STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

August 24, 2015

Mr. Michael Jewell
Chief, Regulatory Branch
U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814

Dear Mr. Jewell:

Pursuant to Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act (33 U.S.C. 403), the California Department of Water Resources (DWR) submits the attached application to the U.S. Army Corps of Engineers (Corps) for a Department of the Army individual permit (33 C.F.R 325) to allow for the implementation of key components of the State's California WaterFix program. Specifically, DWR is seeking authorizations from the Corps necessary for the construction and operation of new water conveyance facilities that will be part of the State Water Project (SWP) and operated in coordination with the U.S. Bureau of Reclamation's (Reclamation's) operation of the Central Valley Project (CVP). The California WaterFix is a critical element of a broader State effort to meet the goals of providing for a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem.

Background

The proposed project reflects the culmination of a multiyear planning process that began in 2006 between DWR, the California Natural Resources Agency, Reclamation, public water agencies, State and federal fish and wildlife agencies, non-governmental organizations, agricultural interests, and the public. The planning process, which was called the Bay Delta Conservation Plan (BDCP) program, was initiated in response to the increasingly significant and escalating conflict between the needs of a range of at-risk Delta species and natural communities adversely affected by a wide range of human activities and the need for more reliable water supplies in California for communities, agriculture, and industry.

Nearly ten years later, the ecological health of the Delta continues to be at risk, and the conflicts between species protection and Delta water exports have become more pronounced, as evidenced by years of litigation regarding the intersection of endangered species laws and the operational criteria of the SWP and CVP. Other factors, such as the continuing subsidence of lands within the Delta, increasing seismic risks and levee vulnerabilities, and rising sea levels caused by climate change, have served to further exacerbate these conflicts. The actions proposed by DWR in this permit application, which are referred to as the California WaterFix, would bring about fundamental, systemic change to the current system, putting the State on a course to

"[a]chieve the two coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem." (California Public Resources Code Section 29702, subd. [a]).

Proposed Conveyance Facilities

The new SWP water conveyance facilities proposed under the California WaterFix and reflected in DWR's application would introduce new operational flexibility into the SWP and CVP, enabling SWP or CVP water to be diverted from the Sacramento River in the north Delta and conveyed to the south Delta or to be directly diverted in the south Delta at existing SWP and CVP facilities. Water would be diverted through one of three new fish-screened intakes located on the east bank of the Sacramento River between Clarksburg and Courtland. These intakes, each with a capacity of 3,000 cfs, would be situated on the river bank and would range from 1,259 to 1,667 feet in length. The intakes would consist of a reinforced concrete structure subdivided into individual bays that would be isolated from each other and operated independently. Two tunnels would be constructed to convey water by gravity from the intake facilities to the south Delta where it would flow into the north cell of a redesigned Clifton Court Forebay. This redesign of the forebay would allow for water flowing from the north Delta facilities to be isolated from water entering Clifton Court Forebay from the south Delta.

Ecological and Water Supply Benefits

The proposed project would result in substantially improved conditions in the Delta for endangered and threatened species and afford greater water supply reliability for the State. With respect to at-risk species, the new conveyance facilities would provide the following benefits:

- Increased operational flexibility for the SWP/CVP through a "dual conveyance" system that allows water managers to shift between intakes to minimize entrainment of at-risk fish species

- Reduction in reverse Old and Middle River flows through adjustments to water operations to better reflect natural seasonal flow patterns

- Siting of new diversions in areas outside of the primary habitat for Delta Smelt and Longfin Smelt

- Integration of state-of-the-art fish screens at each intake to minimize entrainment

The proposed project would also advance the State's water supply goals by:

- Upgrading the SWP/CVP water conveyance system in a manner that improves the ability to capture water during wet years

- Protecting against water supply disruptions associated with catastrophic system failures caused by earthquakes or failed levees

- Protecting against water supply disruptions associated with sea level rise caused by climate change

Based on the foregoing benefits, the implementation of the California WaterFix would represent an important step forward in the State's efforts to resolve the longstanding conflicts within the Delta.

