Contract No. 04-1A5214

INFORMATION HANDOUT

WATER QUALITY

SECTION 404 CLEAN WATER ACT NATIONWIDE PERMIT
APPLICATION AND PRE-CONSTRUCTION NOTIFICATION PACKAGE

PERMITS

USACE CWA SECTION 404 PERMIT*

AGREEMENTS

PURCHASE AGREEMENT FOR THE SUPPLY OF FRICTION
PENDULUM BEARINGS FOR ANTIOCH BRIDGE RETROFIT PROJECT

MATERIALS INFORMATION

NATIONAL MARINE FISHERIES SERVICE (NMFS)
MARINE MAMMAL PROTECTION ACT (MMPA)
INCIDENTAL HARASSMENT AUTHORIZATION (IHA)

U.S. ARMY CORP OF ENGINEERS JURISDICTIONAL
DETERMINATION - DELINEATION OF WETLANDS AND OTHER
WATERS OF THE UNITED STATES

04-CC/SAC-160-0.8/1.3,L0.0/L1.3

ADDED PER ADDENDUM NO. 2 DATED FEBRUARY 24, 2010
***REVISED PER ADDENDUM NO. 2 DATED FEBRUARY 24, 2010**

Antioch Bridge Seismic Retrofit Project

Section 404 Clean Water Act
Nationwide Permit Application and Pre-Construction Notification Package

Contra Costa and Sacramento Counties, California
04-CC-160-PM 0.8/1.3;
03-SAC-160-PM 0.0/1.3

Caltrans EA 1A5210

April 2009

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Chris States, Office of Biological Sciences and Permits, 111 Grand Avenue, Oakland, CA 94623-0660; (510) 286-7185 Voice, or use the California Relay Service TTY number, (800) 735-2929.

Section 404 Clean Water Act
Nationwide Permit Application and Pre-Construction Notification Package

Antioch Bridge Seismic Retrofit Project
Contra Costa and Sacramento Counties, California
04-CC-160-PM 0.8/1.3 in Contra Costa County
03-SAC-160- PM 0/1.3 in Sacramento County

EA 1A5210
April 2009

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration, and
STATE OF CALIFORNIA
Department of Transportation

Prepared By: _____ Date: 4-8-09
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California Department of Transportation

Reviewed By: _____ Date: 4.8.09
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(510) 286-7185
Office of Biological Sciences and Permits
District 4, Oakland
California Department of Transportation

Approved By: _____ SIGNED FOR Date: 4.8.09
Jeffrey G. Jensen, District Office Chief
(510) 622-8729
Office of Biological Sciences and Permits
District 4, Oakland
California Department of Transportation

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT (33 CFR 325)

OMB APPROVAL NO. 0710-003

Public reporting burden for this collection of information is estimated to average 5 hours per response, including the time for reviewing instructions, Searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-003), Washington, DC 20503. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authority: 33 USC 401, Section 10; 1413, Section 404. Principal Purpose: These laws require permits authorizing activities in, or affecting, navigable waters of the United States; the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Routine uses: Information provided on this form will be used in evaluating the application for a permit. Disclosure: Disclosure of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME Jeffrey G. Jensen	8. AUTHORIZED AGENT'S NAME & TITLE (an agent is not required) Christopher States
6. APPLICANT'S ADDRESS 111 Grand Avenue Oakland, CA 94623	9. AGENT'S ADDRESS 111 Grand Avenue Oakland, CA 94623
7. APPLICANT'S PHONE NUMBERS WITH AREA CODE a. Residence b. Business (510) 622-8729	10. AGENT'S PHONE NUMBERS WITH AREA CODE a. Residence b. Business (510) 286-7185

11. STATEMENT OF AUTHORIZATION

I hereby authorize Christopher States to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNED FOR 4/8/09

APPLICANT'S SIGNATURE DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

Antioch Bridge Seismic Retrofit Project (EA 1A5210)

13. NAME OF WATERBODY, IF KNOWN (if applicable) San Joaquin River, Mayberry Slough, and unnamed	14. PROJECT STREET ADDRESS (if applicable) N/A
15. LOCATION OF PROJECT Contra Costa/Sacramen — COUNTY CA — STATE	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

Sections 3, 4, 9, 10, 15, 16; Township 2N; Range 2E; Mt. Diablo Meridian (North Boundary: 121 45' 5.9"W, 38 2' 41.2"N; South Boundary 121 45' 4.6"W, 38 1' 0.1"N)

17. DIRECTIONS TO THE SITE

From Sacramento, take SR 160 south. The bridge occurs just north of the San Joaquin River on Sherman Island and extends south to the City of Antioch. The Sherman Island portion of the work area can be accessed from Sherman Island Levee Road and the southern portion can be accessed via Wilbur Avenue to Bridgehead Road.

18. NATURE OF ACTIVITY (Description of project, include all features)

The proposed project is a seismic safety retrofit and includes retrofitting the existing bridge through installation of steel cross bracings, installing isolation bearings and removing the existing curtain walls. As part of this work the following temporary features are proposed, a temporary marine trestle constructed on the south shore, extending out approximately 900-ft., construction of four temporary access roads, two small trestles to span wetland areas, and staging ares in non-wetlands. A complete and detailed project description is included in Chapter 1 of the attached supplemental information.

19. PROJECT PURPOSE (Describe the reason or purpose of the project, see instructions)

The seismic retrofit of the Antioch Bridge is necessary to meet current design standards. A design strategy meeting a "no collapse" safety standard for a maximum credible earthquake was completed in August 2008. Please refer to Chapter 1 of the attached supplemental for more detail.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. REASON(S) FOR DISCHARGE

Temporary fill of seasonal wetlands on Sherman Island is necessary to access the bridge features for the retrofit. The temporary fill within the San Joaquin River is necessary to construct the temporary marine trestle.

21. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS

24" hollow steel piles (temporary marine trestle): 310.05 cy
Crushed rock and geotextile fabric (temporary access roads and staging): 15,519.39 cy

22. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (see instructions)

4.501 acres (temporary)

23. IS ANY PORTION OF THE WORK ALREADY COMPLETE? YES ○ NO ◉ IF YES, DESCRIBE THE WORK

24. ADDRESSES OF ADJOINING PROPERTY OWNERS, LESSEES, ETC. WHOSE PROPERTY ADJOINS THE WATERBODY (If more than can be entered here, please attach a supplemental list)

25. LIST OF OTHER CERTIFICATIONS OR APPROVALS/DENIALS RECEIVED FROM OTHER FEDERAL, STATE, OR LOCAL AGENCIES FOR WORK DESCRIBED IN THIS APPLICATION

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
USFWS	Biological Opinion	81420-2008-TA-1537-1	March 20, 2009		
NMFS	Biological Opinion	2009/00173	January 26, 2009		
CDFG	1602 SAA				
RWQCB	401 Water Quality Cert				
SHPO	106 NHPA	EA 1A5210	November 12, 2008	March 3, 2009	

* Would include but is not restricted to zoning, building and flood plain permits.

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
SIGNED FOR JEFF JENSEN	4/8/09		4/8/09

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and will fully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, facticious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

U.S. Army Corps of Engineers
South Pacific Division

Nationwide Permit Pre-Construction Notification (PCN) Form

This form integrates requirements of the Nationwide Permit Program within SPD, including General and Regional Conditions. Please consult instructions prior to completing this form.

Box 1 Project Name Antioch Bridge Seismic Retrofit Project (EA 1A5210)		**Applicant Name** Jeffrey G. Jensen	
Applicant Title Office Chief, Office of Biological Sciences and Permits		**Applicant Company, Agency, etc.** California Department of Transportation (Caltrans), District 4	
Mailing Address 111 Grand Avenue, Oakland, CA 94623		**Applicant's internal tracking number (if any)** N/A	
Work Phone with area code (510) 622-8729	**Home Phone with area code**	**Fax #** (510) 286-6301	**E-mail Address** jeffrey_jensen@dot.ca.gov

Relationship of applicant to property

☒ Owner ☐ Purchaser ☐ Lessee ☒ Other: Caltrans ROW and TCEs from the DWR

Application is hereby made for verification that subject regulated activities associated with subject project qualify for authorization under a USACE nationwide permit or permits as described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities. I hereby grant to the agency to which this application is made, the right to enter the above-described location to inspect the proposed, in-progress or completed work. I agree to start work only after all necessary permits have been received.

Signature of applicant SIGNED FOR	**Date (m/d/yyyy)** 4/8/09

Box 2 Authorized Agent/Operator Name and Signature (If an agent is acting for the applicant during the permit process) Chris States			
Agent/Operator Title Senior Biologist		**Agent/Operator Company, Agency, etc.** California Department of Transportation (Caltrans), District 4	
Mailing Address 111 Grand Avenue, Oakland, CA 94623			
E-mail Address christopher_states@dot.ca.gov			
Work Phone with area code (510) 286-5602	**Home Phone with area code**	**Fax #** (510) 286-6301	**Cell Phone #** (510)715-8980

I hereby authorize the above named authorized agent to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application. I understand that I am bound by the actions of my agent and I understand that if a federal or state permit is issued, I, or my agent, must sign the permit.

Signature of applicant SIGNED FOR	**Date (m/d/yyyy)** 4/8/09

I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete, and accurate.

Signature of authorized agent	Date (m/d/yyyy) 4/8/09

Box 3 Name of property owner(s), if other than applicant: Department of Water Resources	
Owner Title Juan Mercado, Senior Land Agent	**Owner Company, Agency, etc.** Department of Water Resources Division of Engineering – Real Estate Branch
Mailing Address 1416 Ninth Street, Room 425, Sacramento, CA 95814	
Work Phone (916) 653-5620	**Home Phone**

Box 4 Name of contractor(s) (if known): N/A	
Contractor Title	**Contractor Company, Agency, etc.**
Mailing Address	
Work Phone	**Home Phone**

Include multiple copies of Box 5 for separate sites.

Box 5 Site Number 1 of 1. Project location(s), including street address, city, county, state, zip code where proposed activity will occur: The Antioch Bridge Seismic Retrofit Project (Project) spans roughly two miles of State Route (SR) 160, from the southern limit of the Project at post mile (PM) 0.8 in Contra Costa County to PM 1.3 at the Contra Costa/Sacramento County line, and from PM 0 to PM 1.3 in Sacramento County to the north, on Sherman Island. The bridge connects the City of Antioch on the south bank of the San Joaquin River to Sherman Island on the north. It spans the 3,600-ft width of the river and over 4,000-ft of Sherman Island, before touching down just north of Mayberry Slough. Figures 1 and 2 in Chapter 1 of the attached Supplement show the locations of proposed construction activity.	
Waterbody (if known, otherwise enter "an unnamed tributary to"): San Joaquin River, Mayberry Slough and associated unnamed irrigation canal.	
Latitude & longitude (D/M/S, DD, or UTM): North Boundary: 121° 45' 5.9" W 38° 2' 41.2" N South Boundary: 121° 45' 4.6" W 38° 1' 0.1" N	**Zoning Designation (no codes or abbreviations):** Caltrans Right of Way
Assessors parcel number: 15800700330000, 15800700290000, 15800900140000, 15800900150000	**Section, Township, Range:** Sections 3, 4, 9, 10, 15 & 16; Township 2N; Range 2E; Mount Diablo Meridian
USGS Quad map name: Antioch North and Jersey Island 7.5' Quadrangles	
Watershed and other location descriptions, if known: Sacramento Delta Hydrological Unit (Sherman Island north of Mayberry Slough), San Joaquin Delta Hydrological Unit (Sherman Island south of Mayberry Slough, the San Joaquin River and a portion of the south shore), and North Diablo Range Hydrological Unit (south shore uplands).	
Directions to the project location: From Sacramento, take SR 160 south. The bridge occurs just north of the San Joaquin River on Sherman Island and extends south to the City of Antioch. The Sherman Island portion of the work area can be accessed from Sherman Island Levee Road and the southern portion can be accessed via Wilbur Avenue to Bridgehead Rd.	

Nature of Activity (Description of project, include all features, see instructions):

The proposed project includes retrofitting the existing bridge through installation of steel cross bracings, installing isolation bearings and removing the existing curtain walls. As part of this work a temporary marine trestle is proposed to be constructed on the south shore, extending out approximately 900-ft, and construction of four temporary access roads (three on Sherman Island and one on the south shore) are proposed. In addition, two small trestles are proposed to span wetland areas and staging areas are proposed in non-wetland areas. A complete and detailed project description is included in Chapter 1 of the attached Supplement.

Project Purpose (Description the reason or purpose of the project, see instructions):

The seismic retrofit of the Antioch Bridge is necessary to meet current design standards. A vulnerability study was completed in 2005. The study concluded that the evidence was insufficient to determine the performance of the Antioch Bridge during a maximum credible earthquake (an approximate magnitude of 8 on the Richter Scale). The study further recommended that a comprehensive seismic analysis be performed, based on complete and accurate geotechnical soil data. Geotechnical investigations were conducted in 2006 and 2007. A design strategy meeting a “no collapse” safety standard for a maximum credible earthquake was completed in December 2008.

Use Box 6 if dredged and/or fill material is to be discharged

Box 6 Reason(s) for Discharge into waters of the United States:

Fills of waters of the U.S., including wetlands have been avoided as much as possible. However, in order to access each of the bridge columns to install the retrofit elements, temporary fills of waters of the U.S., including wetlands are necessary. Within the San Joaquin River, a temporary marine trestle, extending approximately 900-ft from the south shore and approximately 25-ft wide with approximately 160 piles (24” diameter, hollow-steel shell) is proposed to be installed. On Sherman Island, temporary access roads (approximately 4-ft depth, 40-ft wide at the base, 25 ft wide at the top with 2:1 side slopes) and staging areas are proposed to be constructed of crushed rock overlaying geo-textile. Some areas of irrigated cattle pasture, delineated as seasonal wetlands, will be covered with the geo-textile fabric and crushed rock. The temporary marine trestle and its piles and the temporary access roads will be removed upon completion of the project.

Type(s) of material being discharged and the amount of each type in cubic yards:

Temporary marine trestle (24” diameter hollow steel piles): 310.05 cubic yards (calculated as the cylindrical volume of 152 piles as measured from the MHHW to the river bottom)

Temporary access roads and temporary staging (crushed rock and geo-textile fabric) : 21,609.82 cubic yards (calculated as the volume of a trapezoidal prism, 40 ft at the base, 25 ft at the top, with 2:1 slopes)

Total surface area in acres of wetlands or other waters of the U.S. filled (see instructions):

4.501 acres (temporary) of jurisdictional wetlands and waters of the U.S.

Indicate in ACRES and LINEAR FEET (where appropriate) the proposed impacts to waters of the United States, and identify the impact(s) as permanent and/or temporary for each water body type listed below:

Water Body Type	Permanent		Temporary	
	Acres	Linear feet	Acres	Linear feet
Emergent Wetland	-	-	.0001	NA
Seasonal Wetland	-	-	4.445	NA
Irrigation/drainage ditch	-	-	0.045	174
Waters	-	-	0.011	NA
Total:	-	-	4.501	174

Please refer to Chapter 2 of the attached Supplement for maps of these areas and features.

Potential indirect and/or cumulative impacts of proposed discharge (if any):

No indirect and/or cumulative impacts will occur. The temporary materials will be removed upon completion of the work.

Required drawings (see instructions):

Vicinity map: ☒ Attached (or mail copy separately if applying electronically**)**

To-scale Plan view drawing(s): ☒ Attached (or mail copy separately if applying electronically)

To-scale elevation and/or Cross Section drawing(s): ☒ Attached (or mail copy separately if applying electronically)

Please refer to Figures 1 and 2 for the vicinity map and plan view map, and Appendix A for the cross section drawing.

Has a wetlands/waters of the U.S. delineation been completed?

☒ Yes, Attached (or mail copy separately if applying electronically) ☐ No

See Appendix C of the attached Supplement.

If a delineation has been completed, has it been verified in writing by the Corps?

☒ Yes, Date of approved jurisdictional determination (m/d/yyyy): 10/24/2008 Corps file number: SPK-2008-01340

☐ No

Please attach[1] one or more color photographs of the existing conditions (aerials if possible).

[1]or mail copy separately if applying electronically

Aerial photographs are depicted in Figure 3 of the attached Supplement. Other representative photos are contained in Appendix D.

Dredge Volume: Indicate in CUBIC YARDS the quantity of material to be dredged or used as fill: N/A

Indicate type(s) of material proposed to be discharged in waters of the United States: N/A

For proposed discharges of dredged material into waters of the U.S. (including beach nourishment), please attach[2] a proposed Sampling and Analysis Plan (SAP) prepared according to Inland Testing Manual (ITM) guidelines (including Tier I information, if available).

[2]or mail copy separately if applying electronically

Is any portion of the work already complete? ☐ **YES** ☒ **NO**

If yes, describe the work:

Box 7 Intended NWP permit number[3]: NWP 3 (Maintenance)

Intended NWP permit number (2nd):

[3] Enter the intended permit type(s). See NWP regulations for permit types and qualification information (http://www.usace.army.mil/inet/functions/cw/cecwo/reg/nationwide_permits.htm).

Box 8 Authority:

Is Section 10 of the Rivers and Harbors Act applicable?: ☒ YES ☐ NO

Is Section 404 of the Clean Water Act applicable?: ☒ YES ☐ NO

Box 9 Is the discharge of fill or dredged material for which Section 10/404 authorization is sought part of a larger plan of development?: ☐ YES ☒ NO

If discharge of fill or dredged material is part of development, name and proposed schedule for that larger development (start-up, duration, and completion dates):

N/A

Location of larger development (If discharge of fill or dredged material is part of a plan of development, a map of suitable quality and detail of the entire project site should be included):

N/A

Total area in acres of entire project area (including larger plan of development, where applicable):

N/A

Box 10 Threatened or Endangered Species

Please list any federally-listed (or proposed) threatened or endangered species or critical habitat within the project area (use scientific names (e.g., Genus species), if known):

A. *Thamnophis gigas* (giant garter snake; federally-listed as threatened)

B. *Hypomesus transpacificus* (delta smelt; federally-listed as threatened and critical habitat)

C. *Spirinchus thaleichthys* (longfin smelt; federally-proposed as threatened)

D. *Oncoryhynchus tshawytscha* (Sacramento River winter-run Chinook salmon Evolutionary Significant Unit [ESU]; federally-listed as endangered and critical habitat)

E. *Oncoryhynchus tshawytscha* (Central Valley spring-run Chinook salmon ESU; federally-listed as threatened)

F. *Oncorhynchus mykiss irideus* (Central Valley steelhead Distinct Population Segment [DPS]; federally-listed as threatened and critical habitat)

G. *Acipenser medirostris* (North American green sturgeon southern DPS; federally-listed as threatened and critical habitat)

Have surveys, using U.S. Fish and Wildlife Service/NOAA Fisheries protocols, been conducted?

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

Habitat-level and habitat assessments have been conducted for the giant garter snake and rare plants. Please refer to Appendix C of the USFWS Biological Assessment for the giant garter snake habitat survey and Appendix D of the USFWS Biological Assessment for the special-status plant survey report. The USFWS Biological Assessment is included as Appendix B1 of the attached Supplement.

If a federally-listed species would be impacted, please provide a description and a biological evaluation.

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ Not attached

Please refer to Appendix B1 of the attached Supplement for the USFWS Biological Assessment and Appendix B2 of the Supplement for the NMFS Biological Assessment.

Has the USFWS/NOAA Fisheries issued a Biological Opinion?

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

If yes, list date Opinion was issued (m/d/yyyy):

Has Section 7 consultation been initiated by another federal agency?

☒ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☐ No

Please refer to Appendix B of the Supplement for the Section 7 consultation letters with the USFWS and NMFS

Has Section 10 consultation been initiated for the proposed project?

☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

Box 11 Historic properties and cultural resources:

Please list any historic properties listed (or eligible to be listed) on the National Register of Historic Places:

No historic resources have been identified for the project.

Are any cultural resources of any type known to exist on-site?

☐ Yes ☒ No

Has an archaeological records search been conducted?

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

Please refer to Appendix E of the attached Supplement.

Has an archaeological pedestrian survey been conducted for the site?

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

Please refer to Appendix E of the attached Supplement.

Has a Section 106 MOA been signed by another federal agency and the SHPO?

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

Has Section 106 consultation been initiated by another federal agency?

☒ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☐ No

Please refer to Appendix E of the attached Supplement.

Box 12 Measures taken to avoid and minimize impacts to waters of the United States (if any):

The seismic retrofit design has been revised from earlier concepts in part due to early coordination with the resource agencies and due to advanced modeling techniques. The current design utilizes isolation bearings, which will eliminate the need for large diameter pile and extension of pile caps throughout the San Joaquin River. Additional measures incorporated into the design as avoidance and minimization measures include: restricting the size of piles for the temporary marine trestle to 24"-diameter; free spanning two waters of the US features, thus avoiding impacts; maintaining a temporary nature of the impacts (i.e., temporary access roads and temporary trestles); and utilizing a disturbed upland area for contractor staging on Sherman Island.

Include multiple copies of Box 13 for separate sites.

Box 13 Proposed Compensatory Mitigation (site 1 of 1) related to fill/excavation and dredge activities. Indicate in ACRES and LINEAR FEET (where appropriate) the total quantity of waters of the United States proposed to be created, restored, enhanced and/or preserved for purposes of providing compensatory mitigation. Indicate water body type (wetland, riparian streambed, unvegetated streambed, lake, ocean, other) or non-jurisdictional (uplands[5]). Indicate mitigation type (on- or off-site by applicant, mitigation bank, in-lieu fee program):

Water Body Type	Created	Restored	Enhanced	Preserved	Mitigation type
Wetland (emergent, seasonal, and irrigation/drainage ditch)	-	4.490	-	-	On-site
Open water (San Joaquin River)	-	0.011	-	-	On-site
Totals:	-	4.501	-	-	On-site

[5] For uplands, please indicate if designed as an upland buffer.

If no mitigation is proposed, provide detailed explanation of why no mitigation would be necessary:

On-site restoration of the temporarily disturbed areas is proposed.

Has a draft/conceptual mitigation plan been prepared in accordance with the Army Corps of Engineers District guidelines?

☒ Yes, Attached (or mail copy separately if applying electronically) ☐ No

Please refer to Chapter 4 for the Revegetation Plan.

Mitigation site latitude & longitude (D/M/S, DD, or UTM):	**USGS Quad map name:**
Assessors parcel number:	**Section, Township, Range, USGS Quadrangle Map, Latitude/Longitude:**

Other location descriptions, if known:

Directions to the mitigation location:

Box 14 Water Quality Certification (see instructions):

Applying for certification? ☒ Yes, Attached (or mail copy separately if applying electronically) ☐ No

Certification issued? ☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

Exempt? ☐ Yes ☒ No

If exempt, state why: N/A Agency concurrence? ☐ Yes, Attached ☐ No

Box 15 Coastal Zone Management Act (see instructions):

Is the project located within the Coastal Zone? ☐ Yes ☒ No

If yes, applying for a coastal commission-approved Coastal Development Permit?

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

If no, applying for separate CZMA-consistency certification?

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

Permit/Consistency issued? ☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No ☒ N/A

Exempt? ☐ Yes ☒ No

If exempt, state why: N/A

Box 16 List of other certifications or approvals/denials received from other federal, state, or local agencies for work described in this application:

Agency	Type Approval[4]	Identification No.	Date Applied	Date Approved	Date Denied
USFWS	Biological Opinion	81420-2008-TA-1537-1	March 20, 2009	Pending	
NMFS	Biological Opinion	2009/00173	January 26, 2009	Pending	
USCG	Notice to Mariners			Pending	
RWQCB	Section 401 Water Quality Certification			Pending	
CDFG	Section 1602 Streambed Alteration Agreement			Pending	
CDFG	Section 2080.1 Consistency Determination			Pending	
SHPO	Finding of No Historic Properties Affected			March 3, 2009	

[4] Would include but is not restricted to zoning, building, and flood plain permits

NWP General Conditions (GC) Checklist:

1. **Navigation:**

   Project would be in compliance with GC?

   ☒ Yes ☐ No

   The proposed project will have no impact on navigation.

2. **Aquatic Life Movements:**

   Project would be in compliance with GC?

   ☒ Yes ☐ No

   The project will not impede the migration of fish through the San Joaquin River

3. **Spawning Areas:**

   Spawning areas present?

   ☒ Yes ☐ No

   Project would be in compliance with GC?

   ☒ Yes ☐ No

   The USFWS designated window for in-water work (August 1 – November 30) falls outside of the spawning seasons for the fish species likely to be present

4. **Migratory Bird Breeding Areas:**

   Project would be in compliance with GC?

   ☒ Yes ☐ No

   The project does not impact Waters of the US that serve as breeding habitat for migratory birds.

5. **Shellfish Beds:**

   Shellfish beds present?

   ☐ Yes ☒ No

   Project would be in compliance with GC?

   ☒ Yes ☐ No

   Shellfish beds are not present in the project area.

6. **Suitable Material:**

   Project would be in compliance with GC?

   ☒ Yes ☐ No

   All materials that will be placed in Waters of the US (including wetlands) will be clean rock or fill. The clean rock or fill will be removed upon completion of the project.

7. **Water Supply Intakes:**

   Project would be in compliance with GC?

   ☒ Yes ☐ No

   This project will not affect water supply intakes.

8. Adverse Effects From Impoundments:

Project would be in compliance with GC?

☒ Yes ☐ No

The proposed project does not include any activities that will result in the impoundment of water.

9. Management of Water Flows:

Project would be in compliance with GC?

☒ Yes ☐ No

The course, condition, capacity and location of all open water features will not be altered by the project.

10. Fills within 100-Year Floodplains:

Project would be within 100-year floodplains?

☒ Yes ☐ No

If yes, project would be in compliance with restrictions a) and b) below?

☒ Yes ☐ No

There will be no discharges below headwaters resulting in permanent above grade fills. There will be no discharges above headwaters.

a) Discharges Below Headwaters (below point of 5 cfs) resulting in permanent above-grade fills:

NWP 29, 39, 40, 42, 43, and 44: No NWP can be issued.
NWP 12 and 14: Notification required.

b) Discharges in Headwaters (above point of 5 cfs) resulting in permanent above-grade fills:

Flood Fringe

NWP 12, 14, 29, 39, 40, 42, 43, and 44: Notification required.

Floodway

NWP 29, 39, 40, 42, 43, and 44: No NWP can be issued.
NWP 12 and 14: Notification required.

11. Equipment:

Project would be in compliance with GC?

☒ Yes ☐ No

The project will not involve heavy equipment working in wetlands. Temporary access roads constructed of rock over filter fabric will be utilized to preserve the integrity of jurisdictional waters and wetlands.

12. Soil Erosion and Sediment Controls:

Project would be in compliance with GC?

☒ Yes ☐ No

Caltrans will implement standard BMPs to manage soil erosion and sediment.

13. Removal of Temporary Fills:

Project would be in compliance with GC?

☒ Yes ☐ No

All temporary fill materials used during construction will be removed following construction, and the area will be contoured to match pre-construction grade and revegetated with native seed stock.

14. Proper Maintenance:

Project would be in compliance with GC?

☒ Yes ☐ No

All structures installed as part of the proposed project, including the temporary access roads and staging areas, will be properly and regularly maintained by Caltrans

15. Wild and Scenic Rivers:

Project would be in compliance with GC?

☒ Yes ☐ No

The project will not impact waterways that are designated as Wild and Scenic Rivers.

16. Tribal Rights:

Project would be in compliance with GC?

☒ Yes ☐ No

The project will not involve tribal rights.

17. Endangered Species: see Box 11 above.

Please refer to Chapters 3 in the attached Supplement. Formal consultation has been initiated with both the USFWS and NMFS for the species listed in Box 11 above.

18. Historic Properties: see Box 12 above.

Please refer to Appendix E of the attached Supplement.

19. Designated Critical Resource Waters (check those that apply)

Includes:

1. ☐ N0AA designated marine sanctuaries,
2. ☐ National Wild and Scenic Rivers,
3. ☒ Critical habitat for Federally listed species,
4. ☐ Coral reefs,
5. ☐ State natural heritage sites,
6. ☐ Officially designated waters

Applicant is aware of the restrictions a) and b) below?

☒ Yes ☐ No

a) NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44: No NWP can be issued (except in certain cases described in full text of GC#25).

b) NWP 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38: Notification required.

This document serves as notification to the USACE.

20. Mitigation:

Project would be in compliance with GC?

☒ Yes ☐ No

Impacts to Waters of the US (including wetlands) have been avoided to the maximum extent feasible, and all temporary impacts will be mitigated for as described in Chapter 4 of the attached Supplement.

21. Water Quality (401 Certification): see Box 14 above.

Water Quality Certification will be requested from the Central Valley RWQCB. A copy of the Section 401 Water Quality Certification will be supplied to the USACE upon receipt.

22. Coastal Zone Management: see Box 15 above.

This project is not located within the state's coastal zone and is not expected to affect land or water uses or natural resources within the coastal zone.

23. Regional and Case-by-Case Conditions:

Complete the Regional Conditions checklist below.

Project would be in compliance with any case-by-case conditions?

☒ Yes ☐ No

See below.

24. Use of Multiple Nationwide Permits:

Applicant is aware that if total proposed acreage of impact exceeds acreage limit of NWP with highest specified acreage, no NWP can be issued?

☒ Yes ☐ No

Multiple NWPs are not being used for this project.

25. Transfer of Nationwide Permit Verifications:

Project would be in compliance with GC?

☒ Yes ☐ No

The proposed project is not expected to undergo transfer of ownership.

26. Compliance Certification:

Applicant is aware of this post-construction requirement?

☒ Yes ☐ No

The applicant will sign the authorization letter that will accompany the NWP verification certifying that the work and any required mitigation will be completed in accordance with the permit conditions.

27. Notification (*Check mark and provide those that apply*)

☐ NWP 7, 12, 14, 18, 21, 34, 38, 39, 40, 41, 42, and 43: Delineation of wetlands and other waters of the U.S.

☐ NWP 7: Original Design Capacity & Configurations

☐ NWP 14: Compensatory Mitigation Proposal & written statement describing how temporary losses will be minimized to the maximum extent possible

☐ NWP 21: Office of Surface Mining or State-approved mitigation Plan

☐ NWP 27: Documentation of Prior Condition of Site

☐ NWP 29: Past use of NWP, statement of personal residence, parcel size description, land description

☐ NWP 31 (for repeat use): 5 year Maintenance Plan, baseline channel information, delineation, and disposal site information

☐ NWP 33: Restoration Plan

☐ NWP 39, 43, and 44: Written Statement on Avoidance and Minimization Measures

☐ NWP 39 and 42: Compensatory Mitigation Plan/Justifications of no plan

☐ NWP 40: Compensatory Mitigation Proposal

☐ NWP 43: Maintenance Plan (for new construction) and compensatory mitigation proposal

☐ NWP 44: Description of affected waters, minimization measures and reclamation plan

☐ NWPs 12, 14, 29, 39, 40, 42, 43, and 44: FEMA map, FEMA construction requirements and demonstration of FEMA compliance

This document is intended to provide notification, as required by the general condition for NWP 3.

28. Single and Complete Project:

Project would be in compliance with GC?

☒ Yes ☐ No

The proposed activity is part of a single and complete project.

NWP-Specific Requirements Checklist:

A. Nationwide 03 (case iii):

Evidence of damage (due to storm, flood, etc.) such as recent topographic surveys or photographs attached?

☐ Yes ☒ No

The use of NWP 3 is requested for the rehabilitation of the Antioch Bridge in order to meet current safety design standards.

B. Nationwide 07:

NPDES permit or other proof of CWA Section 402 compliance attached?

☐ Yes ☐ No ☒ N/A

C. Nationwides 13, 14, 18, 29, 39, 40, 42, 43, 44:

Activity/crossing must be part of a single and complete project. Project would be in compliance with this requirement?

☐ Yes ☐ No ☒ N/A

D. Nationwide 31:

As-built or approved engineering drawings for each structure attached?

☐ Yes ☐ No ☒ N/A

E. Nationwide 40:

Documentation of an NRCS exemption, an NRCS-certified wetland delineation, and an NRCS-approved compensatory mitigation plan attached?

☐ Yes ☐ No ☒ N/A

NWP Regional Conditions Checklist:

A. Is the project in a fen?

☐ Yes ☒ No

Nationwide Permits 14, 29, 33, 39, 40, 41, 42, 43, and 44 are withdrawn from use in histosols, including fens. For the use of all other nationwide permits in fens, project proponents are required to notify the Corps using the notification or PCN procedures of the nationwide permit program (General Condition 27). This will be a “Corps only” notification.

The proposed project is not in a fen.

B. Will mitigation be completed before or concurrent with construction of the project?

☐ Yes ☒ No

For all activities using any existing and proposed nationwide permits, mitigation that is required by special condition must be completed before or concurrent with project construction. Where project mitigation involves the use of a mitigation bank or in-lieu fee, payment must be made to the bank or in-lieu fee program before commencing construction of the permitted activity.

Mitigation for this project entails restoring the temporarily impacted areas to pre-disturbance conditions. This will be achieved through the removal of the temporary trestles and removal of geo-textile fabric and crushed rock from the temporary access roads and temporary staging areas. Restoring the temporarily disturbed areas will commence after work is complete.

C. Is a statement attached explaining how avoidance and minimization of impacts were achieved?

☒ Yes ☐ No

For all nationwide permits requiring notification, except 27, the applicant must provide a written statement to the district engineer explaining how avoidance and minimization of losses of waters of the United States were achieved on the project site.

Please refer to Chapter 4 of the attached Supplement for more detail.

D. Is the project in Lake Tahoe?

☐ Yes ☒ No

All existing and proposed nationwide permits are suspended in the Lake Tahoe Basin in favor of using Regional General Permit 16.

The proposed project is not in Lake Tahoe.

End of form.

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List of Abbreviations

BA	Biological Assessment
BATA	Bay Area Toll Authority
BMP	Best Management Practice
Caltrans	California Department of Transportation
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CNPS	California Native Plant Society
ESA	environmentally-sensitive area
FESA	Federal Endangered Species Act
ft	foot/feet
GIS	geographic information system
GGS	giant garter snake
in	inch/inches
MHHWM	mean high-water mark
NMFS	National Marine Fisheries Service
NWP	Nationwide Permit
PM	post mile
ROW	right of way
RWQCB	Regional Water Quality Control Board
SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Chapter 1 Introduction

The Bay Area Toll Authority (BATA) and the California Department of Transportation (Caltrans) propose to conduct a seismic safety retrofit to the Antioch Bridge (here-in-after referred to as the Antioch Bridge Seismic Retrofit Project, or the Project). The Antioch Bridge supports State Route (SR) 160 and connects the City of Antioch in eastern Contra Costa County to Sherman Island in Sacramento County. The project is located within the Antioch North and Jersey Island 7.5-minute United States Geological Survey (USGS) quadrangles (Township 2N, Range 2E, Sections 3, 4, 9, 10, 15 and 16 from the Mount Diablo Meridian and Baseline, 38.00145^{o}N / 121.75164^{o}W to 38.01669^{o}N / 121.75128^{o}W).

Within the proposed project area, the Antioch Bridge spans the San Joaquin River and Mayberry Slough on Sherman Island. The project will involves the installation of temporary pile below the mean high water mark (MHWM) off the south bank of the San Joaquin River, and the placement of temporary access roads in seasonal wetland and irrigation ditches, all of which have been delineated and verified as Waters of the U.S. (including wetlands). Specific activities associated with the proposed project include (1) installation of a temporary marine trestle over the shallower waters off the south bank of the San Joaquin River, (2) placement of temporary access roads on the south shore of the river and on Sherman Island, (3) placement of temporary staging areas on Sherman Island, (4) free spanning two aquatic features with small trestles, and (5) permanently widening an existing gravel road for access.

Caltrans is applying for the following Section 404 Nationwide Permit (NWP) from the United States Army Corps of Engineers (USACE):

- NWP #3, Maintenance

This document is intended to provide the required information for the NWP application and is being submitted as part of the request for permit authorization from the USACE.

1.1 Project Purpose and Need

The seismic retrofit of the Antioch Bridge is necessary for the bridge to meet current design standards. The construction of the Antioch Bridge was completed in 1978. Seismic design of the bridge was based on the criteria developed after the San

Fernando Earthquake of 1971. In the early 1990s it was determined that the Antioch Bridge had sufficient seismic resistant features that it was deemed to have minor vulnerabilities in a major earthquake.

The Loma Prieta Earthquake of 1989 prompted Caltrans to implement the Seismic Retrofit Program (Program). After the Northridge Earthquake of 1994, Caltrans implemented Phase Two of the Program, which required seven state-owned toll bridges, including the Antioch Bridge, to be retrofitted.

Significant revisions of the seismic design criteria, implemented through the Seismic Retrofit Program, necessitated reevaluation of the Antioch Bridge's seismic integrity. A vulnerability study was completed in 2005. The study concluded that the evidence was insufficient to determine the performance of the Antioch Bridge during a maximum credible earthquake. The study further recommended that a comprehensive seismic analysis be performed, based on complete and accurate geotechnical soil data. Geotechnical investigations were conducted in 2006-2007. A design strategy, meeting a No Collapse safety standard, was completed in August 2008.

1.2 Project Description

The Antioch Bridge Seismic Retrofit Project (Project) spans roughly two miles (mi) of SR 160, from the southern limit of the Project at Post Mile (PM) 0.8 in Contra Costa County to PM 1.3 at the Contra Costa/Sacramento County line, and from PM 0 to PM 1.3 in Sacramento County in the north, on Sherman Island (Figure 1). The bridge connects the City of Antioch on the south bank of the San Joaquin River to Sherman Island on the north. It spans the 3,600-foot (ft) width of the river and over 4,000-ft of Sherman Island, before touching down just north of Mayberry Slough (Figure 2).

