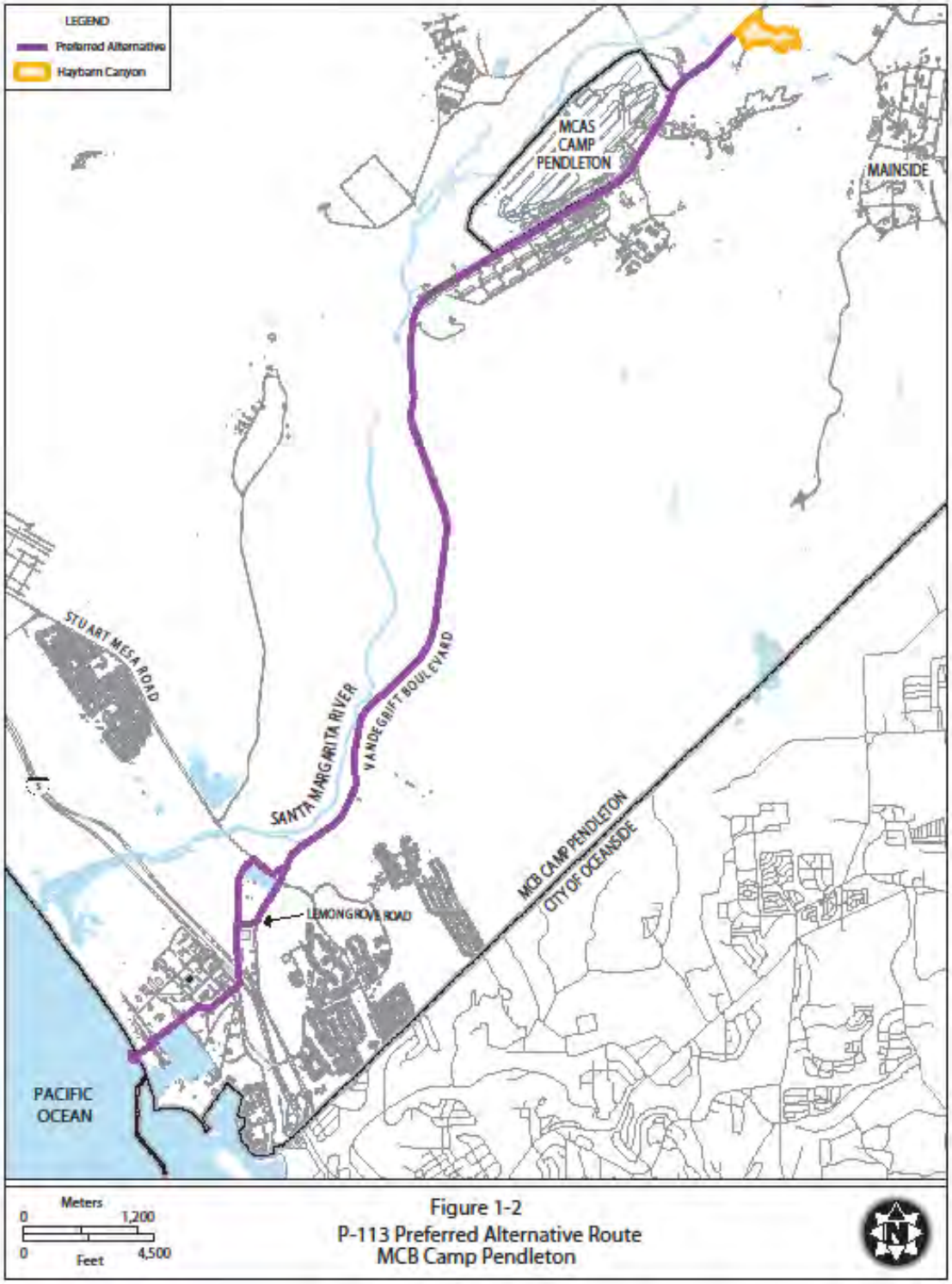

Figure 1. The Advanced Water Treatment Facility and Utility Corridor Project location on MCBCP (Figure 1-2 from the Biological Assessment).

Figure 2. Haybarn Canyon detail, showing the AWTF footprint and vegetation mapping (Figure 2 from the Biological Assessment).

Conservation Measures

The following measures will be implemented to avoid and minimize potential effects of the project on arroyo toad:

- Since project designs are not yet finalized, the construction footprint, including the pipeline, staging areas, air release valves, and associated access roads, will be sited to avoid and minimize impacts to native habitats with listed species, including CSS and riparian vegetation. Final construction designs for the project will be provided to the AC/S ES for distribution to the Service prior to project initiation. These designs will include the final footprint of all facilities relative to arroyo toad locations and vegetation communities and a table showing the final permanent and temporary impacts by vegetation community.

- A biological monitor or monitors familiar with the arroyo toad will be responsible for overseeing construction to ensure compliance with the conservation measures and for preventing unanticipated impacts to arroyo toad.

    - The biological monitor will submit to AC/S ES, in writing, the names, any permit numbers, resumes, and at least three references (of people who are familiar with the relevant qualifications of the proposed biologist), of all biologists who may need to handle, move, survey, or monitor toads for the proposed project.

    - This information will be submitted to the AC/S ES for approval at least 15 days prior to project initiation.

    - Proposed activities will not begin until a biological monitor has been approved by the AC/S ES.

- At least 7 days before project initiation, the project boundary, including temporary features such as staging areas and temporary access roads, will be clearly marked with flagging, fencing, or signposts. All project-related activities will occur within the project boundary.

- A Storm Water Pollution Prevention Plan will be prepared and will incorporate Best Management Practices (BMPs)[1], such as silt fences, silt basins, gravel bags, or other measures, to control erosion and prevent the release of contaminants that could be harmful to arroyo toad.

[1] BMPs can be found in the California Stormwater Quality Association's Stormwater Best Management Practices Handbook for Construction, January 2003. www.cabmphandbooks.com

- Dust migration adjacent to riparian areas will be minimized by lightly spraying areas of exposed soil with water during excavation and grading activities when weather conditions require the use of dust control measures.