Consistency with Requirements of CWA Section 404 and RHA Section 10

DWR believes that the attached application is complete and consistent with the regulatory requirements of CWA Section 404 and RHA Section 10. As set out in the application, DWR has designed the proposed project to avoid impacts to waters of the United States to the maximum extent practicable and has developed measures to minimize any unavoidable impacts. DWR will submit a plan to the Corps that sets out an approach to mitigating for any unavoidable impacts to waters, including an assessment of the functions and values that will be provided by such mitigation to meet the "no net loss" goal established by the Corps and the Environmental Protection Agency. DWR will also submit to the Corps an analysis of alternatives to the proposed project to assist the Corps in its determination that the Section 404 Guidelines have been met.

National Environmental Policy Act (NEPA) Environmental Review

As you know, DWR and Reclamation recently released for public review and comment the *BDCP/California WaterFix Partially Recirculated Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS)*. The comment period is scheduled to end on October 30, 2015. It is DWR and Reclamation's expectation that the final EIR/EIS will be sufficiently comprehensive to satisfy the Corps' environmental review responsibilities under NEPA regarding the issuance of permits pursuant to this application. We understand that the Corps intends to issue a Public Notice of the application to coincide with the public review period on the RDEIR/SDEIS.

DWR has provided the following supporting documents to Zach Simmons, Corps point of contact for this project, in both hard copy and digital format:

- TAB A - Form 4345, Application for Department of the Army Permit

- TAB B - Continuation sheet for Form 4345

- TAB C - Table of impacts

- TAB D - Map book showing impacts
- TAB E - Figures
    - Fig 1 – ES1 from project Conceptual Engineering Report
    - Fig 2 – 3-1 from project Conceptual Engineering Report
- TAB F - Project Conceptual Engineering Report (on disk)

DWR looks forward to continuing to work with the Corps as it develops further documentation to support this application and comply with the regulatory requirements of CWA Section 404 and RHA Section 10. We appreciate the effort that the Corps has invested in the BDCP/California WaterFix programs and we look forward to successful completion of this critical endeavor.

If you have any questions regarding the accompanying permit application, please contact Michael Bradbury, California WaterFix Permit Manager, at 916-651-2987 or mike.bradbury@water.ca.gov.

Sincerely,

Cassandra Enos
Program Manager
BDCP/California WaterFix

cc. Zachary Simmons, USACE

Attachments

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 30-SEPTEMBER-2015

Public reporting for this collection of information is estimated to average 11 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 the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. 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

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated 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/or instructions) and be submitted to the District Engineer having jurisdiction over the location of 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 COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Michael Middle - Last - Bradbury	First - Karen Middle - Last - Shaffer
Company - Department of Water Resources	Company - Gibson & Skordal, LLC
E-mail Address - mike.bradbury@water.ca.gov	E-mail Address - kshaffer@gibsonandskordal.com
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address- 901 P Street, Suite 411b	Address- 2617 K Street, Suite 175
City - Sacramento State - CA Zip - 95814 Country - USA	City - Sacramento State - CA Zip - 95816 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business c. Fax	a. Residence b. Business c. Fax
916-651-2987	916-822-3230 916-822-3231

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Karen Shaffer 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.

_____ _____

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

California WaterFix

13. NAME OF WATERBODY, IF KNOWN (if applicable)

Sacramento/San Joaquin Delta (see Continuation Sheet)

14. PROJECT STREET ADDRESS (if applicable)

Address N.A.

15. LOCATION OF PROJECT

Latitude: ◦N See Continuation Sheet Longitude: ◦W

City - State- Zip-

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

State Tax Parcel ID See Continuation Sheet Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE

See Continuation Sheet

18. Nature of Activity (Description of project, include all features)

The construction and operation of the California WaterFix water conveyance project and the associated habitat creation, restoration and enhancement.

See Continuation Sheet for project details, including details on each of the project components, and construction timing.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

See Continuation Sheet for detail of the reason for the project.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Discharge of fill material into waters of the United States is required to construct various components of the proposed project.

See Continuation Sheet for details.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

See Continuation Sheet.

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres See Continuation Sheet.

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See Continuation Sheet.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See Continuation Sheet.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates 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	Continuation Sheet				
NMFS					
SRWCB					
CDFWS					

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

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this 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

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 willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious 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.