1.2.1 Existing Structure

Built in 1978, the bridge is 9,437-ft long, accommodates one lane of traffic in either direction and includes narrow accommodation for bicyclists and pedestrians. The bridge features two structural elements: the "Main Structure" and the "Slab Span Structure." The Main Structure is 8,650-ft in length and consists of forty spans varying in length from 135-ft to 460-ft. The superstructure of the Main Structure consists of a 43.5-ft wide concrete deck supported on two steel girders that vary in depth from 8-ft to 25-ft. The girders rest on concrete bent cap beams. Most of the bent

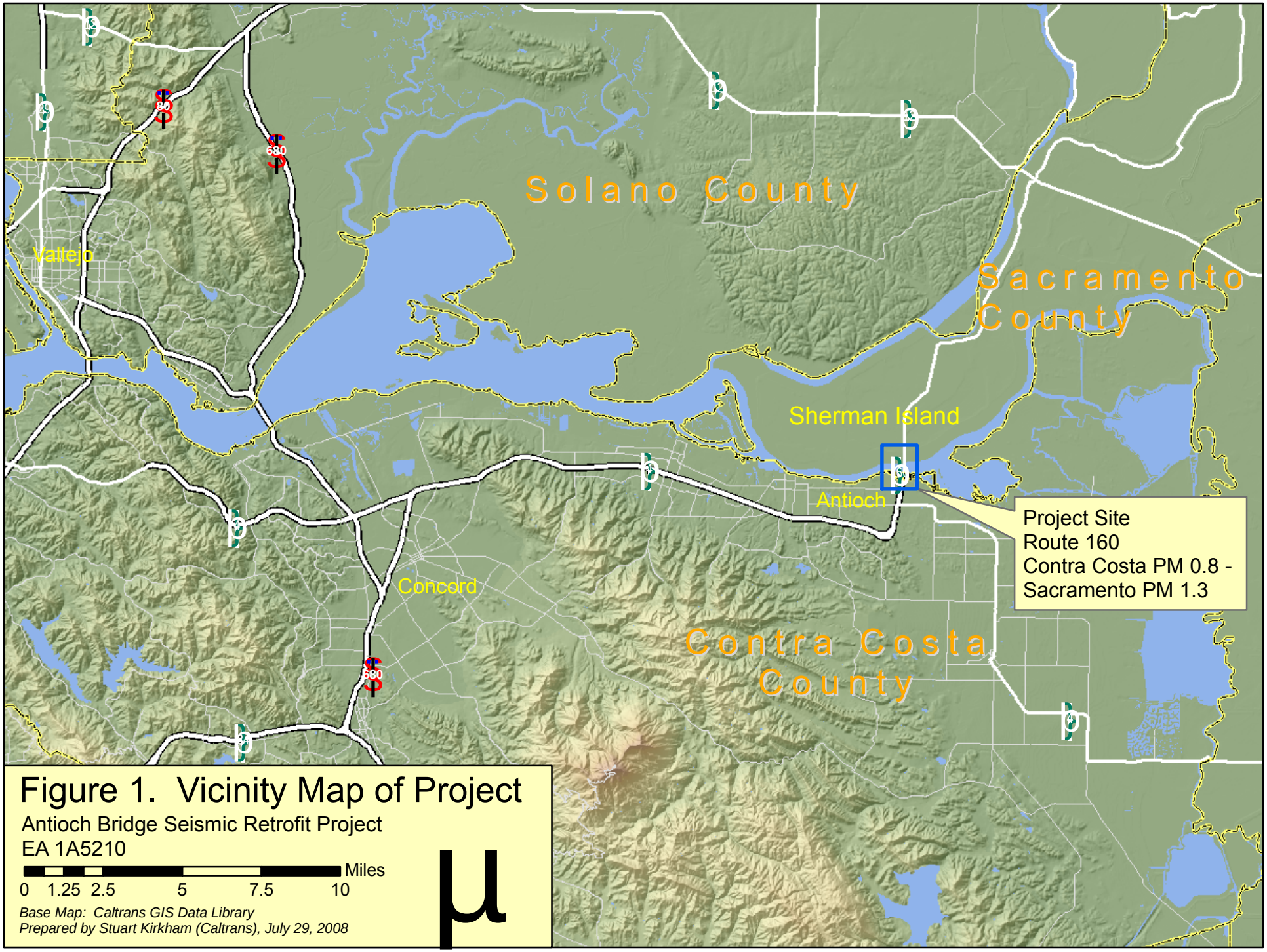

Figure 1. Vicinity Map of Project

Antioch Bridge Seismic Retrofit Project
EA 1A5210

Base Map: Caltrans GIS Data Library
Prepared by Stuart Kirkham (Caltrans), July 29, 2008

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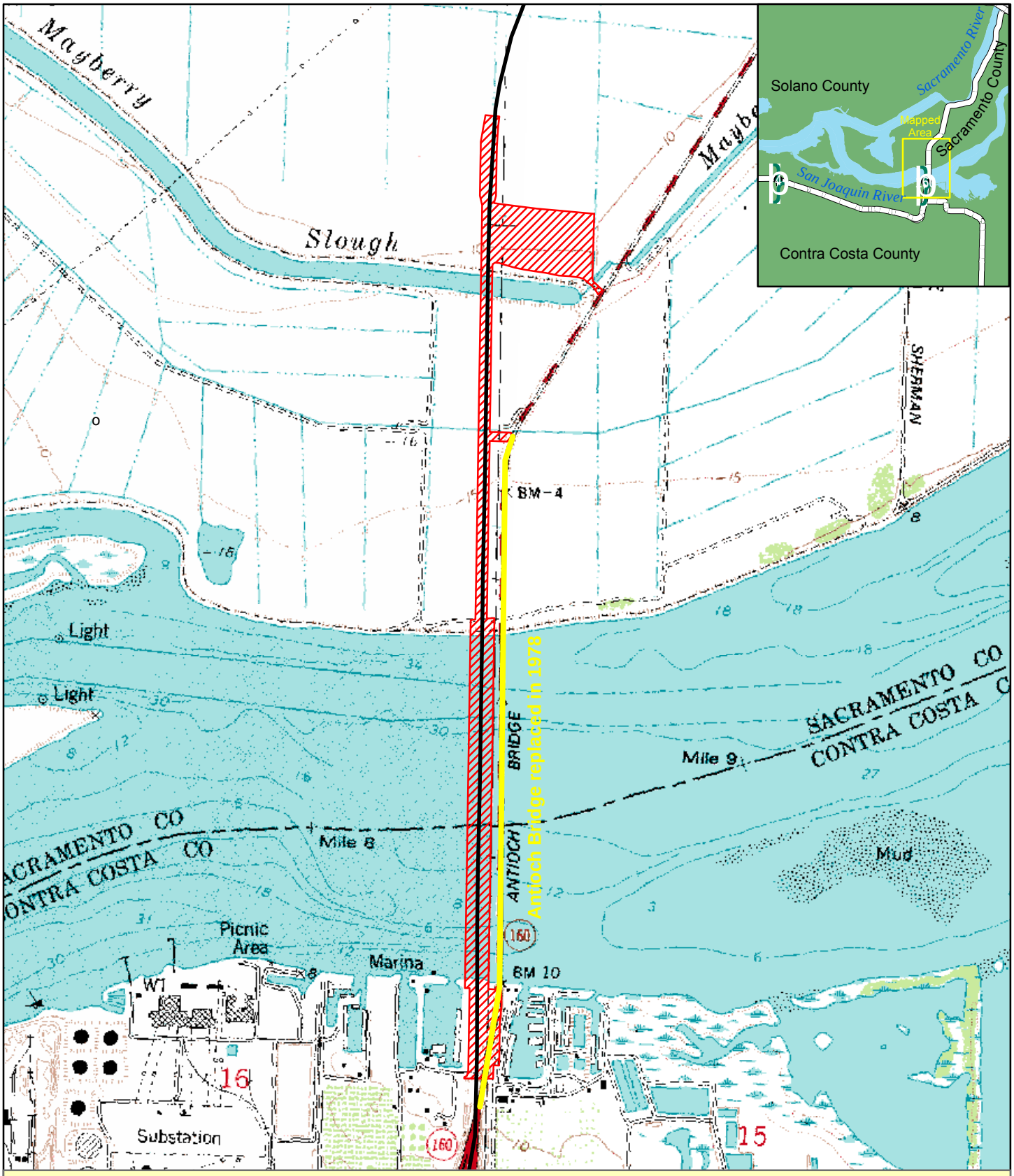

Figure 2. Locality Map of Project

Antioch Bridge Seismic Retrofit Project
Contra Costa and Sacramento Counties
State Route 160, Contra Costa PM 0.8 - Sacramento PM 1.3

Base Map: Antioch North and Jersey Island Quadrangles, USGS 7.5 Minute Quad
Prepared by Stuart Kirkham (Caltrans)
August 14, 2008

Feet
0 750 1,500 3,000

Project Limits

North Boundary: 121° 45' 5.9" W 38° 2' 41.2"N
South Boundary: 121° 45' 4.6" W 38° 1' 0.1" N
Project area spans Sections 3, 4, 9, 10, 15 and 16 of Township 2 North, Range 2E from the Mt. Diablo Meridian

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cap beams are hollow. The columns are supported on driven pile footings. The exterior piles are battered (installed at an angle) at a 3:1 inclination and the interior piles are vertical.

The Slab Span Structure is 787-ft long and consists of 30 spans supported by pile extensions with grade beams holding them at ground level. It extends north of Mayberry Slough to the point at which the bridge structure meets existing grade. The sides of the structure in this area are enclosed with concrete slabs.

1.2.2 Proposed Retrofit Elements and Construction Access

The proposed retrofit elements to the bridge include the following (mapped in Figure 3):

- Installation of steel cross bracing between columns to stiffen the superstructure cross frames (Pier 12 to Pier 31).
- Installation of bracing to existing cross frames at the bent caps (Pier 2 to Pier 40).
- Replacement of the existing elastomeric bearings with isolation bearings (Abutment 1 to Pier 41).
- Removal of the existing curtain walls and retrofit of all the columns within the slab span structure (Bent 42 to Abutment 71).

Proposed construction access includes temporary upland access roads, barge access in the main channel, and a temporary marine trestle on the south end as described below:

- Construction of a temporary marine trestle to access the piers from the Antioch shore to Pier 11.
- Construction of a temporary access road on the south shore, which runs adjacent and parallel to the bridge, in order to access the temporary marine trestle.
- Construction of a temporary access road from the southernmost bridge support on Sherman Island (Pier 22) to the last bridge support south of Mayberry Slough (Pier 38) to provide construction access for retrofit work.

- Construction of temporary access roads parallel to the slab span structure on both sides, north of Mayberry Slough, to facilitate removal of the curtain walls from the slab span structure and reinforce existing columns and abutments.
- Permanent widening of an existing access road along Mayberry Slough to access piers north of Mayberry Slough.

1.3 Proposed Work Areas

The project limits, which include Caltrans right-of-way (ROW) and temporary construction easements, cover approximately 62 acres, including 7.5 acres on the south shore of the San Joaquin River in Contra Costa County, 21 acres of the San Joaquin River in Contra Costa and Sacramento Counties, and 33.5 acres on Sherman Island in Sacramento County.

On the south side of the river, vegetation is primarily characterized by park landscaping vegetation, with non-native, invasive vegetation under the existing bridge. A small fringe of wetland found along the San Joaquin River provides potential suitable habitat for two rare plants in the area adjacent to the Project's temporary access road: Mason's lilaeopsis (*Lilaeopsis masonii*) and Suisun Marsh aster (*Symphyotricum lentum*).

The San Joaquin River is relatively shallow on the south side, with depths of less than 10-ft up to the location of Pier 11. The main shipping channel extends between Piers 12 and 20.

On the north side of the river, the bridge spans over Sherman Island which is characterized by irrigated pasture and irrigated cropland, as well as areas of non-native, invasive vegetation in fallow fields. Mayberry Slough and an irrigation canal cross the project area in the vicinity of Piers 39 and 40, and Pier 32, respectively.

1.3.1 Proposed Terrestrial Work

Temporary Access Road

Temporary access roads are proposed in four locations: (1) one from Pier 22 to Pier 38 south of Mayberry Slough; (2) two north of Mayberry Slough on either side of the slab span structure; and (3) one on the south shore of the San Joaquin River to allow access to the south side of the trestle. In addition, two small trestles will be used to protect a drainage canal and drainage ditch as described below.

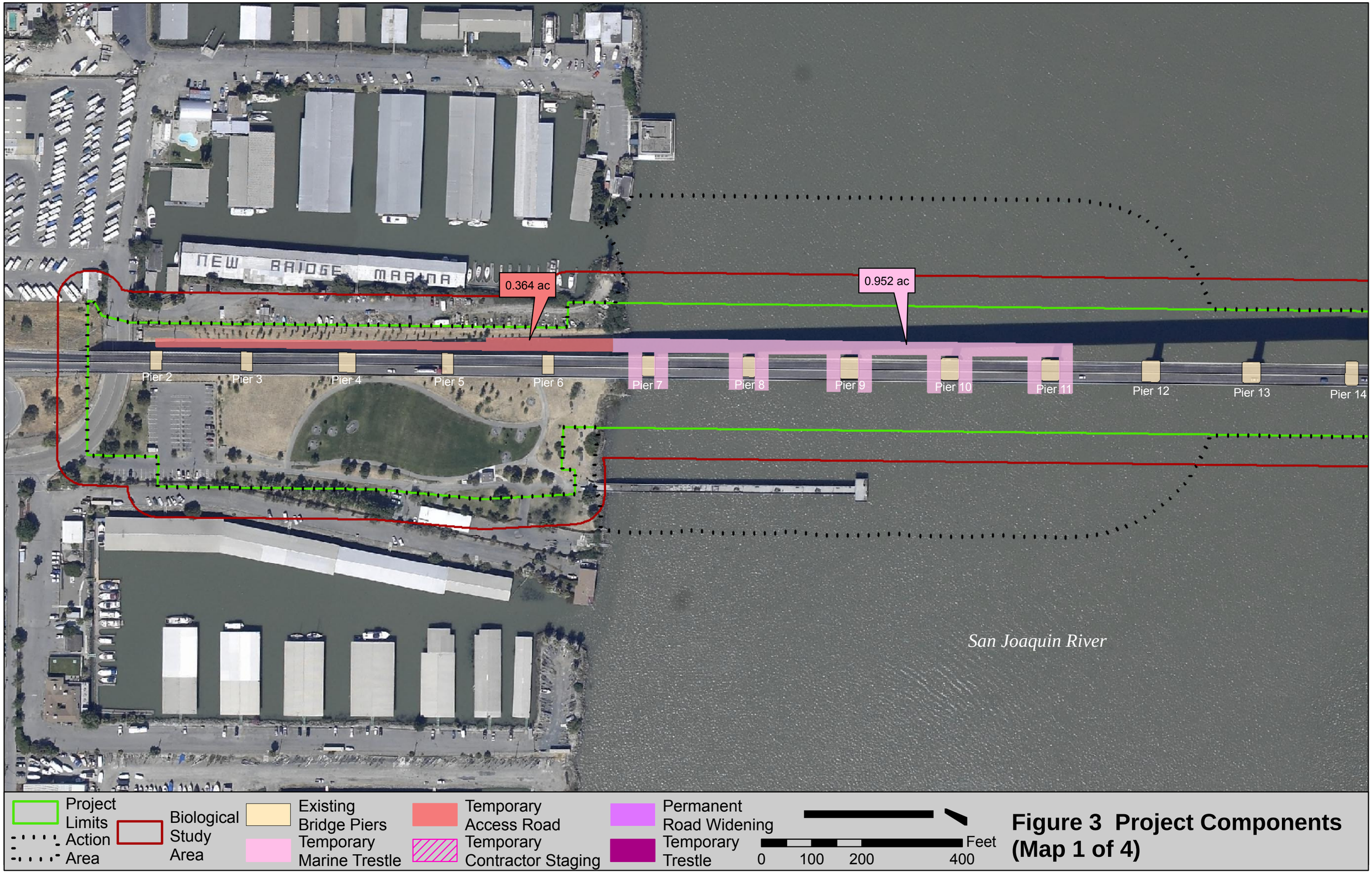


Figure 3 Project Components (Map 1 of 4)

Project Limits
Action Area
Biological Study Area
Existing Bridge Piers
Temporary Marine Trestle
Temporary Access Road
Temporary Contractor Staging
Permanent Road Widening
Temporary Trestle
0 100 200 400 Feet

Figure 3 Project Components (Map 2 of 4)

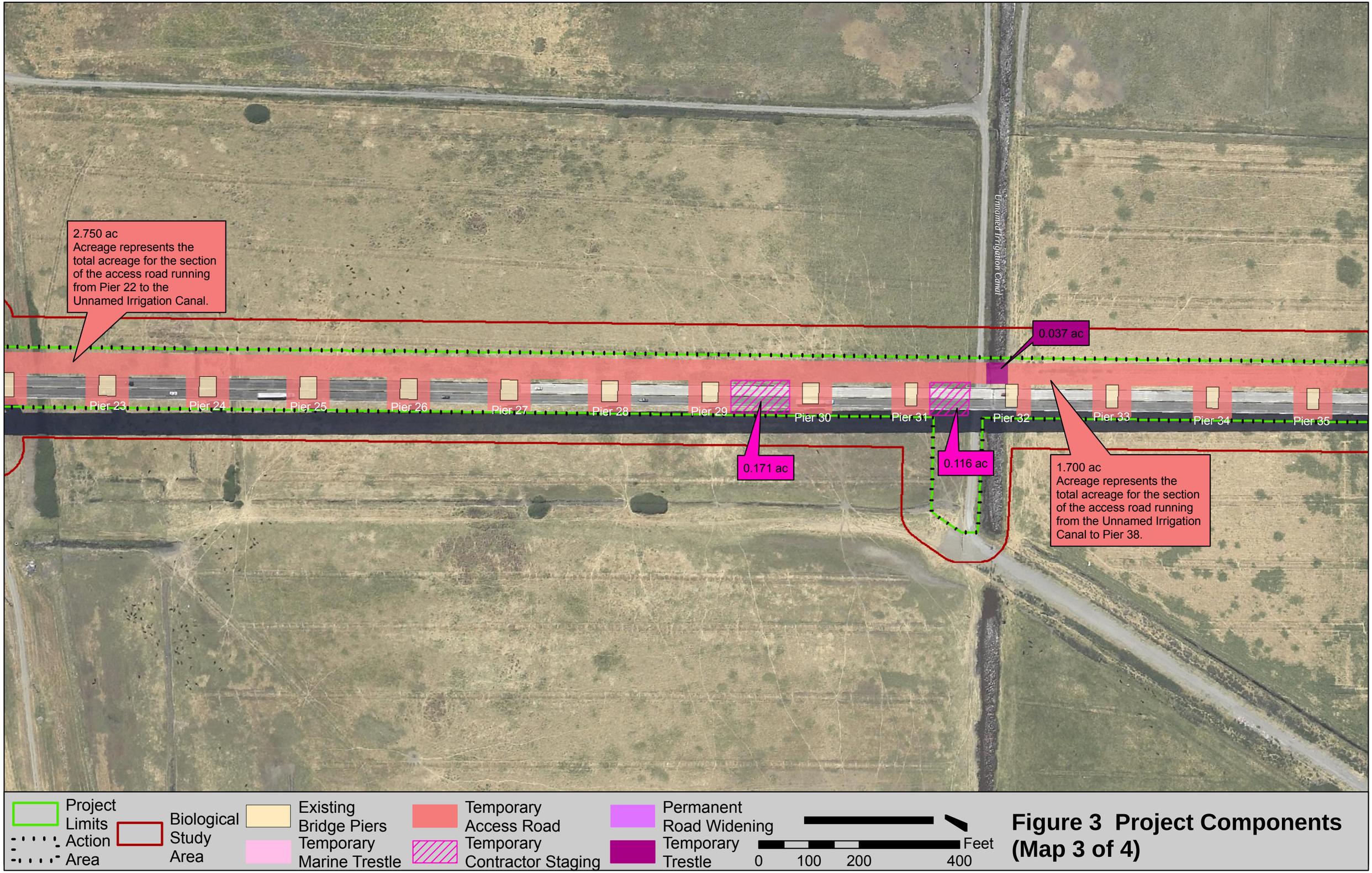


Figure 3 Project Components (Map 3 of 4)

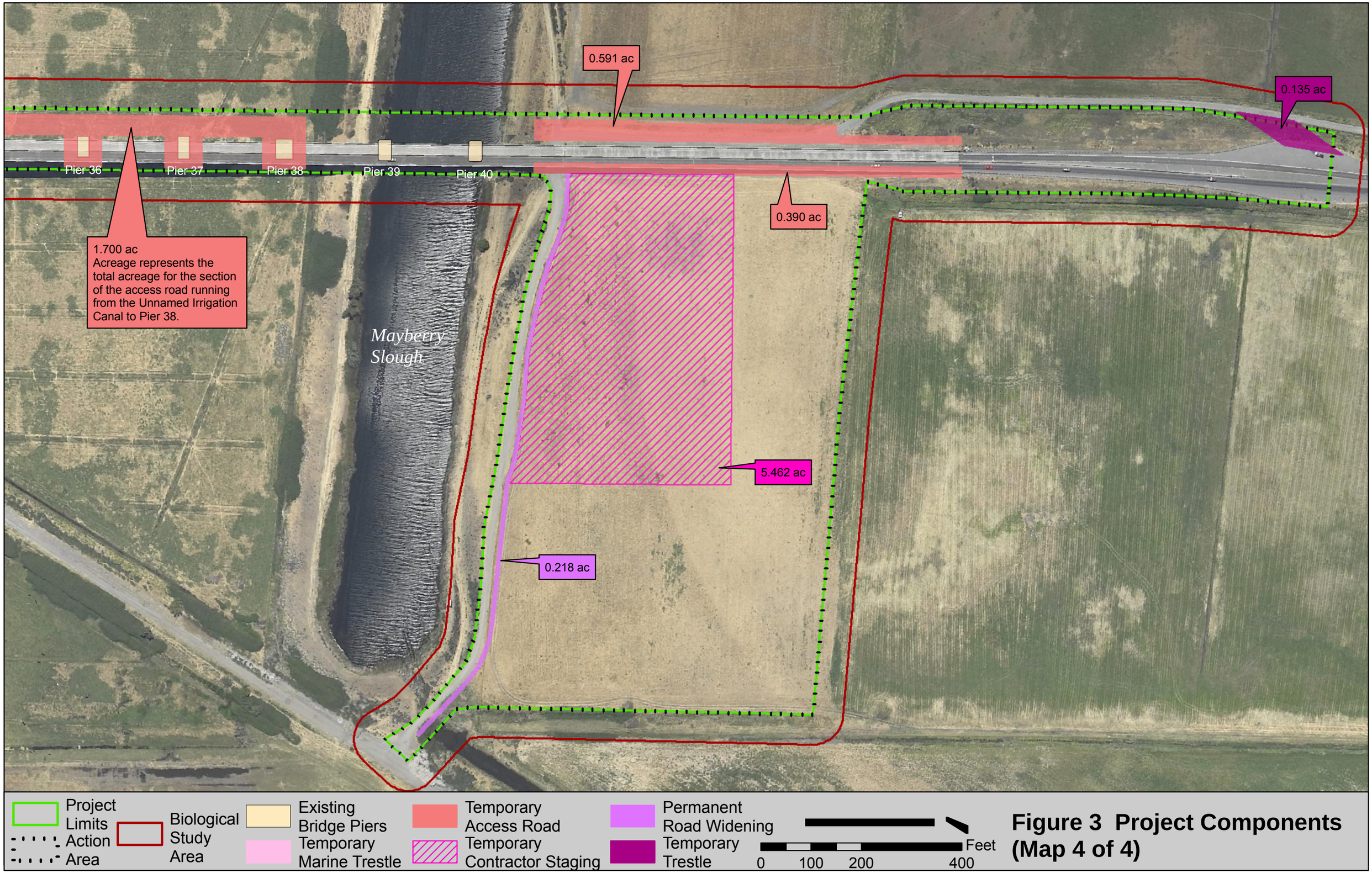


Figure 3 Project Components (Map 4 of 4)

A silt fence will be installed at the base of the temporary access roads as sediment control for the roadway, to minimize the potential for inadvertent encroachment of equipment into the surrounding area, and to minimize the potential for wildlife to enter the roadway. At the completion of the Project, the silt fence, geotextile fabric and crushed rock will be removed and the site will be restored to the pre-existing conditions.

Pier 22 to Pier 38: A temporary access road is proposed within State ROW to provide access for work to all bridge columns south of Mayberry Slough (Pier 22 to Pier 38) on Sherman Island. The temporary access road will consist of placing geotextile fabric and a crushed rock layer, approximately 4-ft in depth over the existing ground. The temporary access road will be approximately 24-ft wide along the travel surface, and will extend with 2:1 slopes to existing ground level. The base of the road will be approximately 40-ft wide at ground level and extend 3,300-ft, covering an estimated 4.45 acres. The temporary access road will stop at Mayberry Slough.

North of Mayberry Slough: Two additional temporary access roads, constructed of a 6-in layer of crushed rock overlaying geotextile fabric, are proposed north of Mayberry Slough on both the west and east sides of the slab span structure. The access road on the west side will occupy 0.6 acre and measure 850-ft long by 36-ft wide; whereas, the access on the east side of the span will occupy 0.4 acre and measure 850-ft long by 20-ft wide.

Small Trestles: Where the access road crosses the irrigation canal near Pier 32, a 24-ft wide temporary trestle will be installed to span the irrigation canal. The temporary trestle will prevent additional load on the existing culvert and avoid the need for fill.

At the northern end of the bridge, a 24-ft wide temporary trestle will be installed to the west to span an irrigation/drainage ditch. The temporary trestle will minimize disturbance to the existing irrigation ditch and wetland area.

Southern Access: On the south shore of the San Joaquin River at the south end of the temporary marine trestle, existing access roads and the Caltrans ROW will be utilized to access the trestle. The existing roads will require a widening from 9-ft to 24-ft wide along 650-ft, and a 24-ft wide extension along another 250-ft. This will be accomplished using a 6-in layer of crushed rock overlaying geotextile fabric. The total expanded/extended area will be 0.364 acre. An environmentally sensitive area

(ESA) fence will be placed along the west side of the access road to avoid impacts to the drainage ditch that borders the ROW.

Temporary contractor staging and lay down area

Temporary staging areas include one main temporary staging and lay down area near the north end of the bridge; two staging areas between bridge piers on Sherman Island near Piers 29 and 30, and 31 north to the access road; and existing paved areas on the south side of the bridge.

Main staging and lay down area: A temporary staging and lay down area has been identified north of Mayberry Slough, in a fallow upland field dominated by ruderal species. The staging area covers approximately 6 acres outside State ROW on the east side of the bridge (See Figure 3). The area will be covered by a layer of crushed rock overlying geotextile fabric, approximately 6-in thick, for drivability. Silt fence and fiber rolls will be installed along the north and east side of the staging area to direct runoff away from the wetlands to the north and east. The staging and lay down areas will be kept at least 100 to 200-ft from the potential giant garter snake habitat to the north and east. At the completion of the Project, the silt fence and fiber rolls, along with the ESA fencing, crushed rocks and geotextile fabric will be removed and the site will be restored to the existing condition.

Temporary staging areas between piers: Two temporary contractor staging areas have been identified between bridge piers. One, located between Piers 29 and 30, will occupy approximately 0.17 acre and measure 115-ft long by 65-ft wide. The other, on Sherman Island and between Pier 31 and the permanently extended access road, will occupy approximately 0.12 acre and measure 81-ft long by 65-ft. These temporary staging areas will consist of placing geotextile fabric and a crushed rock layer, approximately four feet in depth over the existing ground.

South side of the bridge: On the south end of the bridge, the contractor will use existing paved areas for staging. An ESA fence will be placed along the west side of the access road to protect the drainage ditch that borders the ROW.

Permanent widening of access roads

The unpaved access road extending from the old Highway (84) to the staging area is currently 18 to 20-ft wide. This access road needs to be widened to 24-ft over a distance of approximately 1,200-ft in order to accommodate large construction equipment and trucks. Widening of this access road will require minor grading of the approximately 0.218 acre area to be widened, and placing 6-in of crushed rocks over

the adjacent ground. The areas adjacent to this road currently consist of ruderal upland vegetation

1.3.2 Proposed Aquatic Work

Temporary Marine Trestle

A temporary marine trestle with an approximate length of 910-ft and a width of 25-ft will be constructed from the south bank of San Joaquin River to Pier 11 to allow construction access to the piers in the shallow water area. The trestle platform is expected to be approximately five feet above the Mean Higher-High Water Mark (MHHWM). Caltrans biologists and engineers worked closely to define the parameters of constructing the temporary marine trestle. The trestle will be constructed using approximately 160, 24-in steel hollow shell piles and will be installed with a vibratory hammer. Caltrans will proof test one pile per day using an impact hammer. At the completion of the Project, the trestle along with the piles will be removed.

Barge work

Barges will be used to retrofit Piers 12 to 21 and no aquatic impacts are anticipated beyond the potential installation of mooring lines.

1.3.3 Proposed Superstructure Work

Superstructure work includes installation of steel cross bracings between columns, replacing the existing bearings with isolation bearings, and retrofitting the slab span columns as described below:

- Installation of steel cross-bracing between columns to stiffen the superstructure from Pier 12 to Pier 31. Cross bracings will be anchored to the existing concrete columns with resin capsule anchors.
- Installation of bracing to existing cross frames at the bents (Pier 2 to Pier 40).
- Replacement of the existing elastometric bearings with isolation bearings (Abutment 1 to Pier 41).
- Removal of the existing curtain walls and retrofitting of all the columns in the slab span structure by installing composite fiber jackets (Bent 42 to Abutment 71).

- Implementation of best management practices (BMPs) and exclusionary methods will be used to prevent birds from nesting on the structure during construction. These may include exclusionary netting, potential hosing, and/or scheduling work around non-nesting periods.

1.3.4 Borrow and Disposal

This Project will not require on-site borrow or disposal of excavated material. Gravel and rock will be imported for construction of the temporary staging, temporary access road and road widening. These materials will be removed upon completion of the Project, and removal and disposal of this material will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and the Stormwater Pollution Prevention Plan (SWPPP). BMPs and SWPPP measures are a standard part of the plans and specifications for this project and are covered by the Regional Water Quality Control Boards' (RWQCB) 401 Water Quality Certification.

1.4 Project Schedule

Construction is scheduled to begin in mid-2010 and end in late 2012.

Chapter 2 Impacts to Waters of the U.S. (including Wetlands)

2.1 Jurisdictional Overview

Under the authority of Section 404 of the Clean Water Act, the USACE is responsible for regulating the discharge of dredged or fill material into Waters of the U.S. (including wetlands).

Field surveys were conducted on June 26, June 27 and July 2, 2008 by CH2M HILL botanist/wetland scientist Russell Huddleston and Caltrans biologist William S. Kirkham to identify potential wetlands and other waters. Mr. Huddleston and Dana Morawitz (CH2M HILL GIS specialist) conducted a subsequent field survey on September 30, 2008 to revise the wetland maps based on comments from the USACE during the September 23. 2008 field verification. The wetland delineations were conducted according to the methods outlined in the U.S. Army Corps of Engineers' (USACE's) 1987 *Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Arid West Regional Supplement to the 1987 Manual* (USACE, 2006) for all waters of the United States, including wetlands, occurring within the biological study area. The wetland delineation was verified by the USACE on October 24, 2008, and is summarized below. The wetland delineation report and verification letter and representative photographs of the features identified during the 2008 field surveys are included in Appendix C and D, respectively. The impacts to Waters of the U.S. (including wetlands) are mapped in Figure 4.

2.2 Description of Waters of the U.S. (including Wetlands)

Within the proposed project area, Waters of the U.S. (including wetlands) include a portion of the San Joaquin River (OW-1), a portion of Mayberry Slough (OW-4), portions of three open irrigation canals (OW-2, OW-3, OW-5), nine irrigation ditches (I/D-1 through I/D-9), six seasonal wetlands (SW-1 through SW-6), and three emergent wetlands (EM-1 through EM-3). The wetland delineation report and verification letter are contained in Appendix C. Maps of all of these features are contained within the wetland delineation report. Representative photographs from the June-July 2008 wetland delineation are contained in Appendix D. Figure 4 contains a series of four maps that depict the project's temporary impacts to verified features

within the project footprint in relation to the Engineering Design Layout Plans in Appendix A.

2.2.1 Open Water

Five open water features comprising a total of 20.577 acres (490 linear feet) were identified and mapped within the project study area. Open water feature OW-1 represents the segment of San Joaquin River that is located within the project study area (approximately 3,656 linear feet long and 250 feet wide). A small area of emergent vegetation is present along the south bank (EM-1) and a few, small scattered clusters of hardstem bulrush (*Schoenoplectus acutus*) occur on the north side of the river. The mean high water of this feature was estimated at 3.84 vertical feet, as shown in Appendix C, and was mapped using high-resolution aerial imagery from 2002.

Two of the open water features mapped in the study area (OW-2 and OW-3) represent two segments of large irrigation canal located south of Mayberry Slough. These segments are approximately 55 and 13 linear feet long respectively, and approximately 30 feet wide. Within the limits of the project study area the channel is largely devoid of vegetation. A section of Mayberry Slough (OW-4) approximately 260 feet long and 120 feet wide also occurs within the project study area. The majority of the slough is characterized by open water, with narrow wetland areas along the bottom of the interior levees characterized by hardstem bulrush (EM-2 and EM-3). A large routinely maintained irrigation canal (OW-5) is present on the northeast side of Mayberry Slough and is approximately 52 feet long and 40 feet wide.

2.2.2 Emergent Wetlands

Three emergent wetland areas comprising a total of 0.282 acre were identified and mapped within the project study area. These emergent wetlands are located along the south bank of the San Joaquin River (EM-1) and the north and south banks of Mayberry Slough (EM-2 and EM-3), as shown in Appendix C. Species such as hardstem bulrush, Dallis grass (*Paspalum dilatum*), rushes (*Juncus* spp.) characterized the emergent wetland along the south bank of the San Joaquin River. The emergent wetland areas along Mayberry Slough are characterized by dense hardstem bulrush.