- To ensure fire does not commence due to project activities, construction trucks will carry water and shovels or fire extinguishers in the field. Shields, protective mats, or other fire prevention equipment will be used during grinding and welding, and vehicles will not be driven and parked in areas where catalytic converters could ignite dry vegetation.

- Nighttime lighting will be shielded and directed away from upland habitat. A biological monitor will monitor all night-time construction activities in and adjacent to sensitive habitat to minimize disturbance to arroyo toad.

- A contractor education program will be conducted by a biological monitor with oversight by AC/S ES personnel. It will be conducted during all project phases and cover the potential presence of arroyo toads; the requirements and boundaries of the project; the importance of complying with avoidance, minimization, and compensation measures; and problem reporting and resolution methods. The Marine Corps will ensure the placement of signs indicating the necessity for all activities to be strictly confined to the project site.

- All trash will be disposed of properly. Following project completion, all equipment and waste will be removed from the site, and the soil will be re-contoured prior to habitat restoration.

- Based on estimated permanent impacts to 0.60 ha (1.49 ac) of upland arroyo toad habitat, the Marine Corps will deduct 0.60 ha (1.49 ac) from their pool of riparian restoration credits accumulated as a result of removing non-native invasive riparian plant species on MCBCP.

- Based on estimated temporary impacts to 14.72 ha (36.52 ac) of arroyo toad upland habitat that may support aestivating arroyo toads (does not include disturbed habitat, see Effects Analysis, p. 13), the Marine Corps will deduct 2.94 ha (7.30 ac) from their pool of riparian restoration credits accumulated as a result of removing non-native invasive riparian plant species on MCBCP.

- Temporarily impacted native upland vegetation will be restored immediately following project completion. Restoration will be conducted consistent with a restoration plan reviewed and approved by the AC/S ES and the Service prior to initiating the project.

- For portions of the project within 500 m (1,640 ft) of documented arroyo toad observations, the following measures will be implemented:

- Trenching or other ground-disturbing activities will be conducted outside the arroyo toad breeding season (March 15 through August 15), to the maximum extent practicable.

- Temporary silt fencing will be installed around the perimeter of all work areas within potential arroyo toad habitat.

  - Exclusionary fencing will consist of woven nylon netting about 0.9 m (3 ft) high attached to wooden stakes.

  - Prior to installing the fencing, a narrow trench about 2.5 to 5 centimeters (cm) [1 to 2 inches (in)] deep will be excavated and the fence buried, to prevent burrowing beneath the fence.

  - The bottom lip of the fence will have sand bags laid against it to hold it in place and deter toads from burrowing under the fence.

  - All fencing materials (e.g., mesh, stakes) will be removed following construction.

  - Ingress and egress of construction equipment and personnel will be kept to a minimum and will use a single access point to the site.

  - This access point will be as narrow as possible and be closed off by exclusionary fencing when personnel are not on the project site.

  - Photographs of the fencing will be submitted to the AC/S ES after installation and immediately prior to initiating project impacts.

  - Excavation units and trenches that have not been backfilled at the end of the day will be completely covered with rigid and durable materials to exclude toads and avoid toad entrapment.

  - The excavated soil materials/stockpiles will be completely covered with a tarp at the end of the day.

- Prior to construction activities, but after exclusionary fencing has been installed, at least three surveys for arroyo toads will be conducted by a biological monitor to remove arroyo toads from the fenced portion of the project footprint.

  - Surveys will be conducted during appropriate climatic conditions and during the appropriate time of day or night to maximize the likelihood of encountering arroyo toads. If climatic conditions are not appropriate for arroyo toad movement

during the surveys, the biological monitor may attempt to elicit a response from the arroyo toads, during nights (i.e., at least 1 hour after sunset) with temperatures above 10 degrees Celsius (50 degrees Fahrenheit), by spraying the project area with water to simulate a rain event. Prior to spraying an area with water, the biologist will coordinate with the AC/S ES and the Service to determine the specific areas, if any, that will be sprayed.

- If arroyo toads are found within the action area they will be captured and translocated by the biological monitor to the closest area of suitable habitat along the closest creek. The date, time of capture, specific location of capture (using Geographic Positioning Systems), approximate size, age, and health of the individual will be recorded and provided to the AC/S ES, Within 2 weeks of the translocation, the AC/S ES will provide the above information to the Service.

- In addition to conducting pre-construction surveys, the biological monitor will conduct ongoing monitoring of the project.

  - Each morning, the biological monitor will be present prior to initial ground disturbance activities and during removal of excavation unit covers and soil stockpile tarps to check for any arroyo toads that may have entered the area.

  - The biological monitor will be present at the end of the day to ensure that the excavations are properly covered to prevent arroyo toads from entering any open pits.

  - The biological monitor will be on call and available as needed at other times in the event that an arroyo toad is encountered during the activities. The biological monitor will be present on site full-time, for 2 days to 3 days, following any measurable rainfall.

  - Upon notification of an arroyo toad sighting, the biological monitor will contact the AC/S ES, and the Marine Corps will contact the Service directly. Any type of "take" of arroyo toads, which includes: digging up, handling (i.e., relocating the toad), injury, or death will be reported within 24 hours to AC/S ES. The point of contact is Sherri Sullivan at (760) 725-0377.

  - The biological monitor will document and submit a weekly report on all arroyo toad related activities and actions taken.

Action Area

According to 50 CFR § 402.02 pursuant to section 7 of the Act, the "action area" means all areas to be affected directly or indirectly by the Federal action. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area. We consider the action area for the proposed project to be the project footprint (shown in Figures 3, 4, and 5) and a corresponding 152 m (500 ft) buffer. The buffer includes the area potentially affected by project-related noise, dust, and lighting.

STATUS OF THE SPECIES

The status of the arroyo toad, including its status on MCBCP, was described in detail in the recently completed biological opinion addressing effects to arroyo toad associated with the Infantry Squad Battle Course Range P-637 (FWS-MCBCP-08B0581-08F0696, dated September 28, 2008). Please refer to this document for information on the status of the arroyo toad on MCBCP and rangewide.

ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and private actions that are contemporaneous with the consultation in progress.