California WaterFix

Clean Water Act Section 404 Application
Continuation Sheet for ENG FORM 4345

A. Background

In October 2006, various state and federal agencies, water contractors, and other stakeholders initiated a process to develop the Bay Delta Conservation Plan (BDCP) to advance the planning goal of restoring ecological functions to the Delta and improving water supply reliability in the State of California. In July 2012, Governor Edmund G. Brown, Jr. and United States Secretary of the Interior Ken Salazar reaffirmed both the State and federal commitment to the BDCP as a comprehensive solution to achieve the dual goals of a reliable water supply for California and a healthy California Bay Delta ecosystem that supports the State's economy.

In December 2013, after several years of preparation, DWR, Reclamation, USFWS, and NMFS, acting as joint Lead Agencies, published a draft of the BDCP and an associated Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS). The Draft EIR/EIS analyzed a total of 15 action alternatives, including Alternative 4, which was identified as DWR's preferred alternative. The 14 other action alternatives varied from Alternative 4 with respect to such factors as the number of proposed North Delta intakes, the types of conveyance facilities (e.g., surface canals versus underground pipelines), operational rules, and amounts of proposed habitat restoration.

Alternative 4 included three new intakes located in the North Delta and two parallel underground pipelines which would convey diverted water to the existing export facilities in the South Delta. The proposed operations for Alternative 4 reflected the outcome of many years of collaboration between DWR, Reclamation, the water contractors, USFWS, NMFS, and CDFW. By July 2014, at the end of the public review period, the Lead Agencies had received comments on the proposed BDCP from other agencies and members of the public. Many of these comments suggested improvements that could be made to the proposed project (i.e., Alternative 4, the BDCP). For example, some of the comments urged that the Lead Agencies reduce the level and scope of the construction activities, such as number of intakes, as means of reducing air quality and noise impacts. Other comments noted that Alternative 4 contemplated intensive construction activity on Staten Island, which is important wintering habitat for the Greater Sandhill Crane. Many commenters argued that, because the proposed project would lead to significant, unavoidable water quality effects, DWR could not obtain various approvals needed for the project to succeed (e.g., approval by the State Water Resources Control Board for new points of diversion for the north Delta intakes). Others suggested that DWR should pursue a permit with a term shorter than 50 years due to the level of uncertainty regarding both the future effects of climate change and the long-term effectiveness of habitat restoration in restoring fish populations. Still other comments suggested that the proposed conveyance facilities should be separated from the habitat restoration components of the BDCP, with the latter to be pursued separately.

Taking this public and agency input into account, the Lead Agencies substantially modified Alternative 4 and formulated three new sub-alternatives (2D, 4A, 5A). These sub-alternatives assume that incidental take authorizations would be issued for shorter durations than 50 years and propose habitat mitigation and restoration commensurate with impacts of the water conveyance facilities. Other important changes include: (i) the elimination of three pumping plants associated with new intake facilities; (ii) associated reductions in construction-related air pollutant emissions at intake sites; (iii) substantial reductions in the amount of construction occurring on Staten Island; and (iv) reductions in water quality effects.

The proposed project (Alternative 4A), as well as two other sub-alternatives (2D, and 5A), were developed by the Lead Agencies to embody a different implementation strategy, in which State and federal endangered species incidental take authorizations would not be obtained through Section 10 of the Endangered Species Act (ESA) or through the Natural Community Conservation Planning Act (NCCPA), but rather through Section 7 of the ESA and Section 2081(b) of the California Endangered Species Act (CESA). These new sub-alternatives consist of the construction and operation of new north Delta intakes and habitat restoration actions necessary to address the effects associated with the new facilities. This alternative implementation strategy contemplates that other State and federal programs will address broader habitat restoration goals identified for species recovery. Alternative 4A, which is known as "The California WaterFix" is identified as DWR and Reclamation's preferred alternative in the Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) released for public comment in July 2015.

The construction and operation of new conveyance facilities would help resolve many of the concerns with the current south Delta conveyance system, including reducing impacts to endangered and threatened species in the Delta through operational changes to the SWP and CVP and state of the art fish screens to reduce entrainment. Implementing a dual conveyance system, in which water could be diverted from either the north or the south or both, depending on the needs of aquatic organisms, would align water operations to better reflect natural seasonal and east-west flow patterns. The new system is designed to reduce the impacts that occur through sole reliance on the southern diversion facilities and to allow for greater operational flexibility to enhance fish protection. The new conveyance facilities would also help protect critical water supplies against the threats of sea level rise and earthquakes.