Temporary Impacts to Waters of the US (Including Wetlands)

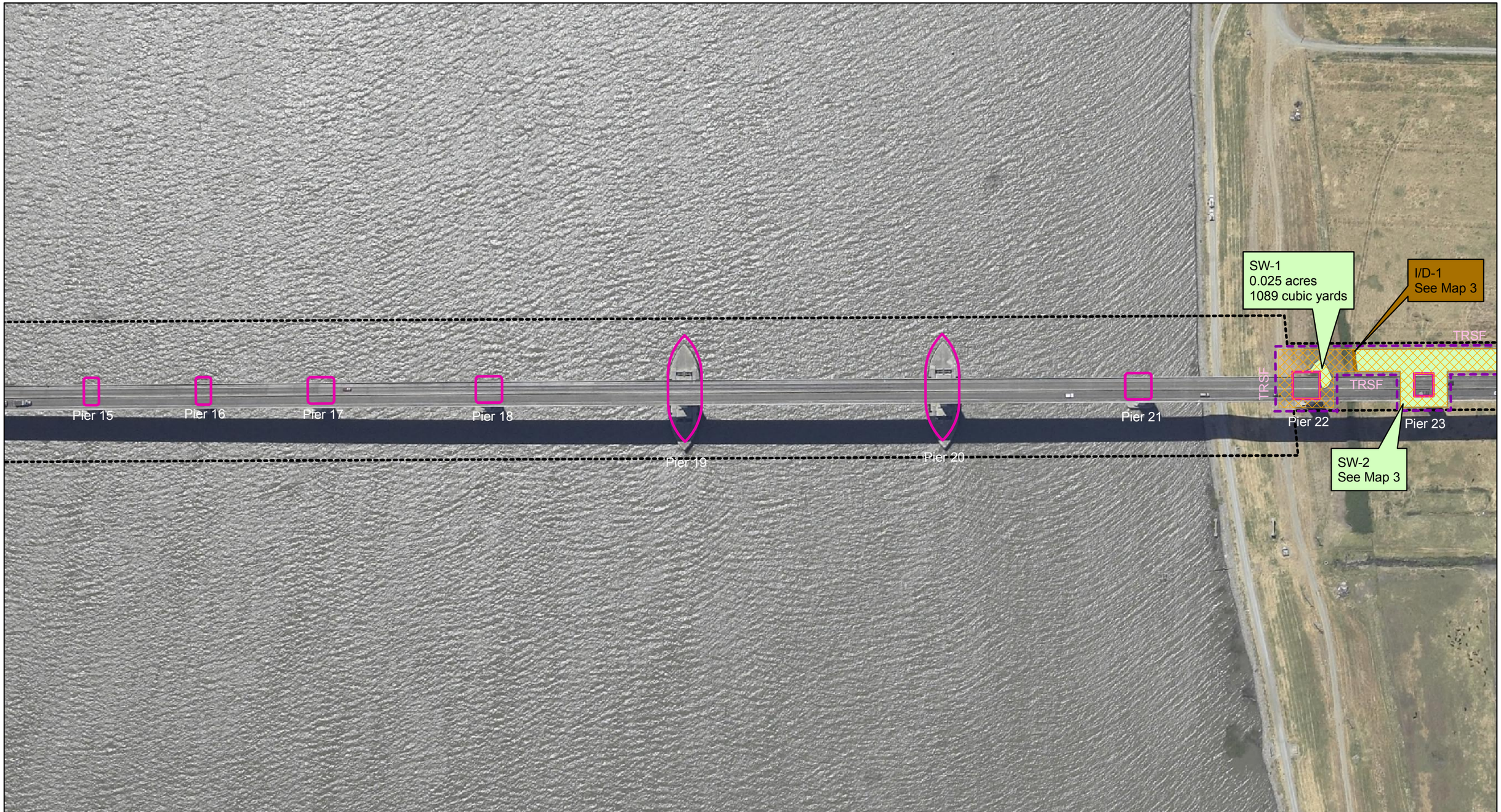
- Open Water (0.011 acres)
- Emergent Wetland (0.0001 acres)
- Irrigation/Drainage (0.045 acres; 174 feet)
- Seasonal Wetland (4.445 acres)

- Project Limits
- Proposed Work
- Erosion Control

0 100 200 400 Feet

Aerial Photo: Caltrans DHIPP Database, June 20, 2002
Map Prepared by Stuart Kirkham (Caltrans), March 12, 2009.
Revised: March 24, 2009, March 25, 2009

Figure 4. Impacts to USACE Jurisdictional Features (Map 1 of 4)



Temporary Impacts to Waters of the US (Including Wetlands)

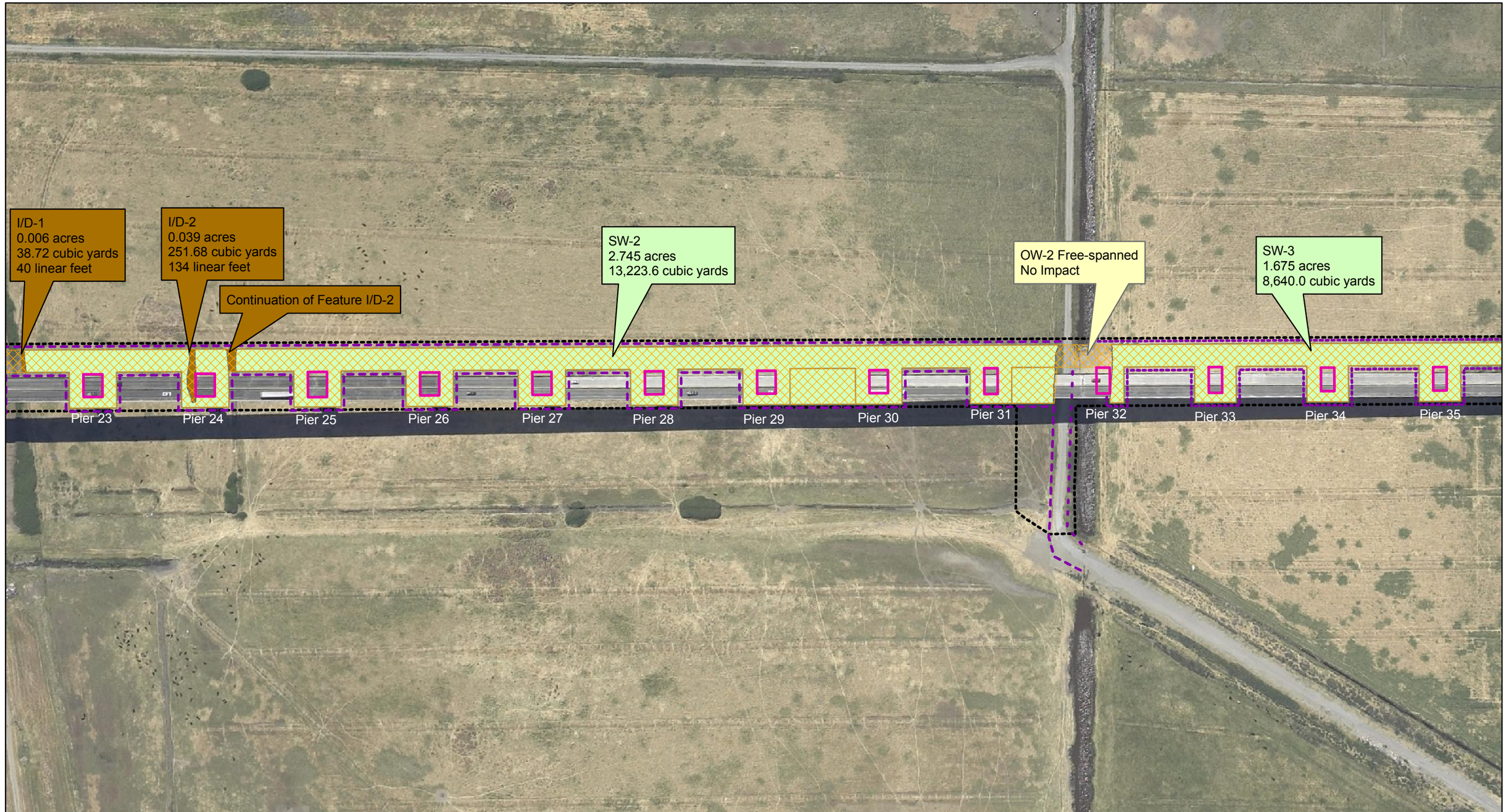
- Open Water (0.011 acres)
- Emergent Wetland (0.0001 acres)
- Irrigation/Drainage (0.045 acres; 174 feet)
- Seasonal Wetland (4.445 acres)

- Project Limits
- Proposed Work
- Erosion Control

0 100 200 400 Feet

Aerial Photo: Caltrans DHIPP Database, June 20, 2002
Map Prepared by Stuart Kirkham (Caltrans), March 12, 2009.
Revised: March 24, 2009, March 25, 2009

Figure 4. Impacts to USACE Jurisdictional Features (Map 2 of 4)



Temporary Impacts to Waters of the US (Including Wetlands)

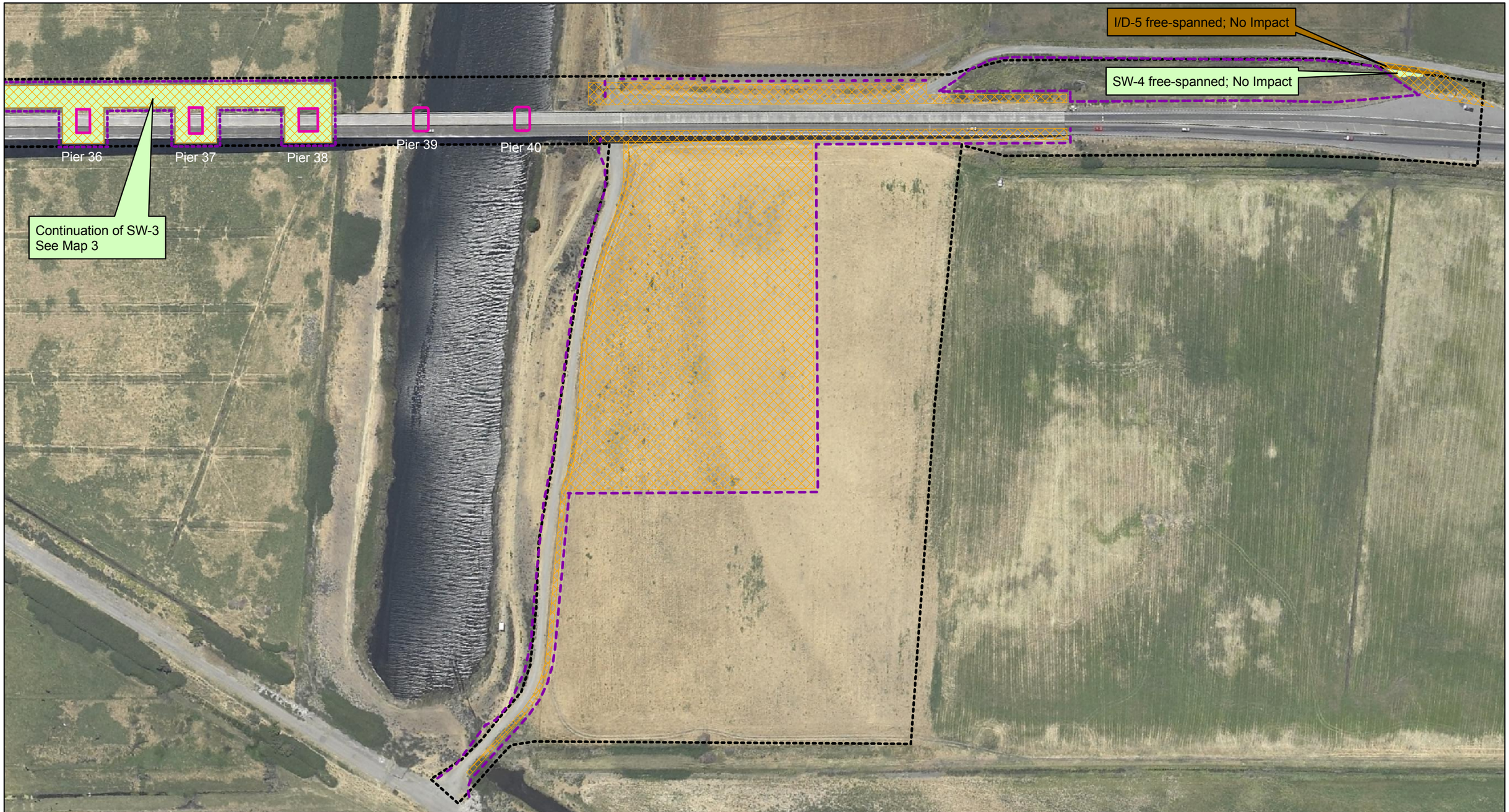
- Open Water (0.011 acres)
- Emergent Wetland (0.0001 acres)
- Irrigation/Drainage (0.045 acres; 174 feet)
- Seasonal Wetland (4.445 acres)

- Project Limits
- Proposed Work
- Erosion Control

0 100 200 400 Feet

Aerial Photo: Caltrans DHIPP Database, June 20, 2002
Map Prepared by Stuart Kirkham (Caltrans), March 12, 2009.
Revised: March 24, 2009, March 25, 2009

Figure 4. Impacts to USACE Jurisdictional Features (Map 3 of 4)



Temporary Impacts to Waters of the US (Including Wetlands)

- Open Water (0.011 acres)
- Emergent Wetland (0.0001 acres)
- Irrigation/Drainage (0.045 acres; 174 feet)
- Seasonal Wetland (4.445 acres)

- Project Limits
- Proposed Work
- Erosion Control

0 100 200 400 Feet

Aerial Photo: Caltrans DHIPP Database, June 20, 2002
Map Prepared by Stuart Kirkham (Caltrans), March 12, 2009.
Revised: March 24, 2009, March 25, 2009

Figure 4. Impacts to USACE Jurisdictional Features (Map 4 of 4)

2.2.3 Seasonal Wetlands

Six seasonal wetlands comprising 10.298 acres were identified and mapped within the project study area per the USACE recommendations made during the September 23, 2008 field verification. The majority of this seasonal wetland habitat, 9.760 acres, consists of lands that are currently used for irrigated pasture. Vegetation in these areas is characterized by Bermuda grass, perennial pepperweed and Italian ryegrass with alkali sida, strawberry clover, cocklebur (*Xanthium strumarium*), rabbitsfoot grass (*Polypogon monspeliensis*) and milk thistle (*Silybum marinum*) also present. In general the soils are characterized by dark, low chroma matrix colors ranging from very dark grayish brown (10 YR 3/2) to black (10 YR 2/1; 7.5 YR 2.5/1) and generally had a clay loam texture. With a few exceptions redox concentrations were not evident in the upper part of the soils. Evidence of seasonal wetland hydrology in these areas included water marks on the bridge support structures, a shallow dry season water table observed at several sample locations, and the presence of oxidized rhizospheres.

2.2.4 Irrigation Drainage/Ditches

Nine irrigation/drainage ditches comprising 0.723 acre were identified and mapped within the project study area (Appendix C). Many of these ditches are used to convey water used to flood irrigate and drain the cattle pasture within the project study area. Vegetation associated with these ditches includes species such as Himalayan blackberry (*Rubus discolor*), common reed (*Phragmites australis*), narrow leaf cattail *(Typha angustifolia*), water smartweed, nut sedge (*Cyperus eragrostis*), Bermuda grass, Dallis grass, annual rabbitsfoot grass and duckweed (*Lemna minuscula*). Hydrology in the drainages was variable with some areas completely dry at the time of the survey and others with several inches of water due to active irrigation at the time of the survey.

2.2.5 Upland Areas

A few additional sample points were established in upland areas including a non-irrigated pasture and ruderal areas immediately adjacent to the bridge structure. The non-irrigated pasture is characterized by foxtail barley, alkali sida and yellow star thistle. The soil in this area is a black (10 YR 2/1) sandy clay loam, similar to the adjacent irrigated pasture. Ruderal areas near the bridge were characterized by species such as rip-gut brome, wild radish, fennel, perennial pepperweed, and poison hemlock.

2.3 Description of Proposed Activities in Waters of the U.S. (including Wetlands)

The proximity of the proposed project to Waters of the U.S. (including wetlands) will result in temporary impacts to these features from project construction. Impacts were minimized and avoided to the maximum extent possible by implementing the avoidance and minimization measures and Best Management Practices (BMPs) listed in Chapter 4.

Waters of the U.S. (including wetlands) located within the existing Caltrans right-of-way (ROW) on Sherman Island were determined to be temporarily impacted. Temporary impacts in these areas include constructing temporary access roads and temporary staging areas. Temporary fill material consists of geo-textile fabric and crushed rock. Waters of the U.S. (including wetlands) on the south shore were determined to be temporarily impacted by the temporary marine trestle. Temporary impacts in these areas include shading and placement of temporary piles. Temporary fill material consists of 24-in hollow steel shell piles. Figure 4 (Maps 1 through 4) depict the temporary impacts to Waters of the U.S (including wetlands) expected as a result of project activities.

2.4 Area and Volume of Fill

Table 1 describes the proposed temporary impacts to Waters of the U.S. (including wetlands). The proposed project is expected to temporarily impact approximately 0.011 acres of Waters of the U.S. (excluding wetlands). Approximately 4.490 acres of Waters of the U.S. (wetlands) will be temporarily impacted during construction. A total of approximately 4.501 acres of Waters of the U.S. (including wetlands) will be restored after construction.

The area figures were determined through a GIS overlay analysis of the project footprint with the delineated waters of the U.S. (including wetlands). Volume of fill for the temporary access roads were estimated by calculating the standard volume of a trapezoidal prism, using the specifications from the project description of the temporary roadways being 40-ft wide at the base, 25-ft at the top, and with 2:1 slopes. Depths to the bottom of the San Joaquin River were obtained from bathymetric measurements made during geotechnical surveys for the project (Golder Associates 2007). To estimate volume of fill in the river from temporary piles, the depths for each pile were determined from taking the difference between the MHWM and

bottom depth for each pile, and these depths were then multiplied by the cross-sectional area of the pile. The volumes of fill are shown in Table 1.

Table 1 Summary of Impacts to Waters of the U.S. (including wetlands)

Feature Name	Map # in Figure 4	Permanent Impacts				Temporary Impacts			
		Area (ft^2)	Area (ac)	Volume (yd^3)	Length (lf)	Area (ft^2)	Area (ac)	Volume (yd^3)	Length (lf)
Waters of the U.S. (excluding wetlands)									
OW-1	1	-	-	-	-	477.522	0.011	310.05	-
Subtotal	**-**	**-**	**-**	**-**	**-**	**477.522**	**0.011**	**310.05**	**-**
Waters of the U.S. (wetlands)									
EM-1	1	-	-	-	-	6.283	0.0001	-	-
SW-1	2	-	-	-	-	1,089.00	0.025	161.3	-
I/D-1	3	-	-	-	-	261.36	0.006	38.72	40
I/D-2	3	-	-	-	-	1,698.84	0.039	251.68	134
SW-2	3	-	-	-	-	119,572	2.745	13,223.6	-
SW-3	3 & 4	**-**	**-**	**-**	**-**	72,936.0	1.675	8,640	-
Subtotal		**-**	**-**	**-**	**-**	**195,564**	**4.490**	**22,315.3**	**174**
Total		**-**	**-**	**-**	**-**	**196,041**	**4.501**	**22,625.4**	**174**

2.5 Cumulative and Indirect Impacts

The project is a seismic safety upgrade of the existing bridge. The main structure will not be altered beyond the upgrades defined in Chapter 1.2. The capacity of the roadway will not be increased, and no additional development resulting from this project is anticipated. Land on the north end of the bridge surrounding the Caltrans right-of-way is owned by the California Department of Water Resources, which leases the land to tenants for grazing cattle. The southern section of the project area is located in the East Bay Regional Park District's Oakley Regional Park and includes a small portion of a developed marina area.

There are no plans for development in any of these areas or within the project area of the proposed project, and cumulative effects are not anticipated. Surface flow and detention in the creeks, ditches, and wetland areas are expected to be the same after construction as before due to the implementation of the BMPs listed in Chapter 4. The project will have negligible contributions to cumulative and indirect effects to Waters of the U.S. (including wetlands).

Chapter 3 Other Environmental Impacts

3.1 Vegetation

3.1.1 Rare Plants

Botanical surveys were conducted in August and early September 2008 to capture late-summer blooming listed plant species as well as other special-status plants with potential to occur in the action area. No federally listed plant species were identified within the biological study area during the surveys. All plant species encountered during the botanical survey were identified to the extent necessary to determine if they met the criteria as a federal- or state-listed rare, threatened, or endangered species under the Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), CNPS or California Environmental Quality Act (CEQA) criteria (i.e., identified using local floras to the genus or species level). Given that the survey was conducted late in the 2008 blooming season, a follow-up survey is planned for spring and summer 2009 to identify occurrences of species that were outside of their blooming period in the 2008 survey. An amendment to the USFWS BA will be submitted upon completion of the spring 2009 botanical survey.

The late season special-status plant surveys identified two special status plants, Mason's lilaeopsis and Suisun Marsh aster, in the emergent wetland on the south shore of the San Joaquin River. If additional species are encountered during the 2009 special-status plant surveys, this document will be revised to reflect the survey results. However, due to the highly disturbed nature of the area on both the north and south ends of the bridge, additional occurrences are not anticipated at this time. No special-status plants were observed in the biological study area north of the San Joaquin River. The complete results of the special-status plant survey are presented in the USFWS Biological Assessment, included as Appendix B.

3.1.2 Native Trees

The project lies in an area that has been highly modified by human action. There are no trees in the irrigated pastures within the project limits on Sherman Island. Trees occur solely in the public park located at the base of the Antioch Bridge at the southern shore of the San Joaquin River. Landscaped areas consisted of manicured lawn, ornamental trees, poplars (*Populus* sp.), and non-irrigated areas dominated by yellow-star thistle (*Centaurea solstitialis*), kochia (*Kochia scoparia*), alfalfa

(*Medicago sativa*), and gumweed (*Grindelia camporum*). No native trees occur in the project limits.

3.1.3 Riparian Vegetation

Shaded riverine aquatic habitat (riparian plant cover) is absent throughout the project limits. The north bank of the San Joaquin River is a rip-rapped levee dominated by ruderal vegetation. The south shore consists predominantly of a landscaped park setting, with some remnant riprap on the shore and some fringing coastal brackish marsh (designated as EM-1 in Figure 4) within the tidal inundation zone.

3.2 Federally-listed Species

Federally-listed species (or those proposed for listing) that could potentially occur within the project area include the giant garter snake (GGS; *Thamnophis gigas*, federally threatened), Delta smelt (*Hypomesus transpacificus*; federally threatened), longfin smelt (*Spirinchus thaleichthys*; currently petitioned for threatened status), Chinook salmon (*Oncorhynchus tshawytscha*, including the federally endangered Sacramento River winter run and the federally threatened Central Valley spring run), Central Valley steelhead (*Oncorhynchus mykiss irideus*; federally threatened) and green sturgeon (*Acipenser medirostris*; federally threatened). The potential for the proposed project to affect each of these species is briefly addressed below. The Biological Assessments submitted to USFWS and NMFS, including a complete list of the avoidance and minimization measures that will be implemented to avoid and minimize impacts to these species is provided in Appendix B.

3.2.1 Giant Garter Snake

A search of the CNDDB indicates three GGS occurrence records within 10 miles of the action area; two of these records fall within 5 miles (CNDDB, 2008). These occurrences are described in further detail in the USFWS Biological Assessment (BA) included in Appendix B.

Habitat suitability and historical locality records suggest that GGS may be present in the project area. However, much of the project alignment is located more than 200-ft from aquatic habitat, and effects to this species is unlikely in areas where staging and construction activities are located more than 200-ft from aquatic areas. An evaluation of habitat suitability conducted by species expert Eric Hansen (Hansen 2008) identified potentially suitable habitat along the levee banks of Sherman Island,

particularly on the levee banks above Mayberry Slough and along the south bank of the San Joaquin River. Suitable habitat along the south bank of the San Joaquin River was extremely limited and, owing to regular disturbance the site receives as a city park, this area is unlikely to provide habitat for GGS.

If GGS are present within the project limits, aspects of the Project would result in an increased risk of mortality or species take. Potential impacts are associated with facilities construction and increased vehicle traffic on surface roads adjacent to open-water habitat during Project construction. GGS could be crushed beneath heavy construction equipment or entombed in below ground retreats during staging activities. Avoidance and minimization measures to reduce impacts to the giant garter snake are discussed in further detail in Chapter 4.

3.2.2 Delta Smelt and Longfin Smelt

No aquatic surveys were conducted for the Delta smelt. However, because the project area lies within designated critical habitat for delta smelt, presence of the species is inferred. This species may be present in the brackish water of the San Joaquin River where the Project is located.

No aquatic surveys were conducted for the longfin smelt. However, reviewing the seasonal variation in salinity and temperature for the Antioch monitoring station, salinity in this area is generally much lower than the preferred salinity levels for the species, so the species is likely to be present only during its spawning season, from November to June with its peak from February to April, with a preference for the Sacramento River.

Hydro-acoustic modeling was performed to analyze potential impacts to aquatic species during pile installation for the temporary marine trestle, in which peak sound levels above 206 db and cumulative sound exposure levels (SEL) above 183 db, levels that are lethal to fish smaller than 2 grams in mass, were identified.

The avoidance and minimization measures incorporated into the proposed project for the delta smelt and other listed fish species are discussed in further detail in Chapter 4.

3.2.3 Chinook Salmon

Several runs of Chinook Salmon pass through the project area in the San Joaquin River, including the federally endangered Sacramento River winter run, the federally

threatened Central Valley spring run, and the federal species of concern Central Valley fall and late-fall runs. Each of these runs are addressed below.

From their known life history characteristics, during the August 1 – November 30 proposed in-water work window for constructing the temporary marine trestle, adult Sacramento River winter-run Chinook salmon are spawning in the upper regions of the Sacramento River basin and are not likely to be present in the Project area. Should the construction work period needed for installing the temporary trestle extend into November, then adult Sacramento River winter-run Chinook salmon may be, but are unlikely to be, present within the Project limits.

From their known life history characteristics, spawning and rearing of the adult Central Valley spring-run Chinook salmon occur in the upper reaches of the Sacramento River watershed. The presence of Central Valley spring-run Chinook salmon in the BSA is inferred during the upstream migration of adults (March – May) and the downstream migration of juveniles (March – April). During the agency designated in-water work window from August 1 – November 30, Central Valley Spring-Run Chinook salmon will be absent from the project area.

The federal species of concern Central Valley Fall and Late Fall Run Chinook salmon are inferred to be present during the upstream migration of adults and the downstream migration of juveniles, which for the Fall Run (June – October) and the Late Fall Run (October – April) will occur during the agency designated in-water work window.

The avoidance and minimization measures for listed fish species are described in Chapter 4.

3.2.4 Central Valley Steelhead

Based on existing literature and the documented life history characteristics of Central Valley steelhead, adult Central Valley steelhead are expected to be present within the action area during the in-water work window.

Given that adult Central Valley steelhead are migrating through the project area during the August 1 – November 30 work window, it is highly unlikely that any individuals will be physically harmed by the cumulative sound exposure levels over the course of a working day, and mortality would only arise from impacting the piles to proof them. Harassment from the noise, however, is likely to occur. Any rearing or migrating Central Valley steelhead juveniles that may be present during pile driving

may be affected by the peak sound levels from piles being proofed and/or from cumulative sound levels over the course of a working day. However, the proposed avoidance and minimization measures for listed fish species, as described in Chapter 4, will minimize the likelihood of potential adverse effects and mortalities in these cases.

3.2.5 Southern Green Sturgeon

Based on existing literature and the documented life history characteristics of green sturgeon, juvenile/sub-adult green sturgeon are inferred to be present in the project area during the August 1 – November 30 in-water work window. From what is known of their life history, upstream migration of adult southern green sturgeon and spawning occur outside of the August 1 to November 30 in-water work window. Post-spawning adult southern green sturgeon remain in the Sacramento River through the fall, however, and are likely to return downstream to San Pablo Bay and the San Francisco Bay Estuary outside of the work window. Juvenile/sub-adult southern green sturgeon remain in the Delta region for two to three years prior to returning to the estuary or the ocean, so individual juvenile/sub-adult southern green sturgeon are inferred to be present within the action area during the August 1 to November 30 work window.

Avoidance and minimization measures for listed fish species are described in Chapter 4.

3.3 Archaeological and Historic Resources

Cultural resource surveys performed for this project did not identify any archaeological or historic resources that would be affected by the project. As a result, a Finding of No Historic Properties Affected was made. Appendix E contains the Final Cultural Resources Compliance memorandum and the Historic Property Survey Report.

Chapter 4 Avoidance and Minimization Measures and Proposed Mitigation

4.1 Avoidance and Minimization Measures

In conjunction with the National Environmental Policy Act, Executive Order 11990 requires that impacts to wetlands be avoided and minimized to the maximum extent practicable. The project has been designed to avoid and minimize impacts to Waters of the U.S. (including wetlands) to the maximum extent possible. The following design measures were implemented for avoidance and minimization:

- Free-spanning jurisdictional waters with trestles.
- Eliminating permanent pile driving in the San Joaquin River.
- Designing access roads to be temporary and to be removed upon completion of the project.

Caltrans will implement the following avoidance and minimization measures, including BMPs to ensure protection of the aquatic environment and water quality. These include:

1) Caltrans will delineate environmentally-sensitive areas (ESAs) on the final plans and will install temporary fencing outlining the ESA prior to project initiation that will remain in place until completion of the project.

2) No work activities, equipment storage, or construction material storage will occur inside these ESA limits to minimize impacts to seasonal wetlands and giant garter snake habitat.

3) Caltrans will maintain erosion and sediment control measures identified by the Central Valley Regional Water Quality Control Board (RWQCB) during the construction period. These measures include the use of filter fabric, silt fences and fiber rolls as described in Chapter 1.

4) Best management practices (BMPs), including a Storm Water Pollution Prevention Plan and Water Pollution Control Program, will be implemented to

minimize effects to federally listed species during construction. Best management practices will be implemented to prevent sedimentation from entering environmentally sensitive areas (ESAs) and to reduce erosion, dust, noise, and other deleterious aspects of construction related activities. These BMPs may include, but are not limited to, silt fencing, fiber rolls, and restrictions on cleaning and fueling equipment in or near ESAs. Runoff from dust control and hazardous materials will be retained on the construction site and prevented from flowing into the ESAs.

5) Three jurisdictional water features (OW-2, SW-4 and I/D-5 on Figure 4 and Table 1) will be free-spanned with trestles.

6) Project sites shall be revegetated with an appropriate assemblage of native grasses suitable for the area and shall provide USFWS with a species list. The revegetation plan is presented in Section 4.2.

7) During construction, Caltrans will remove all trash and construction debris from the work areas on a daily basis. All food-related trash items, such as wrappers, cans, bottles, and food scraps, must be disposed of in closed containers and removed at the end of each workday from the entire project site.

8) All fueling and maintenance of vehicles and other equipment and staging areas shall occur at least 20 meters from any riparian habitat or water body. Caltrans will ensure that fueling, maintenance, and staging do not contaminate the site. During project construction, Caltrans will implement a plan that ensures a prompt and effective response to any accidental spills.

9) A Worker Environmental Awareness Training Program for construction personnel shall be conducted by the USFWS-approved biologist for all construction workers, including contractors, prior to the commencement of construction activities. The program shall provide workers with information on their responsibilities with regard to federally listed species, an overview of the life history of these species, information on take prohibitions, protections afforded this species under the Endangered Species Act, and an explanation of the relevant terms and conditions of the forthcoming Biological Opinions. Written documentation of the training must be submitted to the Sacramento Fish and Wildlife and NMFS Office within 30 days of the completion of training.

10) Caltrans will implement several measures to avoid and minimize adverse effects to listed fish species when construction occurs in the San Joaquin River. The following minimization measures are proposed:

- Restricting in-water work to the window of August 1 – November 30.
- Requiring the contractor to install all temporary piles for the temporary marine trestle with a vibratory pile driver, limiting the maximum pile size to a maximum diameter of 24 in. Caltrans will proof one pile per day for every 4 – 6 piles installed by vibration.
- Performing hydro-acoustic monitoring to measure sound levels in the water.

11) Caltrans will implement several measures to avoid and minimize potential effects to GGS during construction. The following minimization measures are proposed, following guidelines presented in a recent biological opinion (USFWS 2008) and programmatic consultation (USFWS 2004):

- All ground-disturbing construction activity within GGS habitat shall be conducted between May 1 and October 1. Given that all construction activity is confined to upland habitat (over-wintering and movement habitat), the laying of temporary access roads in giant garter snake habitat will occur during the snake's active season; once the temporary access road is in place, no further ground disturbing activity will take place, and mortality to any individuals of the species during hibernation due to construction is not anticipated.
- A qualified biologist shall inspect construction-related activities at the proposed Project site to ensure that no unauthorized take of federally listed species or destruction of their habitat occurs. The biologist shall be available for monitoring throughout all phases of construction that may result in adverse effects to the GGS. Additionally, if a GGS is encountered during construction, the biologist shall have the authority through communication with the resident engineer to stop construction activities in the immediate area until appropriate corrective measures have been completed, or until the snake is determined to be unharmed. Snakes encountered during construction activities shall be allowed to move away from the area on their own volition. The biologist shall notify the USFWS immediately if any listed species are found on-site, and will submit a report, including date(s), location(s), habitat description, and any

corrective measures taken to protect the species found. The biologist shall be required to report any take of listed species to the Service immediately by telephone at 916/ 414-6600 and by electronic mail or written letter addressed to the Chief, Endangered Species Division, within three (3) working days of the incident.

- At most, 24 hours prior to the commencement of construction activities, the Project site shall be surveyed for GGS by a qualified biologist. The Project area shall be re-inspected by the monitoring biologist whenever a lapse in construction activity of two weeks or greater has occurred.

- Tightly woven fiber netting or similar material shall be used for erosion control and other purposes at the Project site to ensure that the GGS is not trapped or become entangled. This limitation shall be communicated to the contractor using special provisions included in the bid solicitation package.

- During construction operations, the number of access routes, number and size of staging areas, and the total area of the proposed Project activity will be limited to the minimum necessary. Routes and boundaries will be clearly demarcated. Movement of heavy equipment to and from the Project site will be restricted to established roadways to minimize habitat disturbance. Project-related vehicles shall observe a 20-mile-per-hour speed limit within construction areas, except on county roads and on state and federal highways. This is particularly important during periods when the snake may be sunning or moving on roadways. All heavy equipment, vehicles, and supplies will be stored at the designated staging area at the end of each work period.

- During construction operations, stockpiling of construction materials, portable equipment, vehicles, and supplies will be restricted to the designated construction staging areas and exclusive of the ESAs. Caltrans will ensure that contamination of habitat does not occur during such operations.

- Prior to the commencement of construction activities, high visibility fencing will be erected around the habitats of federally listed species to identify and protect these designated environmentally sensitive areas from encroachment of personnel and equipment. These areas will be avoided by all construction personnel. The fencing shall be inspected before the start of each work day and maintained by the Project proponents until completion of the Project. The fencing may be removed only when the construction of the Project is

completed. Fencing will be established at least 200-ft from the edge of aquatic snake habitat.

- Signs will be posted every 50-ft along the edge of the ESAs, with the following information: “This area is habitat of federally-threatened and/or endangered species, and must not be disturbed. These species are protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment.” The signs should be clearly readable from a distance of 20-ft, and must be maintained for the duration of construction.

- After construction activities are complete, any temporary fill or construction debris shall be removed and disturbed areas restored to their pre-project conditions. An area subject to “temporary” disturbance includes any area that is disturbed during the Project, but that, after Project completion, will not be subject to further disturbance and has the potential to be re-vegetated. All snake habitats subject to temporary ground disturbances, including storage and staging areas and temporary roads, will be restored. These areas shall be re-contoured, if appropriate, and re-vegetated with appropriate locally collected native plant species to promote restoration of the area to pre-project conditions. Appropriate methods and plant species used to re-vegetate such areas will be determined on a site-specific basis. Restoration work may include replanting emergent vegetation. A written report shall be submitted to the Service within ten (10) working days of the completion of construction at the Project site.

- Caltrans will restore the site to pre-construction conditions and monitor the Project site for one (1) year following the completion of construction and restoration activities. Monitoring reports documenting the restoration effort should be submitted to the Service upon the completion of the restoration implementation and one (1) year after the restoration implementation. Monitoring reports should include photo-documentation, when restoration was completed, what materials were used, specified plantings, and justifications of any substitutions to the Service-recommended guidelines.

4.2 Proposed Mitigation and Monitoring

Since all impacts to U.S. waters and wetlands are temporary in nature, off-site mitigation is not proposed for this project. The vegetation in areas of temporary impacts will be restored to preconstruction conditions, and is expected to take on the same vegetation community structure of the existing pastures adjacent to the areas of impact. Restoration will be accomplished by disking the top 4 to 6 inches of the soil and applying a seed mixture of native grasses. The seed mixture will include *Deschampsia caespitosa* (Prostrate Tufted Hairgrass), *Hordeum californicum* (California Barley), *Nassella pulchra* (Purple Needlegrass), *Vulpia microstachys* (Three Weeks Fescue). Monitoring of the revegetation effort is not proposed.

Chapter 5 Compliance with Nationwide Permit Program

The NWP proposed for this project is NWP 3 (*Maintenance*). Listed below are the general conditions and regional conditions for the NWP Program (USACE Sacramento District) and a statement of compliance for each condition.

5.1 General Conditions

Listed below are the general conditions and regional conditions for the NWP Program (USACE Sacramento District), as reissued on March 12, 2007, and a statement of compliance for each condition. Appendix F contains an excerpt from the Federal Register outlining NWP 3.

1. **Navigation.** Caltrans has been in consultation with the United States Coast Guard (USCG) in establishing a lighting plan for the temporary trestle and for conducting barge work in the San Joaquin River. In a letter dated September 15, 2008, the USCG indicated to Caltrans that the project will have no impact on navigation.

2. **Aquatic Life Movements.** The project will not impact aquatic life movements because the 24-inch piles of the temporary marine trestle will not impede the migration of fish through the San Joaquin River.

3. **Spawning Areas.** The project will not impact spawning areas because the agency designated in-water work window occurs outside the spawning season for the fish species likely to be present in the project area.

4. **Migratory Bird Breeding Areas.** The project does not impact waters of the U.S. that serve as breeding habitat for migratory birds.

5. **Shellfish Beds.** Shellfish beds are not present in the project area.

6. **Suitable Material.** All material that will be placed in Waters of the U.S. (including wetlands) will be clean rock or fill. The clean rock or fill will be removed upon completion of the project.

7. **Water Supply Intakes.** This project will not affect any water supply intakes.

8. **Adverse Effects from Impoundments.** The proposed project does not include any activities that will result in the impoundment of water.

9. **Management of Water Flows.** The course, condition, capacity and location of all open water features will not be altered by the project.

10. **Fills Within 100-year Floodplains.** The proposed project will comply with applicable floodplain management requirements.

11. **Equipment.** The proposed project will not involve heavy equipment working in wetlands. Temporary access roads constructed of rock over filter fabric to preserve the integrity of jurisdictional waters and wetlands will be utilized, as described in this document.

12. **Soil Erosion and Sediment Controls.** Caltrans will implement standard BMPS to manage soil erosion and sediment. BMPs may include (but will not be limited to) the use of fiber rolls, silt fences, and demarcation of ESAs that are adjacent to the project area. Specifically, the project will utilize:

    - Temporary Reinforced Silt Fence (Type 1)
    - Erosion Control (Type D)
    - Temporary Fiber Roll
    - Temporary Fence (Type ESA)

13. **Removal of Temporary Fills.** All temporary fill materials used during construction will be removed following construction, and the area will be contoured to match pre-construction grade and revegetated with native seed stock.

14. **Proper Maintenance.** All structures installed as part of the proposed project, including the temporary access roads and staging areas, will be properly and regularly maintained by Caltrans.

15. **Wild and Scenic Rivers.** The project will not impact any waterways that are designated as a Wild and Scenic River.

16. **Tribal Rights.** The project will not involve tribal rights, such as tribal water, hunting, and/or fishing rights.

17. **Endangered Species.** As described in Section 3.0, giant garter snake, Delta smelt, longfin smelt, Chinook salmon (Sacramento River winter run and Central Valley spring run), Central Valley steelhead and green sturgeon are known to occur or have the potential to occur within the project area. Avoidance and minimization measures, as described in Section 4.0 and in Appendix B, will be implemented to minimize impacts to all listed species.