The action area contains a variety of habitat types including CSS, native and non-native grasslands, eucalyptus, disturbed areas, woody riparian vegetation (willow riparian forest and scrub and mulefat scrub), and developed areas. However, project-related impacts to riparian habitat and individual arroyo toads within the riparian habitat are addressed by the Riparian BO. About half of the upland impacts occur within disturbed habitat where past or present physical disturbance is prevalent. These areas support some vegetative cover, suggesting they are not disturbed regularly and likely contain portions with soils suitable for aestivating; more compacted soils closer to Vandegrift Boulevard are likely used by toads for foraging and dispersal. Data from basewide surveys were used to determine arroyo toad presence; no focused arroyo toad surveys were conducted specifically for this project.

Studies have demonstrated that arroyo toads are frequently found within 500 m (1,640 ft) of the edge of the nearest stream course and have been observed up to 1.1 km (0.7 mi) from the edge of the nearest stream course (Holland and Sisk 2001). Arroyo toads are likely to disperse even greater distances occasionally (Service 1999), although this has not been observed directly. The project footprint is about 91 m (300 ft) west of the Santa Margarita River, which contains arroyo toad breeding habitat and supports the highest density of arroyo toads on MCBCP. The action

area along the Santa Margarita River occurs from Pueblitos Canyon south to Stuart Mesa Road (Figure 1). Because arroyo toads use upland habitat within 1.1 km (0.7 mi) from the edge of the nearest stream course, we consider all suitable habitat within this distance of the Santa Margarita River as upland habitat used for foraging, aestivating and dispersal. Therefore, including both permanent and temporary impacts, the project will impact up to 22.64 ha (55.94 ac) of upland arroyo toad habitat.

Between 1998 and 2000, Holland and Sisk (2001) used extensive pitfall trapping in an attempt to determine arroyo toad distribution in the upland and riparian environment on MCBCP, including trapping locations adjacent to Santa Margarita River. Arroyo toads were captured in the upland environment from 31 to 684 m (102 to 2,244 ft) (mean = 268 m [879 ft]) from the upland/ riparian interface. Thus, the area trapped by Holland and Sisk (2001) is similar to the action area in terms of distance from the riparian/upland interface. The density of arroyo toads in the upland environment near Santa Margarita River averaged 0.31 arroyo toads/ha (0.12 arroyo toads/ac) per year. However, this trapping effort likely detected only a fraction of the arroyo toads present in the area sampled. The overall recapture rate of arroyo toads over the course of the study was about 17 percent, with the great majority of recaptures being toads captured earlier in the same year. Thus, if we assume that the study detected about 17 percent of the arroyo toads in the upland environment in a given year and that the density of toads in the action area is similar to the study site, the density of arroyo toads in the action area is about 1.8 arroyo toads/ha (0.72 arroyo toads/ac).

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the proposed action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time but are still reasonably certain to occur.

Construction-Related Death and Injury

A biological monitor will be present during project implementation to oversee and conduct measures aimed at avoiding and minimizing impacts to arroyo toads. The biological monitor will identify any potential occupied habitat which will be fenced off along the perimeter of the project area to minimize the number of arroyo toads that enter the project footprint after construction has started. Additionally, pre-project surveys will be conducted in the project footprint to capture and release arroyo toads into the nearest suitable habitat. Arroyo toads in the project footprint may be moved from harms way as a result of these measures, but there are no assurances that all aestivating arroyo toads can be located. Thus, construction activities are

anticipated to kill arroyo toads aestivating underground in the area of impact by crushing them during earth-disturbing activities, such as trenching, grading, placement of project fencing, and by driving over them with heavy equipment.

Arroyo toads found in the project footprint by the biological monitor that could be killed during subsequent construction activities will be captured and released into the nearest suitable habitat along the Santa Margarita River. There is the potential for toads to be killed, injured, or stressed if they become entangled or trapped within exclusionary fencing and during capture and relocation efforts. However, fence placement and trapping and relocation efforts will be conducted by individuals familiar with arroyo toad biology and ecology, whose qualifications will be subject to review by the Service. Therefore, we expect very few arroyo toads (i.e., no more than two toads) to be killed or injured due to handling and translocation. The watering of impact areas to cause aestivating toads to surface may increase the stress experienced by arroyo toads by causing them to surface when conditions are not ideal, but the physiological stress experienced by arroyo toads in the project footprint will be preferable to their death or injury during construction. Arroyo toad density may be increased within areas where they are translocated from the project area. However, given the fact that a large amount of suitable arroyo toad breeding and upland habitat will remain outside the project footprint during project construction, we do not anticipate that the translocation of arroyo toads from the impact areas to adjacent suitable habitat will result in adverse impacts associated with overcrowding.

Based on the above analysis, we assume that arroyo toads in the area of impact will suffer injury or death. Within the 22.64 ha (55.94 ac) of upland arroyo toad habitat in the project footprint, we estimate that about 7.86 ha (19.42 ac) consists of disturbed habitat along the unpaved shoulders on the east and west sides of Vandegrift Boulevard and are compacted and, therefore, likely used only for foraging and dispersal. The remaining 14.72 ha (36.52 ac) likely include loose soils where arroyo toads can burrow underground and which can be used for foraging, aestivating, and dispersal for subadult and adult arroyo toads. Therefore, using our estimate that there are about 1.8 arroyo toads/ha (0.72 arroyo toads/ac; see Environmental Baseline) within the 14.72 ha (36.52 ac) of habitat suitable for foraging, aestivating, and dispersal, we estimate there are about 26 arroyo toads in the project footprint. The purpose of this analysis is to provide a rough estimate of the number of arroyo toads in the action area based on the best available information.

The project will temporarily remove 22.04 ha (54.45 ac) and permanently remove 0.6 ha (1.49 ac) of foraging, aestivating, and dispersal habitat. The temporary loss of 22.04 ha (54.45 ac) of upland habitat may affect the ability of arroyo toads to forage and seek cover from predation and during daytime periods of inactivity (Service 2005). However, the great majority of aestivating habitat within the adjacent upland habitat will remain available for arroyo toads during project implementation, particularly in proximity to the existing breeding habitat along the Santa Margarita River, where the highest concentrations of arroyo toads are likely to occur. Permanent impacts to 0.6 ha (1.49 ac) of upland habitat will remove potential foraging, aestivating, and dispersal habitat for the arroyo toad and will contribute to the incremental loss of upland habitat

at MCBCP and rangewide. Despite this loss, arroyo toads are expected to continue to survive and be sustained in habitat adjacent to the project area. Thus, this impact is not expected to result in an appreciable reduction in the numbers, reproduction, or distribution of arroyo toads on MCBCP or rangewide.