Although Alternatives 4A, 2D, and 5A include only those habitat restoration measures necessary to mitigate for the effects of the new conveyance facilities, habitat restoration is still recognized as a critical component of the State's long-term plans for the Delta. Such larger endeavors, however, will likely be implemented over time under actions separate and apart from the proposed project. The primary habitat restoration program is called California EcoRestore (EcoRestore), which will be overseen by the California Natural Resources Agency and implemented under the California Water Action Plan. Under EcoRestore, the State will pursue restoration of more than 30,000 acres of fish and wildlife habitat by 2020.

B. Design Overview

The proposed project consists of the construction and operation of a dual-conveyance water delivery system that would modernize the hub of California's aging water supply system in a way that balances the needs of the Delta ecosystem and California's water supplies. The design of the new facilities has evolved over the years, due primarily to additional engineering analyses, environmental considerations, landowner concerns, and public comment. The original concept was the All Tunnel Option (ATO), which relied primarily on tunnels to convey the water through the Delta. The next concept was the Pipeline Tunnel Option (PTO), which included a combination of pipelines and tunnels. The third concept was the Modified Pipeline Tunnel Option (MPTO), which made significant changes to the earlier concepts, including reducing the number of intakes, increasing the size of the tunnels in the gravity-feed portion of the system, decreasing the size of the intermediate forebay, and eliminating an intermediate pumping plant.

The conveyance facility alignment in the proposed project (Alternative 4A) is identified as the "Dual Conveyance Facility Modified Pipeline/Tunnel Option – Clifton Court Forebay Pumping Plant Option," or "MPTO/CCO" in DWR's Conceptual Engineering Report which analyzes the project. This latest configuration optimizes the earlier MPTO design concept to better utilize the Clifton Court Forebay. Changes to the conveyance facilities resulting from the optimization in alignment and features, include the following:

- Larger north tunnels for gravity feed system;
- Reduction of the internal hydrostatic head within the tunnel system;
- Optimized intermediate forebay;
- Relocation of RTM sites off of Staten Island
- Consolidated pumping plant at Clifton Court Forebay (CCF);
- Modification to the CCF; and
- Elimination of the pumping plants at the intakes.

The proposed project also includes the installation of a permanent barrier at the Head of Old River (HORB) to ensure fish remain in the San Joaquin River, rather than enter the South Delta through Old River.

Based on the construction schedule, DWR will seek CWA Section 404 and RHA Section 10 authorizations in phases. It is understood that the components of the project which will require 408 authorization cannot be approved under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act until the 408 authorization is obtained. Based on current information, DWR expects to seek permits pursuant to the following phases :

- Phase 1 – Construction of the Pumping Plant at Clifton Court Forebay
- Phase 2 – Construction of the North Tunnels, Intermediate Forebay, and Dual Main Tunnels; Disposal of Tunnel Material; CCF Dredging; and the modification of the existing CCF to create two forebays
- Phase 3 – Construction of the Intakes and Head of Old River Barrier

C. Additional Application Form 4345 Data

The following information is provided as a supplement to **ENG FORM 4345** and is provided in the same order in which information is requested on the form.

Block 13. NAME OF WATERBODY

The proposed project is located in the Sacramento/San Joaquin Delta and crosses several waterways and wetland features within the Delta. A comprehensive list of each waterbody/wetland affected by the proposed project can be found at **TAB C, Table of Impacts**, and **TAB D, Map Book of Impacts**. Named waterbodies include Italian Slough, Old River, West Canal, San Joaquin River, North Victoria Canal, Potato Slough, Connection Slough, Middle River, Snodgrass Slough, and the Sacramento River.

Block 15. LOCATION OF PROJECT

The location of the proposed project is shown on **Figure 1** of **TAB E, Project Figures**. The northern most component of the project is located at approximate Latitude 38.42° North and Longitude 121.51° West, while the southern-most component is located at approximate Latitude 37.80° North and Longitude 121.58° West. The location of each waterway and wetland crossing is included on the Table of Impacts at TAB C.

Block 16. OTHER LOCATION DESCRIPTIONS

The components of the proposed project are located within Sacramento, San Joaquin, Contra Costa and Alameda Counties.

Block 17. DIRECTIONS TO THE SITE

Portions of the proposed project work area can be accessed by public roads such as State Route 160, Highway 12, and Highway 4; but much of the project area is currently accessible only by private roadway. See the figures at TAB E for locational information.