18. **Historic Properties.** No historic properties were identified for this project. Appendix E contains information relevant to this condition.

19. **Designated Critical Resource Waters.** The project site does include designated critical habitat for Delta smelt and Central Valley steelhead. This document serves as notification to the USACE for purposes of satisfying this general condition for NWP 3.

20. **Mitigation.** Impacts to Waters of the U.S., including wetlands, have been avoided to the maximum extent feasible, and all temporary impacts will be mitigated for as described in Section 4.2.

21. **Water Quality.** Water Quality Certification will be requested from the RWQCB. A copy of the Section 401 Water Quality Certification will be supplied to the USACE upon receipt.

22. **Coastal Zone Management.** This project is not located within the state's coastal zone and is not expected to affect land or water uses or natural resources within the coastal zone. Therefore, documentation of consistency with the Coastal Zone Management Act is not required.

23. **Regional and Case-By-Case Conditions.** Compliance with regional conditions is described in Section 5.3.

24. **Multiple Use of Nationwide Permits.** Multiple NWPs are not being used for this project.

25. **Transfer of Nationwide Permit Verifications.** The proposed project area is not expected to undergo transfer of ownership.

26. **Compliance Certification.** The applicant will sign the authorization letter that will accompany the NWP verification certifying that the work and any required mitigation will be completed in accordance with the permit conditions.

27. **Pre-construction Notification.** This document is intended to provide notification, as required by this general condition for NWP 3. A wetland delineation has been completed and verified (see Appendices D, E, and F) in fulfillment of the requirements for NWP 3. Other requirements of this NWP, including a discussion of avoidance and minimization measures, are included as part of this Pre-construction Notification.

28. **Single and Complete Project.** The proposed activity is part of a single and complete project.

5.2 NWP-Specific Requirements Checklist

A. **Nationwide 03 (case iii)**.

The use of NWP 3 is requested for the rehabilitation of the Antioch Bridge in order to meet current safety design standards.

B. **Nationwide 07**.

This NWP is not applicable to this project.

C. **Nationwides 13, 14, 18, 29, 39, 40, 42, 43, 44**.

These NWPs is not applicable to this project.

D. **Nationwide 31**.

This NWP is not applicable to this project.

E. **Nationwide 40**

This NWP is not applicable to this project.

5.3 Regional Conditions

1. **Is the Project in a Fen?**

The project is not in a fen.

2. **Will Mitigation be Completed Before or Concurrent with Construction of the Project?**

No offsite mitigation for Waters of the U. S. (including wetlands) are proposed. Restoration of temporary impacts to seasonal wetlands is described in Chapter 4 of this document. Caltrans will purchase credits from USFWS and CDFG approved mitigation banks to offset impacts to 0.218 acres of upland habitat for giant garter snake and 0.15 acres of shaded shallow water habitat (as a proxy for "take") for Delta smelt.

3. **Is a Statement Attached Explaining How Avoidance and Minimization of Impacts Were Achieved?**

   Chapter 4 of this document explains the avoidance and minimization measures used for this project. The project has been designed to avoid and minimize impacts to Waters of the U.S. (including wetlands) to the maximum extent possible.

4. **Is the Project in Lake Tahoe?**

   The project is not in Lake Tahoe.

Chapter 6 Site-specific Public Interest Factors

Table 2 lists site-specific information on public interest factors.

Table 2 Site Specific Information on Public Interest Factors

(Per U.S. Army Corps of Engineers Public Notice 97-3, March 28, 1997)

Public Interest Factor	Project Impact
Conservation	No significant effect on conservation interests will occur as a result of the proposed project.
Economics	The project is not expected to have a significant effect on economics.
Aesthetics	The project may result in minor impacts to the visual character of the area due to construction activities, and the addition of cross-bracing between the columns on each bridge pier. However, the construction activities will be temporary and the visual impact is not expected to significantly impact aesthetics.
General Environmental Concerns	Implementation of the Avoidance and Mitigation Measures presented in this document and in Appendix B will prevent significant environmental impacts.
Wetlands	Impacts to Waters of the U.S., including wetlands, have been avoided to the maximum extent feasible. All impacts are temporary, all temporary fills will be removed at the end of the project, and the temporarily impacted areas will be restored.
Fish and Wildlife Values	Implementation of the proposed project could potentially affect fish and wildlife species (see Appendix B for effects on all Endangered Species Act-listed species). However, with implementation of the avoidance and minimization measures listed in Chapter 4 and the mitigation in Appendix B, impacts are expected to be less than significant.
Flood Hazards	No adverse effect to flood hazards will occur as a result of the proposed project.
Floodplain Values	Floodplain values, including flood storage, will not be adversely impacted by the proposed project.
Land Use	The land use within the majority of the existing ROW consists of grazed farmland. On the southern shore of the San Joaquin River, land use is a public park (Oakley Regional Park) administered by the East Bay Regional Park system
Shoreline Accretion	The project area is not located within the ocean shoreline.
Recreation	The proposed project will not affect recreation.
Water Supply and Conservation	The proposed project will not affect water supply and conservation.
Energy Needs	The proposed project will not affect energy needs.
Safety	The proposed project will benefit the public by improving seismic safety.

Table 2 Site Specific Information on Public Interest Factors

(Per U.S. Army Corps of Engineers Public Notice 97-3, March 28, 1997)

Public Interest Factor	Project Impact
Food and Fiber Production	The proposed project will not impact the production of food and fiber.
Mineral Needs	The proposed project will not impact mineral needs.
Considerations of Property Ownership	In order to implement the proposed project, Caltrans will acquire additional temporary construction easements (TCE). However, conversion of this land to TCE is not expected to impact land ownership within the region.
Needs and Welfare of the People	This project would result in a benefit to the public by improving seismic safety.

Chapter 7 References

California Natural Diversity Database (CNDDB). 2008. Records search of the Antioch North, Jersey Island, Rio Vista, Isleton, Bouldin Island, Woodward Island, Brentwood, Antioch South, Clayton, Honker Bay, Denverton, and Bird's Landing 7.5-minute quadrangles. V 3.0.05. California Department of Fish and Game.

Federal Register. 2007. Reissuance of Nationwide Permits. Vol. 72, No. 47. March 12.

Golder Associates. 2007. Results of the Offshore Geophysical Investigation: Dumbarton and Antioch Bridges.

Hansen, E.C. 2008. Evaluation of Giant Garter Snake habitat and consideration of potential species impacts for the Antioch Bridge Seismic Retrofit Project, Sacramento and Contra Costa Counties, California. November 12, 2008.

U.S. Army Corps of Engineers (USACE). 1987. Waterways Experiment Station. *Corps of Engineers Wetland Delineation Manual*. Wetlands Research Program Technical Report Y-87-1. Vicksburg, MS.

_____. 2006. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West*.

U.S. Fish and Wildlife Service (USFWS). 2008. Biological Opinion on the Sacramento International Airport Terminal Modernization Project in Sacramento County, California. Sacramento. 34 pages.

_____. 2004. Programmatic formal consultation for U.S. Army Corps of Engineers 404 permitted projects with relatively small effects on the giant garter snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo counties, California. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office. 1-1-F-97-149.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

August 20, 2009

Regulatory Division (SPK-2008-01340)

California Department of Transportation
Jeffery G. Jensen
Chief, Office of Biological Sciences and Permits
111 Grand Avenue
P.O. Box 23660
Oakland California 94623-0660

Dear Mr. Jensen:

We are responding to your April 10, 2009 request for a Department of the Army permit for the Antioch Bridge Seismic Retrofit project. This approximately 383-acre project involves activities, including discharges of dredged or fill material, in waters of the United States to retrofit selected marine footings, land piers, grade beam structures, and Bents 4-38, in the river channel and on Sherman Island. The project is located on or near San Joaquin River, in Sections 3, 4, 9, 10, 15, and 16, Township 2 North, Range 2 East, M.D.B.&M. Survey, Latitude 38° 2' 41.2", Longitude 121° 45' 5.9", Contra Costa and Sacramento Counties, California.

Based on the information you provided, the proposed activity in approximately 4.501 acres of waters of the United States, including wetlands, is authorized by Nationwide Permit Number 3, Maintenance. The proposed temporary impacts associated with this work include; approximately 0.011-acre of impacts to San Joaquin River and approximately 4.490 acres of impacts to wetlands abutting San Joaquin River. However, until Section 401 Water Quality Certification for the activity has been issued or waived, our authorization is denied without prejudice. Once you have provided us evidence of water quality certification, the activity is authorized and the work may proceed subject to the conditions of certification and the Nationwide Permit. Your work must comply with the general terms and conditions listed on the enclosed Nationwide Permit information sheets and the following special conditions:

1. To mitigate for the temporary loss of 4.501 acres of waters of the U.S. and abutting wetlands, you shall restore the 4.501 acres of waters of the U.S., including wetlands, back to their pre-existing condition. Upon completion of construction, you shall return the disturbed areas back to their per-construction elevation and grade. The temporarily affected areas shall be re-vegetated according to the document entitled *Antioch Bridge Seismic Retrofit Project NWP PCN Package*, dated April 2009.

2. To ensure mitigation success, you shall monitor the on-site re-establishment areas for one year. This period shall commence upon completion of the authorized fill activity, but not later than one year after the initiation of fill activity. You shall submit a monitoring report to this office at the end of the first-year monitoring period.

3. To ensure mitigation compliance, continued success of the re-establishment areas, without human intervention, must be demonstrated for one consecutive year. The mitigation will not be deemed successful until this criterion has been met. A final monitoring report shall be submitted at the end of the one year period demonstrating successful re-establishment of vegetation without human intervention. The primary focus of this monitoring shall be to assure that the temporary impact areas are successfully restored and maintained, and the integrity of water quality is maintained.

4. To document pre-project construction conditions, you shall submit numbered and dated pre-construction photos of waters of the U.S. (including wetlands) to be impacted within the project site.

5. To document post-project construction conditions, you shall submit numbered and dated post-construction photos of temporarily impacted waters of the U.S. (including wetlands) taken in approximately the same locations as the pre-project photos, within 30 days after project completion.

6. Your responsibility to complete the required compensatory mitigation as set forth in Special Condition 1 will not be considered fulfilled until you have demonstrated mitigation success and have received written verification from the U.S. Army Corps of Engineers.

7. This Corps permit does not authorize you to take an endangered species, in particular giant garter snake *(Thamnophis gigas)*, delta smelt *(Hypomesus transpacificus),* longfin smelt *(Spirincus thaleichthys)*, Sacramento River winter-run Chinook salmon Evolutionary Significant Unit [ESU] *(Oncoryhynchus tshawytscha),* Central Valley spring-run Chinook salmon ESU *(Oncoryhynchus tshawytscha),* Central Valley steelhead Distinct Population Segment [DPS] *(Oncoryhynchus mykiss irideus)*, North American green sturgeon southern DPS *(Acipenser medirostris)*, or designated critical habitat. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (e.g., an Endangered Species Act Section 10 permit, or a Biological Opinion under Endangered Species Act Section 7, with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service Biological Opinion (Number 81420-2008-F-1537-3, dated August 14, 2009) and National Marine Fisheries Service Biological and Conference Opinion (Number 2009/00173, dated June 23, 2009 and errata sheet dated August 18, 2009), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the Biological and/or Conference Opinions. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with "incidental take" of the attached Biological and/or Conference Opinions, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the Biological/Conference Opinions, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The Fish and Wildlife Service and/or National Marine Fisheries Service are the appropriate authorities to determine compliance with the terms and conditions of their Biological/Conference Opinions, and with the Endangered Species Act. The permittee must comply with all conditions of the Biological and/or Conference Opinions, including those ascribed to the Corps.

8. You shall design and construct all crossings of waters of the U.S. to retain a natural substrate and to accommodate all reasonably foreseeable fish passage, and expected high flows. Examples of water crossings include bridges, trestles, culverts, and pipes.

9. You shall follow the specifications and standards described in the Storm Water Pollution Prevention Plan (SWPPP) and/or Water Pollution Control Plan (WPCP), to prevent erosion and sedimentation during and after construction.

10. You shall employ Best Management Practices (BMP's) to avoid and minimize environmental impacts. Temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations and conditions. The affected areas must be re-vegetated with a weed-free native seed mix.

11. Excavated materials shall only be placed in upland locations. The upland disposal site(s) shall be delineated for waters of the U.S. and must be approved by the Corps of Engineers prior to disposal.

12. All equipment staging, including Temporary Construction Areas (TCA's), shall take place within Caltrans approved areas within the project boundary. Prior to construction implementation, you shall ensure all equipment staging, TCA's, demolition and disposal, excavation, off pavement detour, and borrow and fill areas, have been evaluated under National Environmental Policy Act (NEPA), Section 401 and 404 of the Clean Water Act, Section 7 of the Endangered Species Act and Section 106 of the National Historical Preservation Act and all required permits have been obtained.

13. You must allow representatives from the Corps of Engineers to inspect the authorized activity and any avoidance areas at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

14. To prevent unauthorized fills and unforeseen impacts, you shall, prior to proceeding with any activity otherwise authorized by this permit, install high-visibility fencing and appropriate signage around the entire perimeter of avoided waters of the U.S. within the project area. To ensure fencing is installed in the appropriate locations, a qualified construction site monitor shall be present when fencing is erected. All fencing surrounding avoidance areas shall allow unrestricted visibility of these areas to discourage vandalism, destruction or disturbance.

15. You must install and maintain, at your expense, any safety lights and signals prescribed by the United States Coast Guard (USCG), through regulations or otherwise, on your authorized facilities.

Your use of the permitted activity must not interfere with the public's right to free navigation on all navigable waters of the United States.

You understand and agree, that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, you will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

You must sign the enclosed Compliance Certification and return it to this office within 30 days after completion of the authorized work.

This verification is valid for two years from the date of this letter or until the Nationwide Permit is modified, reissued, or revoked, whichever comes first. Failure to comply with the General Conditions of this Nationwide Permit, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website at: http://per2.nwp.usace.army.mil/survey.html.

Please refer to identification number SPK-2008-01340 in any correspondence concerning this project. If you have any questions, please contact Ms. Leah Fisher at our California North Branch Office, 1325 J Street, Room 1480, Sacramento, California 95814-2922 email *leah.m.fisher@usace.army.mil*, or telephone 916-557-6639. You may also use our website: *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Paul Maniccia

Paul M. Maniccia
Chief, California South Branch

Enclosure(s)

Copy furnished without enclosure(s)

Mr. William Marshall, Storm Water and Water Quality Certification Unit, Central Valley Regional Water Quality Control Board, 11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114

Mr. Ryan Olah, Coast Bay-Delta Branch, Endangered Species Division, U.S. Fish and Wildlife Service, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901

Mr. Chris States, California Department of Transportation, Division of Environmental Planning & Engineering, Mail Station 8E, P.O. Box 23660, Oakland California 94623-0660

Ms. Monica Gutierrez, National Marine Fisheries Service, 650 Capitol Mall, Suite 8-300, Sacramento California 95814

COMPLIANCE CERTIFICATION

Permit File Number: SPK-2008-01340, Antioch Bridge Seismic Retrofit Project

Nationwide Permit Number: 3, Maintenance

Permittee:
California Department of Transportation
Jeffery G. Jensen
Chief, Office of Biological Sciences and Permits
111 Grand Avenue
P.O. Box 23660
Oakland California 94623-0660

County: Sacramento

Date of Verification: August 20, 2009

Within 30 days after completion of the activity authorized by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Sacramento District, Regulatory Division
1325 J Street Room 1480
Sacramento, California 95814-2922
Fax: 916-557-6877

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of the permit your authorization may be suspended, modified, or revoked. If you have any questions about this certification, please contact the Corps of Engineers.

* * * * * * * * *

I hereby certify that the work authorized by the above-referenced permit, including all the required mitigation, was completed in accordance with the terms and conditions of the permit verification.

_____ _____
Signature of Permittee Date

3. Maintenance.

(a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This NWP authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(b) This NWP also authorizes the removal of accumulated sediments and debris in the vicinity of and within existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.) and the placement of new or additional riprap to protect the structure. The removal of sediment is limited to the minimum necessary to restore the waterway in the immediate vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend further than 200 feet in any direction from the structure. This 200 foot limit does not apply to maintenance dredging to remove accumulated sediments blocking or restricting outfall and intake structures or to maintenance dredging to remove accumulated sediments from canals associated with outfall and intake structures. All dredged or excavated materials must be deposited and retained in an upland area unless otherwise specifically approved by the district engineer under separate authorization. The placement of riprap must be the minimum necessary to protect the structure or to ensure the safety of the structure. Any bank stabilization measures not directly associated with the structure will require a separate authorization from the district engineer.

(c) This NWP also authorizes temporary structures, fills, and work necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

(d) This NWP does not authorize maintenance dredging for the primary purpose of navigation or beach restoration. This NWP does not authorize new stream channelization or stream relocation projects.

Notification: For activities authorized by paragraph (b) of this NWP, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). Where maintenance dredging is proposed, the pre-construction notification must include information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals. (Sections 10 and 404)

Note: This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Clean Water Act Section 404(f) exemption for maintenance**.**

A. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as appropriate, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP.

☐ **1. Navigation.**

☐ (a) No activity may cause more than a minimal adverse effect on navigation.

☐ (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

☐ (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made

against the United States on account of any such removal or alteration.

☐ **2. Aquatic Life Movements**. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

☐ **3 Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized**.**

☐ **4. Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

☐ **5. Shellfish Beds**. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48.

☐ **6. Suitable Material**. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

☐ **7. Water Supply Intakes**. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

☐ **8. Adverse Effects From Impoundments**. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

☐ **9. Management of Water Flows**. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

☐ **10. Fills Within 100-Year Floodplains**. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

☐ **11. Equipment**. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

☐ **12. Soil Erosion and Sediment Controls**. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

☐ **13. Removal of Temporary Fills**. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

☐ **14. Proper Maintenance**. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

☐ **15. Wild and Scenic Rivers**. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

☐ **16. Tribal Rights**. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

☐ **17. Endangered Species**.

☐ (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

☐ (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

☐ (c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have

"no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed.

☐ (d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

☐ (e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide Web pages at http://www.fws.gov/ and http://www.noaa.gov/fisheries.html respectively.

☐ **18. Historic Properties**.

☐ (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

☐ (b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

☐ (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

☐ (d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

☐ (e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

☐ **19. Designated Critical Resource Waters.** Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment.

☐ (a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and

50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

☐ (b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

☐ **20 Mitigation.** The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

☐ (a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

☐ (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

☐ (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10 acre and require pre-construction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. For wetland losses of 1/10 acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

☐ (d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment.

☐ (e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2 acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2 acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

☐ (f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

☐ (g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

☐ (h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

☐ **21. Water Quality.** Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

☐ **22. Coastal Zone Management**. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

☐ **23. Regional and Case-By-Case Conditions**. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

☐ **24. Use of Multiple Nationwide Permits**. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit

of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

☐ **25. Transfer of Nationwide Permit Verifications**. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

(Transferee)

(Date)

☐ **26. Compliance Certification**. Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include:

☐ (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions;

☐ (b) A statement that any required mitigation was completed in accordance with the permit conditions; and

☐ (c) The signature of the permittee certifying the completion of the work and mitigation.

☐ **27. Pre-Construction Notification.**

☐ (a) **Timing**.. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

☐ (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

☐ (2) Forty-five calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

☐ (b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

☐ (1) Name, address and telephone numbers of the prospective permittee;

☐ (2) Location of the proposed project;

☐ (3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);

☐ (4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must

be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;

☐ (5) If the proposed activity will result in the loss of greater than 1/10 acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

☐ (6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

☐ (7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

☐ (c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

☐ (d) Agency Coordination:

☐ (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

☐ (2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring pre-construction notification to the district engineer that result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

☐ (3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

☐ (4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination.

☐ (5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

☐ (e) In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than 1/10 acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and

conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

☐ **(a) 28. Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

B. Regional Conditions:

I. Sacramento District (All States, except Colorado)

1. When pre-construction notification (PCN) is required, the prospective permittee shall notify the Sacramento District in accordance with General Condition 27 using either the South Pacific Division Preconstruction Notification (PCN) Checklist or a completed application form (ENG Form 4345). In addition, the PCN shall include:

a. A written statement explaining how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States;

b. Drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and size (in acreage) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the high tide line should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation; and

c. Pre-project color photographs of the project site taken from designatedlocations documented on the plan drawing.

2. The permittee shall complete compensatory mitigation required by special conditions of the NWP verification before or concurrent with construction of the authorized activity, except when specifically determined to be impracticable by the Sacramento District. When project mitigation involves use of a mitigation bank or in-lieu fee program, payment shall be made before commencing construction.

3. The permittee shall record the NWP verification with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records of title to or interest in real property against areas (1) designated to be preserved as part of mitigation for authorized impacts, including any associated covenants or restrictions, or (2) where structures such as boat ramps or docks, marinas, piers, and permanently moored vessels will be constructed in or adjacent to navigable waters (Section 10 and Section 404). The recordation shall also include a map showing the surveyed location of the authorized structure and any associated areas preserved to minimize or compensate for project impacts.

4. The permittee shall place wetlands, other aquatic areas, and any vegetative buffers preserved as part of mitigation for impacts into a separate "preserve" parcel prior to discharging dredged or fill material into waters of the United States, except where specifically determined to be impracticable by the Sacramento District. Permanent legal protection shall be established for all preserve parcels, following Sacramento District approval of the legal instrument.

5. The permittee shall allow Corps representatives to inspect the authorized activity and any mitigation areas at any time deemed necessary to determine compliance with the terms and conditions of the NWP verification. The permittee will be notified in advance of an inspection.

6. For NWPs 29, 39, 40, 42, 43, 44, and 46, requests to waive the 300 linear foot limitation for intermittent or ephemeral waters of the U.S. shall include an evaluation of functions and services provided by the waterbody taking into account the watershed, measures to be implemented to avoid and minimize impacts, other measures to avoid and minimize that were found to be impracticable, and a mitigation plan for offsetting impacts.

7. Road crossings shall be designed to ensure fish passage, especially for anadromous fisheries. Permittees shall employ bridge designs that span the stream or river, utilize pier or pile supported structures, or involve large bottomless culverts with a natural streambed, where the substrate and streamflow

conditions approximate existing channel conditions. Approach fills in waters of the United States below the ordinary high water mark are not authorized under the NWPs, except where avoidance has specifically been determined to be impracticable by the Sacramento District.

8. For NWP 12, clay blocks, bentonite, or other suitable material shall be used to seal the trench to prevent the utility line from draining waters of the United States, including wetlands.

9. For NWP 13, bank stabilization shall include the use of vegetation or other biotechnical design to the maximum extent practicable. Activities involving hard-armoring of the bank toe or slope requires submission of a PCN per General Condition 27.

10. For NWP 23, the PCN shall include a copy of the signed Categorical Exclusion document and final agency determinations regarding compliance with Section 7 of the Endangered Species Act, Essential Fish Habitat under the Magnussen-Stevens Act, and Section 106 of the National Historic Preservation Act.

11. For NWP 44, the discharge shall not cause the loss of more than 300 linear feet of streambed. For intermittent and ephemeral streams, the 300 linear foot limit may be waived in writing by the Sacramento District. This NWP does not authorize discharges in waters of the United States supporting anadromous fisheries.

12. For NWPs 29 and 39, channelization or relocation of intermittent or perennial drainage, is not authorized, except when, as determined by the Sacramento District, the relocation would result in a net increase in functions of the aquatic ecosystem within the watershed.

13. For NWP 33, temporary fills for construction access in waters of the United States supporting fisheries shall be accomplished with clean, washed spawning quality gravels where practicable as determined by the Sacramento District, in consultation with appropriate federal and state wildlife agencies.

14. For NWP 46, the discharge shall not cause the loss of greater than 0.5 acres of waters of the United States or the loss of more than 300 linear feet of ditch, unless this 300 foot linear foot limit is waived in writing by the Sacramento District.

15. For NWPs 29, 39, 40, 42, and 43, upland vegetated buffers shall be established and maintained in perpetuity, to the maximum extent practicable, next to all preserved open waters, streams and wetlands including created, restored, enhanced or preserved waters of the U.S., consistent with General Condition 20. Except in unusual circumstances, vegetated buffers shall be at least 50 feet in width.

16. All NWPs except 3, 6, 20, 27, 32, 38, and 47, are revoked for activities in histosols and fens and in wetlands contiguous with fens. Fens are defined as slope wetlands with a histic epipedon that are hydrologically supported by groundwater. Fens are normally saturated throughout the growing season, although they may not be during drought conditions. For NWPs 3, 6, 20, 27, 32, and 38, prospective permittees shall submit a PCN to the Sacramento District in accordance with General Condition 27.

17. For all NWPs, when activities are proposed within 100 feet of the point of groundwater discharge of a natural spring, prospective permittees shall submit a PCN to the Sacramento District in accordance with General Condition 27. A spring source is defined as any location where ground water emanates from a point in the ground. For purposes of this condition, springs do not include seeps or other discharges which lack a defined channel.

II. California Only

1. In the Lake Tahoe Basin, all NWPs are revoked. Activities in this area shall be authorized under Regional General Permit 16 or through an individual permit.

2. In the Primary and Secondary Zones of the Legal Delta, NWPs 29 and 39 are revoked. New development activities in the Legal Delta will be reviewed through the Corps' standard permit process.

III. Nevada Only

1. In the Lake Tahoe Basin, all NWPs are revoked. Activities in this area shall be authorized under Regional General Permit 16 or through an individual permit.

IV. Utah Only

1. For all NWPs, except NWP 47, prospective permittees shall submit a PCN in accordance with General Condition 27 for any activity, in waters of the United States, below 4217 feet mean sea level (msl) adjacent to the Great Salt Lake and below 4500 feet msl adjacent to Utah Lake.

2. A PCN is required for all bank stabilization activities in a perennial stream that would affect more than 100 linear feet of stream

3. For NWP 27, facilities for controlling stormwater runoff, construction of water parks such as kayak courses, and use of grout or concrete to construct in-stream structures are not authorized. A PCN is required for all projects exceeding 1500 linear feet as measured on the stream thalweg, using in stream structures exceeding 50 cubic yards per structure and/or incorporating grade control structures exceeding 1 foot vertical drop. For any stream restoration project, the post project stream sinuosity shall be appropriate to the geomorphology of the surrounding area and shall be equal to, or greater than, pre project sinuosity. Sinuosity is defined as the ratio of stream length to project reach length. Structures shall allow the passage of aquatic organisms, recreational water craft or other navigational activities unless specifically waived in writing by the District Engineer.

V. Colorado Only

1. Final Regional Conditions Applicable to Specific Nationwide Permits within Colorado.

a. Nationwide Permit Nos. 12 and 14, Utility Line Activities and Linear Transportation Projects. In the Colorado River Basin, utility line and road activities crossing perennial water or special aquatic sites require notification to the District Engineer in accordance with General Condition 27 (Pre-Construction Notification).

b. Nationwide Permit No. 13 Bank Stabilization. In Colorado, bank stabilization activities necessary for erosion prevention in streams that average less than 20 feet in width (measured between the ordinary high water marks) are limited to the placement of no more than 1/4

cubic yard of suitable fill* material per running foot below the plane of the ordinary high water mark. Activities greater than 1/4 cubic yard may be authorized if the permittee notifies the District Engineer in accordance with General Condition 27 (Pre-Construction Notification) and the Corps determines the adverse environmental effects are minimal. [* See (g) for definition of Suitable Fill]

c. Nationwide Permit No. 27 Aquatic Habitat Restoration, Establishment, and Enhancement Activities.

(1) For activities that include a fishery enhancement component, the Corps will send the Pre-Construction Notification to the Colorado Division of Wildlife (CDOW) for review. In accordance with General Condition 27 (Pre-Construction Notification), CDOW will have 10 days from the receipt of Corps notification to indicate that they will be commenting on the proposed project. CDOW will then have an additional 15 days after the initial 10-day period to provide those comments. If CDOW raises concerns, the applicant may either modify their plan, in coordination with CDOW, or apply for a standard individual permit.

(2) For activities involving the length of a stream, the post-project stream sinuosity will not be significantly reduced, unless it is demonstrated that the reduction in sinuosity is consistent with the natural morphological evolution of the stream (sinuosity is the ratio of stream length to project reach length).

(3) Structures will allow the upstream and downstream passage of aquatic organisms, including fish native to the reach, as well as recreational water craft or other navigational activities, unless specifically waived in writing by the District Engineer. The use of grout and/or concrete in building structures is not authorized by this nationwide permit.

(4) The construction of water parks (i.e., kayak courses) and flood control projects are not authorized by this nationwide permit.

d. Nationwide Permits Nos. 29 and 39; Residential Developments and Commercial and Institutional Developments. A copy of the existing FEMA/locally-approved floodplain map must be submitted with the Pre-Construction Notification. When reviewing proposed developments, the Corps will utilize the most accurate and reliable FEMA/locally-approved pre-project floodplain mapping, not post-project floodplain mapping based on a CLOMR or LOMR. However, the Corps will accept revisions to existing floodplain mapping if the revisions resolve inaccuracies in the original floodplain mapping and if the revisions accurately reflect pre-project conditions.

2. Final Regional Conditions Applicable to All Nationwide Permits within Colorado

e. Removal of Temporary Fills. General Condition 13 (Removal of Temporary Fills) is amended by adding the following: When temporary fills are placed in wetlands in Colorado, a horizontal marker (i.e. fabric, certified weed-free straw, etc.) must be used to delineate the existing ground elevation of wetlands that will be temporarily filled during construction.

f. Spawning Areas. General Condition 3 (Spawning Areas) is amended by adding the following: In Colorado, all Designated Critical Resource Waters (see enclosure 1) are considered important spawning areas. Therefore, In accordance with General Condition 19 (Designated Critical Resource Waters), the discharge of dredged or fill material in not authorized by the following nationwide permits in these waters: NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50. In addition, in accordance with General Condition 27 (Pre-Construction Notification), notification to the District Engineer is required for use of the following nationwide permits in these waters: NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37 and 38".

g. Suitable Fill. In Colorado, use of broken concrete as fill material requires notification to the District Engineer in accordance with General Condition 27 (Pre-Construction Notification). Permittees must demonstrate that soft engineering methods utilizing native or non-manmade materials are not practicable (with respect to cost, existing technology, and logistics), before broken concrete is allowed as suitable fill. Use of broken concrete with exposed rebar is prohibited in perennial waters and special aquatic sites.

h. Invasive Aquatic Species. General Condition 11 is amended by adding the following condition for work in perennial or intermittent waters of the United States: If heavy equipment is used for the subject project that was previously working in another stream, river, lake, pond, or wetland within 10 days of initiating work, one the following procedures is necessary to prevent the spread of New Zealand Mud Snails and other aquatic hitchhikers:

(1) Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and keep the equipment dry for 10 days. OR

(2) Remove all mud and debris from Equipment (tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment with either a 1:1 solution of Formula 409 Household Cleaner and water, or a solution of Sparquat 256 (5 ounces Sparquat per gallon of water). Treated equipment must be kept moist for at least 10 minutes. OR

(3) Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment with water greater than 120 degrees F for at least 10 minutes.

3. Final Regional Conditions for Revocation/Special Notification Specific to Certain Geographic Areas

i. Fens: All Nationwide permits, except permit Nos. 3, 6, 20, 27, 32, 38 and 47, are revoked in fens and wetlands adjacent to fens. Use of nationwide permit Nos. 3, 20, 27 and 38, requires notification to the District Engineer, in accordance with General Condition 27 (Pre-Construction

Notification), and the permittee may not begin the activity until the Corps determines the adverse environmental effects are minimal. The following defines a fen:

> Fen soils (histosols) are normally saturated throughout the growing season, although they may not be during drought conditions. The primary source of hydrology for fens is groundwater. Histosols are defined in accordance with the U.S. Department of Agriculture, Natural Resources Conservation Service publications on Keys to Soil Taxonomy and Field Indicators of Hydric Soils in the United States (http://soils.usda.gov/technical/classification/taxonomy).

j. Springs: Within the state of Colorado, all NWPs, except permit 47 (original 'C'), require preconstruction notification pursuant to General Condition 27 for discharges of dredged or fill material within 100 feet of the point of groundwater discharge of natural springs. A spring source is defined as any location where groundwater emanates from a point in the ground. For purposes of this regional condition, springs do not include seeps or other discharges which do not have a defined channel.

4. Additional Information

The following provides additional information regarding minimization of impacts and compliance with existing general Conditions:

a. Permittees are reminded of the existing General Condition No. 6 which prohibits the use of unsuitable material. Organic debris, building waste, asphalt, car bodies, and trash are not suitable material. Also, General Condition 12 requires appropriate erosion and sediment controls (i.e. all fills must be permanently stabilized to prevent erosion and siltation into waters and wetlands at the earliest practicable date). Streambed material or other small aggregate material placed along a bank as stabilization will not meet General Condition 12. Also, use of erosion control mates that contain plastic netting may not meet General Condition 12 if deemed harmful to wildlife.

b. Designated Critical Resource Waters in Colorado. In Colorado, a list of designated Critical Resource Waters has been published in accordance with General Condition 19 (Designated Critical Resource Waters). This list will be published on the Albuquerque District Regulatory home page (http://www.spa.usace.army.mil/reg/)

c. Federally-Listed Threatened and Endangered Species. General condition 17 requires that nod-federal permittees notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project. Information on such species, to include occurrence by county in Colorado, may be found at the following U.S. Fish and Wildlife Service website: http://www.fws.gov/mountain%2Dprairie/endspp/name_county_search.htm

.C. Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project.

D. Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration, establishment (creation), enhancement, or preservation of aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Discharge: The term "discharge" means any discharge of dredged or fill material.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the

project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of waters of the United States.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of “open waters” include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (see 33 CFR 328.3(e)).

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands adjacent to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects waterbodies with their adjacent uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 20.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete project: The term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or

partnership or other association of owners/developers. A single and complete project must have independent utility (see definition). For linear projects, a “single and complete project” is all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single waterbody several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream’s course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a wetland (i.e., water of the United States) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line, which is defined at 33 CFR 328.3(d).

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a jurisdictional water of the United States that, during a year with normal patterns of precipitation, has water flowing or standing above ground to the extent that an ordinary high water mark (OHWM) or other indicators of jurisdiction can be determined, as well as any wetland area (see 33 CFR 328.3(b)). If a jurisdictional wetland is adjacent--meaning bordering, contiguous, or neighboring--to a jurisdictional waterbody displaying an OHWM or other indicators of jurisdiction, that waterbody and its adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of “waterbodies” include streams, rivers, lakes, ponds, and wetlands.

Earthquake Protection Systems, Inc.
451 Azuar Drive, Bldg. 759, Mare Island, Vallejo, California 94592
Tel: (707) 644-5993 Fax: (707) 644-5995

November 17, 2009

PURCHASE AGREEMENT FOR THE SUPPLY OF FRICTION PENDULUM BEARINGS FOR ANTIOCH BRIDGE RETROFIT PROJECT

Total Pages in Purchase Agreement: 7

Earthquake Protection Systems ("EPS") agrees to supply, and the below named Contractor awarded the construction contract ("Contractor" and "Buyer") agrees to purchase Friction Pendulum Bearings and other products and services provided for herein (the "Bearings") in accordance with the provisions and terms stated in this agreement (the "Agreement"). The Bearings are sold and purchased in conformance with the Contract Special Provisions Section 10-1 Furnish Seismic Isolation bearings, and as show on plan sheets "Isolation Bearing, Details No. 1" and "Isolation Bearing, Details No. 2", and the terms and conditions as stated herein. This offer by EPS to supply bearings shall remain in effect through Decemeber 15, 2010, and is contingent upon receipt by EPS of the signed acceptance of this Agreement, without modifications, no later than December 15, 2010.

SCOPE OF WORK

EPS shall manufacture, test and supply the types and number of Friction Pendulum Bearings as specified in the Special Provisions in accordance with this Purchase Agreement. Any structure connection plates above or below the bearings, connecting bolts, shim plates, sole plates, and grout are the responsibility of the Buyer.

Buyer is responsible for pick up the Bearings from the EPS facility.

The bearing system, manufacturing details, materials, methods, and procedures are those of Earthquake Protection Systems. The bearings will be manufactured and tested in accordance with EPS's ISO 9001:2000 Quality Control System for the Design and Manufacture of Seismic Isolation Bearings, as Certified by the Orion Register. Bearing testing will be performed in accordance with Testing Program specified in the Bearing Specifications. Testing will be performed for 100% of the Production bearings, with test results and bearing properties provided to Buyer.
After testing, assembly, and packaging is complete, Buyer will pick up the bearings from the EPS facility. EPS will package the bearings for shipment and unloading by crane/fork trucks.

The EPS Scope Of Work under this agreement includes the design of the bearings to satisfy the capacities, properties and performance as specified herein. The bearing design included herein has been pre approved by CALTRANS. Prototype manufacturing and testing work of the bearings for the Antioch Bridge Retrofit project has been completed by EPS and approved by CALTRANS. Buyer hereby approves and accepts the bearing design work by EPS as satisfactory and complete for the Buyer's requirements and use.

EPS's scope of work includes the bearing manufacture, testing, and manufacturer's support during the construction phase, as specified herein. The manufacturer's support included is that normally provided by EPS staff performing its work at the EPS facility. Any non-customary support services, and support that requires EPS to work away from the EPS facility, will be paid for as additional services per the attached Schedule of Standard Charges. EPS shall be notified three weeks in advance for any required site visits. Access to the bearings, handling, assistance and labor as required to complete the inspections, are to be provided by Buyer or the Owner.