To offset the estimated impacts described above, the Marine Corps will deduct 3.54 ha (8.79 ac) from their pool of riparian restoration credits accumulated as a result of removing non-native invasive riparian plant species on MCBCP. In addition, the Marine Corps will restore temporarily impacted native upland vegetation immediately following project completion.

Water Quantity

Operation of the AWTF will use existing groundwater supplies, and the amount of water withdrawn for the existing water treatment plant operation will not change. Therefore, it is anticipated that there will be no change in the water table or water supply to the Santa Margarita River as a result of this project.

Erosion and Water Quality

Changes to water quality in adjacent arroyo toad breeding habitat could result due to construction-related sedimentation and pollution. Changes in sedimentation dynamics can reduce the suitability of arroyo toad habitat. Siltation can asphyxiate eggs and larvae (Service 1999). Changes to the water quality (temperature and chemical composition) can lead to reduced oxygen uptake, reduced feeding, and a general decline in species health, which can lead to disease, decreased growth and reproduction, or death.

To minimize the potential for water quality impacts to the Santa Margarita River from the proposed project, measures will be implemented to prevent construction-related siltation and runoff from entering the Santa Margarita River and other drainages. Temporary erosion control measures such as silt fencing, sand bags, and straw matting will be installed during all phases of construction activities.

Maintenance Activities

Routine maintenance activities will involve traveling along developed roads and paths and checking the air release valve access stations. These activities are not anticipated to affect arroyo toads or their habitat. Non-routine maintenance activities, such as fixing pipeline breaks and digging in arroyo toad habitat, are not addressed by this consultation.

Effects on Recovery

The proposed project is not anticipated to impede recovery. It will permanently remove only about 0.6 ha (1.49 ac) and temporarily remove about 22.04 ha (54.45 ac) of arroyo toad-occupied

habitat. This represents a small fraction of the available foraging, aestivating, and dispersal habitat for arroyo toads along the Santa Margarita River. The great majority of habitat will remain during project construction. Following project completion, the Marine Corps will restore all areas of temporary impacts. In addition, a maximum of 26 arroyo toads are anticipated to be injured, killed, or harmed as a result of project activities, which is a small percentage of the arroyo toad population at MCBCP and rangewide. The loss of these individuals and their habitat is not anticipated to have a long-term impact on the population of arroyo toads on MCBCP, and therefore, the project will not significantly impair conservation or recovery of arroyo toad on MCBCP or throughout its range.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are unaware of any non-Federal actions affecting listed species that are reasonably certain to occur in the action area considered by these opinions.

CONCLUSION

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed Advanced Water Treatment Facility and Utility Corridor Project is not likely to jeopardize the continued existence of the arroyo toad. We reached these conclusions by considering the following.

1. Permanent and temporary impacts to toad foraging and aestivating habitat [22.64 ha (55.94 ac)] represents only a fraction of the arroyo toad upland habitat at MCBCP and rangewide.

2. Temporary impacts to upland arroyo toad habitat, which represent the majority of impacts to toad habitat, will be restored following project completion.

3. The loss of arroyo toads within the project footprint (estimated to be up to 26) represents a fraction of the estimated arroyo toad population along the Santa Margarita River and rangewide. The loss of individual arroyo toads will be minimized through the efforts of the biological monitor both prior to and during construction activities.

4. The project will not impact arroyo toad breeding habitat, and toad reproduction will not be impacted.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations issued pursuant to section 4(d) of the Act, prohibit take of endangered and threatened species without a special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that actually kills or injures a listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2) of the Act, such incidental taking is not considered to be a prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary and must be implemented by the Marine Corps, in order for the exemption from section 7(o)(2) of the Act to apply. The Marine Corps has a continuing duty to regulate the activity that is covered by this incidental take statement. If the Marine Corps fails to retain oversight to ensure compliance with these measures, the protective coverage of section 7(o)(2) of the Act may lapse. To monitor the impacts of incidental take, the Marine Corps must report the progress of the action and its impact on the species to our agency as specified [50 CFR §402.14(I)(3)].

AMOUNT OR EXTENT OF TAKE

The exact distribution and population size of toads is difficult to determine due to the dynamic conditions associated with their habitat and biology and because detection of toads outside of the breeding season is very difficult. However, as described in the effects analysis, we anticipate that up to 26 arroyo toads are likely to be killed or injured as a result of project implementation. Because we will not be able to effectively monitor the death or injury of aestivating toads, we have established take thresholds that, if exceeded, will trigger reinitiation of consultation.

Take of arroyo toad is authorized as follows:

- Capture and release of up to 26 toads within the project construction footprint;
- Accidental death or injury of 2 toads as a direct result of exclusionary fencing, capture, and release efforts;
- Harm to arroyo toads from trenching and other ground disturbing activities within 22.64 ha (55.94 ac) of upland arroyo toad habitat; and

- Because there is a low likelihood that any of the arroyo toads killed during project construction will be observed, the take threshold will be met if more than 2 arroyo toads are observed to be killed or injured as a result of construction activity.

Disposition of Sick, Injured, or Dead Specimens

This office is to be notified within 1 working day if any arroyo toads are found dead or injured as a direct or indirect result of the implementation of this project. Notification must include the date, time, and location of any arroyo toads and any other pertinent information. Dead animals should be collected in an appropriate manner only by a biologist approved by the Service.

EFFECT OF TAKE

In the accompanying biological opinion, we determined that this level of anticipated take is not likely to result in jeopardy to the arroyo toad.

REASONABLE AND PRUDENT MEASURES

The Marine Corps is implementing conservation measures as part of the proposed action to minimize the incidental take of arroyo toads. In addition to these conservation measures, the following reasonable and prudent measure is necessary to monitor and report the effects of the incidental take of arroyo toad:

1. The Marine Corps will monitor and report on compliance with established take thresholds for arroyo toads associated with the proposed action.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Marine Corps must comply with terms and conditions which implement the reasonable and prudent measures described above.