Block 18. NATURE OF ACTIVITY

The proposed project will include the following:

- Three Intake Facilities along the Sacramento River in the north Delta with fish-screened on-bank intake structures.
- Two gravity-flow water conveyance tunnels (North Tunnels) that connect the intakes to an Intermediate Forebay.
- The Intermediate Forebay (IF) which receives water from the North Tunnels, equalizes pressure, and passes the water to the dual gravity-flow Main Tunnels.
- Dual Main Tunnels connecting the IF to Clifton Court Forebay (CCF).
- A Pumping Plant located at the northeast corner of CCF.
- Eleven disposal sites for tunnel material excavated from the North Tunnels and Dual Main Tunnels.
- Division of CCF into two parts: North Clifton Court Forebay (NCCF) and South Clifton Court Forebay (SCCF).
- A permanent operational barrier at the Head of Old River.

The water conveyance facilities included in the proposed project assume the following:

- The MPTO/CCO delivers up to 9,000 cubic feet per second (cfs) from the Sacramento River in the north Delta to the south Delta export pumping plants.
- The proposed project is engineered to:
  - Transport water through conveyance facilities isolated from existing rivers and sloughs.
  - Divert water from the Sacramento River through fish-screened intakes.
  - Deliver water to the SWP and CVP export pumping plants' intake channels downstream of their respective fish collection facilities.
- Withstand a 200-year flood event taking into account the sea level rise (SLR) predicted from climate change.

- Use gravitational flow through the Main Tunnels.

The physical characteristics of each of the proposed project's components are described below.

Intakes

The three Intake Facilities (Intakes No. 2, 3, and 5) will each have a capacity of 3,000 cfs as proposed by DWR and a team of experts, including State and federal fish agency biologists, called the Fish Facilities Technical Team (FFTT). The Intake Facilities are proposed for sites along the Sacramento River which were selected in coordination with the FFTT. Intake numbering is consistent with the earlier Pipeline/Tunnel Option (PTO) CER numbering system.

Each Intake Facility will consist of the following:

- A fish-screened intake structure that employs state-of-the-art on-bank fish screens.
- Twelve large gravity collector box conduits that will extend through the levee to convey flow to the sedimentation system.
- A sedimentation system consisting of gravity settling basin to capture sand-sized sediment and a drying lagoon for sediment drying and disposal.

Water will pass through baffled fish screens and flow under the modified levee and rerouted Highway 160 through gated box conduits. Water will exit the box conduits into one of two sediment basins, then flow through an afterbay to the discharge shaft that leads to the tunnel system. Electric power will be supplied through a substation with transformers and switching equipment that will be located at each site.

North and Main Tunnel Alignments

The proposed conveyance tunnels consist of the North Tunnels, which consist of three separate tunnel reaches totaling approximately 14 miles that connect the three Intake Facilities to the IF, and two parallel Main Tunnels to the NCCF, each approximately 30 miles long. The North Tunnels are two single-bore 28-foot and one single-bore 40-foot inside diameter (ID) tunnels. The Main Tunnels are twin-bore 40-foot inside diameter tunnels. The inlets and outlets would be equipped with isolation structures to allow the tunnels to be dewatered, maintained, and inspected.

As part of the construction of the tunnels, five temporary barge landings would be constructed at locations adjacent to construction work areas for the delivery of construction materials. Each of the five proposed barge landings would include in-water and over-water structures, such as piling dolphins, docks, ramps, and possibly conveyors for loading and unloading materials; and vehicles and other machinery. Construction of the five barge landings would involve piles at each landing.

Disposal of Tunnel Material

The material excavated from both the North Tunnels and the Dual Main Tunnels will be disposed of near the tunnel boring machines' launch shafts. Proximity to the tunnel shafts is required to reduce truck traffic associated with the transport the material to a remote disposal site. There are currently 11 disposal sites identified, and excavated tunnel material will be transported to spoil sites a maximum of 16,000 feet from launch shafts, primarily by conveyor. The daily volume of tunnel material withdrawn

from the tunneling operations at any one shaft location would vary, with an average volume of approximately 6,000 cubic yards per day. Transport of the material to the RTM storage sites would be nearly continuous during mining or advancement of the TBM. The material would be carried on a conveyor belt from the tunnel boring machines to the base of the launching shaft and then to a work area. The material would be segregated for transport to treatment area as appropriate. The material would be stacked to a height of between six and 15 feet, depending on storage location. If feasible, the tunnel material will be reused during the construction of various habitat restoration and creation efforts within the Delta.