EPS's role under this Agreement is that of a supplier of the Bearings as specified herein, including the manufacturer's support specified. EPS is not a contractor, subcontractor, engineer, or consultant for the design and construction of the project. EPS's scope of work and responsibilities do not include bearing installation, or any work or requirements specified under construction documents or plans. EPS's scope of work and responsibilities do not include those services normally provided by a contractor or design engineer.

The Buyer, or Buyer's consultants, are responsible for the overall facility, structural and seismic design, and seismic performance of the structure, bearings, facility, and contents. Buyer is responsible to implement the appropriate bearing connection details, and structure strengths, as required to adequately accomidate all structure, enviormental, and seismic loadings. Buyer is responsible for compliance with all code and government requirements pertaining to the use of the Bearings.

For any additions or changes in scope of work, sizes of bearings or delivery schedule, or technical support services, the Total Price, corresponding payment breakdowns, and delivery schedule shall be adjusted accordingly following the attached Schedule of Standard Charges.

SCHEDULE OF PRICES

Bearing are being sold at the unit bearing prices are listed in the attached Special Provisions, plus other applicable charges as specified herein. The unit prices are Freight On Board (FOB), EPS facility CA. Buyer agrees to pay to EPS all applicable sales and use taxes, custom duties, and other taxes and charges levied by government entities as a result of the sale and use of the Bearings.

The Total Price for the 82 bearings listed in the Special provisions is $3,635,810, plus applicable sales taxes.

PAYMENT SCHEDULE

Payments shall be received by EPS, as invoiced, for the items below:

1) 10% of the Total Price, upon execution of the Purcahse Agreement

2) 50% of the Total Price, pro-rated upon completion of machining of concave, slider, and housing

3) 30% of the Total Price pro-rated upon completion of testing

4) 10% of the Total Price pro-rated upon acceptance of assembled bearings

PAYMENT TERMS

All payments shall be electronically deposited to EPS's account specified below on or before the due date.

Citibank NA, 111 Wall Street, New York, NY 1005
Citibank ABA# 021000089
For Credit to Charles Schwab & Co. Act# 4055-3953
For Further Credit to Earthquake Protection Systems Act# 3173-7878

Payment Items 1 thru 4 shall be received by EPS Net 30 days from the date of Invoice, with no retention. Payments past due shall bear late payment charges at the rate of two percent (2%) per month, for each month or fraction thereof for which a payment is more than five days late.

READY TO SHIP SCHEDULE AND DELIVERY:

Bearings will be ready to ship, on or before, 2 bearings/week starting 26 weeks from the date of receipt by EPS of Payment Item 1, and the signed and fully execution of Purchase Agreement without modifications.

The schedule for the bearing ready to ship dates will be extended one day for each day a payment to EPS is late. Bearings will not be shipped until all applicable payments for that bearing have been received by EPS.

Bearings will be tested, assembled and stored at EPS for up to 24 months, or until picked up by Buyer.

Bearings will be packaged for loading and unloading by forklifts. EPS will load bearings on flatbed trucks at the request of Buyer. EPS is not responsible for shipping or delay in shipping and its impact on the project.

The ready to ship dates are based on the terms and conditions as specified in this Agreement. These dates shall be extended for any delays to EPS's work resulting from the Buyer or Owner's actions, including any requirements, conditions or terms which differ from those stated in this agreement, or delays in approval of submittals, or work performed, or late payments from Buyer.

In the event EPS is late in meeting the bearings ready to ship dates, damages claimed against EPS shall not exceed 2% of the unit bearing prices for each week that a bearing is shipped late, up to a maximum

delay charge of 10% of the Total Price or actual damages incurred by the Buyer, whichever of these is less.

EXCLUSIONS

Jobsite labor of any kind, including, but not limited to unloading, handling, storing and installation or removal of the bearing assemblies for any reason what so ever including any warranty repairs or replacement of bearings, bearing parts, or installation hardware.

Repair of paint damage or misalignment of bearings, caused by installation or shipping. The Buyer shall be responsible to repair all paint damage and accidental mis-alignments with technical support provided by EPS.

Responsibility for engineering or structure designs or details by others. The Buyer or Owner's consultants are solely responsible for the structure design, and the proper incorporation and use into that design of the bearings supplied herein.

Supply or performance bonds provided by EPS.

Any applicable sales taxes, shipping cost, use taxes, custom charges, import duties, or tariffs. Buyer to provide EPS with copy of resale certificate where applicable.

Any item not specifically included in the scope of work as defined in this Purchase Agreement.

WORK STOPPAGE

If the Purchase or portion thereof is canceled by Buyer for reasons not directly and primarily caused by EPS's failure to perform under this Agreement, or stopped by Buyer for more than 6 months, or payments due to EPS are more than 6 months late, the Buyer shall be responsible to immediately pay EPS for all work in progress on a pro-rated percentage of completion basis, based on the schedule of values in the Payment Schedules herein, and also compensate EPS for any termination and delay costs, and any costs to re-start work if later directed to do so. If the Purchase or portion thereof is canceled by Buyer, or stopped for more than 12 months, or payments due to EPS are more than 12 months late, the work in progress shall be considered abandoned and the title and ownership of all parts and work in progress shall automatically transfer to EPS, and Buyer shall receive a credit equal to the scrap value for all parts and materials previously paid for by Buyer.

LIMMITATION OF LIABILITY

ANY DAMAGES CLAIMED AGAINST EPS FOR FAILURE TO PERFORM SHALL BE LIMMITED TO AN AMOUNT EQUAL TO THE TOTAL PRICE AS SPECIFIED HEREIN. ANY AND ALL DAMAGES CLAIMED AGAINST EPS FOR NEGLIGENCE, OR ANY DEFECTIVE PRODUCTS OR SERVICES, OR ANY OTHER REASON WHATSOEVER NOT OTHERWISE LIMMITED HEREIN, SHALL BE LIMMITED TO A MAXIMUM OF THE TOTAL PRICE AS SPECIFIED HEREIN. UNDER NO CIRCUMSTANCES SHALL EPS BE LIABLE FOR ANY INCIDENTAL OR

CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER INCLUDING WITHOUT LIMITATION, LOST PROFIT OR REVENUE, WHETHER OR NOT SUCH CLAIMS ARE BASED IN CONTRACT OR TORT OR UPON ANY OTHER LEGAL THEORY.

ENTIRE AGREEMENT, ASSIGNMENT, GOVERNING DOCUMENT AND LAW

This Agreement contains the entire agreement among the parties pertaining to the subject matter contained in it and supersedes any and all prior oral or written discussions, negotiations, agreements, representations and understandings. Should this Agreement or the products or services provided hereunder be named in any purchase order issued by the Buyer, the provisions of this Agreement shall be the sole provisions applicable to the products or services provided hereunder. Should the products or services provided hereunder be sold or assigned by the Buyer to a third party, the Buyer assumes sole responsibility to transfer all provisions and limitations of this Agreement and Warranty to said third party, and Buyer agrees to indemnify, defend and hold Seller harmless from any claims by said third party which extend beyond the responsibilities and liabilities of the Seller as specified under this Agreement. The laws of the State of California will govern this Agreement. The applicable courts located in the City of Vallejo or the County of Solano shall have exclusive jurisdiction over any dispute concerning this Agreement or the products or services provided hereunder. In the event that any legal action arises out of this Agreement or the products or services provided hereunder, the prevailing party shall be entitled to recover from the other its reasonable attorney's fees and costs of suit.

ACCEPTANCE

The Buyer and Seller named below accept this Agreement for the purchase of the bearings and services specified herein. Signed acceptance of this Agreement may be transmitted by electronic file, facsimile, or signed paper original, any form of which when executed by each party named below, shall constitute a complete contract, and the entire agreement between the parties.

Buyer: Contractor Company Name:	Seller: EARTHQUAKE PROTECTION SYSTEMS, Inc. Vallejo, California
_____	
Authorized Representative	Authorized Representative
Signature: _____	Signature: _____
Name: _____	Name: Victor Zayas
Title: _____	Title: President

Date: _____ Date: _____

Earthquake Protection Systems, Inc.
451 Azuar Drive, Bldg. 759, Mare Island, Vallejo, California 94592
Tel: (707) 644-5993 Fax: (707) 644-5995

8/8/08

WARRANTY TERMS

Earthquake Protection Systems ("EPS") warrants the Friction Pendulum bearings ("Bearings") against defects in materials and workmanship under the normal use and service for which they were designed for the full period of 36 months from the date the bearings are ready to ship. This warranty is limited to correcting defects in materials and workmanship, which materially affect the Bearing's ability to perform its intended function in accordance with the Bearing Specifications provided herein. For any Bearing determined to be outside the warranted performance, EPS shall, at its sole expense and option, either recondition or replace the Bearing or components to be within the Bearing Property Specifications for new bearings.

For any bearing warranty work, Owner or Buyer shall be responsible for Bearing removal, reinstallation, and freight to and from EPS's facility, including all associated costs of these items. For any Bearing found to be within the warranted performance, Owner or Buyer shall be responsible for all related costs incurred by EPS including testing, inspection, freight, handling, repair, and reconditioning.

This warranty does not cover cosmetic defects or changes, paint chipping or peeling, damage caused by installation or construction, fire or accidental damage, abuse, neglect, overloads, or failure of Contractor, Buyer or Owner to install and maintain Bearings according to EPS recommended procedures. Any obligation under this warranty terminates if the Bearings are modified or directly exposed to fire. In such instances, Owner may reactivate the warranty by hiring EPS to inspect all Bearings and for Owner to pay EPS to recondition or replace any Bearing that is deemed required. In no case shall the warranty period be extended beyond the period listed above, whether or not a Bearing is replaced or reconditioned by EPS.

DISCLAIMER OF WARRANTIES

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, WRITTEN, OR ORAL, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS AND IS PROVIDED IN LIEU OF ALL OBLIGATIONS AND LIABILITIES OF SELLER WITH RESPECT TO DEFECTS IN MATERIALS OR WORKMANSHIP. THE RIGHTS AND REMEDIES CONTAINED IN THIS WARRANTY CONSTITUTE THE OWNER'S, CONTRACTOR'S, OR BUYER'S SOLE RECOURSE TO EPS FOR COSTS AND EXPENSES TO CURE DEFECTS IN THE BEARINGS. THIS WARRANTY EXCLUDES AND WAIVES ANY RIGHT TO BUYER TO CONSEQUENTIAL OR INCIDENTAL DAMAGES.

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451 Azuar Drive, Bldg. 759, Mare Island, Vallejo, California 94592
Tel: (707) 644-5993 Fax: (707) 644-5995

September 2009

Schedule of Standard Charges

The following charges shall apply for all services or materials requested by Buyer and provided by EPS that are beyond those in the specified EPS Scope of Work as specified herein.

Rates for In-House Engineering Support, Shop Labor and Services are as follows:

Principal Engineer	$300/hour
Senior Engineer	$255/hour
QC Admin + Support Documentation	$150/hour
Shop Supervisor	$200/hour
Senior Technician	$175/hour
Machinist	$150/hour
Shop Laborer	$100/hour

Overtime work is charged at 30% above the specified standard rates. Charges for materials, tooling, and outsourced services will be at cost plus 50% overhead charges.

Inspection and services provided away from EPS facilities will be at the above rates plus reimbursement for travel time and cost of travel, including airfare, car rental, hotel, meals etc.

Review of customer requested technical requirements, specifications, evaluations, delivery schedule changes, or purchase terms and conditions, shall be at the above rates, plus costs of legal review and outsourced service charges.

Testing rates are charged per each day the equipment is occupied by the test operation. Rates for Testing Equipment Use and Operation, including test labor and data reporting, are as follows:

Real Time, 15 million lbs. Capacity Test System	$10,000/day
Low-Speed, 2 million lbs. Capacity Test System	$4,000/day

Extendeed Warranties of up to 50 years are available when specified and purchased with the original executed Purchase Agreement. Extended warranties are charged at 1% of the Total Price for each additional year the warranty is extended. Extended warranties are charged at 1% of the Total Price for each additional year the warranty is extended.

Charges for accelerating the ready-to-ship dates shall be a two-percent increase in bearing price for each percent reduction in the ready-to-ship schedule. Charges for storing bearings shall be 0.5% of the bearing prices for each month bearings are stored beyond 3 months after the ready-to-ship dates.

Earthquake Protection Systems, Inc.
451 Azuar Drive, Bldg. 759, Mare Island, Vallejo, California 94592
Tel: (707) 644-5993 Fax: (707) 644-5995

November 17, 2009

Mr. Steve Margaris
Specifications Manager
State of California, Department of Transportation
Division of Engineering Services – MS#9-2/2H
P.O. Box 168041
Sacramento, CA 95816-8041

RE: Guaranteed Prices for Friction Pendulum Bearings for Contract No. 04-1A5211, Antioch Bridge Seismic Retrofit.

Dear Mr. Margaris:

Inasmuch as it is deemed advisable by the State Department of Transportation to require the use of Friction Pendulum bearings supplied by Earthquake Protection Systems, Inc., on the contract stated above, to be constructed under contract awarded pursuant to competitive bidding, the undersigned,

Earthquake Protection Systems, Inc.
451 Azuar Drive, Bld. 759. Mare Island
Vallejo, CA 94592
Tel: 707 644 5993
Fax: 707 644 5995
Contact Stanley Low

A manufacturer and supplier of Friction Pendulum bearings that meet the requirements of the California Department of Transportation contract plans and specifications, hereby agrees to sell said bearings to the Contractor awarded the above referenced State Highway contract, at the guaranteed unit prices of:

12 Bearings, Type 1 @ $86,130.00 each
70 Bearings, Type 2 @ $37,175.00 each
Guaranteed Total Bearing Price (82 bearings) = $ 3,635,810.00

The guaranteed prices are offered for bearings meeting the requirements of the Contract Special Provisions Section 10-1 Furnish Seismic Isolation Bearing, and as show on contract plan sheets "Isolation Bearing, Details No. 1" and "Isolation Bearing, Details No. 2", and are offered for bearings purchased under the attached Purchase Agreement dated November 17, 2009, and the terms and conditions therein.

Sincerely Yours,

Victor Zayas,
President EPS

www.export.gov.
http://www.buyusa.gov/northdakota

Project Officer for Nigeria

Mr. Chamberlain Eke, Commercial Specialist, U.S. Commercial Service Lagos, Ph: +234–1–4603400/Fax: +234–1–2610544, E-mail: *Chamberlain.eke@mail.doc.gov http://www.buyusa.gov/nigeria*

Alternate Contacts for Nigeria

Mr. Larry Farris, Commercial Counselor, U.S. Commercial Service Lagos, Ph: +234–1–4603400/Fax: +234–1–2610544, E-mail: *Larry.farris@mail.doc.gov http://www.buyusa.gov/nigeria*

Mr. Christopher Becker, Commercial Officer, U.S. Commercial Service Lagos, Ph: +234–1–4603400/Fax: +234–1–2610544, E-mail: *Christopher.becker@mail.doc.gov http://www.buyusa.gov/nigeria*

Sean Timmins,

Global Trade Programs, Commercial Service Trade Missions Program.

[FR Doc. E9–30325 Filed 12–18–09; 8:45 am]

BILLING CODE 3510–FP–P

DEPARTMENT OF COMMERCE

NMFS MMPA IHA

National Oceanic and Atmospheric Administration

RIN 0648–XS24

Takes of Marine Mammals Incidental to Specified Activities; Antioch Bridge Seismic Retrofit Project, California

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments.

SUMMARY: NMFS has received an application from the California Department of Transportation (Caltrans) for an Incidental Harassment Authorization (IHA) to take marine mammals, by harassment, incidental to the Antioch Bridge Seismic Retrofit Project. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an IHA to Caltrans to incidentally harass, by Level B Harassment only, 10 harbor seals (*Phoca vitulina*) and 10 California sea lions (*Zalophus californianus*) during the specified activity.

DATES: Comments and information must be received no later than January 20, 2010.

ADDRESSES: Comments on the application should be addressed to Michael Payne, Chief, Permits, Conservation and Education Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225. The mailbox address for providing email comments is *PR1.0648–XS24@noaa.gov*. NMFS is not responsible for e-mail comments sent to addresses other than the one provided here. Comments sent via e-mail, including all attachments, must not exceed a 10–megabyte file size.

Instructions: All comments received are a part of the public record and will generally be posted to *http://www.nmfs.noaa.gov/pr/permits/incidental.htm* without change. All Personal Identifying Information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit Confidential Business Information or otherwise sensitive or protected information.

A copy of the application containing a list of the references used in this document may be obtained by writing to the address specified above, telephoning the contact listed below (see **FOR FURTHER INFORMATION CONTACT**), or visiting the internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental.htm*. Documents cited in this notice may also be viewed, by appointment, during regular business hours, at the aforementioned address.

FOR FURTHER INFORMATION CONTACT: Jaclyn Daly, Office of Protected Resources, NMFS, (301) 713–2289, ext 151.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Section 101(a)(5)(D) establishes a 45–day time limit for NMFS review of an application followed by a 30–day public notice and comment period on any proposed authorizations for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny the authorization.

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) 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 [Level B harassment].

Summary of Request

On May 5, 2009, NMFS received an application from Caltrans for the taking, by Level B harassment, of marine mammals incidental to retrofitting the Antioch Bridge, located 5.4 miles east of the confluence of the Sacramento and San Joaquin Rivers. To access shallow water piers, a temporary support trestle would be installed using a pile driver hammer. Because pile driving has the potential to result in behavioral harassment to marine mammals located in the action area, an authorization under section 101(a)(5)(D) of the MMPA is warranted.

Description of the Specified Activity

The Antioch Bridge, completed in 1978, was designed based on seismic standards that the Caltrans established in 1971. After the Loma Prieta in 1989, Caltrans implemented the Seismic Retrofit Program. After the Northridge Earthquake of 1994, Caltrans implemented Phase Two of the Program, which required seven state-owned toll bridges, including the Antioch Bridge, to be retrofitted. The Antioch Seismic

Retrofit Project would provide a seismic upgrade of the Antioch Bridge; the upgrade would meet the current requirements.

The Antioch Bridge is 9,437–ft long, accommodates one lane of traffic in either direction, and includes narrow accommodation for bicyclists and pedestrians. Proposed retrofit elements to the bridge include installation of steel bracings; replacement of the existing elastometric bearings with isolation bearings; and removal of the existing curtain walls and retrofit of all the columns within the slab span structure. To accomplish this, a temporary trestle would be built to allow access to the piers in shallow water (out to Pier 11). The temporary marine trestle would be constructed from the south shore of the San Joaquin River; out approximately 910–ft into the river along the west side of the existing bridge structure. This is where water depths are less than 10–ft below mean lower-low water (MLLW) and are too shallow to be accessed by barge. The trestle will be 25 ft wide with piles spaced 25–ft apart. It will be constructed using approximately 160 24–in steel hollow shell piles which will be installed with a vibratory hammer. Vibrating a single 24–in pile into place requires, at the most, ten minutes of noise generating vibration. In addition, Caltrans will "proof" or test one pile per day using an impact hammer to ensure the pile can sustain the required load. Proofing the piles would require approximately 20 blows per day, generating sound pressure for about one minute per day. The entire project is expected to take 2.5 years to complete; however, installation of the temporary piles is expected to take approximately 4 months and is planned for August 1- November 1, 2010. At the completion of the project, the trestle and all piles would be removed. All pile driving would be conducted during daylight hours only.

Some components of the project, (e.g., creation of access roads; installation of bracings) would not involve in-water work and therefore are not expected to harass marine mammals. In-air noise from these activities is not a concern in this case as pinnipeds are not known to haul-out near the bridge (see Affected Environment). Therefore, NMFS has preliminary determined that these specified activities do not warrant an authorization and they will not be discussed further.

Action Area

The Antioch Bridge project area includes Caltrans right-of-way (ROW) and temporary construction easements. This area covers approximately 62 acres (ac), including 7.5 ac on the south shore of the San Joaquin River in Contra Costa County, 21 ac of the San Joaquin River, and 33.5 ac on Sherman Island in Sacramento County. On the south side of the river, vegetation is primarily park landscaping, with weedy ruderal vegetation under the existing bridge. A small fringe wetland is found along the San Joaquin River around the bridge.

The San Joaquin River is relatively shallow on the south side, with depths of less than 10–ft out to Pier 11. The main channel extends between Piers 12 and 20, with deep water passage between Piers 19 and 20, near the northern shore. On the north side of the river, Sherman Island supports irrigated pasture and irrigated crops, as well as an area of ruderal vegetation in fallow fields. Mayberry Slough and an irrigation canal cross the area in the vicinity of Piers 39 and 40, and Pier 32, respectively. The waters around the bridge are not heavily used by marine mammals but do provide some foraging habitat for certain pinniped species.

Description of Marine Mammals in the Area of the Specified Activity

The project area lies outside the range of most marine mammal species. The Guadalupe fur seal (*Arctocephalus townsendi*), northern elephant seal (*Mirounga angustirostris*), northern fur-seal (*Callorhinus ursinus*), and northern (Stellar) sea lion (*Eumetopias jubatus*) have distributions that extend northward along the California coast but their ranges do not extend into the bays and estuaries of the Delta. There have been two documented occurrences of humpback whales (*Megaptera novaeangliae*) traveling up the Sacramento River, but these occurrences do not represent the normal behavior patterns of the species. Occurrences of humpback whales have never been documented and are not anticipated at the bridge location.

The only marine mammal species which may be affected by the project are the California sea lion and Pacific harbor seal. Both species have been known to sporadically venture into estuaries and rivers in search of food, and the California Department of Fish and Game (CDFG) indicates that the ranges of these two species encompasses the region of the Delta in which the project occurs.

California Sea Lion

The California sea lion is the most abundant marine mammal in California with an estimated population of 50,000 along the entire California coast and islands. The entire US population has been estimated at 238,000 in 2005, and growing at a rate of approximately 6.52 % annually between 1975 and 2005 (NMFS, 2007). The California stock of sea lions is not listed as depleted under the MMPA or threatened or endangered under the MMPA.

California sea lions exhibit seasonal migration patterns organized around their breeding patterns. The sea lions breed in rookeries in the Channel Islands and Mexico from May through August. Females tend to remain close to the rookeries throughout the year, while males migrate north after the breeding season in the late summer, and then migrate back south to the breeding grounds in the spring (CDFG, 1990).

Sea lions feed on fish and cephalopods, including Pacific whiting, rockfish, anchovy, hake, flat-fish, small sharks, squid, and octopus. Sea lions are often solitary feeders; however they also hunt in groups which can vary in size according to the abundance of prey. Within the action area; sea lions are often solitary.

Main breeding rookeries are found in the Channel Islands. Males haul out on Farallon Island and Ano Nuevo Island throughout the year. Sea lions can be found at sea from the surf zone out to near shore and pelagic waters. On land, the sea lions are found resting and breeding in groups of various sizes, and haul out on rocky surfaces and outcroppings and beaches, as well as manmade structures such as jetties and buoys. Sea lions prefer haulout sites and rookeries near abundant food supplies, with easy access to water; although sea lions occasionally travel up rivers and bays in search of food.

No known haulout sites occur in the vicinity of the bridge. During the designated August 1 to November 30 work window for installing the temporary marine trestle, California sea lions will likely be absent during August, as they are still in the breeding season and will be located further south, in the Channel Islands (CDFG 1990). Beginning in September, the likelihood of sea lions foraging in the San Joaquin River Delta increases, as males are beginning to return from the Channel Island rookeries at this time (CDFG 1990).

Harbor Seals

Harbor seals are the most widely distributed pinniped species, occurring on both sides of the northern Pacific and Atlantic Ocean (NMFS 2005). The Pacific harbor seal ranges from Baja Mexico to the Aleutian Islands, and occurs along the entire length of the California coast. Harbor seal populations in California were estimated at 34,233 in 2005, and have

been growing at an estimated rate of 3.5 % from 1982 to 1995 (NMFS 2005). Harbor seals are not listed as depleted under the MMPA or threatened or endangered under the MMPA.

The breeding season lasts from March through June each year, with peak births occurring between April and May. Females give birth to one pup each year, and mate again shortly after weaning. Harbor seals are not territorial on land, but do maintain spacing between individuals in haul outs.

Harbor seals feed on fish, crustaceans and some cephalopods. Foraging occurs in shallow littoral waters, and common prey items include flounder, sole, hake, codfish, sculpin, anchovy and herring. Harbor seals are typically solitary while foraging, although small groups have been observed. Seals spotted within the action area are usually solitary.

Unlike California sea lions, harbor seals are rarely found in pelagic waters and typically stay within the tidal and intertidal zones. On land, harbor seals haul out on rocky outcrops, mudflats, sandbars and sandy beaches with unrestricted access to water and with minimal human presence. Harbor seals are non-migratory, but will make short to-moderate distance journeys for feeding and breeding needs, including venturing into estuaries and rivers (CDFG 2005).

The area of the Delta where the project occurs falls within the limits of the range of harbor seals; however, no known haulout sites have been identified in the vicinity of the bridge. Potential occurrences of harbor seals would be limited to individuals in search of food upstream into the San Joaquin River.

Potential Effects on Marine Mammals

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water. Sound levels are compared to a reference sound pressure to identify the medium. For air and water, these reference pressures are "re 20 microPa" and "re 1 microPa", respectively. Sound is generally characterized by several variables, including frequency and sound level. Frequency describes the sound's pitch and is measured in hertz (Hz) or kilohertz (kHz), while sound level describes the sound's loudness and is measured in decibels (dB). Sound level increases or decreases exponentially with each dB of change. For example, 10–dB yields a sound level 10 times more intense than 1 dB, while a 20 dB level equates to 100 times more intense, and a 30 dB level is 1,000 times more intense. However, it should be noted that humans perceive a 10 dB increase in sound level as only a doubling of sound loudness, and a 10 dB decrease in sound level as a halving of sound loudness.

Marine mammals use sound for vital life functions, and introducing sound into their environment could be disrupting to those behaviors. Sound (hearing and vocalization/ echolocation) serves 4 main functions for marine mammals. These functions include (1) providing information about their environment; (2) communication; (3) enabling remote detection of prey; and (4) enabling detection of predators. Noise from pile driving may affect marine mammals at a level which could cause behavioral harassment. The distances to which these sounds are audible depend on source levels, ambient noise levels, and sensitivity of the receptor (Richardson *et al.* 1995). Mitigation measures (see Mitigation section) and the low source level of vibratory pile driving (the main method used to install piles) are expected to prevent injurious exposure.

Pinnipeds produce a wide range of hearing social signals, most occurring at relatively low frequencies (Southall *et al.*, 2007), suggesting hearing is keenest at these frequencies. Pinnipeds communicate acoustically both on land and in the water suggesting they possess amphibious hearing and have difference hearing capabilities dependant upon the media (air or water). Based on numerous studies, as summarized in Southall *et al.* (2007), pinnipeds are more sensitive to a broader range of sound frequencies in water than in air. In-water, pinnipeds can hear frequencies from 75 Hz to 75kHz. In-air, the lower limit remains at 75 Hz but the highest audible frequencies are only around 30kHz (Southall, *et al.*, 2007).

Hearing Impairment

Temporary or permanent hearing impairment is a possibility when marine mammals are exposed to very loud sounds. Hearing impairment is measured in two forms: temporary threshold shift and permanent threshold shift. Relationships between TTS and PTS thresholds have not been studied in marine mammals, but are assumed to be similar to those in humans and other terrestrial mammals. There is no empirical data for onset of PTS in any marine mammal, and therefore, PTS-onset must be estimated from TTS-onset measurements and from the rate of TTS growth with increasing exposure levels above the level eliciting TTS-onset. PTS is presumed to be likely if the threshold is reduced by ≥ 40 dB (i.e., 40 dB of TTS). Due to proposed mitigation measures and source levels, NMFS does not expect that marine mammals will be exposed to levels that could elicit PTS and therefore it will not be discussed further.

Temporary Threshold Shift (TTS)

TTS is the mildest form of hearing impairment that can occur during exposure to a loud sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises and a sound must be louder in order to be heard. TTS can last from minutes or hours to (in cases of strong TTS) days. For sound exposures at or somewhat above the TTS-onset threshold, hearing sensitivity recovers rapidly after exposure to the noise ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals. Southall *et al.* (2007) considers a 6 dB TTS (i.e., baseline thresholds are elevated by 6 dB) sufficient to be recognized as an unequivocal deviation and thus a sufficient definition of TTS-onset. Because it is non-injurious, NMFS considers TTS Level B harassment that is mediated by physiological effects on the auditory system; however, NMFS does not consider onset TTS to be the lowest level at which Level B harassment may occur.

Sound exposures that elicit TTS in pinnipeds underwater have been measured in harbor seals, California sea lions, and northern elephant seals from broadband or octaveband (OBN) non-pulse noise ranging from approximately 12 minutes to several hours (Kastak and Schusterman, 1996; Finneran *et al.*, 2003; Kastak *et al.*, 1999; Kastak *et al.*, 2005). Collectively, Kastak *et al.* (2005) analyzed these data to indicate that in the harbor seal, a TTS of ca. 6 dB occurred with 25 minute exposure to 2.5 kHz OBN with SPL of 152 dB re:1 microPa; the California sea lion showed TTS-onset at 174 dB re: 1 microPa (as summarized in Southall *et al.*, 2007). Underwater TTS experiments involving exposure to pulse noise is limited to a single study. Finneran *et al.* (2003) found no measurable TTS when two California sea lions were exposed to sounds up to 183 dB re: 1 microPa (peak-to-peak).

Behavioral Impacts

The source of underwater noise during construction would be pile driving to construct the temporary work trestle. There are limited data available on the effects of non-pulse noise on pinnipeds in-water; however, field and captive studies to date collectively suggest that pinnipeds do not strongly react to exposures between 90–140 dB re: 1 microPa. Jacobs and Terhune (2002) observed wild harbor seal

reactions to acoustic harassment devices (ADH) around nine sites. Seals came within 44 m of the active ADH and failed to demonstrate any behavioral response when received SPLs were estimated at 120–130 dB re: 1 microPa. In a captive study, a group of seals were collectively subjected to non-pulse sounds (e.g., vibratory pile driving) at 8–16 kHz (Kastelein, 2006). Exposures between 80–107 dB re: 1 microPa did not induce strong behavioral responses; however, a single observation at 100–110 dB re: 1 microPa indicated an avoidance response at this level. The group returned to baseline conditions following exposure (i.e., no long term impact). Southall *et al.* (2007) notes contextual differences between these two studies noting that the captive animals were not reinforced with food for remaining in the noise fields, whereas free-ranging subjects may have been more tolerant of exposures because of motivation to return to a safe location or approach enclosures holding prey items. Southall *et al.* (2007) reviewed relevant data from studies involving pinnipeds exposed to pulse noise (e.g., impact pile driving) and concluded that exposures to 150 to 180 dB re: 1 microPa generally have limited potential to induce avoidance behavior.

Seals and sea lions exposed to threshold level sounds (120 dB for non-pulse; 160 dB for pulse) may elicit temporary avoidance behavior around the bridge, which may affect movement of seals under the bridge or temporarily inhibit them from foraging near the bridge. However, limiting pile driving to one to hours per day would allow for minimal disruption of harbor seal foraging or use of dispersal habitat. Very few sea lions use the South Bay for foraging and no known sea lion haul-outs exist in the South Bay; therefore, impacts are expected to be equally minimal than those of harbor seals.

Based on these studies, NMFS has preliminarily determined that seals and sea lions exposed to threshold level sounds (120 dB for non-pulse; 160 dB for pulse) may elicit temporary pinniped avoidance behavior. The most likely impact to pinnipeds from the pile installation would be temporary disruption of feeding patterns as individual sea lions or harbor seals pass through the area in pursuit of food. However, limiting pile driving to one to two hours per day would allow for minimal disruption of foraging or use of dispersal habitat. No haulouts exist and no pupping or breeding is known to occur on land near the bridge; therefore, no impacts to reproduction or interruption of mom/pup bonding or nursing are anticipated. Temporary hearing loss is possible for those pinnipeds that enter into zone of Level B harassment, but permanent hearing loss or other harm is not anticipated due to monitoring and mitigation efforts, as described below) and low source level of pile driving.

Estimated Take by Incidental Harassment

NMFS typically uses threshold sound levels to estimate takes and establish appropriate mitigation. Current NMFS practice regarding exposure of marine mammals to anthropogenic noise is that in order to avoid injury of marine mammals (e.g., PTS), cetaceans and pinnipeds should not be exposed to impulsive sounds of 180 and 190 dB rms or above, respectively. This level is considered precautionary as it is likely that more intense sounds would be required before injury would actually occur (Southall *et al.*, 2007). As such, Caltrans has proposed safety zones based on hydroacoustical modeling for the pile sizes and type of hammers used for the Dumbarton Bridge project and water depth. The model simulates spherical spreading and uses a transmission constant of 15. Potential for behavioral harassment (Level B) is considered to have occurred when marine mammals are exposed to sounds at or above 160dB rms for impulse sounds (e.g., impact pile driving) and 120dB rms for non-pulse noise (e.g., vibratory pile driving), but below the aforementioned thresholds. These levels are considered precautionary. Estimated distances to NMFS' current harassment threshold levels from pile driving during the proposed action are outlined in Table 1 below.

TABLE 1: UNDERWATER DISTANCES TO NMFS HARASSMENT THRESHOLD LEVELS DURING PILE DRIVING.

Pile Type	Hammer Type	Sound Levels (rms)		
		190 dB	160 dB	120 dB
24" steel	Impact	16.8 m (55 ft)	1,000 m (3,280 ft)	n/a
24" steel	Vibratory	n/a	n/a	16.4 km (10.2 miles)

For the impact portion of the trestle pile installation, a source level of 194 dB RMS at 35–ft was used to calculate NMFS level harassment distances. Based on this source level, models estimated that pile installation for the Project could generate sound levels above 190 dB that would extend out about 55–ft from the pile. The calculated distance for sounds above 160 dB (Level B harassment) is approximately 3,300–ft. For the vibratory portion of the trestle pile installation, a source level of 166 dB RMS at 35–ft is assumed; therefore, sound levels above 190 dB would not be reached during the installation of piles by vibratory hammer. The calculated distance for sounds above 120 dB (Level B harassment threshold for non-impulse sounds) would be around 10.2 miles.

Current NMFS practice regarding in-air exposure of pinnipeds to noise generated from human activity is that the onset of Level B harassment for harbor seals and all other pinnipeds is 90 dB_{rms} and 100 dB_{rms} re: 20 micoPa, respectively. In-air noise calculations from pile driving for the Dumbarton Bridge project, which uses the same size and type of piles and hammers, predict that noise levels will be reduced to approximately 83 dB_{rms} re: 20 microPa at 800m. Harbor seals or California sea lions are not known to haul-out anywhere near the Antioch Bridge; therefore, in-air noise is not considered to contribute to harassment for this project.

It is difficult to estimate the number of California sea lions and Pacific harbor seals that could be affected by the installation of piles for the temporary marine trestle, as pinnipeds only sporadically venture into the project area in pursuit of food. Due to the project location lying at the extreme margins of these species' ranges, the number of individual pinnipeds expected to be encountered is very low. Through consultation with NMFS' Southeast Regional Office, Caltrans requests the take of 10 California seal lions. These individuals would most likely be adult males, as the females and pups tend to remain close to the breeding rookeries. Similarly, Caltrans requests, and NMFS' proposes, authorization to take 10 individual

harbor seals incidental to pile driving activities; also likely males in pursuit of food.

Proposed Mitigation

Caltrans has proposed mitigation both in their application and supplemental communication to reduce impact to environmental resources. Measures set in place to protect birds and fish (e.g., using the vibratory hammer at all times except for load bearing tests) also protect marine mammals. The following proposed mitigation measures are designed to eliminate potential for injury and reduce Level B harassment of marine mammals.

Establishment of safety and zones and shut down requirements

Vibratory pile driving does not elicit source levels at or above NMFS' harassment threshold for Level A harassment, therefore, no required shut down zones would be established for vibratory pile driving. The isopleth for the Level A harassment threshold (190 dB) is modeled to be within 55 ft (16.8 m) of the impact pile hammer (see Table 1); however, Caltrans has proposed to delay impact pile driving should a marine mammal come within or approach 100 ft (30 m) of the pile being driven; further reducing the risk of Level A harassment.

Limited use of impact hammer

As a result of Section 7 consultation discussions with NMFS, Caltrans has agreed to drive all temporary piles with a vibratory hammer, to reduce impacts to listed fish, with the exception of one pile per day being "proofed" with an impact hammer. Proofing requires approximately 20–40 blows per pile which equates to approximately 15–20 seconds of impact hammering per day. This action would also serve to reduce impacts to marine mammals.

Soft start to pile driving activities

A "soft start" technique would be used at the beginning of each pile installation to allow any marine mammal that may be in the immediate area to leave before impact piling reaches full energy. The soft start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by 1–minute waiting period. The procedure would be repeated two additional times. Due to the short duration of impact pile driving (20 seconds), the traditional ramp-up requirement for impact pile driving does not apply as it would actually increase the duration of noise emitted into the environment and monitoring should effectively detect marine mammals within or near the proposed impact pile driving shut down of 100 ft (30 m). If any marine mammal is sighted within or approaching this shut down zone prior to pile-driving, Caltrans would delay pile-driving until the animal has moved outside and on a path away from such zone or after 15 minutes have elapsed since the last sighting of the marine mammal.