1.1 The Marine Corps will provide the results of the pre-construction arroyo toad surveys and capture/relocation efforts to the CFWO prior to initiating any project trenching and other ground disturbing activities.

1.2 The Marine Corps will notify the CFWO of any arroyo toads that are captured and translocated during subsequent monitoring during trenching and other ground disturbing activities within 30 days of project completion or when take thresholds are reached (i.e., if more than 26 arroyo toads are found within the project site during pre-project surveys and subsequent monitoring during project implementation).

1.3 If death or injury of any arroyo toads is observed in association with pre-project surveys and relocation efforts, the biological monitor will immediately notify the Marine Corps and the CFWO, so that the activities resulting in take can be reviewed to determine if additional protective measures are required and, within 1 business day, submit a written report describing the incident.

1.4 The Marine Corps will notify the CFWO when construction-related impacts to arroyo toad habitat [up to 22.64 ha (55.94 ac)] in the project footprint are complete. This notification will be provided within 30 days of completing construction-related impacts to arroyo toad habitat.

1.5 If death or injury of any arroyo toads is observed in association with construction activities, the biological monitor will immediately notify the Marine Corps and the CFWO, so that the activities resulting in take can be reviewed to determine if additional protective measures are required and, within 1 business day, submit a written report describing the incident.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or proposed critical habitat, help implement recovery plans, or to develop information. There are no conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the improvements and expansion of the Advanced Water Treatment Facility and Utility Corridor Project outlined in materials submitted to us. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this biological opinion; and (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion, including the creation of; or (4) a new species is listed or critical habitat designated that may be affected by the action.

If you have any questions regarding this consultation, please contact Fish and Wildlife Biologist Katy Kughen at (760) 431-9440, extension 201.

Sincerely,

Karen A. Goebel

for Jim A. Bartel
Field Supervisor

LITERATURE CITED

Holland, D. and N. Sisk. 2001. Habitat use and population demographics for the arroyo toad (*Bufo californicus*) on MCB Camp Pendleton, San Diego County, California 1998-2000. Prepared for AC/S Environmental Security, Resource Management Division, Marine Corps Base Camp Pendleton. Contract # M00681-97-C-0034. 32 pp. + append.

U.S. Fish and Wildlife Service (Service). 1995. Biological opinion on programmatic activities and conservation plans in riparian and estuarine/beach ecosystems on Marine Corps Base, Camp Pendleton (1-6-95-F-02). 61 pp. + appendices.

U.S. Fish and Wildlife Service (Service). 1999. Arroyo southwestern toad (*Bufo microscaphus californicus*) recovery plan. Portland, Oregon. 119 pp.

U.S. Fish and Wildlife Service (Service). 2005. Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Arroyo Toad (*Bufo californicus*); Final rule. Federal Register 70:19253-19678.

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U.S. Marine Corps (Marine Corps). 2009. Biological Assessment, Advanced Water Treatment Facility/Utility Corridor Project (P-113), Marine Corps Base Camp Pendleton. November 2009.

M00681-04210-007 amended

MEMORANDUM OF AGREEMENT

BETWEEN THE DEPARTMENT OF THE NAVY, U.S. MARINE CORPS,

AND THE

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

REGARDING THE TERTIARY TREATMENT PLANT PROJECT (P-002, P-110/A)

AND ADVANCED WATER TREATMENT FACILITY (P-113)

CAMP PENDLETON, SAN DIEGO COUNTY, CALIFORNIA

WHEREAS, the U.S. Marine Corps (USMC) proposes to construct a Tertiary Treatment Plant, advanced water treatment facility, associated conveyance and discharge systems, and to demolish Sewage Treatment Plants 1, 2, 3, 8, and 13 (undertaking) at Camp Pendleton, California, in order to attain compliance with applicable water quality standards; and

WHEREAS, the USMC, in consultation with the California State Historic Preservation Officer (CASHPO), has determined that the undertaking will adversely affect site CA-SDI-14170 and may affect sites CA-SDI-12100, CA-SDI-12577, CA-SDI-12628, CA-SDI-14748, CA-SDI-14749, CA-SDI-14750, CA-SDI-14751, and CA-SDI-14752, archaeological properties determined or considered eligible for inclusion in the National Register of Historic Places (NRHP) (historic properties); and

WHEREAS, the USMC has consulted with the CASHPO, and notified the Advisory Council on Historic Preservation (ACHP) of the adverse effect finding, in accordance with 36 CFR Part 800, regulations effective August 5, 2004, implementing Section 106 of the National Historic Preservation Act, as amended, (16 U.S.C. 470f) (NHPA). The ACHP has responded by letter on April 23, 2010 and has declined to participate in this MOA and consultation; and

WHEREAS, the USMC has consulted with the Pala Band of Mission Indians, Pauma Band of Mission Indians, Pechanga Band of Mission Indians, Soboba Band of Mission Indians, Rincon Band of Mission Indians, and La Jolla Band of Mission Indians (Tribes) regarding the proposed undertaking and its effect on historic properties, will continue to consult with the Tribes, will afford the Tribes, should the Tribes so desire, with the opportunity to participate in the implementation of this Memorandum of Agreement (MOA) and has invited the Tribes to concur in this MOA;

NOW THEREFORE, the USMC and the CASHPO agree that if the undertaking proceeds, the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic properties, and further agree that these stipulations shall govern the undertaking and all of its parts until this MOA expires or is terminated.

STIPULATIONS

The USMC shall ensure that the following stipulations are implemented:

I. AREA OF POTENTIAL EFFECTS

The signatory parties agree that the following historic properties are located within the undertaking's current area of potential effects (APE): CA-SDI-12100, CA-SDI-12577, CA-SDI-14752, CA-SDI-14170, CA-SDI-12628, CA-SDI 14151, CA-SDI-14748, CA-SDI-14749, and CA-SDI-14750. The signatory parties acknowledge that unforeseen circumstances or other conditions may require the APE to be modified following execution of this MOA. Any such modification shall proceed in accordance with 36 CFR § 800.4(a).