Intermediate Forebay

The proposed Intermediate Forebay (IF) would be located on the Glanville Tract, east of the Pearson District and west of Interstate 5. The IF serves as an atmospheric break in the system from the inlet to the dual Main Tunnels. This break in the system allows the flows from each Intake to merge and be distributed equally to each barrel of the Main Tunnels, improving operational stability in the Clifton Court pumping plant, and allowing for independent operation of each of the North Tunnels and the Main Tunnels. The IF would have no regulating gates controlling gravitational flow to the Main Tunnels; therefore, no daily operational storage would be necessary at IF beyond that necessary to accommodate water surface changes at the downstream NCCF. The IF would have a bottom elevation of -20 feet and would be 28 acres in size. The sizing of the facility reflects the smallest practicable area that would accommodate construction of the inlet and outlet structures and provide sufficient reduction in velocity to capture sand-sized sediment not otherwise captured at the Intake Facilities.

Clifton Court Forebay

The Clifton Court Forebay (CCF), which has a water surface area of approximately 2215 acres, will be expanded by approximately 590 acres to the southeast of the existing forebay to create a new overall footprint of approximately 2805 acres. The existing CCF will be dredged, and the expansion area excavated, to design depths of -8 feet for the north cell (the NCCF) and -10 feet for the south cell (the SCCF). A new embankment would be constructed around the perimeter of the forebay, and coffer dam would divide the forebay into two sections, the NCCF and the SCCF; the new forebay sections would have a surface area of 822 acres and 1756 acres, respectively. Water from the Dual Main Tunnels would be pulled from the tunnels' terminus by the Clifton Court Pumping Plant at the northeastern end of the NCCF, south of Victoria Island, and enter the NCCF. Water flow from the tunnels into the NCCF by gravity only would be feasible when the Sacramento River is at exceptionally high stages.

The NCCF provides the daily operational storage required to equalize and balance differences between the south Delta inflow and water exported by the SWP and CVP pumps. Preliminary calculations indicate an operational storage capacity range of approximately 4,300 to 10,200 acre-feet (AF), with an approximate water storage surface area of 822 acres, depending on depth. Constraints on the exporting pumping plants fixed a normal forebay operating range of 7.0 feet (elevation +0.50 to +7.5 feet). This operating range would allow for approximately 4,300 AF of potential active storage in the NCCF. Additional operating storage up to 10,200 AF may be obtained by operating NCCF at a range of up to 9.0 feet, which would be within the efficient operating range of both NCCF and the export pumping plants.

The SCCF has been designed to be hydraulically dependent on Delta waterways and to be operated under the same criteria as the existing CCF. The SCCF would incorporate part of Byron Tract located on

the south side of the existing CCF. The SCCF would draw its supply from the West Canal using intake gates and would provide flow to Banks PP. SCCF would have an approximate water storage surface area of 1756 acres at maximum water elevation. Constraints on the exporting pumping plants limit the normal operating range to 7.0 feet (elevation +1.1 to +8.1 feet). This operating range would allow for approximately 14,000 AF of potential active storage in SCCF. Additional operating storage could be created with increase to the existing operating range.

An emergency spillway would be constructed in the NCCF east side embankment, south of the CCPP fill pad. The spillway has been sized to carry emergency overflow (9,000 cfs, the maximum inflow) to the Old River, so a containment area is not necessary. The shallow foundation beneath this existing structure requires improvements to prevent strength loss and seismic settlement. The ground improvement would be to elevation -50.0 feet within the footprint of the structure and beyond the structure by a distance of approximately 25 feet. The work would be performed within the sheet pile installed for embankment filling.

Head of Old River Barrier
The proposed project includes the construction of a barrier at the Head of Old River, which would consist of fish and flow control gates as well as a small boat lock to allow recreational boat passage during operation of the gates. The barrier gates would be operated from October 1 through June 15 each year. From June 16 through September 30, the gates would be open.