Marine Mammal Monitoring

Safety zone monitoring would be conducted during all active pile driving. Monitoring of the 100 ft (30 m) safety zone would be conducted by qualified, NMFS approved marine mammal observers (MMOs). Impact pile driving would not begin until the 100 ft safety zone is clear of marine mammals and would be stopped in the event that marine mammals enter the safety zone. For all pile driving, MMOs would begin monitoring at least 30 minutes prior to the commencement of pile driving and could conduct monitoring from small boats, as observation from a higher vantage point may not be practical. MMOs would remain 50 yards from swimming pinnipeds in accordance with NMFS marine mammal viewing guidelines (*http://swr.nmfs.noaa.gov/psd/rookeryhaulouts/CASEALVIEWBROCHURE.pdf*). This would prevent additional harassment to pinnipeds from the vessel. If a land based monitoring point can be found, MMOs would be stationed here. Observations would be made with binoculars during daylight hours. Data on all observed marine mammals would be recorded and include information such as species, numbers, time of observation, location, and behavior.

Acoustic Monitoring

Monitors would be present to conduct hydro-acoustic monitoring, in order to empirically establish the 190 dB RMS (impulse) safety zone and behavioral harassment zones. Field measurements of sound pressure levels would be recorded and analyzed. A more detailed marine mammal monitoring plan and hydro-acoustic monitoring plan would be made by the monitoring contractor prior to the start of the Antioch Bridge seismic retrofit.

Reporting

NMFS would be notified 2 weeks prior to the initiation of proposed work. Weekly monitoring reports would be sent to NMFS and include information such as species, numbers, time of observation, location, and behavior. Additionally, the report would include an assessment of the number of California sea lions and harbor seals that may have been harassed as a result of pile driving activity, based on direct observation of sea lions and harbor seals observed passing through the area. Should the acoustic monitoring reveal noise level isopleths different than those described here, a modification to the safety zone reflecting those data would occur.

Preliminary Determination

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, NMFS preliminarily finds that pile driving associated with the Anitoch Bridge Seismic Retrofit Project would result in the incidental take of small numbers of marine mammals, by Level B harassment only, and that the total taking would have a negligible impact on the affected species or stocks. No subsistence hunting of marine mammals occurs in the region; therefore, no impact on the availability of a species or stock for subsistence use would occur.

Endangered Species Act (ESA)

On January 26, 2009, NMFS received a request from Caltrans' to initiate consultation under section 7 of the ESA on its proposed Antioch Bridge Seismic Retrofit Project. NMFS concluded consultation on this action on July 13, 2009 and issued an incidental take statement authorizing the take of listed steelhead and green sturgeon. No ESA-listed marine mammal species occur within the action area; therefore, none would be affected.

National Environmental Policy Act (NEPA)

NOAA Administrative Order Series 216–6, May 20, 1999 (NAO), identifies issuance of IHAs as a type of Federal action that may be categorically excluded from preparation of an environmental assessment or environmental impact statement. In determining whether a categorical exclusion (CE) is appropriate for a given IHA, NMFS must consider: (1) factors listed in Section 5.05b of the NAO regarding prior analysis for the "same" action; (2) context and intensity of impacts, as defined in 40 CFR 1508.27; and (3) factors listed in Section 5.05c of the NAO regarding exceptions to CEs. NMFS has prepared, supplemented, or adopted numerous EAs leading to Findings of No Significant Impact (FONSIs) for pile driving activities similar to the proposed activity, including ones for Caltrans' projects which involved driving larger piles in

the northern section of the Bay where pinniped and cetacean species are more abundant. Based on these previous NEPA analyses and the analysis contained within this notice, NMFS has determined that issuance of a one-year IHA to Caltrans for the taking, by Level B harassment only, incidental to the Antioch Bridge Seismic Retrofit project does not have the potential to result in any significant changes to the human environment. Therefore, the issuance of an IHA to Caltrans for the specified activity falls under the category of those actions which can be categorically excluded from the need to prepare an Environmental Assessment or Environmental Impact Statement.

Dated: December 14, 2009.

Helen M. Golde,

Deputy Director, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. E9–30179 Filed 12–18–09; 8:45 am]

BILLING CODE 3510–22–S

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Public Hearings for the Draft Environmental Impact Statement/ Overseas Environmental Impact Statement for the Gulf of Alaska Navy Training Activities; Correction

AGENCY: Department of Navy, DoD.

ACTION: Notice; correction.

SUMMARY: The Department of the Navy published a document in the **Federal Register** (74 FR 65761) of December 11, 2009, concerning public hearings on a Draft Environmental Impact Statement/ Overseas Environmental Impact Statement for the Gulf of Alaska Navy Training Activities. The document contained an incorrect date.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command Northwest, Attention: Mrs. Amy Burt, Gulf of Alaska Navy Training Activities EIS/OEIS Project Manager, 1101 Tautog Circle, Suite 203, Silverdale, WA 98315–1101; or *http://www.GulfofAlaskaNavyEIS.com.*

Correction

In the **Federal Register** (74 FR 65761) of December 11, 2009, on page 65762, in the first column, correct the fifth paragraph to read:

5. Tuesday, January 12, 2010, at Orca Adventure Lodge Meeting Room & Café, 2500 Orca Road, Cordova, Alaska.

Dated: December 15, 2009.

T. M. Cruz,

Lieutenant Commander, Office of the Judge Advocate General, U.S. Navy, Alternate Federal Register Liaison Officer.

[FR Doc. E9–30318 Filed 12–18–09; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF EDUCATION

Notice of Proposed Information Collection Requests

AGENCY: Department of Education.

SUMMARY: The Acting Director, Information Collection Clearance Division, Regulatory Information Management Services, Office of Management, invites comments on the proposed information collection requests as required by the Paperwork Reduction Act of 1995.

DATES: Interested persons are invited to submit comments on or before February 19, 2010.

SUPPLEMENTARY INFORMATION: Section 3506 of the Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires that the Office of Management and Budget (OMB) provide interested Federal agencies and the public an early opportunity to comment on information collection requests. OMB may amend or waive the requirement for public consultation to the extent that public participation in the approval process would defeat the purpose of the information collection, violate State or Federal law, or substantially interfere with any agency's ability to perform its statutory obligations. The Acting Director, Information Collection Clearance Division, Regulatory Information Management Services, Office of Management, publishes that notice containing proposed information collection requests prior to submission of these requests to OMB. Each proposed information collection, grouped by office, contains the following: (1) Type of review requested, *e.g.* new, revision, extension, existing or reinstatement; (2) Title; (3) Summary of the collection; (4) Description of the need for, and proposed use of, the information; (5) Respondents and frequency of collection; and (6) Reporting and/or Recordkeeping burden. OMB invites public comment.

The Department of Education is especially interested in public comment addressing the following issues: (1) Is this collection necessary to the proper functions of the Department; (2) will this information be processed and used in a timely manner; (3) is the estimate of burden accurate; (4) how might the Department enhance the quality, utility, and clarity of the information to be collected; and (5) how might the Department minimize the burden of this collection on the respondents, including through the use of information technology.

Dated: December 15, 2009.

James Hyler,

Acting Director, Information Collection Clearance Division, Regulatory Information Management Services, Office of Management.

Office of Postsecondary Education

Type of Review: New.

Title: IEPS Fulbright-Hays Group Projects Abroad Customer Surveys.

Frequency: On occasion.

Affected Public: Individuals or households.

Reporting and Recordkeeping Hour Burden:

Responses: 1,829.

Burden Hours: 809.

Abstract: The purpose of this evaluation is to assess the impact of the Group Projects Abroad (GPA) program in enhancing the foreign language capacity of the United States. Three surveys will be conducted: a survey of GPA Project Directors; a survey of 2002–2008 GPA alumni; and a survey of 2009 alumni. Results from the three surveys will inform the writing of a final report determining the impact of the GPA program.

Requests for copies of the proposed information collection request may be accessed from *http://edicsweb.ed.gov,* by selecting the "Browse Pending Collections" link and by clicking on link number 4182. When you access the information collection, click on "Download Attachments" to view. Written requests for information should be addressed to U.S. Department of Education, 400 Maryland Avenue, SW., LBJ, Washington, DC 20202–4537. Requests may also be electronically mailed to *ICDocketMgr@ed.gov* or faxed to 202–401–0920. Please specify the complete title of the information collection when making your request.

Comments regarding burden and/or the collection activity requirements should be electronically mailed to *ICDocketMgr@ed.gov* 202–401–0526. Individuals who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339.

[FR Doc. E9–30276 Filed 12–18–09; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

October 24, 2008

Regulatory Division (SPK-2008-01340)

California Department of Transportation
Mr. Chris States
District 4, Division of Environmental
Planning & Engineering
Mail Station 8E
P.O. Box 23660
Oakland California 94623-0660

Dear Mr. States:

We are responding to your request for an approved jurisdictional determination for the proposed Antioch Bridge Seismic Retrofit Project site. This approximately 67-acre site is located in Sections 3, 4, 9, 10, 15, and 16, Township 2 North, Range 2 East, MDB&M, Latitude 38° 2' 41.2", Longitude 121° 45' 5.9", Contra Costa and Sacramento Counties, California.

Based on available information, we concur with the estimate of waters of the United States, as depicted on the October 8, 2008, "Attachment 1. Potential Wetlands and Other Waters in the Study Area (Map 1-4), prepared by CH2M Hill and the California Department of Transportation. Approximately 31.880-acres of waters of the United States, including the San Joaquin River and its abutting wetlands, are present within the survey area. These waters are regulated under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, since the wetlands are abutting the San Joaquin River, a Traditionally Navigable Waterway (TNW).

This verification is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331.

A Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form is enclosed. If you request to appeal this determination you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDS-O, 1455 Market Street, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the NAP. Should you decide to submit an RFA form, it must be received at the above address by 60 days from the date of this letter. It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This determination has been conducted to identify the limits of Corps of Engineers' Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please complete our customer survey at *http://www.spk.usace.army.mil/customer_survey.html*. Your passcode is "conigliaro".

Please reference identification number SPK-2008-01340 in any correspondence concerning this project. If you have any questions, please contact Mr. Paul Maniccia at email *paul.m.maniccia@usace.army.mil*, or telephone 916-557-6704. You may also use our website: *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Nancy A. Haley
Chief, California North Branch

Enclosures

Copy Furnished without enclosures:

Mr. William Marshall, Storm Water and Water Quality Certification Unit, Central Valley Regional Water Quality Control Board, 11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114

Mr. Ryan Olah, Coast Bay-Delta Branch, Endangered Species Division, U.S. Fish and Wildlife Service, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901

Antioch Bridge Seismic Retrofit Project

Delineation of Wetlands and Other Waters of the United States

State Route 160

Contra Costa and Sacramento Counties, California

04-CC-160-PM 0.8-1.3 (KP 1.3-2.1)

04-SAC-160-PM 0-1.3 (KP 0-2.1)

Caltrans EA 1A5210

October 2008

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Chris States, Office of Biological Sciences and Permits, 111 Grand Avenue, Oakland, CA 94623-0660; (510) 286-7185 Voice, or use the California Relay Service TTY number, (800) 735-2929.

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Attachment

Attachment 1 Potential Wetlands and Other Waters in the Study Area (Color Maps 1 through 4)

Appendixes

Appendix A Soil Maps
Appendix B Data Sheets
Appendix C Representative Photographs

Acronyms and Abbreviations

Caltrans	California Department of Transportation
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
CWA	Clean Water Act
FAC	facultative
FACU	Facultative Upland
FACW	facultative wetland
GPS	Global Positioning System
HUC	Hydrologic Unit Code
NL	not listed
NRCS	Natural Resource Conservation Service
OBL	obligate
RWQCB	Regional Water Quality Control Board
USACE	United States Army Corps of Engineers

Chapter 1 Introduction

Wetlands and other waters are ecological habitats that are protected under The Clean Water Act (CWA). Activities that have the potential to discharge fill materials into "waters of the United States," including wetlands must be authorized by the United States Army Corps of Engineers (USACE). This report presents the results of a wetland delineation conducted for the California Department of Transportation (Caltrans) Antioch Bridge Seismic Retrofit Project in Sacramento and Contra Costa Counties. The results of this delineation are preliminary pending verification by the USACE. A general description of the project and the environmental setting is provided below. Study methods and the survey results are provided in the following sections.

1.1 Project Description

The Antioch Bridge supports State Route (SR) 160 by spanning the San Joaquin River and connects the City of Antioch in eastern Contra Costa County to Sherman Island in Sacramento County. The Bay Area Toll Authority and Caltrans are currently proposing a number of improvements to the bridge as part of the Antioch Bridge Seismic Retrofit Project, EA 1A5210, which may include:

- Retrofitting the grade beam structure, which will involve removing the curtain wall on the north end from Pier 41 to Abutment 71, north of Mayberry Slough, and reinforcing existing columns and abutments.
- Retrofitting Bents 4 through 38, both in the channel and on Sherman Island, by installing cross-bracings in between the existing columns.
- Installing isolation bearings between all columns and superstructure from Abutment 1 to Pier 41.
- Constructing a temporary marine trestle on the south shore at the Oakley Regional Park to access the piers out to Pier 11.
- Constructing a temporary access road between Piers 22 and 39 on Sherman Island.
- Constructing temporary access roads parallel to the slab span structure, north of Mayberry Slough, to facilitate the removal of the curtain walls.

- Utilize a portion of the upland field north of Mayberry Slough and east of the slab span structure for temporary contractor staging and lay down area.

1.2 Project Location

The Antioch Bridge is the only northerly highway connection across the San Joaquin River connecting Contra Costa County with Sacramento County. The south end of the project study area is located in northern Contra Costa County, just east of the City of Antioch and extends to Sherman Island in southwestern Sacramento County. The project is located in the Antioch North and Jersey Island United States Geological Survey Quadrangles, as shown in Figure 1-1.

The bridge span is 9,437 feet long and has one lane in each direction and a bike/pedestrian lane. For the purposes of the wetland delineation, the study area was limited to the approximately 67-acre area in which permanent and temporary project construction activities could potentially occur.

1.3 Environmental Setting

The project study area is located in the Delta subsection of the Great Valley subregion (Miles and Goudey, 1997). This region is characterized by a low, level plain at the confluence of the Sacramento and San Joaquin Rivers. Numerous artificial levees have been constructed throughout the region to reclaim lands for agricultural production. Elevations are generally around sea level, but decomposition of organic matter has resulted in subsidence of areas within the levees where the elevation is between 10 and 15 feet below sea level, as shown in Figure 1-2. The following sections provide a description of the terrestrial habitats, climate, major hydrologic features, and soils.

1.3.1 Terrestrial Habitats

The southern section of the project area is located in the East Bay Regional Park District's Oakley Regional Park and includes a small portion of a developed marina area. The north end of the project is located on Sherman Island and is characterized by irrigated and non-

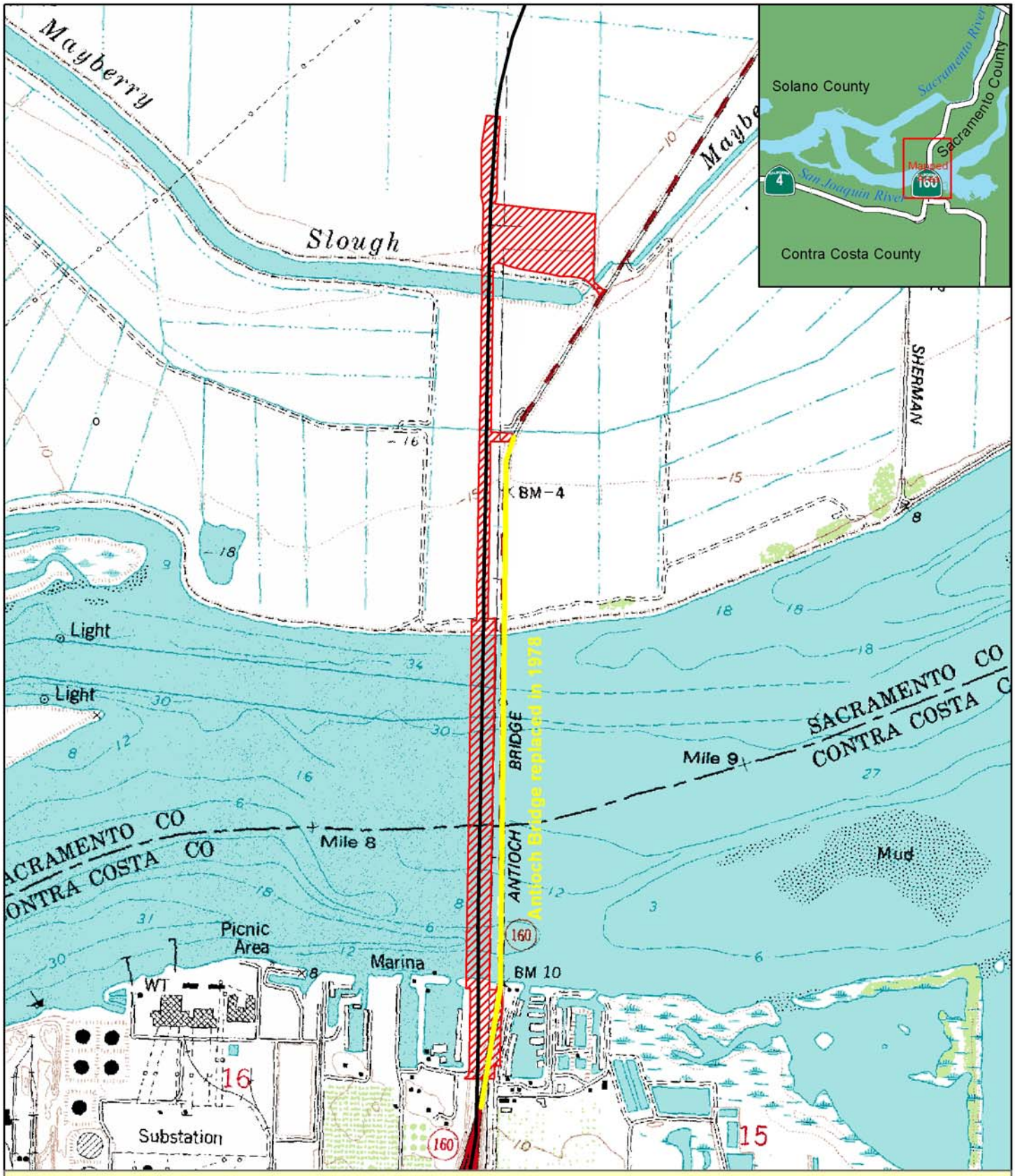


Figure 1-1: Location Map

0 1,250 2,500 5,000 Feet

Antioch Bridge Seismic Retrofit Project
Contra Costa and Sacramento Counties
State Route 160, Contra Costa PM 0.8 - Sacramento PM 1.3

Base Map: Antioch North and Jersey Island Quadrangles, USGS 7.5 Minute Quad
Prepared by Stuart Kirkham (Caltrans)
August 14, 2008

N W E S

Project Study Area

North Boundary: 121° 45' 5.9" W 38° 2' 41.2"N
South Boundary: 121° 45' 4.6" W 38° 1' 0.1" N
Project area spans Sections 3, 4, 9, 10, 15 and 16 of Township 2 North, Range 2E from the Mt. Diablo Meridian

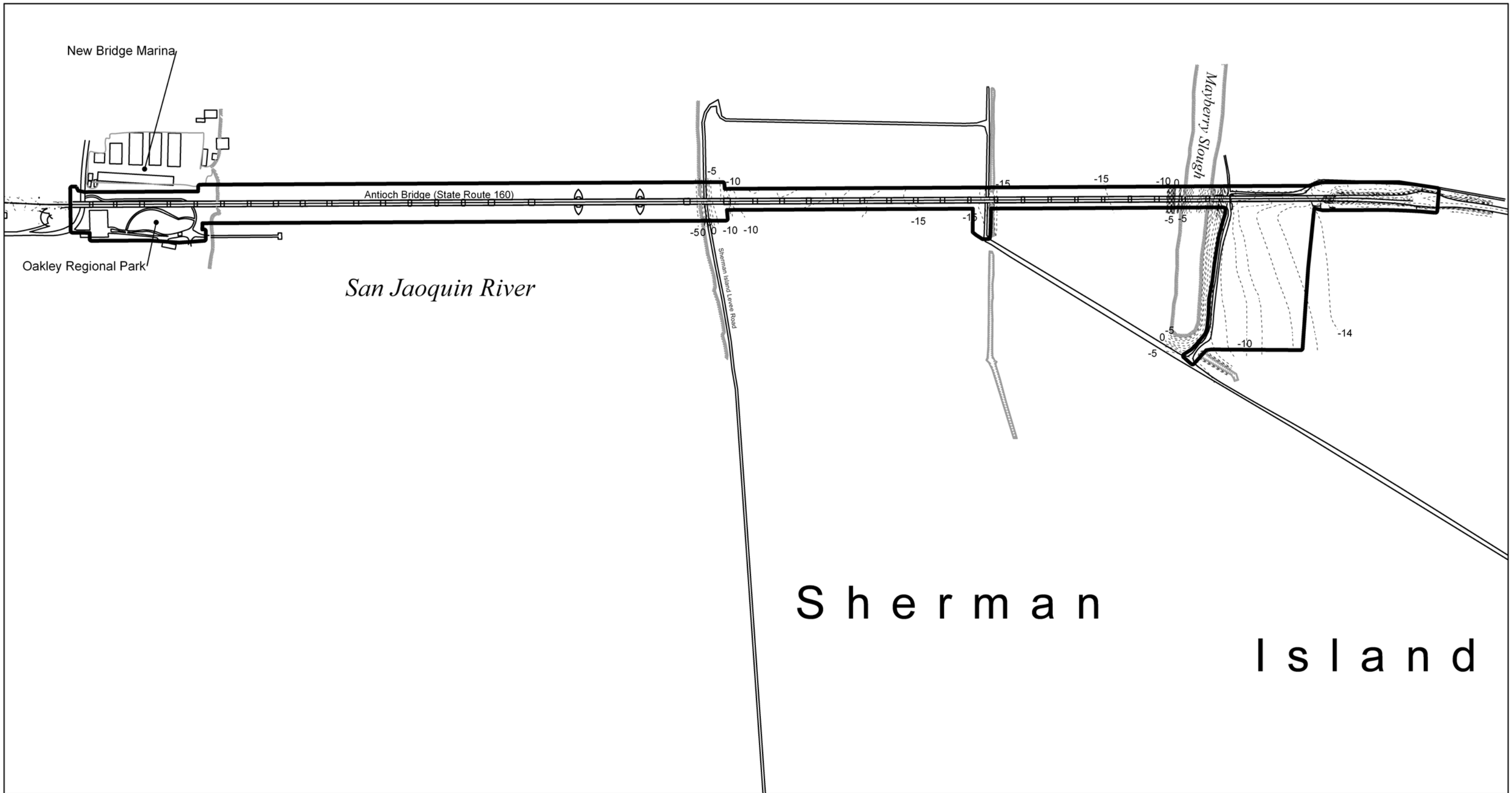


Figure 1-2. Topography of Project Study Area

Antioch Bridge Seismic Retrofit Project

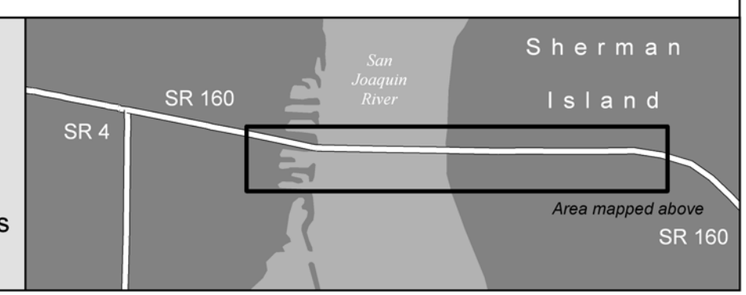
Map Prepared by Stuart Kirkham (Caltrans), August 15, 2008

W
S N
E

Contour Lines (1 ft interval)

Project Study Area

0 0.125 0.25 0.5 0.75 1 Miles



irrigated pasture land and ruderal vegetation areas. Irrigated pasture is characterized by Bermuda grass (C*ynodon dactylon*) Italian ryegrass (*Lolium multiflorum*), perennial pepperweed (*Lepidium latifolium*), birdsfoot trefoil (*Lotus corniculatus*), and strawberry clover (*Trifolium fragiferum*). Foxtail barley (*Hordeum murinum* subsp. *leporinum*) is dominant in the non-irrigated pasture with scattered yellow star thistle (*Centaurea solstitialis*), alkali sida (*Malva leprosa*), orchard grass (*Dactylis glomerata*), field bindweed (*Convolvulus arvensis*), and birdsfoot trefoil. Ruderal areas adjacent to the bridge structure are characterized by species such as bull mallow (*Malva nicaensis*), rip-gut brome (*Bromus diandrus*), fennel (*Foeniculum vulgare*), wild radish (*Raphanus sativa*), poison hemlock (*Conium maculatum*), and perennial pepperweed.

1.3.2 Climate and Hydrology

The regional climate is characterized by cool, wet winters and warm, dry summers. To some extent, summer temperatures are moderated by bay breezes and coastal fog. Average temperatures range from a low of 35°F in December and January to a high of 95°F in July. Based on long-term data from the Antioch Pump Station 3 weather station (UCIPM, 2008) located approximately 3 miles south of the project study area, the average annual precipitation is 13.26 inches, the majority of which occurs between November and March, as shown in Figure 1-3.

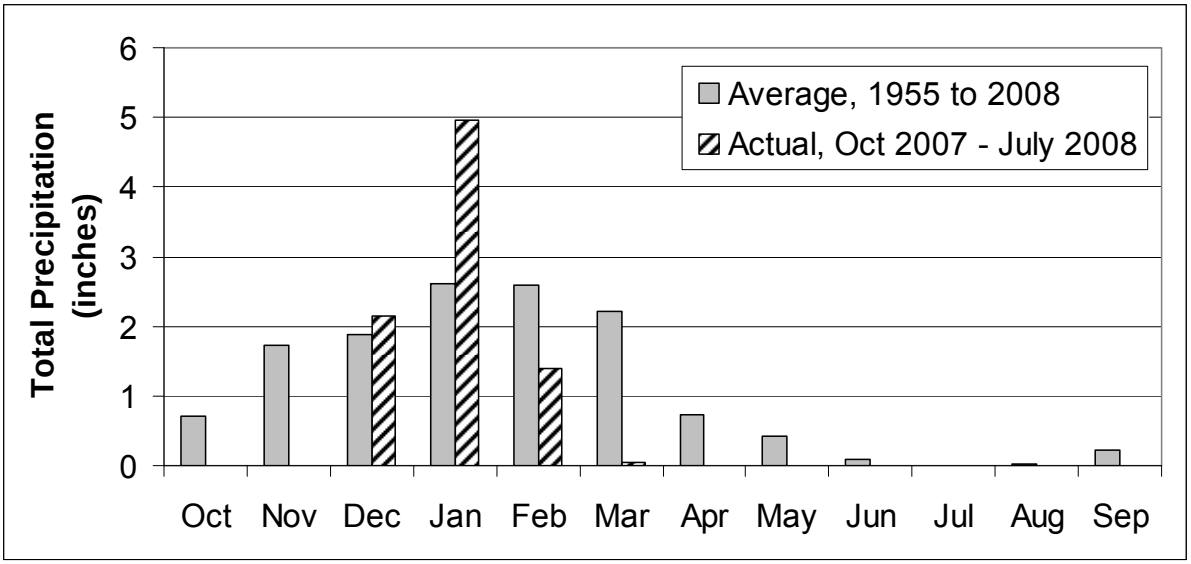


Figure 1-3 Rainfall Data Recorded at the Antioch Pump Station 3 Weather Station

The wetland delineation was conducted during a below-average rainfall year due to extremely dry conditions in all months except December 2007 and January 2008, in which rainfall was above average, as shown in Figure 1-3. Total rainfall between October 2007 and July 2008 was 8.6 inches, which is 66 percent of normal for this time period.

The project study area spans two hydrologic units. The southern area (south of Mayberry Slough) is located in the San Joaquin Delta watershed, Hydrologic Unit Code (HUC) 1804003, which includes approximately 433,300 acres. The northern section is located in the Lower Sacramento River watershed (HUC 18020109), which has a drainage area of approximately 28,945 acres.

1.3.3 Soils

Seven soil series are found in the study area (USDA, 2008a), which spans two soil survey areas: Contra Costa County and Sacramento County. Soil maps for the project area are included in Appendix A. The Gazwell, Rindge, Sailboat, Joice, Shima, and Scribner series are included on the state hydric soil list (USDA, 2008b). General descriptions of the soil series based on the Natural Resources Conservation Service (NRCS) official Soils Series Descriptions (USDA, 2008c) are provided below. All soil colors are for moist soils.

1.3.3.1 Gazwell Series (155), Partially Drained, 0 to 2 Percent Slopes

The Gazwell series consists of very deep, very poorly drained mineral soils with a buried organic soil. They formed in alluvium from mixed rock sources underlain by decomposed hydrophytic plant remains. Gazwell soils are found in backswamps along the edge of freshwater marshes at elevations between sea level and 15 feet below on slopes from 0 to 2 percent. The surface soil is a dark grayish brown (10YR 4/2) mucky clay, underlain by very dark gray (10YR 3/1) sapric material. Runoff is very slow, and permeability is moderate in the mineral soil and rapid in the underlying organic soil.

Depth to the buried organic soil ranges from 28 to 39 inches. Stratification is weak and is expressed as a variation in organic matter content. It is assumed that the soil between depths of 5 and 15 inches was saturated before it was artificially drained, as natural drainage is very poor. The water table is maintained at a depth of 18 to 60 inches through pumping. These soils subside and are protected by levees and have a rare hazard of flooding.

1.3.3.2 Delhi Series (DaC) 2 to 9 Percent Slopes

The Delhi series consists of very deep, somewhat excessively drained soils that formed in wind-modified material weathered from granitic rock sources. Delhi soils are found on floodplains, alluvial fans, and terraces and have slopes ranging from 0 to 15 percent. The soil

between depths of about 12 to 35 inches is continuously dry from late April or May until late October or early December and is continuously moist in some or all parts all the rest of the year. Delhi soils lack stratification. Surface soil (from 0 to 21 inches) is a brown (10YR 5/3), moderately acidic (pH 6.5) sand. This soil is somewhat excessively drained and has negligible to slow runoff and rapid permeability.

1.3.3.3 Rindge Series (200, 201), Partially Drained, 0 to 2 Percent Slopes

The Rindge series consists of very deep, very poorly drained organic soils that formed in freshwater marshes, sloughs, and drainage channels from mixed decomposed reeds, tules and alluvium. Slopes range from 0 to 2 percent. In the Delta, the water table is lowered by artificial drainage with open drains and pumps. The water is usually at a depth of 36 inches during the growing season and at or near the surface at some time during the winter. Areas along the coast are not drained, and the water table is near the surface at all times. Soil colors range from black (10 YR 2/1) muck to very dark brown (10 YR 2/2) mucky peat. This soil has very slow runoff with rapid permeability.

1.3.3.4 Sailboat Series (210), Partially Drained, 0 to 2 Percent Slopes

The Sailboat series consists of very deep, somewhat poorly drained soils that formed in alluvium from mixed sources and contain a buried A horizon. Sailboat soils are on natural levees of large rivers and sloughs and on low flood plains. Slopes range from 0 to 2 percent.

The soil between the depths of 6 to 18 inches is generally moist from October to mid-May and dry from mid-June to mid-October. The clay content between 10 to 40 inches ranges from 18 to 35 percent with an average of more that 15 percent fine to coarse sand. The organic matter content decreases irregularly with depth.

Surface soil (from 0 to 6 inches) is a light yellowish-brown (10YR 6/4) silt loam underlain by a very pale brown (10YR 7/4) silt loam. Depth to the buried A horizon ranges from 20 to 45 inches, which is a grayish-brown (2.5 Y 5/2) clay loam underlain by a light brownish-gray (2.5 Y 6/2) loam.

1.3.3.5 Joice Series (JA)

The Joice soils are found in flat saltwater marshes. They are found near sea level and were formed from hydrophytic plant remains and mixed alluvium. The organic layers extend to a depth of 60 inches or more. The natural fibers are dark brown (10YR 3/2), easily discolored when pressed, and many are destroyed with rubbing. The soil reaction changes with drainage and conditions; where natural drainage has been improved, the soils become more acidic. The lower layers are more fibrous, moderately alkaline, strongly saline, black clayey muck that becomes strongly or very strongly acidic if allowed to oxidize.

Joice soils develop wide cracks when they dry and the cracks remain after the soil is re-wet. Small yellow masses (jarosite) are visible in some pores between depths of 10 to 48 inches. Fresh soil samples from a depth of 20 to 50 inches may smell strongly of hydrogen sulfide. The surface tier (0 to 12 inches) has an estimated organic matter content of 40 to 45 percent. The soils are strongly or very strongly acidic. The subsurface horizons (12 to 35 inches) have an estimated organic matter content of 35 to 45 percent by weight and range from very strongly acid to moderately alkaline.

1.3.3.6 SHIMA SERIES (SE)

The Shima series consists of very deep, very poorly drained soils formed in highly decomposed organic material underlain by coarse textured alluvium from mixed sources. Shima soils are in fresh water marshes and river channels where slopes are less than 2 percent. Organic layers have from 40 to 65 percent organic matter but typically range from 40 to 55 percent. The fiber content ranges from a trace to 40 percent before rubbing and from 0 to 10 percent after rubbing. Depth to mineral layer ranges from 17 to 36 inches. Elevations range from 5 feet above to 15 feet below sea level.

1.3.3.7 SCRIBNER SERIES (222), PARTIALLY DRAINED, 0 TO 2 PERCENT SLOPES

The Scribner series consists of very deep, poorly drained soils that formed in mixed alluvium. Scribner soils are on edges of backswamps on the flood plain or delta of the Sacramento and San Joaquin Rivers. These soils formed in alluvium from mixed rock sources. Elevations range from 10 feet below sea level to 75 feet above sea level with slopes between 0 to 2 percent.

The organic matter content decreases irregularly with depth and ranges from 1 to 10 percent weighted average. The mollic epipedon is 24 to 40 inches thick and is a very dark gray (10 YR 3/1) loam with distinct to prominent dark grayish-brown and (10 YR 4/2), brown (10 YR 5/2) features in the lower part.

These soils have negligible to low runoff and moderately slow to slow permeability (sandy substratum phase has rapid permeability below a depth of 40 inches). The drainage of these soils has been altered by the use of levees and pumps. In December through April, the water table is maintained between 36 to 60 inches but is sometimes as shallow as 20 inches. These soils are protected by levees and have a rare hazard of flooding.

Chapter 2 Methods

Caltrans biologist William S. Kirkham and CH2M HILL wetland scientist Russell Huddleston conducted field surveys on June 26, June 27, and July 2, 2008 to identify potential wetlands and other waters. A field verification of USACE jurisdictional features occurred on September 23, 2008, and was attended by Mike Finan and Paul Maniccia of the US Army Corps of Engineers, Caltrans biologists Christopher States and William S. Kirkham, and CH2M HILL's wetland scientist Russell Huddleston and environmental planner David Lundgren. Mr. Huddleston and Dana Morawitz (CH2M HILL GIS specialist) conducted a subsequent field survey occurred on September 30, 2008 to revise the wetland maps based on comments from the USACE during the September 23rd field verification.

The study area extended roughly from the south end of the Antioch Bridge in Contra Costa County to the north end of the Bridge on Sherman Island in Sacramento County and included approximately 67 acres (Figure 1-1 and Figure 1-2). The following sections describe the field sampling procedures and the methods used to determine and map the wetland boundaries.

2.1 Wetland Delineation

The USACE defines wetlands as areas that are "inundated by surface water or groundwater with 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" (Title 40 Code of Federal Regulations [CFR] Section 230.3 and Title 33 CFR Section 238). The survey methodology followed USACE's 1987 *Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Arid West Regional Supplement to the 1987 Manual* (USACE, 2006).

The USACE uses the three-parameter approach (vegetation, soils, and hydrology) to determine the presence of wetlands. As a general rule, under this method, evidence of a minimum of one positive indicator for each parameter must be found (under normal circumstances and in non-problem areas) in order to make a positive wetland determination. In general, wetlands will normally meet the following criteria:

- **Hydrophytic Vegetation:** More than 50 percent of the dominant vegetation is composed of plant species that are adapted to survive and grow in hydrophytic (wet) conditions. Plants are assigned a wetland indicator status based on their probability of occurring in

wetlands (see Table 3-2 in Section 3.0 for wetland indicator status of plants observed at the sample locations).

- **Hydric Soils**: The NRCS defines hydric soil as "soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part…" (Federal Register, July 13, 1994). The criteria for establishing the presence of hydric soils vary among soil types, drainage classes, and land resource regions. The NRCS has developed field indicators for identification of hydric soils. These indicators are currently used by the USACE in the *Arid West Regional Supplement to the 1987 Manual* (USACE, 2006). They rely on soil characteristics such as texture, color, and the presence of redoximorphic features to determine if soils are hydric.

- **Wetland Hydrology**: Areas with wetland hydrology are defined as "…inundated either permanently or periodically at mean water depths less than 2 meters (6.6 feet), or the soil is saturated to the surface at some time during the growing season" (Environmental Laboratory, 1987). This saturation or inundation must be present for at least 5 percent of the growing season.

Wetland sample points were established at 30 locations in potential seasonal wetlands (including the irrigated pastures) and adjacent uplands. Vegetation, soil, and hydrology indicators for each sample point were recorded on USACE wetland determination data sheets included in Appendix B. Representative photographs are included in Appendix C.