II. TREATMENT OF HISTORIC PROPERTIES

A. Complete Avoidance and Protection of CA-SDI-10156/12599/H, CA-SDI-12100, CA-SDI-12577 and CA-SDI-14752.

The USMC shall ensure that sites CA-SDI-10156/12599/H, CA-SDI-12100, CA-SDI-12577 and CA-SDI-14752 are protected from any potential effect of the undertaking by designating the locations of these sites and a suitable buffer area (at least 25 meters) around them as Environmentally Sensitive Areas (ESAs). These ESAs shall be described in information included in the final construction plans for the undertaking. ESAs may be demarcated on the ground using suitable fencing, flagging or other obvious and effective markers. The USMC shall require that an archaeologist who meets the Professional Qualifications Standards (see stipulation VII.A.1. below) and Native American monitor, should the Tribes choose to participate, inspect these ESAs throughout the duration of any construction in the vicinity so that their integrity and effectiveness are ensured.

B. Preparation and Implementation of a Historic Properties Treatment Plan

1. The USMC will prepare, in consultation with Tribes, or cause to be prepared, and will subsequently implement, an Historic Properties Treatment Plan (HPTP) that includes all of the requirement outlined in Attachment A.

2. The USMC will not authorize any undertaking-related activity that it determines could result in an adverse effect to historic properties covered by this MOA to proceed in that area until the fieldwork portion of the actions prescribed by HPTP including data recovery, of this stipulation have been completed.

3. Amendment of the HPTP by the USMC, in consultation with the CASHPO, will not require amendment of this MOA.

III. REPORTING REQUIREMENTS

A. Review of the HPTP

1. The USMC will upon completion submit the HPTP prescribed by stipulation II.B. in draft form to the CASHPO and the tribal signatories to this MOA, for review and comment. The reviewing parties shall have 45 calendar days from receipt of the draft HPTP to comment in writing to the USMC. The USMC may extend the review period at the request from a reviewing party. Absent such request, or upon a decision by the USMC not to extend the review period, failure of the reviewing parties to respond within the stipulated time frame, shall not preclude the USMC from finalizing the draft HPTP as it may deem appropriate. Before finalizing the draft HPTP, the USMC will provide the CASHPO and the tribal signatories to this MOA with written documentation indicating whether and how the draft HPTP will be modified in accordance with any reviewing party comments. Unless the CASHPO or the tribal signatories object to this documentation in writing to the USMC within 15 calendar days following receipt, the USMC may finalize the draft HPTP as it may deem appropriate and proceed to implement the final HPTP.

2. If the USMC proposes to modify the final HPTP, it will notify the reviewing parties concurrently in writing about the proposed modifications. The reviewing parties will have 15 calendar days from receipt of notification to comment in writing to the USMC. Failure of the reviewing parties to respond within this time frame shall not preclude the USMC from modifying the final HPTP as it may deem appropriate. Before modifying the final HPTP, the USMC will provide the reviewing parties with written documentation indicating whether and how the final HPTP will be modified in accordance with any reviewing party comments. Unless the reviewing parties object to this documentation in writing to the USMC within 10 calendar days following receipt, the USMC may modify the final HPTP as it may deem appropriate and proceed to implement the modified final HPTP.

B. Reporting the Results of HPTP Implementation

1. The USMC shall prepare and concurrently distribute to all other signatories, a written draft technical report that documents the results of implementing the HPTP and the terms of stipulation II.A. The reviewing parties shall have 45 calendar days from receipt of the draft technical report to comment in writing to the USMC. The USMC may extend the review period at the request of a reviewing party. Absent such request or upon a

decision by the USMC not to extend the review period, failure of the reviewing parties to respond within the stipulated time frame shall not preclude the USMC from finalizing the draft technical report as it may deem appropriate. Before finalizing the draft technical report, the USMC will provide the other signatories to this MOA with written documentation indicating whether and how the final draft technical report will be modified in accordance with any reviewing party comments. Unless the other signatories to this MOA object to this documentation in writing to the USMC within 30 calendar days following receipt, the USMC may finalize the draft technical report as it may deem appropriate and distribute the final draft technical report in accordance with item 2., immediately below.

2. Copies of the final technical report documenting the results of implementing the HPTP and stipulation II.A. of this MOA will be distributed by the USMC to the CASHPO, to the Tribes, to the appropriate California Historical Resources Information Survey (CHRIS) Regional Information Center, and members of the public who have requested copies subject to the terms of stipulation VII.B.

3. The USMC shall prepare a written draft document that communicates in non-technical terms the results of implementing the HPTP. The USMC will distribute this draft document for a 30 calendar day review and comment period concurrently with and in the same manner as that prescribed for the draft technical report prescribed by item 1 of section B. of this stipulation. Upon completion, the USMC shall publish the document in final form, and distribute it to the CASHPO, to the Tribes, and to any other entity that the USMC, the CASHPO, and the Tribes through consultation may deem appropriate, subject to the terms of stipulation VII.B.

IV. DISCOVERIES AND UNANTICIPATED EFFECTS

A. The USMC shall address any discoveries and unanticipated effects that may arise during implementation of the HPTP or during construction of the undertaking in accordance with applicable provisions of the HPTP.

V. NATIVE AMERICAN CONSULTATION

A. The USMC has consulted with the Tribes regarding the proposed undertaking and its effects on historic properties, will continue to consult with the Tribes, and will afford the Tribes, should the Tribes so desire, the opportunity to participate in the implementation of the MOA and of the undertaking. Such participation may include, but is not necessarily limited to, monitoring during any archaeological fieldwork prescribed in stipulation II. and during implementation of the undertaking. Should the tribes so request, the DON/USMC will consult with the tribes on their participation.

VI. TREATMENT OF HUMAN REMAINS OF NATIVE AMERICAN ORIGIN

A. The USMC shall ensure the disposition of any human remains and associated funerary objects of Native American origin encountered during any action subject to this MOA complies with § 3(d)(2) of the NAGPRA and its implementing regulations codified at 43 CFR Part 10.

VII. ADMINISTRATIVE PROVISIONS

A. Professional Qualifications and Standards

1. Professional Qualifications. The USMC shall ensure that all activities prescribed by stipulations II, III. IV. and VI. of this MOA conducted by or under the direct supervision of a person or persons meeting, at a minimum, the Secretary of Interior's Professional Qualifications Standards (PQS) in the discipline of archaeology (48 FR 44738-44739).