At each sample point, the dominant plant species were identified, and the percent cover was visually estimated and recorded. All taxonomic designations follow *The Jepson Manual of Higher Plants of California* (Hickman, 1993). The wetland indicator status was determined using the *National List of Plant Species that Occur in Wetlands* (Reed, 1988). Dominant species within each vegetation strata (tree, shrub, and herb) included the most abundant species whose cumulative cover accounted for at least 50 percent of the total cover, as well as any single species that accounted for at least 20 percent of the total vegetative cover, per the *Arid West Regional Supplement* guidelines (USACE, 2006). Strata that contained less than 5 percent total cover were not considered in the dominance test. The sample area for herbaceous species included a 5-foot radius from the sample point.

Descriptions of soils were made at each sample location by examining soil pits dug with a tile spade to a depth of 18 to 24 inches. Soil morphological features such as texture, color, and redoximorphic features were noted. Soils texture was estimated in the field using the "ribbon test" to approximate the clay and sand content. Moist soil colors were determined

using Munsell® color charts. Determinations of hydric soils were based in the NRCS *Field Indicators of Hydric Soil* (NRCS, 2006).

Wetland hydrology was determined based on observations of saturation or inundation, the presence of water marks on the bridge support structures and oxidized rhizospheres observed during the summer field survey. Seasonal rainfall, site drainage, landscape position, irrigation practices, and general site topography were also considered when making wetland hydrology determinations.

Wetland boundaries were determined in the field based on changes in plant species composition and cover, presence/absence of hydric soil characteristics, hydrologic conditions, and local micro-topography. The boundaries were mapped in the field using a Trimble® Geo-XT Global Positioning System Unit. Data were then differentially corrected to generally sub-meter accuracy and mapped on an aerial photograph from 2002.

2.2 Other Waters

Other water features, including the San Joaquin River, Mayberry Slough, and an irrigation canal, were mapped based on during the wetland delineation. The limits of these features were determined based on defined bed and bank characteristics, as well as evidence of ordinary high water such as scouring, drift lines, and sediment deposits. The ordinary high-water mark was then digitized on high resolution aerial photographs of the site.

Chapter 3 Results

The results described below have been updated to reflect the findings identified during the September 23, 2008 field verification.

Delineation of wetlands and other waters in some portions of the project study area, particularly on Sherman Island, were problematic due to substantial historic modifications to the Delta and current land use practices (i.e. flood irrigation of cattle pastures). Over 90 percent of the tidal–freshwater wetlands of the Sacramento–San Joaquin Delta have been leveed and removed from tidal and floodwater inundation (Reed, 2002). Reclamation of the Delta dates back to the Arkansas Act (Swampland Act) of 1850 under which the federal government ceded marshlands to the states to encourage their reclamation, including nearly 500,000 acres of the Sacramento–San Joaquin Delta. Through the construction of over 2,600 miles of levees, the former marshlands in the Delta have been converted into 57 islands or tracts that are used predominantly for agricultural (Lund et al., 2007). Substantial levees were constructed around Sherman Island between 1869 and 1874 (SacDelta, 2008). Conversion of the marshland to agricultural resulted in significant changes to the natural hydrology and soils in the area. Flood control and dewatering of the substrate enhanced aerobic decomposition of organic material in marsh soils and has result in significant subsidence of many of the leveed Delta islands. Natural hydrology has been altered not only by the levees, but also by pumping to control ground water levels as well as agricultural irrigation. Furrow and border irrigation, in which large irrigation canals have been constructed to convey water to smaller spur ditches that are used to flood and drain the agricultural fields and pastures, is a common practice throughout the Delta, including the portion of Sherman Island within the project study area. The water table in several areas is generally high as a result of seepage, but is controlled by pumping and maintained at depths ranging from 18 to 60 inches (NRCS, 1993). Vegetation throughout much of the area not in active cultivation, is characterized by hydrophytic species such as Bermuda grass (FAC) Italian ryegrass (not listed but generally considered to be a FAC species) and perennial pepperweed (FACW).

As noted previously, rainfall was only 66 percent of the long term average for the area. Other problems encountered in the project study area included the following:

- **Problematic Vegetation:** Hydrophytic vegetation occurs throughout much of the northern end of the project study area on Sherman Island including in irrigated pasture lands and along the edges of the bridge structure including FAC, FACW and in some areas OBL species. At the time of the survey it was difficult to determine to what extent these species were present as a result of natural wetland hydrology and to what extent

they occurred due to current irrigation practices, wet season shallow groundwater and/or past disturbance history.

- **Problematic Soils:** Flood control and drainage has significantly altered the soils throughout the Delta. The soils observed in the sample locations generally did not match the typical profiles of the mapped soil units in the project study area. While the soils were generally low chroma colors due to high organic matter, this material was highly decomposed and not at all mucky or sapric. In a few locations few to common redoximorphic features were observed in the upper part of the soil, primarily along the root channels. This redox generally decreased with depth and was generally not evident in the lower part of the soil profile. Soils in several locations were very low chroma black soils below 12 inches and could meet the thick dark surface hydric soil indicator [A12] (NRCS 2006); however, soil pits were not excavated past 24 inches and the presence of a reduced or gleyed matrix below the dark surface could not be determined.

- **Problem Hydrology:** As previously noted the natural hydrology of Sherman Island was significantly altered back in the 1870's by the construction of levees around the island. Furrow and border and other flood irrigation practices are common in this area with a typical irrigation regime consisting of flooding the fields for a period of three days on a 10 day rotation (Personal Communication; Gene Peck, 2008). In several of the sample locations, including areas characterized by upland vegetation, ground water was encountered within the upper 24 inches. This shallow water table is likely the result of natural seepage given the elevation of the study area of 10 to 15 feet below sea level.

A total of 11.304 acres of potential wetlands, including emergent wetlands, seasonal wetlands (predominantly irrigated pasture) and irrigation/drainage ditches were identified in the 67-acre study area. Five open water features, totaling 20.577 acres, were also identified in the study area, as shown in Table 3-1. Maps included in attachments 1 show the location of delineated features within the project study area. The entire site, including the irrigated pasture, was considered a problem area based on the manipulated hydrologic regime (flood irrigation and drainage) and altered natural soils as a result of historic levee construction and drainage. Based on the field verification, most of these areas were considered to be wetlands, as shown in Attachment 1.

A list of plant species observed at the sample point locations is provided in Table 3-2, together with each species wetland indicator status. Data sheets and representative site photographs are found in Appendixes B and C, respectively. The open water, emergent

wetlands, seasonal wetlands, and irrigation/drainage ditches identified in the project study area are described in Sections 3.1 through 3.5 and upland areas are described in Section 3.6.

Table 3-1 Summary of Wetlands and Other Waters

Feature	Acreage	Preliminary Jurisdictional Determination	Comments
		USACE	
Wetlands			
Emergent Wetland (EM-1)	0.152	X	This emergent wetland area is located along south bank of OW-1 (San Joaquin River).
Emergent Wetland (EM-2)	0.07	X	This emergent wetland area is located along the south bank of OW-4 (Mayberry Slough).
Emergent Wetland (EM-3)	0.06	X	This emergent wetland area is located along the north bank of OW-4 (Mayberry Slough).
Seasonal Wetland (SW-1)	0.025	X	Depressional area around bridge support structure with notable change in vegetation relative to adjacent areas.
Seasonal Wetland (SW-2)	4.893	X	Irrigated pasture largely characterized by ruderal hydrophytes and scattered upland species; subject to flood irrigation and probable natural high water table during the wet season (November – March)
Seasonal Wetland (SW-3)	3.284	X	Irrigated pasture largely characterized by ruderal hydrophytes and scattered upland species; subject to flood irrigation and probable natural high water table during the wet season (November – March)
Seasonal Wetland (SW-4)	0.501	X	Area of dense perennial pepperweed with pockets of water smartweed along an irrigation/drainage ditch
Seasonal Wetland (SW-5)	0.012	X	Fringe wetland located adjacent to irrigation ditch (I/D-6).
Seasonal Wetland (SW-6)	1.583	X	Irrigated pasture largely characterized by ruderal hydrophytic species; subject to flood irrigation and probable natural high water table during the wet season (November – March)
Irrigation/Drainage (I/D-1)	0.017	X	Narrow excavated channel characterized by dense blackberries along the edges of the channel.
Irrigation/Drainage (I/D-2)	0.107	X	Excavated channel with scattered wetland vegetation such as rabbitsfoot grass along the edges; used for flood irrigation.
Irrigation/Drainage (I/D-3)	0.007	X	Excavated drainage along the east side of an irrigated pastures, rabbitsfoot grass common throughout the channel
Irrigation/Drainage (I/D-4)	0.014	X	Excavated channel characterized by dense common reed along the edges and throughout the channel; adjacent to south levee along Mayberry Slough.
Irrigation/Drainage (I/D-5)	0.116	X	Excavated channel characterized by patches of cattail, blackberry, and water smartweed, runs parallel to existing gravel access road
Irrigation/Drainage (I/D-6)	0.121	X	Excavated drainage channel with water smartweed, blackberry and patches of cattail; located along the west side of an irrigated pasture and drains to the north
Irrigation/Drainage (I/D-7)	0.227	X	Excavated irrigation channel – conveys water to an irrigated pasture, scattered nut sedge Dallis grass, smartweed and hardstem bulrush within the channel
Irrigation/Drainage (I/D-8)	0.018	X	Small excavated irrigation canal use to flood irrigate a cattle pasture; nut sedge, smartweed, cocklebur and Bermuda grass within and adjacent to the channel
Irrigation/Drainage (I/D-9)	0.097	X	Excavated irrigation canal characterized by dense Bermuda grass, perennial pepperweed and patches of dense hardstem bullrush
Total Wetlands	**11.304**		

Table 3-1 Summary of Wetlands and Other Waters

Feature	Acreage	Preliminary Jurisdictional Determination	Comments
		USACE	
Waters			
Open Water (OW-1)	19.952	X	The feature is a portion of the San Joaquin River.
Open Water (OW-2)	0.008	X	This feature is a large, open irrigation canal.
Open Water (OW-3)	0.043	X	This feature is a large, open irrigation canal.
Open Water (OW-4)	0.533	X	This feature is a portion of Mayberry Slough.
Open Water (OW-5)	0.042	X	This feature is a large, open irrigation canal.
Total Waters	**20.577**		

Table 3-2 List of Wetland Plant Species Observed

Scientific Name[a]	Common Name	Stratum	Wetland Indicator Status[b]
Ambrosia psilostachya	Ragweed	Herbaceous	FAC
Atriplex triangularis	Spearscale	Herbaceous	NL
Avena barbata	Slender wild oat	Herbaceous	NL
Bromus catharticus	Rescue grass	Herbaceous	NL
Bromus diandrus	Rip-gut brome	Herbaceous	NL
Carduus pycnocephalus	Italian thistle	Herbaceous	NL
Centaurea solstitialis	Yellow star-thistle	Herbaceous	NL
Cirsium vulgare	Bull thistle	Herbaceous	FACU
Conium maculatum	Poison hemlock	Herbaceous	FACW
Convolvulus arvensis	Field bindweed	Herbaceous	NL
Cotula coronopifolia	Common brass buttons	Herbaceous	FACW+
Cynodon dactylon	Bermuda grass	Herbaceous	FAC
Dactylis glomerata	Orchard grass	Herbaceous	FACU
Distichlis spicata	Salt grass	Herbaceous	FACW
Foeniculum vulgare	Sweet fennel	Herbaceous	FACU
Hordeum murinum subsp. *gussonianum*	Mediterranean barley	Herbaceous	FAC
Hordeum marinum subsp. *leporinum*	Foxtail barley	Herbaceous	NI
Juncus mexicanus	Mexican rush	Herbaceous	FACW
Lactuca saligna	Willow-leaf lettuce	Herbaceous	NI
Lactuca serriola	Prickly lettuce	Herbaceous	FAC
Lepidium latifolium	Perennial pepperweed	Herbaceous	FACW
Leymus triticoides	Creeping wildrye	Herbaceous	FAC+
Lolium multiflorum	Italian ryegrass	Herbaceous	NL
Lotus corniculatus	Bird's-foot trefoil	Herbaceous	FAC
Malva nicaeensis	Bull mallow	Herbaceous	NL
Malvella leprosa	Alkali sida	Herbaceous	FAC*
Melilotus alba	White sweet clover	Herbaceous	FACU+
Phalaris aquatica	Harding grass	Herbaceous	FAC+
Picris echioides	Bristly ox-tongue	Herbaceous	FAC*
Polygonum amphibium	Water smartweed	Herbaceous	OBL
Polygonum arenastrum	Prostrate knotweed	Herbaceous	NL
Polygonum hydropiperoides	Swamp smartweed	Herbaceous	OBL
Polypogon monspeliensis	Annual rabbitsfoot grass	Herbaceous	FACW+
Raphanus sativus	Wild radish	Herbaceous	NL
Rumex crispus	Curly dock	Herbaceous	FACW-
Silybum marianum	Blessed milkweed	Herbaceous	NL
Sonchus asper	Spiny sowthistle	Herbaceous	FAC
Sorghum halepense	Johnson grass	Herbaceous	FACU
Trifolium fragiferum	Strawberry clover	Herbaceous	NI*
Typha angustifolia	Narrow-leaf cattail	Herbaceous	OBL
Xanthium strumarium	Rough cocklebur	Herbaceous	FAC+

Notes:
[a] Plant taxonomy follows *The Jepson Manual: Higher Plants of California* (Hickman, 1993).
[b] Wetland indicator status follow *Plants of the United States of America, Region 0* (Reed, 1988).
OBL = Obligate Wetland – Occurs with an estimated 99 percent probability in wetlands.
FACW = Facultative Wetland – Estimated 67 to 99 percent probability of occurrence in wetlands.
FAC = Facultative – Equally likely to occur in wetlands and non-wetlands (34 to 66 percent probability).
FACU = Facultative Upland – 67 to 99 percent probability in non-wetlands, 1 to 22 percent in wetlands.
NL = Not Listed – Not listed in National List of Plant Species that Occur in Wetlands; is presumed an upland plant.
+/- = Indicates greater (+) or lesser (-) tendency to occur in wetlands.
* = Indicates a tentative status code assignment.

3.1 Open Water

Five open water features comprising a total of 20.577 acres (490 linear feet) were identified and mapped within the project study area. Open water feature OW-1 represents the segment of San Joaquin River that is located within the project study area (approximately 3,656 linear feet long and 250feet wide). A small area of emergent vegetation is present along the south bank (EM-1) and a few, small scattered clusters of hardstem bulrush (*Schoenoplectus acutus*) occur on the north side of the river. The mean high water of this feature was estimated at 3.84 vertical feet, as shown in Attachment 1, and was mapped using high-resolution aerial imagery from 2002.

Two of the open water features mapped in the study area (OW-2 and OW-3) represent two segments of large irrigation canal located south of Mayberry Slough. These segments are approximately 55 and 13 linear feet long respectively, and approximately 30 feet wide. Within the limits of the project study area the channel is largely devoid of vegetation. A section of Mayberry Slough (OW-4) approximately 260 feet long and 120 feet wide also occurs within the project study area. The majority of the slough is characterized by open water, with narrow wetland areas along the bottom of the interior levees characterized by hardstem bulrush (EM2 and EM3). A large routinely maintained irrigation canal (OW-5) is present on the northeast side of Mayberry Slough and is approximately 52 feet long and 40 feet wide.

3.2 Emergent Wetlands

Three emergent wetland areas comprising a total of 0.282 acre were identified and mapped within the project study area. These emergent wetlands are located along the south bank of the San Joaquin River and the north and south banks of Mayberry Slough, as shown in Attachment 1. Species such as hardstem bulrush, Dallis grass (*Paspalum dilatum*), rushes (*Juncus* spp.) characterized the emergent wetland along the south bank of the San Joaquin River. The emergent wetland areas along Mayberry Slough are characterized by dense hardstem bulrush.

3.3 Seasonal Wetlands

Six potential seasonal wetlands comprising 10.298 acres were identified and mapped within the project study area per the USACE recommendations made during the September 23, 2008 field verification. The majority of this seasonal wetland habitat, 9.760 acres, consists of lands that are currently used for irrigated pasture. Vegetation in these areas is characterized by

Bermuda grass, perennial pepperweed and Italian ryegrass with alkali sida, strawberry clover, cocklebur (*Xanthium strumarium*), rabbitsfoot grass (*Polypogon monspeliensis*) and milk thistle (*Silybum marinum*) also present. In general the soils are characterized by dark, low chroma matrix colors ranging from very dark grayish brown (10 YR 3/2) to black (10 YR 2/1; 7.5 YR 2.5/1) and generally had a clay loam texture. With a few exceptions redox concentrations were not evident in the upper part of the soils. Evidence of seasonal wetland hydrology in these areas included water marks on the bridge support structures, a shallow dry season water table observed at several sample locations, and the presence of oxidized rhizospheres.

Seasonal wetlands were observed adjacent to some of the excavated irrigation/drainage ditches. These areas were generally characterized by dense perennial pepperweed, poison hemlock (*Conium maculatum*) and patches of water smartweed (*Polygonum amphibium*). In most of the sample locations the surface soils appeared to be fill material, likely associated with the bridge and roadway construction, but native black soils were typically present in the lower horizon. Shallow ground water was observed in one sample location (SP-29) at a depth of 18 inches; at other sample locations soils were moist but not saturated at the time of the survey.

One seasonal wetland (SW-1) occurs in a low depressional area at the base of one of the bridge support structures. The vegetation in this area is dominated by Mexican rush (*Juncus mexcicanus*), creeping wildrye (*Leymus triticoides*) and hardstem bulrush, with some Bermuda grass, salt grass (*Distichlis spicata*), and perennial pepperweed. Soils in the upper 12 inches in this area is a very dark grayish brown (2.5 YR 3/2) loamy sand with approximately 2 percent dark reddish brown (2.5 YR 3/4) concentrations. Below 12 inches the soil is a dark gray (10 YR 4/1) clay loam. Given the proximity to the levee this area appears to support a seasonal high water table due to seepage.

3.4 Irrigation/Drainage Ditches

Nine irrigation/drainage ditchges comprising 0.723 acre were identified and mapped within the project study area (Attachment 1). Many of these ditches are used to convey water used to flood irrigate and drain the cattle pasture within the project study area. Vegetation associated with these ditches includes species such as Himalayan blackberry (*Rubus discolor*), common reed (*Phragmites australis*), narrow leaf cattail *(Typha angustifolia*), water smartweed, nut sedge (*Cyperus eragrostis*), Bermuda brass, Dallis grass, annual rabbitsfoot grass and duckweed (*Lemna minuscula*). Hydrology in the drainages was variable

with some areas completely dry at the time of the survey and others with several inches of water due to active irrigation at the time of the survey.

3.5 Upland Areas

A few additional sample points were established in upland areas including a non-irrigated pasture and ruderal areas immediately adjacent to the bridge structure. The non-irrigated pasture is characterized by foxtail barley, alkali sida and yellow star thistle. The soil in this area is a black (10 YR 2/1) sandy clay loam, similar to the adjacent irrigated pasture. Groundwater was noted at a depth of 22 inches in one location (SP06). Sample points were also taken further east of the bridge structure within an area with a noticeable elevation change between the non-irrigated pasture and the irrigated pasture (SP24 and SP25). Ruderal areas near the bridge were characterized by species such as rip-gut brome, wild radish, fennel, perennial pepperweed, and poison hemlock. Soil matrix colors ranged from dark grayish brown (10 YR 4/2) to grayish brown (10 YR 5/2). No evidence of wetland hydrology was observed in these areas (SP07, SP08, SP28 and SP30).

Chapter 4 Conclusions

This wetland delineation identified and mapped open water features, emergent wetlands, seasonal wetlands, and irrigation/drainage ditches within the approximately 67 acre project study area. These features included 11.304 acre of wetlands (including seasonal wetlands, emergent wetland, and irrigation/drainage ditches) and five open water features (including the San Joaquin River, Mayberry Slough and large irrigation canals) for a total of 20.577 acres. These wetlands and water features may be subject to regulation under the federal Clean Water Act. The results presented in this report are preliminary pending verification by the U.S. Army Corps of Engineers.

Chapter 5 References

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5.1 Personal Communication

Russell Huddleston, CH2M HILL personal communication with Gene Pack, General Manager, Reclamation District 341 on July 2, 2008.

Attachment 1 Potential Wetlands and Other Waters in the Study Area (Color Maps 1 through 4)

New Bridge Marina

NEW BRIDGE MARINA

MEAN HIGH WATER (MHW) = 3.84 FT
NAVD 88 VERTICAL DATUM

EW-1
0.152
acres

OW-1
19.952 acres

Oakley Regional Park

San Joaquin River

Attachment 1. Potential Wetlands and Other Waters in the Study Area (Map 1 of 4)

Antioch Bridge Seismic Retrofit Project

Delineators: Russell Huddleston (CH2M HILL), Stuart Kirkham, Diane Joy Hughey, Kevin Hostert (Caltrans)
Aerial Photo: Caltrans DHIPP Database, June 20, 2002
Map Prepared 8/14/2008: Stuart Kirkham (Caltrans)
Map Revised 10/8/08: Dana Morawitz (CH2M HILL)

0 50 100 200 Feet

Contour Lines (1 foot interval)

USACE Jurisdictional Verification Boundary

Sample Plots (SP)

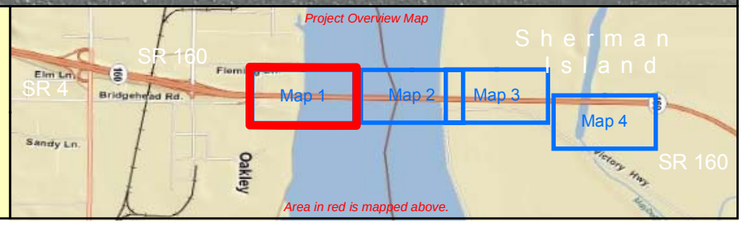
Emergent Wetland (EW) - 0.282 acres

Irrigation/Drainage (I/D) - 0.723 acres

Open Water (OW) - 20.577 acres

Seasonal Wetland (SW) - 10.298 acres

Note: Acreages in legend refer to total per wetland type. Acreage on maps refers to the acreage of the feature e.g. SW-5 0.012 acres.



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MEAN HIGH WATER (MHW) = 3.84 FT
NAVD 88 VERTICAL DATUM

OW-1
19.952 acres

San Joaquin River

Sherman Island Levee Rd

SP-22
SP-20
SP-21
SP-17
SP-16
SP-15
SP-14
SP-13

SW-1
0.025
acres

I/D-1
0.017
acres

SW-2
4.693
acres

I/D-2
0.107
acres

Attachment 1. Potential Wetlands and Other Waters in the Study Area (Map 2 of 4)

Antioch Bridge Seismic Retrofit Project

Delineators: Russell Huddleston (CH2M HILL), Stuart Kirkham, Diane Joy Hughey, Kevin Hostert (Caltrans)
Aerial Photo: Caltrans DHIPP Database, June 20, 2002
Map Prepared 8/14/2008: Stuart Kirkham (Caltrans)
Map Revised 10/8/08: Dana Morawitz (CH2M HILL)

N

0 50 100 200 Feet

Contour Lines (1 foot interval)

USACE Jurisdictional Verification Boundary

Sample Plots (SP)

Emergent Wetland (EW) - 0.282 acres

Irrigation/Drainage (I/D) - 0.723 acres

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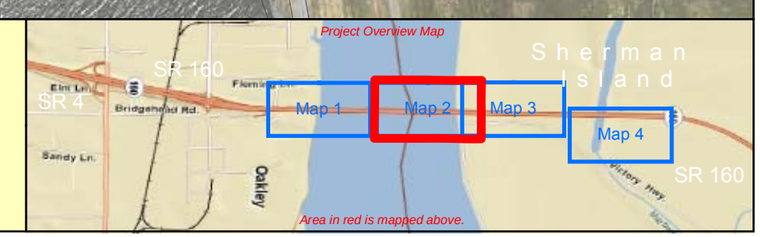
Seasonal Wetland (SW) - 10.298 acres

Note: Acreages in legend refer to total per wetland type. Acreage on maps refers to the acreage of the feature e.g. SW-5 0.012 acres.



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Attachment 1. Potential Wetlands and Other Waters in the Study Area (Map 3 of 4)

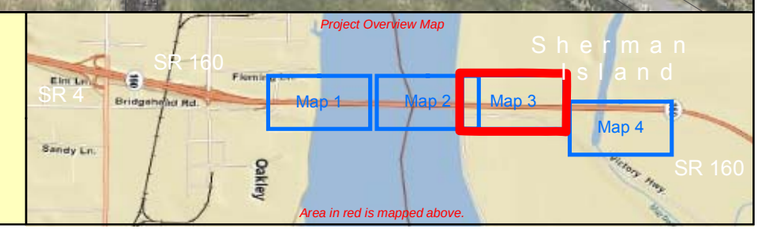
Antioch Bridge Seismic Retrofit Project

Delineators: Russell Huddleston (CH2M HILL), Stuart Kirkham, Diane Joy Hughey, Kevin Hostert (Caltrans)
Aerial Photo: Caltrans DHIPP Database, June 20, 2002
Map Prepared 8/14/2008: Stuart Kirkham (Caltrans)
Map Revised 10/8/08: Dana Morawitz (CH2M HILL)

0 50 100 200 Feet

Contour Lines (1 foot interval)
USACE Jurisdictional Verification Boundary
Sample Plots (SP)
Emergent Wetland (EW) - 0.282 acres
Irrigation/Drainage (I/D) - 0.723 acres
Open Water (OW) - 20.577 acres
Seasonal Wetland (SW) - 10.298 acres

Note: Acreages in legend refer to total per wetland type. Acreage on maps refers to the acreage of the feature e.g. SW-5 0.012 acres.



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Attachment 1. Potential Wetlands and Other Waters in the Study Area (Map 4 of 4)

Antioch Bridge Seismic Retrofit Project

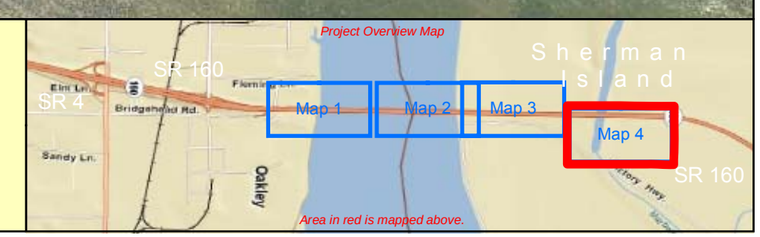
Delineators: Russell Huddleston (CH2M HILL), Stuart Kirkham, Diane Joy Hughey, Kevin Hostert (Caltrans)
Aerial Photo: Caltrans DHIPP Database, June 20, 2002
Map Prepared 8/14/2008: Stuart Kirkham (Caltrans)
Map Revised 10/8/08: Dana Morawitz (CH2M HILL)

N

0 50 100 200 Feet

Contour Lines (1 foot interval)
USACE Jurisdictional Verification Boundary
Sample Plots (SP)
Emergent Wetland (EW) - 0.282 acres
Irrigation/Drainage (I/D) - 0.723 acres
Open Water (OW) - 20.577 acres
Seasonal Wetland (SW) - 10.298 acres

Note: Acreages in legend refer to total per wetland type. Acreage on maps refers to the acreage of the feature e.g. SW-5 0.012 acres.



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Appendix A Soil Maps

608500
609000
609500
610000
610500
611000
611500
4211500
4211000
4210500
4210000
4209500
4209000
4208500
4208000
4207500
Mayberry Slough
201
155
247
222
201
222
247
201
155
201
247
200
210
247
247
W
Ub
Ja
Se
Fc Rd
W
W
W
Ub
W
W
W
W
W
Ja
DaC
HWY 160
HWY 160
160
SHERMAN ISLAND CROSS RD
SHERMAN ISLAND EAST LEVEE RD
SHERMAN ISLAND LEVEE RD
FLEMING LN
WILBUR AVE
BRIDGEHEAD RD
BIG BREAK RD
WEIBEL CIR
N
Meters
0
300
600
1,200
1,800
Feet
0
1,000
2,000
4,000
6,000

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Gully

Short Steep Slope

Other

Political Features

Municipalities

Cities

Urban Areas

Water Features

Oceans

Streams and Canals

Transportation

Rails

Roads

Interstate Highways

US Routes

State Highways

Local Roads

Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Contra Costa County, California
Survey Area Data: Version 8, Jul 22, 2008

Soil Survey Area: Sacramento County, California
Survey Area Data: Version 9, Mar 13, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 6/12/1993; 6/15/1993; 6/16/1993

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Contra Costa County, California (CA013)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
DaC	DELHI SAND, 2 TO 9 PERCENT SLOPES	373.2	18.1%
Fc	FLUVAQUENTS	1.9	0.1%
Ja	JOICE MUCK	49.6	2.4%
Rd	RINDGE MUCK	3.3	0.2%
Se	SHIMA MUCK	39.5	1.9%
Ub	URBAN LAND	92.6	4.5%
W	WATER	360.9	17.5%

Sacramento County, California (CA067)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
155	Gazwell mucky clay, partially drained, 0 to 2 percent slopes	488.0	23.7%
200	Rindge muck, partially drained, 0 to 2 percent slopes	11.4	0.6%
201	Rindge mucky silt loam, partially drained, 0 to 2 percent slopes	190.4	9.2%
210	Sailboat variant silty clay loam, partially drained, 0 to 2 perc ent slopes	75.0	3.6%
222	Scribner clay loam, partially drained, 0 to 2 percent slopes	29.6	1.4%
247	Water	345.9	16.8%
Totals for Area of Interest (AOI)		2,061.2	100.0%

Appendix B Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 26 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-01

Investigator(s): R. Huddleston, S. Kirkham, D. Hughey Section, Township, Range: Sect. 3 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38˚ 02' 33.15" Long: -121˚ 45' 04.96" Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Fringe wetland area adjacent to constructed drainage channel associated with irrigated pasture.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Polygonum amphibium*	60	X	OBL
2. *Conium maculatum*	20	X	FACW
3. *Ambrosia psilostachya*	5		FAC
4. *Raphanus sativus*	5		NL
5. *Sonchus asper*	5		FAC
6. *Cynodon dactylon*	5		FAC
7. *Carduus pycnocephalus*	>1		NL
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Vegetation observed in this area is a mixture of plant species common in the adjacent drainage ditch with scattered upland ruderal species observed along the upland area adjacent to the roadway and bridge structure

SOIL

Sampling Point SP-01

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[a]	Loc[b]	Texture	Remarks
0-5	10 YR 2/1	100					L	
5-7	10 YR 2/1	50	5 YR 5/8	1	C	M	CL	Matrix colors highly mixed, few, fine prominent concentrations present
	5 YR 5/3	50						
7-9	10 YR 4/4	70	5 YR 5/8	2	C	M	CL	Matrix colors highly mixed, few, fine prominent concentrations present
	2.5 YR 5/3	30						
9-10.5	10 YR 2/1	100					SCL	
10.5 - 24	2.5 YR 3/2	100					SCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soils between 5 and 9 inches appear to be fill material, likely associated with roadway construction in this area. Evidence of shallow ground water observed in this location indicates that soils in this area may be subject to a shallow ground water table during the wet season (November – March) that could result in anaerobic conditions within the upper 12 inches.

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 19.5		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 19.5	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Sample point is adjacent to constructed drainage associated with an irrigated pasture, soils moist throughout the profile with shallow dry season water table (although field is actively irrigated).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 26 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-02

Investigator(s): R. Huddleston, S. Kirkham, D. Hughey Section, Township, Range: Sect. 3 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38˚ 02' 33.17" Long: -121˚ 45' 05.14" Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Ruderal area adjacent to bridge structure, on slightly elevated (potentially roadway fill) area above an irrigated pasture

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Centaurea solstitialis*	30	X	NL
2. *Cynodon dactylon*	30	X	FAC
3. *Conium maculatum*	5		FACW
4. *Rumex crispus*	3		FACW-
5. *Sonchus asper*	2		FAC
6. *Carduus pycnocephalus*	1		NL
7. *Lactuca saligina*	1		NI*
8. Lactuca serriola	1		FAC
Total Cover:	75%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 25% % 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: 50% (A/B)

Prevalence Index Worksheet:

	Total % Cover Of:		Multiply By:
OBL species	1	×1 =	1
FACW species	8	×2 =	16
FAC species	33	×3 =	99
FACU species		×4 =	
UPL species	31	×5 =	155
Column Totals:	73 (A)		271 (B)

Prevalence Index = B/A = 3.71

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Other sparse species observed in this area (1% cover or less) included *Ploygonum amphibium* (OBL) and *Raphanus sativus* (NL)

SOIL

Sampling Point SP-02

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[a]	Loc[b]	Texture	Remarks
0-24	2.5 YR 3/2	100					SL	No redox evident in upper 24 inches

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Possible roadway fill material; No evidence of hydric soil at this location

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** ___ **No** X

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

Remarks: No evidence of wetland hydrology observed at this location

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 26 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-03

Investigator(s): R. Huddleston, S. Kirkham, D. Hughey Section, Township, Range: Sect. 3 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38˚ 02' 33.18" Long: -121˚ 45' 04.82" Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Sample point located within excavated drainage at the west end of an irrigated pasture, water appears to flow from this area to the north through defined channel.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Polygonum amphibium*	60	X	OBL
2. *Conuim maculatum*	30	X	FACW
3. *Cynodon dactylon*	10		FAC
4. *Sorghum halapense*	5		FACU
5. *Raphanus sativus*	2		NL
6. *Sonchus asper*	2		FAC
7. *Lactuca saligna*	1		NI*
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Dense patch of Himalayan blackberry to the north of this sample location.

SOIL

Sampling Point SP-03

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[a]	Loc[b]	Texture	Remarks
0-24	10 YR 2/1	100					SCL	No redox evident in upper 24 inches

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: *This soil could potentially meet indicator A12 if redox is present below 24 inches, based on defined drainage channel, evidence of a shallow dry season water table and abundance of FACW and OBL plants, hydric soils were assumed present at this location.

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches):	___
Water Table Present?	Yes	X	No	___	Depth (inches):	24
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	24

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks: Excavated drainage associated with an irrigated pasture, water table present at a depth of 24 inches during the dry season (although field is actively irrigated).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 26 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-04

Investigator(s): R. Huddleston, S. Kirkham, D. Hughey Section, Township, Range: Sect. 3 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38˚ 02' 33.21" Long: -121˚ 45' 04.52" Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Sample point located within an irrigated pasture, natural soils and hydrology in this area historically altered by levee construction, drainage and irrigation practices

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	100	X	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Irrigated pasture – dense monoculture of Bermuda grass at this sample location

SOIL

Sampling Point SP-04

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[a]	Loc[b]	Texture	Remarks
0-24	10 YR 2/1	100					SCL	No redox evident in upper 24 inches

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: *This soil could potentially meet indicator A12 if redox is present below 24 inches. Assumed hydric soils occur in this area based on the presence of hydrophytic vegetation and >2% oxidized rhizospheres in the upper 5 inches of the soil (note: - no pore linings observed)

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)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: More than 2% reddish roots were observed in the upper 5 inches of the soil profile in this area, all associated with living plant material and thus assumed to be oxidized live roots. Shallow ground water was observed in adjacent sample points (in the drainage ditch) but not in this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 26 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-05

Investigator(s): R. Huddleston, S. Kirkham, D. Hughey Section, Township, Range: Sect. 3 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38˚ 02' 32.00" Long: -121˚ 45' 03.99" Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Sample point located at the edge of an irrigated pasture; natural soils and hydrology in this area historically altered by levee construction, drainage and irrigation practices; marginal vegetation in this location – sample point in transition area from irrigated pasture to non-irrigated pasture on very slight slope between the two fields. Wetland boundary was mapped along this edge.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Atriplex triangularis*	45	X	NL
2. *Malvella leprosa*	30	X	FAC*
3. *Lepidium latifolium*	10		FACW
4. *Cotula coronopifolia*	2		FACW+
5. *Polygonum arenastrum*	2		NL
6. *Lolium multiflorum*	1		NL
7.			
8.			
Total Cover:	90%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground 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: 50% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		×1 =	
FACW species	12	×2 =	24
FAC species	30	×3 =	90
FACU species		×4 =	
UPL species	48	×5 =	240
Column Totals:	90 (A)		354 (B)

Prevalence Index = B/A = 3.9

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Edge of irrigated pasture in transition to upland (non-irrigated area)

SOIL

Sampling Point SP-05

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[a]	Loc[b]	Texture	Remarks
0-24	10 YR 2/1	100					SCL	No redox evident in upper 24 inches

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: *This soil could potentially meet indicator A12 if redox or gleyed soil is present below 24 inches. Shallow ground water present, but no strong evidence of wetland vegetation in this area

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)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ 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	___	No	X	Depth (inches):	___
Water Table Present?	Yes	X	No	___	Depth (inches):	23
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	23

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks: More than 2% reddish roots were observed in the upper 6 inches of the soil profile in this area, all associated with living plant material and thus assumed to be oxidized live roots, shallow ground water present (although this field is actively irrigated)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 26 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-06

Investigator(s): R. Huddleston, S. Kirkham, D. Hughey Section, Township, Range: Sect. 3 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38˚ 02' 32.00" Long: -121˚ 45' 03.99" Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Sample point located adjacent to an irrigated pasture; natural soils and hydrology in this area historically altered by levee construction, drainage and irrigation practices, this grassland appears to be slightly elevated with dryer surface soil relative to the adjacent irrigated pasture

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Hordeum marinum* ssp. *leporinum*	45	X	NI
2. *Malvella leprosa*	35	X	FAC*
3. *Polygonum arenastrum*	10		NL
4. *Bromus catharticus*	2		NL
5. *Atriplex triangularis*	2		NL
6. *Lotus corniculatus*	2		FAC
7. *Dactylis glomerata*	1		FACU
8. *Convolvulus arvense*	1		NL
Total Cover:	>95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum <5% % 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: 50% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		×1 =	
FACW species		×2 =	
FAC species	39	×3 =	117
FACU species	1	×4 =	4
UPL species	58	×5 =	290
Column Totals:	98 (A)		411 (B)

Prevalence Index = B/A = 4.19

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Upland non-irrigated pasture; other sparse species present in this area include *Lolium multiflorium* (NL) and *Xanthium straumarium* (FAC); Note: *Hordeum marinum* ssp. *leporinum* is not assigned an indicator status under Reed 1988, but this species is generally considered to be an upland plant

SOIL

Sampling Point SP-06

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[a]	Loc[b]	Texture	Remarks
0-24	10 YR 2/1	100					SCL	No redox evident in upper 24 inches

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: *This soil could potentially meet indicator A12 if redox is present below 24 inches, however the vegetation in this area is not indicative of hydric soil conditions, despite the presence of a shallow dry season water table at a depth of 22 inches.

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ 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	___	No	X	Depth (inches):	___
Water Table Present?	Yes	X	No	___	Depth (inches):	22
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	22

Wetland Hydrology Present? **Yes** ___ **No** X

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

Remarks: Ground water present at a depth of 22 inches; vegetation observed does not support a water table within the upper 12 inches during the wet season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 27 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-07

Investigator(s): R. Huddleston, S. Kirkham, Section, Township, Range: Sect. 4 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38˚ 02' 32.51" Long: -121˚ 45' 06.14" Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Sample point located adjacent to bridge structure in patch of ruderal vegetation

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Bromus diandrus*	40	X	NL
2. *Raphanus sativus*	30	X	NL
3. *Foeniculum vulgare*	20	X	FACU
4. *Malva nicaeensis*	5		NI
5. *Hordeum marinum* ssp. *leporinum*	1		NL
6. *Lepidium latifolium*	1		FACW
7. *Avena barbata*	1		NL
8. *Phalaris aquatica*	1		FAC+
Total Cover:	90%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Upland ruderal vegetation adjacent to bridge structure – sparse (less than 1%) *Lactuca saligna* (NI*) also present in this area

SOIL

Sampling Point SP-07

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[a]	Loc[b]	Texture	Remarks
0-24	2.5 YR 4/2	100					SCL	Some gravel also present in this area

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: No evidence of hydric soil in this location, soil is likely fill material associated with road construction

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** ___ **No** X

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

Remarks: Soil was dry throughout upper 24 inches, no evidence of seasonal wetland hydrology

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 27 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-08

Investigator(s): R. Huddleston, S. Kirkham Section, Township, Range: Sect. 4 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38˚ 02' 32.46" Long: -121˚ 45' 06.38" Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

Are Vegetation Yes, Soil Yes, or Hydrology Yes 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 Present?	Yes ____	No X	

Remarks: Sample point located at the upper slope of a low area characterized by invasive hydrophytic species, soils appear to be fill associated with bridge construction, soils dry throughout.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Lepidium latifolium*	45	X	FACW
2. *Conium maculatum*	35	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	80%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 20% % 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: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:
OBL species		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Area is characterized by dense perennial pepperweed and poison hemlock

SOIL

Sampling Point SP-08

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[a]	Loc[b]	Texture	Remarks
0-14	2.5 YR 5/2	100					SC	
14-18	10 YR 2/1	100					SC	
18-24	2.5 YR 5/3	100					SCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: No evidence of hydric soil in this location, soil appear to be fill material associated with road construction in this area

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** ___ **No** X

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

Remarks: Soil was dry throughout upper 24 inches, no evidence of seasonal wetland hydrology at this location other than the presence of weedy hydrophytic vegetation

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 27 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-09

Investigator(s): R. Huddleston, S. Kirkham Section, Township, Range: Sect. 4 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.042374˚ Long: -121.751986˚ Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Sample point located within excavated drainage channel that appears to flow to the north

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Typha angustifolia*	80	X	OBL
2. *Lepidium latifolium*	15		FACW
3. *Raphanus sativus*	5		NL
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Dense Typha within the channel at this location – dense Himalayan blackberry to the north, *Raphanus* is restricted to the upper edges of the drainage channel

SOIL

Sampling Point SP-09

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[a]	Loc[b]	Texture	Remarks
0-6	10 YR 4/1	100					CL	Mucky material present in surface soils

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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)
- X Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

Hydric Soil Present? **Yes** X **No** ___

Remarks: Dense *Typha* rhizomes along with saturated soils prevented deeper excavation of soil in this area; soils appear to be wet for most of the year based on dense, lush OBL vegetation and presence of muck in the surface layer.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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)
- ___ 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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): 0		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Soils were saturated to the surface with standing water present immediately blow the soil, drainage appears to flow to the north where up 18 inches of water is present in the ditch

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 27 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-10

Investigator(s): R. Huddleston, S. Kirkham Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.038012° Long: -121.751749° Datum: WGS84

Soil Map Unit Name: Ridge mucky silt loam, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Irrigated pasture; area is characterized by weedy hydrophytic vegetation and dark black soils throughout the upper 24 inches – water lines evident on bridge support structure may indicate shallow wet season water table within the upper 24 inches of the soil in this area, or could be the result of flood irrigation in this field; topographic position (10 -15 feet below sea level) suggest a natural shallow ground water table occurs in this area

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	50	X	FAC
2. *Lepidium latifolium*	40	X	FACW
3. *Hordeum marinum* ssp. *leporinum*	5		NI
4. *Lolium multiflorum*	1		NL
5. *Polypogon monspeliensis*	1		FACW+
6.			
7.			
8.			
Total Cover:	>95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum <5% % 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: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Weedy hydrophytic species common throughout this pasture

SOIL

Sampling Point SP-10

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[a]	Loc[b]	Texture	Remarks
0-24	10 YR 2/1	100					CL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Possible A12 if redox features or gleyed soils are present below 24 inches; No shallow ground water observed at this sample point but shallow ground water table possible at this location during the wet season - site was considered to potentially support hydric soils due to likely shallow ground water during the winter and early spring months.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X 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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Soils were moist throughout, but not saturated, evidence of water mark on adjacent bridge support structures and topographic position suggest that a natural shallow water table may be present in this area during the wet season (November – March).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 27 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-11

Investigator(s): R. Huddleston, S. Kirkham Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.034902˚ Long: -121.751811˚ Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Irrigated pasture; area is characterized by weedy hydrophytic vegetation and dark black soils throughout the upper 24 inches – water lines evident on bridge support structure may indicate shallow wet season water table within the upper 24 inches of the soil in this area, or could be the result of flood irrigation in this field; topographic position (10 -15 feet below sea level) suggest a natural shallow ground water table occurs in this area

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	70	X	FAC
2. *Lepidium latifolium*	15		FACW
3. *Lotus corniculatus*	5		FAC
4. *Hordeum murinium* ssp. *gussonianum*	5		FAC
5. *Lolium multiflorum*	2		NL
6.			
7.			
8.			
Total Cover:	>95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum <5% % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Weedy hydrophytic species common throughout this area of the pasture

SOIL

Sampling Point SP-11

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[a]	Loc[b]	Texture	Remarks
0-24	10 YR 2/1	100					CL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Possible A12 if redox features or gleyed soils are present below 24 inches; No shallow ground water observed at this sample point but shallow ground water table possible at this location during the wet season - site was considered to potentially support hydric soils due to likely shallow ground water during the winter and early spring months

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X 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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Soils were moist throughout, but not saturated, evidence of water marks on adjacent bridge support structures and topographic position suggest that a natural shallow water table may be present in this area during the wet season (November – March)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 27 June 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-12

Investigator(s): R. Huddleston, S. Kirkham Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.034902˚ Long: -121.751811˚ Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Irrigated pasture; area is characterized by weedy hydrophytic vegetation– water lines evident on bridge support structure may indicate shallow wet season water table within the upper 24 inches of the soil in this area, or could be the result of flood irrigation in this field; topographic position (10 -15 feet below sea level) suggest a natural shallow ground water table occurs in this area

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Lolium multiflorum*	60	X	NL
2. *Cynodon dactylon*	15		FAC
3. *Lepidium latifolium*	10		FACW
4. *Trifolium fragiferum*	5		NI*
5. *Lotus corniculatus*	5		FAC
6. *Cirsum vulgare*	1		FACU
7. *Polypogon monspeliensis*	1		FACW+
8.			
Total Cover:	>95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum <5% % 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% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Lolium multiflorum has no wetland indicator status on the Reed 1988 list, however this species is commonly observed in seasonal wetlands, swales and drainages ditches as well as uplands and is widely considered to be a facultative species.

SOIL

Sampling Point SP-12

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[a]	Loc[b]	Texture	Remarks
0-24	10 YR 2/2	100					CL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soil in this area is drier and browner (not as black) as the soils observed at SP10 and SP11, similar texture – generally similar topographic position other sample points and therefore would also be subject to shallow wet season (November – March) water table

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X 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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Soils were moist throughout, but not saturated, evidence of water marks on adjacent bridge support structures and topographic position suggest that a natural shallow water table may be present in this area during the wet season (November – March)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-13

Investigator(s): R. Huddleston, S. Kirkham, K. Hostert Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.031229° Long: -121.751616° Datum: WGS84

Soil Map Unit Name: Sailboat variant silty clay loam, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Irrigated pasture; area is characterized by weedy hydrophytic vegetation – water lines evident on bridge support structure may indicate shallow wet season water table within the upper 24 inches of the soil in this area, or could be the result of flood irrigation in this field; topographic position (10 -15 feet below sea level) suggest a natural shallow ground water table occurs in this area

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	60	X	FAC
2. *Lolium multiflorum*	25	X	NL
3. *Xanthium straumarium*	10		FAC+
4. *Raphanus sativus*	2		NL
5. *Polypogon monspeliensis*	2		FACW+
6. *Malvella leporsa*	1		FAC*
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 50% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Lolium multiflorum has no wetland indicator status on the Reed 1988 list; however this species is commonly observed in seasonal wetlands, swales and drainages ditches as well as uplands and is widely considered to be a facultative species.

SOIL

Sampling Point SP-13

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[a]	Loc[b]	Texture	Remarks
0-8	10 YR 2/1	100					CL	
8-12	10 YR 3/2	85					CL	
	10 YR 5/2	15					C	grayish brown clay inclusions mixed
12-24	10 YR 3/2	90						
	10 YR 5/2	10						grayish brown clay inclusions mixed

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: No redox observed, soils below 8 inches appear to have been mixed. No evidence of redox in this area, but water marks on bridge support pillars and topographic position suggest that a seasonal high water table may be present in this location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X 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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Soils were moist throughout, but not saturated, evidence of water marks on adjacent bridge support structures and topographic position suggest that a natural shallow water table may be present in this area during the wet season (November – March)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-14

Investigator(s): R. Huddleston, S. Kirkham and K. Hostert Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.031937° Long: -121.751613° Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Irrigated pasture; area is characterized by weedy hydrophytic vegetation and dark black soils throughout the upper 24 inches – water lines evident on bridge support structure may indicate shallow wet season water table within the upper 24 inches of the soil in this area, or could be the result of flood irrigation in this field; topographic position (10 -15 feet below sea level) suggest a natural shallow ground water table occurs in this area

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Polypogon monspeliensis*	55	X	FACW+
2. *Lolium multiflorium*	35	X	NL
3. *Rumex crispus*	10		FACW-
4. *Trifolium fragiferum*	2		NI*
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 50% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: *Lolium multiflorum* has no wetland indicator status on the Reed 1988 list; however this species is commonly observed in seasonal wetlands, swales and drainages ditches as well as uplands and is widely considered to be a facultative species.

SOIL

Sampling Point SP-14

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[a]	Loc[b]	Texture	Remarks
0-15	10 YR 3/2	100					CL	
15-24	10 YR 2/1	100					SiCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soil in this area may meet indicator A12 if gleyed soils or redox is present below 24 inches; topographic position and observation of shallow water table suggest a high seasonal water table may occur in this location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X 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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ 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	___	No	X	Depth (inches):	___
Water Table Present?	Yes	X	No	___	Depth (inches):	19
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	19

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks: Shallow ground water noted at a depth of 19 inches, evidence of water marks on adjacent bridge support structures and topographic position suggest that a natural shallow water table may be present in this area during the wet season (November – March)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-15

Investigator(s): R. Huddleston, S. Kirkham Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.030951˚ Long: -121.751604˚ Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Irrigated pasture; water lines evident on bridge support structure and oxidized rhizospheres indicate shallow wet season water table within the upper 24 inches of the soil in this area, or could be the result of flood irrigation in this field; topographic position (10 -15 feet below sea level) suggest a natural shallow ground water table occurs in this area

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Lolium multiflorium*	65	X	NL
2. *Trifolium fragiferum*	25	X	NI*
3. *Rumex crispus*	5		FACW-
4. *Malvella leprosa*	3		FAC*
5. *Polypogon monspeliensis*	3		FACW+
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *Lolium multiflorum* has no wetland indicator status on the Reed 1988 list; however this species is commonly observed in seasonal wetlands, swales and drainages ditches as well as uplands and is widely considered to be a facultative species; subdominant species in this location are all hydrophytic.

SOIL

Sampling Point SP-15

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[a]	Loc[b]	Texture	Remarks
0-13	10 YR 3/2	100	5 YR 3/4	2	C	M	CL	
13-24	10 YR 2/1	100					SiCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Evidence of redox noted in the upper part of the soils in this location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X 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)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Soils were moist throughout, but not saturated, evidence of water marks on adjacent bridge support structures and topographic position and reddish roots from living plants suggest that a natural shallow water table may be present in this area during the wet season (November – March)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-16

Investigator(s): R. Huddleston, S. Kirkham and K. Hostert Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.031076˚ Long: -121.751779˚ Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Irrigated pasture; area is characterized by weedy hydrophytic vegetation and dark black soils throughout the upper 24 inches – water lines evident on bridge support structure may indicate shallow wet season water table within the upper 24 inches of the soil in this area, or could be the result of flood irrigation in this field; topographic position (10 -15 feet below sea level) suggest a natural shallow ground water table occurs in this area

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	60	X	FAC
2. *Lolium multiflorium*	20	X	NL
3. *Polypogon monspeliensis*	10		FACW+
4. *Trifolium fragiferum*	5		NI*
5. *Rumex crispus*	3		FACW-
6. *Lotus corniculatus*	2		FAC
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 50% (A/B)

Prevalence Index Worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Lolium multiflorum has no wetland indicator status on the Reed 1988 list; however this species is commonly observed in seasonal wetlands, swales and drainages ditches as well as uplands and is widely considered to be a facultative species.

SOIL

Sampling Point SP-16

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[a]	Loc[b]	Texture	Remarks
0-17	10 YR 3/2	100	2.5 YR 4/6	5	C	M	CL	
17-24	10 YR 2/1	100					CL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Evidence of redox noted in the upper part of the soil in this location

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X 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)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Soils were moist throughout, but not saturated, evidence of water marks on adjacent bridge support structures, reddish live roots and topographic position suggest that a natural shallow water table may be present in this area during the wet season (November – March)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-17

Investigator(s): R. Huddleston, S. Kirkham and K. Hostert Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.030607° Long: -121.7516912° Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Sample point taken at the southern end of an irrigated pasture at elevation around 10 feet below sea level – the vegetation and soils in this area are not strongly indicative of seasonal wetland hydrology at this location, but the elevation of the wet season water table was indeterminate at this time – for the purposes of the delineation this entire irrigated pasture area was considered a potential seasonal wetland area.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Lepidium latifolium*	60	X	FACW
2. *Bromus diandrus*	25	X	NL
3. *Raphanus sativus*	10		NL
4. *Malvella leprosa*	3		FAC*
5. *Lolium multiflorium*	2		NL
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 50% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		×1 =	
FACW species	60	×2 =	120
FAC species	3	×3 =	9
FACU species		×4 =	
UPL species	37	×5 =	185
Column Totals:	100 (A)		314 (B)

Prevalence Index = B/A = 3.14

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Mixture of upland and ruderal hydrophytic plant species in this location within same general irrigated pasture habitat , although this area may be slightly higher than sample points taken to the north in this same habitat.

SOIL

Sampling Point SP-17

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[a]	Loc[b]	Texture	Remarks
0-24	10 TR 3/2						CL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: No evidence of hydric soil noted at this location

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: No evidence of wetland hydrology noted at this sample point at the time of the survey – area is located on subsided Delta Island 10 feet below seas level and could be subject to seasonal (Nov-March) shallow water table.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-18

Investigator(s): R. Huddleston, S. Kirkham and K. Hostert Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.031580° Long: -121.751463° Datum: WGS84

Soil Map Unit Name: Sailboat Variant, silty clay loam, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Irrigated pasture;

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	80	X	FAC
2. *Lolium multiflorum*	15		NL
3. *Lotus corniculatus*	5		FAC
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

	Total % Cover Of:	Multiply By:
OBL species		×1 =
FACW species		
FAC species		
FACU species		
UPL species		
Column Totals:		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0*

___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Vegetation in this area is typical for much of the irrigated pasture, although this area is missing perennial pepperweed which is common and widespread in other areas.

SOIL

Sampling Point SP-18

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[a]	Loc[b]	Texture	Remarks
0-12	10 YR 3/2	85					CL	Soil is highly mixed in this area
	2.5 Y 5/2	10					SiC	Silty-Clay inclusions intermixed
	5 YR 4/6	5					SiC	
12-24	10 YR 2/1	100					Loam	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soil could meet indicator A12 if gleyed soils or a reduced matrix is present at depths greater than 24 inches, soils above 12 inches appear to be mixed, soils in this area may be saturated in upper 12 inches during the wet season due to shallow water table

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 Soils (C6)
- X Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Soils were moist throughout, but not saturated, natural shallow water table may be present in this area during the wet season (November – March)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-19

Investigator(s): R. Huddleston, S. Kirkham and K. Hostert Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.031580° Long: -121.751462° Datum: WGS84

Soil Map Unit Name: Sailboat Variant, silty clay loam, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Irrigated pasture; no strong evidence of wetland conditions in this location, but the entire irrigated pasture was considered to be a potential seasonal wetland based on the possibility of a naturally high water table in the wet season (November-March) – small upland inclusions were not separately mapped in this area as part of the delineation given the complexity of the site and the timing of the wetland delineation (July).

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Lolium multiflorum*	70	X	NL
2. *Silybum marianum*	20	X	NL
3. *Raphanus sativus*	10		NL
4. *Cirsum vulgare*	1		FACU
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 0 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Although not included on the wetland plant list (Reed 1988) *Lolium multiflorum* is generally considered to be a FAC species, but this sample area would still not pass the dominance test or the PI test for hydrophytic vegetation as other associated species are all upland or FACU

SOIL

Sampling Point SP-19

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[a]	Loc[b]	Texture	Remarks
0-17	10 YR 3/2	90					CL	Soil is highly mixed in this area
	2.5 Y 5/2	5					SiC	Silty-Clay inclusions intermixed
	5 YR 4/6	5					SiC	
17-24	10 YR 2/1	100					Loam	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Soil could possibly meet indicator A12 if gleyed soils or a reduced matrix is present at depths greater than 24 inches, surface soils above 17 inches appear to be mixed – no strong indication of wetland vegetation or hydrology noted at the time of the survey

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** ___ **No** X

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

Remarks: Soils were moist throughout, but not saturated, a natural shallow water table may be present in this area during the wet season (November – March)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-20

Investigator(s): R. Huddleston, S. Kirkham and K. Hostert Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.031580° Long: -121.751462° Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

Are Vegetation Yes, Soil Yes, or Hydrology Yes 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 Present?	Yes X	No ____	

Remarks: This area is characterized by dense salt grass and has a shallow water table, soils unusual in that they do not appear to be native to this area. While this area is characterized by hydrophytic vegetation and meets secondary wetland hydrology indicators difficult to determine if this is due to seepage from the levee or a normal shallow water table. This area was tentatively considered to be an upland based on site characteristics.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Distichilis spicata*	90	X	FACW
2. *Lepidium latifolium*	10		FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Dense salt grass is present throughout this area between gravel road at toe of levee and an agricultural irrigation ditch on the south side of an irrigated pasture. Vegetation in this area is very dry and brown.

SOIL

Sampling Point SP-20

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[a]	Loc[b]	Texture	Remarks
0-5	10 YR 4/3	100					LS	
5-24	G1 3.5 /GY	100					Sand	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soils in this location very different from mapped type – and soils observed at other nearby sample locations – very sandy texture, soils below5 inches are a very dark grayish green, but are to low a value to be considered a gleyed soil. Surface soils very dry; no redox

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches):	___
Water Table Present?	Yes	X	No	___	Depth (inches):	23.5
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	23.5

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks: Surface soils were dry in the upper 5 inches, sandy soil below was moist – possible seepage from the levee in this area could result in shallow ground water.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-21

Investigator(s): R. Huddleston, S. Kirkham and K. Hostert Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.031580° Long: -121.751462° Datum: WGS84

Soil Map Unit Name: Sailboat Variant, silty clay loam, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Depressional area around the base of bridge support structure that supports distinctive wetland plant community; notably different from adjacent grassland areas.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Leymus triticoides*	40	X	FAC+
2. *Juncus mexicanus*	40	X	FACW
3. *Lepidium latifolium*	15		FACW
4. *Cirsum vulgare*	3		FACU
5. *Sonchus asper*	2		FAC
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Dense *Schoenoplectus* [*Scirpus*] *acutus* also present in this area around the base of the bridge footing structure, but outside of sample plot taken at the outer edge of the wetland area.

SOIL

Sampling Point SP-21

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[a]	Loc[b]	Texture	Remarks
0-12	2.5 YR 3/2	100	2.5 YR 3/4	2	C	M	LS	
12-24	10 YR 4/1	100					CL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Redox present in the upper 12 inches

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 Soils (C6)
- X Other (Explain in Remarks)

Secondary Indicators (two 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks: Surface soils were dry in the upper 5 inches, sandy soil below was moist – possible seepage from the levee in this area – evidence of hydrophytic vegetation, hydric soils and landscape position (adjacent to levee, subsided Delta Island) would suggest a shallow seasonal water table is present in this area during the wet season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 2 July 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-22

Investigator(s): R. Huddleston, S. Kirkham and K. Hostert Section, Township, Range: Sect. 9 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.031580° Long: -121.751462° Datum: WGS84

Soil Map Unit Name: Sailboat Variant, silty clay loam, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

Are Vegetation Yes, Soil Yes, or Hydrology Yes 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 X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Sample point on sloped area between gravel road along the toe slope of the levee and an excavated ditch along the south end of an irrigated pasture.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	95	X	FAC
2. *Lotus corniculatus*	2		FAC
3. *Lepidium latifolium*	1		FACW
4. *Distichlis spicata*	1		FACW
5. *Sonchus asper*	1		FAC
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Taken at edge of transition area on gentle slope near toe of the levee where vegetation shifts from dense salt grass to dense Bermuda grass

SOIL

Sampling Point SP-22

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[a]	Loc[b]	Texture	Remarks
0-10	10 YR 4/2	100	2.5 YR 3/4	2	C	M	LS	
10-24	10 YR 4/3	100					S	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Redox features noted in the upper 12 inches in this location

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** ___ **No** X

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

Remarks: Soils were dry throughout with no evidence to suggest seasonal saturation or inundation occur in this location under current circumstances.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 30 Sept. 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-23

Investigator(s): R. Huddleston, D. Morawitz Section, Township, Range: Sect. 3 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.042053° Long: -121.748013° Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

Are Vegetation Yes, Soil Yes, or Hydrology Yes 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 Present?	Yes X	No ____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	100	X	FAC
2. *Malvella leprosa*	2		FAC*
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0*

___ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Irrigated pasture- sparse bull thistle (*Cirsum vulgare*) [FACU] and *cocklebur (Xanthium straumarium*) [FAC] scattered but outside of sample plot in this area.

SOIL

Sampling Point SP-23

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[a]	Loc[b]	Texture	Remarks
0-24	10 YR 2/1	100					CL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soil could possibly meet indicator A11 if gleyed soils or a reduced matrix is present at depths greater than 24 inches. Soil in this location was considered potentially hydric based on observations of shallow ground water

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 Soils (C6)
- X Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ 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	___	No	X	Depth (inches):	___
Water Table Present?	Yes	X	No	___	Depth (inches):	20
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	20

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks: Soils moist throughout, field is actively flood irrigated for cattle pasture – dominated by FAC vegetation but potential high water table during the wet season (Nov-March) in this area – therefore site was considered to possibly support natural wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 30 Sept. 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-24

Investigator(s): R. Huddleston, D. Morawitz Section, Township, Range: Sect. 3 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.042005˚ Long: -121.748017˚ Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

Are Vegetation Yes , Soil Yes , or Hydrology Yes 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 Present?	Yes ____	No X	

Remarks: Transition area between irrigated pasture and non-irrigated pasture, sample point taken on gentle slope that separated the two pasture areas

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	45	X	FAC
2. *Hordeum marinum* ssp. *leporinum*	25	X	NI
3. *Malvella leprosa*	20	X	FAC*
4. *Cirsum vulgare*	1		FACU
5. *Convolvulus arvensis*	1		NL
6.			
7.			
8.			
Total Cover:	>95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum <5% % 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: 66% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:	Multiply By:
OBL species ____	x1= ____
FACW species ____	x2= ____
FAC species ____	x3= ____
FACU species ____	x4= ____
UPL species ____	x5= ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Outer edge of Irrigated pasture on slight slope to the south where the vegetation grades into non-irrigated pasture; this area has been mowed and vegetation best estimate based on existing and remnant vegetation and may be under estimating the amount of *Hordeum marinum* due to mowing.

SOIL

Sampling Point SP-24

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[a]	Loc[b]	Texture	Remarks
0-9	7.5 YR 2.5/1	100					CL	Dry throughout
9-16	7.5 YR 2.5/1	100					CL	Soils moist
16-24	7.5 YR 2.5/1	100					SiCL	Soils very moist, but not saturated

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Soil could possibly meet indicator A11 if gleyed soils or a reduced matrix is present at depths greater than 24 inches. Soils similar in color and texture to soils in the irrigated pasture, but the upper part was dry at the time of the survey.

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** ___ **No** X

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

Remarks: Soils below 9 inches were moist and soil moisture increased with depth, but no saturated soils or ground water was evident in the upper 24 inches at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 30 Sept. 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-25

Investigator(s): R. Huddleston, D. Morawitz Section, Township, Range: Sect. 3 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.041804˚ Long: -121.748062˚ Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Annual grassland pasture, this field is slightly elevated relative to adjacent irrigated pasture to the north, area has been mowed.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Hordeum marinum* ssp. *leporinum*	85	X	NI
2. *Raphanus sativus*	10		NL
3. *Centaurea solstitialis*	5		NL
4. *Sonchus asper*	1		FAC
5. *Maslvella leprosa*	1		FAC*
6. *Polygonum aerinastrium*	1		NL
7.			
8.			
Total Cover:	>95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum <5% % 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: 0 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Non-irrigated pasture; this area has been mowed and vegetation best estimate based on existing and remnant vegetation in this area, may be under estimating the amount of *Hordeum marinum* and/or *Raphanus sativus* due to mowing.

SOIL

Sampling Point SP-25

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[a]	Loc[b]	Texture	Remarks
0-24	7.5 YR 2.5/1	100					CL	Dry throughout

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soil could possibly meet indicator A12 if gleyed soils or a reduced matrix is present at depths greater than 24 inches. Dry throughout, but similar color and texture to soils in the adjacent irrigated pasture, but this area characterized by upland vegetation.

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** ___ **No** X

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

Remarks: No evidence of wetland hydrology was observed at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 30 Sept. 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-26

Investigator(s): R. Huddleston, D. Morawitz Section, Township, Range: Sect. 2 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.042326˚ Long: -121.751900˚ Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay loam, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Low area between bridge fill slope and excavated irrigation ditch characterized by dense perennial pepperweed with scattered poison hemlock, soils moist throughout with ground water observed at a depth of 25 inches below the surface.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Lepidium latifolium*	95	X	FACW
2. *Conium maculatum*	5		FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Dense patch of perennial pepperweed with poison hemlock in low area between the edge of the bridge fill and an irrigation drainage channel

SOIL

Sampling Point SP-26

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[a]	Loc[b]	Texture	Remarks
0-24	7.5 YR 2.5/1	100					CL	Moist throughout

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soil could possibly meet indicator A12 if gleyed soils or a reduced matrix is present at depths greater than 24 inches, no redox noted in the upper 15 inches, but evidence of shallow ground water and FACW wetland vegetation indicate that hydric soils could be present at this location.

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 Soils (C6)
- X Other (Explain in Remarks)

Secondary Indicators (two 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches):	___
Water Table Present?	Yes	X	No	___	Depth (inches):	25
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	25

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks: Topographic low area characterized by dense FACW vegetation, shallow ground water observed at depth of 25 inches, soils moist throughout the upper 25 inches at the time of the survey.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 30 Sept. 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-27

Investigator(s): R. Huddleston, D. Morawitz Section, Township, Range: Sect. 2 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.043981˚ Long: -121.751890˚ Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay loam, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

Are Vegetation Yes , Soil Yes , or Hydrology Yes 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 Present?	Yes ____	No X	

Remarks: Dense perennial pepperweed throughout this area adjacent to excavated irrigation drainage; soil in this area appears to be comprised of fill material, no evidence of wetland hydrology noted at the time of the survey – weedy vegetation, fill material associated with the soils and potential seasonal hydrology – thus this area was considered a problem area – wetland boundary mapped based on USACE recommendations.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Lepidium latifolium*	100	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:	Multiply By:
OBL species ____	x1= ____
FACW species ____	x2= ____
FAC species ____	x3= ____
FACU species ____	x4= ____
UPL species ____	x5= ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Dense patch of perennial pepperweed between the edge of the bridge and an irrigation drainage channel.

SOIL

Sampling Point SP-27

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[a]	Loc[b]	Texture	Remarks
0-3	10 YR 2/1	100					SL	
3-10	10 YR 4/2	80					SCL	Soils mixed, sandy texture – fill
	10 YR 5/4	20						
10-15	10 YR 4/3	85					S	Soils mixed – appears to be fill
	10 YR 5/3	10					S	
	7.5 YR 4/5	5					S	
15-24	7.5 YR 2.5/1	100				I	CL	Distinct boundary with above layer

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** X **No** ___

Remarks: Soil could possibly meet indicator A11 if gleyed soils or a reduced matrix is present at depths greater than 24 inches, given the black clay loam soils observed at a depth of 15 inches. Soils above 15 inches appear to include fill material

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >24		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24	**Wetland Hydrology Present?**	**Yes** ___ **No** X

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

Remarks: In contrast to sample point to the south with less fill and more water smartweed no shallow ground water was evident in this area at the time of the survey.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 30 Sept. 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-28

Investigator(s): R. Huddleston, D. Morawitz Section, Township, Range: Sect. 2 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.043987° Long: -121.751840° Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

Are Vegetation Yes, Soil Yes, or Hydrology Yes 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 Present?	Yes ____	No X	

Remarks: Fill slope between roadside and excavated irrigation ditch, characterized by dense weedy hydrophytic species and scattered upland plants, soil was dry throughout the upper 20 inches of the profile.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Lepidium latifolium*	70	X	FACW
2. *Cynodon dactylon*	10		FAC
3. *Carduus pycnocephalus*	5		NL
4.			
5.			
6.			
7.			
8.			
Total Cover:	85%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 15% % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Dense patch of perennial pepperweed between the edge of the bridge fill and an irrigation drainage channel, bare ground includes thatch and debris as well as bare soil.

SOIL

Sampling Point SP-28

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[a]	Loc[b]	Texture	Remarks
0-4	10 YR 4/3	60					SL	Soil mixed, sandy texture
	10 YR 3/2	40					SL	
4-7	7.5 YR 2.5/1	100					CL	Distinct band of black soil
7-20	10 YR 4/3	90					SL	Abundant gravels throughout, sandy
	2.5 Y 4/4	10					SL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >20

Hydric Soil Present? **Yes** ___ **No** X

Remarks: surface soil appears to be fill material likely associated with bridge construction, 3 inch layer of black clay loam soil between 4 and 7 inches with very distinct and abrupt boundaries with sandy layers above and below

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >20		
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:

Remarks: Soil was dry throughout the upper 20 inches, with the exception of dense perennial pepperweed no evidence of wetland hydrology was noted in this area.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 30 Sept. 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-29

Investigator(s): R. Huddleston, D. Morawitz Section, Township, Range: Sect. 2 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.043257° Long: -121.751924° Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay , partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

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

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

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

Remarks: Low area along slope between bridge structure and excavated drainage channel characterized by dense OBL and FACW vegetation, relative to adjacent area that was characterized by FAC species and mixture of FACW and upland plants. Ground water at 18 inches below the surface and most soils throughout upper 18 inches.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Polygonum amphibiam*	60	X	OBL
2. *Lepidium latifolium*	40	X	FACW
3. *Conium maculatum*	2		FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 0 % 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: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:		Multiply By:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: Dense patch of water smartweed and perennial pepperweed between the edge of the bridge fill and an irrigation ditch.

SOIL

Sampling Point SP-29

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[a]	Loc[b]	Texture	Remarks
0-18	7.5 YR 2.5/1	100					L-CL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: May meet indicator A12 if gleyed soils or a reduced matrix is present at depths greater than 24 inches, no redox features evident in the upper 24 inches – based largely on the shift towards OBL and FACW vegetation and shallow ground water soil was considered potentially 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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ 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)
- 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):	18

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks: As with the adjacent soil pit shallow ground water was observed at a depth of 18 inches, soils in this area were moist to the surface where adjacent surface soils were dry.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Antioch Bridge Seismic Retrofit Project City/County: Sacramento County Date: 30 Sept. 2008

Applicant/Owner: Caltrans District 4 State: CA Sampling Point: SP-30

Investigator(s): R. Huddleston, D. Morawitz Section, Township, Range: Sect. 4 T. 02 N R. 02 E (MDM)

Landform (hillslope, terrace, etc.): Delta Island Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): California – C Lat: 38.0432601° Long: 121.751853° Datum: WGS84

Soil Map Unit Name: Gazwell mucky clay, partially drained, 0-2% slopes NWI classification: Palustrine Farmed (Pf)

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

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

Are Vegetation Yes, Soil Yes, or Hydrology Yes 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 Present?	Yes ____	No X	

Remarks: Area appears to be fill slope between bridge structure and excavated drainage, characterized predominantly by weedy hydrophytic vegetation, soils appear to be fill (likely from bridge construction); shallow ground water at a depth of 18 inches was noted in this location, but surface soils were dry. This sample point was considered to occur in an upland area.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
Total Cover:	N/A		
Sapling/Shrub Stratum			
1. None			
2.			
3.			
4.			
5.			
Total Cover:	N/A		
Herb Stratum			
1. *Cynodon dactylon*	35	X	FAC
2. *Lepidium latifolium*	15		FACW
3. *Conium maculatum*	15		FACW
4. *Raphanus sativus*	15		NL
5. *Malvella leprosa*	15		FAC*
6. *Melilotus alba*	1		FACU+
7.			
8.			
Total Cover:	95%		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	N/A		

% Bare Ground in Herb Stratum 5% % 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: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover Of:	Multiply By:
OBL species ____	x1= ____
FACW species ____	x2= ____
FAC species ____	x3= ____
FACU species ____	x4= ____
UPL species ____	x5= ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Ruderal hydrophytic vegetation on slope between bridge structure and excavated irrigation ditch. Species observed in this location are common throughout this entire area between the drainage and the edge of the bridge structure, with *Lepidium* becoming more dense along the lower slope adjacent to the drainage channel.

SOIL

Sampling Point SP-30

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[a]	Loc[b]	Texture	Remarks
0-3	10 YR 4/2	50					SCL	Mixed
	10 YR 4/3						SCL	
3-9	2.5 Y 4/2	100					SCL	
9-12	7.5 YR 2.5/1	100					CL	Distinct 3 inch band of black soil
12-18	2.5 Y 4/3	80					SCL	Mixed, gravel throughout this section
	7.5 YR 2.5/1	10					SCL	
	10 YR 4/6	10				I	SCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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**)
- ___ 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 Pools (F9)

Indicators for Problematic Hydric Soils[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Soils in this area are mixed, appears to be fill material likely associated with the construction of the roadway and bridge in this area, no evidence of hydric soil was noted in this location despite the abundance of hydrophytic vegegation.

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 Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (two 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 X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >18		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >18	**Wetland Hydrology Present?**	**Yes** ___ **No** X

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

Remarks: Surface soils were dry in this area; vegetation includes a mixture of weedy FAC, FACW and upland species and no strong evidence of hydric soil was noted in this area; note: subdominants only meet the FAC neutral test.

Appendix C Representative Photographs

Appendix C: Representative Photographs

Delineation of Wetlands and Other Waters

Antioch Bridge Seismic Retrofit Project – Caltrans EA 1A521

OW-1 San Joaquin River

OW-2 and OW-3 Irrigation Canal

OW-4 Mayberry Slough

EW-1

EW-2

EW-3

SW-1

IW-1

ID-1

ID-2

ID-3

ID-4

Irrigated Pasture – Lay-Down Area

Irrigated Pasture – Lay-Down Area

Irrigated Pasture – Lay-Down Area