2. Documentation Standards. The USMC shall ensure that documentation prepared in partial fulfillment of the stipulations in this MOA is consistent with the *Secretary of the Interior's Standards for Archaeological Documentation* (1983) and the *Secretary of the Interior's Guidelines for Archaeological Documentation* (48 FR 44734-44737), and with the California Office of Historic Preservation's December 1989 *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Preservation Planning Bulletin No. 4[a]).

3. Curation and Curation Standards. The USMC shall ensure that, to the extent that it does not conflict with § 3(d)(2) of the NAGPRA and its implementing regulations codified at 43 CFR Part 10, curation of materials and records resulting from the activities prescribed by stipulations II. IV. and VI. of this MOA complies with 36 CFR Part 79.

B. Confidentiality

1. Confidentiality regarding the nature and location of archaeological sites covered by this MOA or any of its attachments shall be maintained on a "need to know" basis limited to the Commanding General (or his designee), Marine Corps Base, Camp Pendleton; Naval Facilities Engineering Command, Southwest; designated representatives of the Tribes, the CASHPO, and the undertaking archaeological contractors.

2. The USMC shall ensure that all sensitive information relating to an historic property (as defined in Section 301(5) of the NHPA), a traditional cultural property (as defined in the

Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act), and sacred objects, items of cultural patrimony, human remains and associated funerary objects (as defined in Section 2 of NAGPRA) is protected to the fullest extent available under law.

3. All parties to this MOA shall safeguard information about the nature and location of archeological, historic, and traditional cultural properties, and not reveal that information to any additional parties, pursuant to Section 304 of the NHPA and Section 9 of the ARPA, without the express written permission of the USMC.

C. Resolving Objections.

1. Should any party to this MOA object to the manner in which the terms of this MOA are implemented, to any action carried out or proposed with respect to implementation of the MOA (other than the undertaking itself) or to any documentation prepared in accordance with and subject to the terms of this MOA, the USMC shall immediately notify the other parties of the objection and consult with the objecting party, all other MOA parties, and any Tribes listed on page 1, paragraph 4 that are not MOA parties, for no more than 14 days to resolve the objection. The USMC shall reasonably determine when this consultation will commence. If the objection is resolved through such consultation, the action in dispute may proceed in accordance with the terms of that resolution. If, after initiating such consultation, the USMC determines that the objection cannot be resolved through consultation, the USMC shall forward all documentation relevant to the objection to the ACHP, including the USMC's proposed response to the objection, with the expectation that the ACHP will within thirty (30) days after receipt of such documentation:

a. Advise the USMC that the ACHP concurs in the USMC's proposed response to the objection, whereupon the USMC will respond to the objection accordingly; or

b. Provide the USMC with recommendations, which the USMC will consider in reaching a final decision regarding its response to the objection; or

c. Notify the USMC that the objection will be referred for comment pursuant to 36 CFR § 800.7(c), and proceed to refer the objection and comment. The USMC shall consider the resulting comment in accordance with 36 CFR § 800.7(c)(4) and Section 110(1) of the NHPA.

2. Should the ACHP not exercise one of the above options within 30 days after receipt of all pertinent documentation, the USMC may assume the ACHP's concurrence in its proposed response to the objection.

3. The USMC shall consider any ACHP recommendation or comment provided in accordance with this stipulation with reference only to the subject of the objection. USMC's responsibility to carry out all actions under this MOA that are not the subjects of the objection will remain unchanged.

4. At any time during implementation of the measures stipulated in this MOA, should an objection pertaining to such implementation be raised by a member of the public, the USMC shall notify the parties to the MOA in writing of the objection and take the objection into consideration. The USMC shall consult with the objecting party and, if the objecting party so requests, with the CASHPO and other MOA parties for no more than 15 days. Within ten (10) days following closure of this consultation period, the USMC will render a decision regarding the objection and notify all consulting parties of its decision in writing. In reaching its decision, the USMC will consider any comments from the consulting parties regarding the objection, including the objecting party. The USMC's decision regarding the resolution of the objection will be final.

5. The USMC shall provide the CASHPO, the Tribes, the ACHP when ACHP comments have been issued hereunder, and any parties that have objected pursuant to paragraph 4. of section C. of this stipulation with a copy of its final written decision regarding any objection addressed pursuant to this stipulation.

6. The USMC may authorize any action subject to objection under this stipulation to proceed after the objection has been resolved in accordance with the terms of this stipulation.

D. Amendments.

1. Any party to this MOA may propose that this MOA be amended, whereupon the parties will consult for no more than 30 days to consider such amendment. The amendment process shall comply with 36 CFR §§ 800.6(c)(1) and 800.6(c)(7). This MOA may be amended only upon the written agreement of the signatory parties. If it is not amended, this MOA may be terminated by either signatory party in accordance with Stipulation IX.D., below.

E. Termination.

1. If this MOA is not amended as provided for in section D. of this stipulation, or if either signatory party proposes termination of this MOA for other reasons, the signatory party proposing termination shall, in writing, notify the other MOA parties, explain the reasons for proposing termination, and consult with the other MOA parties for at least 30 days to seek alternatives to termination. Such consultation shall not be

required if the USMC proposes termination because the undertaking no longer meets the definition set forth in 36 CFR § 800.16(y).

2. Should such consultation result in an agreement on an alternative to termination, then the MOA parties shall proceed in accordance with the terms of that agreement.

3. Should such consultation fail, the signatory party proposing termination may terminate this MOA by promptly notifying the other MOA parties, and any Tribes listed on page 1, paragraph 4 that are not MOA parties in writing. Termination hereunder shall render this MOA without further force or effect.

4. If this MOA is terminated hereunder and if the USMC determines that the undertaking will nonetheless proceed, then the USMC shall either consult in accordance with 36 CFR § 800.6 to develop a new MOA or request the comments of the ACHP pursuant to 36 CFR Part 800.

F. Duration of the MOA.

1. Unless terminated pursuant to section E. of this stipulation, or unless it is superseded by an amended MOA, this MOA will be in effect following execution by the signatory parties until the USMC, in consultation with the other MOA parties, determines that all of its stipulations have been satisfactorily fulfilled. Upon a determination by the USMC that all of the terms of this MOA have been satisfactorily fulfilled, this MOA will terminate and have no further force or effect. The USMC will promptly provide the CASHPO, the other MOA parties, and any Tribes listed on page 1, paragraph 4 that are not MOA parties, with written notice of its determination and of the termination of this MOA. Following provision of such notice, this MOA will have no further force or effect.

2. The terms of this MOA shall be satisfactorily fulfilled within 12 years following the date of execution by the CASHPO. If the USMC determines that this requirement cannot be met, the MOA parties will consult to reconsider its terms. Reconsideration may include the continuation of the MOA as originally executed, amendment, or termination. In the event of termination, the USMC will comply with section E.4. of this stipulation if it determines that the undertaking will proceed notwithstanding termination of this MOA.

3. If the undertaking has not been implemented within 12 years following execution of this MOA by the CASHPO, this MOA shall automatically terminate and have no further force or effect. In such event, the USMC shall notify the other MOA parties, and any Tribes listed on page 1, paragraph 4 that are not MOA parties, in writing and, if it chooses to continue with the undertaking, shall reinitiate review of the undertaking in accordance with 36 CFR Part 800.

G. Effective Date of this MOA

1. This MOA will take effect on the date that it has been executed by the CASHPO.

EXECUTION of this MOA by the USMC and the CASHPO, its transmittal by the USMC to the ACHP in accordance with 36 CFR § 800.6(b)(1)(iv), and subsequent implementation of its terms, shall evidence, pursuant to 36 CFR § 800.6(c), that this MOA is an agreement with the ACHP for purposes of Section 110(1) of the NHPA, and shall further evidence that the USMC has afforded the ACHP an opportunity to comment on the undertaking and its effects on historic properties, and that the USMC has taken into account the effects of the undertaking on historic properties.

SIGNATORY PARTIES:

THE U.S. MARINE CORPS

13 Sep 2010

Colonel N. F. Marano, Commanding Officer, MCB Camp Pendleton — Date

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

for Denan Saunders 11/17/10

M. Wayne Donaldson, F.A.I.A., State Historic Preservation Officer — Date

INVITED SIGNATORIES:

10/28/2010

Mark Macarro, Chairman, Pechanga Band of Luiseño Indians — Date

Attachment A
Requirements for the Historic Properties Treatment Plan

Historic Properties Treatment Plan (HPTP) shall provide for all of the following:

1. resolving in part the undertaking's adverse effects to CA-SDI-14170 through preconstruction archaeological trenching and data recovery that are planned, implemented, and completed in accordance with specifications prescribed in this stipulation;

2. for the P-002/110 portion of the undertaking, determining prior to construction whether portions of sites CA-SDI-12628, CA-SDI 14751, CA-SDI-14748, CA-SDI-14749, CA-SDI-14750 extend into the undertaking's area of direct effect. A combination of mechanical excavation, non-mechanical excavation, and remote sensing including, but not limited to, ground penetrating radar, and resistivity survey has been used to make the determination herein stipulated. The results of these determinations will be used for the P-113 portion of the undertaking as well. The USMC shall promptly notify the CASHPO and the Tribes in writing regarding the results of the actions herein prescribed and shall indicate whether these results may require further action by the USMC pursuant to items B.1.c. and B.1.d. of this stipulation;

3. determining prior to construction of the undertaking, and in consultation with the CASHPO and the Tribes, whether portions of CA-SDI-12628, CA-SDI 14751, CA-SDI-14748, CA-SDI-14749, CA-SDI-14750 that are found to extend into the undertaking's area of direct effect contribute to the NRHP eligibility of these sites;

4. determining whether portions of CA-SDI-12628, CA-SDI 14751, CA-SDI-14748, CA-SDI-14749, CA-SDI-14750 that are found to contribute to the NRHP eligibility of these sites can be avoided through redesign of the undertaking or other suitable measures or, where it is determined by the USMC that such avoidance is not possible, to resolve the undertaking's adverse effect on any of these sites through data recovery that is planned, implemented, and completed in accordance with specifications prescribed in item B.2. of this stipulation;

5. monitoring by a qualified archaeologist and Native American, should the Tribes choose to participate, of grading within areas adjacent to archaeological sites within the undertaking's APE;

6. a plan (including a schedule for reporting completed results) for monitoring construction activities in archaeologically sensitive areas in order to ensure that the likelihood of inadvertent effects to archaeological properties is minimized; and

7. a discovery plan that will specify how archaeological deposits discovered during construction will be addressed. This plan shall conform to 36 CFR 800.13(a)(2) and 36 CFR 800.13(c).

8. The data recovery element of the HPTP herein prescribed shall at a minimum include the following:

a. discussion of the NRHP significance of the property;

b. research questions that are directly pertinent to those data sets that qualify the property for inclusion in the National Register under Criterion D and, as may be applicable, directly to the interests and concerns of the Tribes as identified through government-to-government consultation;

c. a discussion that explains why it is in the public interest to pursue answers to these research questions. The discussion should indicate whether, why, and how the public may benefit from the scope and nature of the information developed through data recovery, and demonstrates that the costs of proceeding with the data recovery are prudent and reasonable.

d. results of previous research relevant to the archaeological sites;

e. proposed investigations (data needed to address research questions and the proposed methods and techniques to acquire that data, including any special studies);

f. field methods and techniques that will address the property's structure and content in the context of the defined research questions and the property's stratigraphic and geomorphic context;

g. a construction monitoring and discovery treatment plan prepared in consultation with the Tribes;

h. laboratory processing and analyses and of their relevance to the property and its research values;

i. methods and techniques used in artifact, data, and other records management.

j. provisions for ongoing Native American consultation and coordination;

k. qualifications of key personnel;

l. disposition, including curation, of recovered materials and records resulting from implementation of the data recovery plan;

m. report preparation schedule, including the names of parties that will receive copies of reports upon completion;

n. explicit provisions for disseminating research findings to professional peers in a timely manner; and .

o. synopsis of the MCB Camp Pendleton NAGPRA Comprehensive Agreement

will be included detailing the steps taken should there be an inadvertent discovery.

Attachment B

Archaeological Documentation and Historic Properties Treatment Plan for the Advance Water Treatment Facility and Utility Corridor (P 113) (November 2009)