Additional information and figures regarding the engineering details of the proposed project can be found on the compact disk at **TAB F, Conceptual Engineering Report**, Modified Pipeline/Tunnel Option – Clifton Court Forebay Pumping Plant, Volume 1, dated April 1, 2015.

Block 19. PROJECT PURPOSE
Consistent with the information requested on FORM 4345, this section sets out the purpose and need for the proposed project. Applicant will submit a separate Basic and Overall Project Purpose Statement as part of the analysis of alternatives it conducts to assist the Corps in making determinations pursuant to the Section 404(b)(1) Guidelines.

One of the primary challenges facing California is how to comprehensively address the increasingly significant and escalating conflict between the ecological needs of a range of at-risk Delta species and natural communities that have been and continue to be adversely affected by a wide range of human activities, while providing for more reliable water supplies for people, communities, agriculture, and industry.

This challenge must be addressed, in decisions made by DWR, CDFW, and the State Water Resources Control Board (State Water Board), as they endeavor to strike a reasonable balance between these competing public policy objectives and various actions taken within the Delta, including the proposed project. State policy regarding the Delta is summarized in the Sacramento–San Joaquin Delta Reform Act of 2009, which states:

> "it is the intent of the Legislature to provide for the sustainable management of the Sacramento-San Joaquin Delta ecosystem, to provide for a more reliable water supply for the state, to protect and enhance the quality of water supply from the Delta, and to establish a governance structure that will direct efforts across state agencies to develop a legally enforceable Delta Plan." (California Water Code, Section 85001, subd. [c]).
>
> The Delta "serves Californians concurrently as both the hub of the California water system and the most valuable estuary and wetland ecosystem on the west coast of North and South America." (California Water Code, Section 85002).

The ecological health of the Delta continues to be at risk, and the conflicts between species protection and Delta water exports have become more pronounced. Other factors, such as the continuing subsidence of lands within the Delta, increasing seismic risks and levee failures, and sea level rise associated with climate change, serve to further exacerbate these conflicts. Simply put, the overall system as it is currently designed and operated does not appear to be sustainable from an environmental perspective, and so a proposal to implement a fundamental, systemic change to the current system is necessary. This change is necessary if California is to "[a]chieve the two coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem." (California Public Resources Code Section 29702, subd. [a]).

This section presents the Lead Agencies' Project Objectives, which are required by the State CEQA Guidelines, and the Purpose and Need Statement, which is required by the CEQ NEPA Regulations.

Purpose and Need

Just as CEQA requires an EIR to include a statement of "project objectives" as described above, NEPA requires that an EIS include a statement of "purpose and need" to which the federal agency is responding in proposing the alternatives, including the proposed action (40 CFR 1502.13). This purpose statement of the proposed action and project need described below, are consistent with the above project objectives in Section 1.1.4.1.

Purpose Statement

The purposes of the proposed actions are to achieve the following:

1. Construction and operation of facilities and/or improvements for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
2. Operation of the existing and potential new SWP facilities and existing CVP Delta facilities.
3. The activities described in 1) and 2) occurring in a manner that minimizes or avoids adverse effects to listed species, and allows for the protection, restoration and enhancement of aquatic, riparian and associated terrestrial natural communities and ecosystems.
4. Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts held by SWP

contractors and certain members of San Luis Delta Mendota Water Authority, and other existing applicable agreements.

The above Purpose statement reflects the intent to advance the coequal goals set forth in the Sacramento–San Joaquin Delta Reform Act of 2009 of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The above phrase—restore and protect the ability of the SWP and CVP to deliver up to full contract amounts—is related to the upper limit of legal CVP and SWP contractual water amounts and delineates an upper bound for development of EIR/EIS alternatives, not a target. It is not intended to imply that increased quantities of water will be delivered under the proposed project. As indicated by the "up to full contract amounts" phrase, alternatives need not be capable of delivering full contract amounts on average in order to meet the project purposes. Alternatives that depict design capacities or operational parameters that would result in deliveries of less than full contract amounts are consistent with this purpose.

Project Need

The need for the action is derived from the multiple, and sometimes conflicting, challenges currently faced within the Delta. The Delta has long been an important resource for California, providing municipal, industrial, agricultural and recreational uses, fish and wildlife habitat, and water supply for large portions of the state. However, by several key criteria, the Delta is now widely perceived to be in crisis. There is an urgent need to improve the conditions for threatened and endangered fish species within the Delta. Improvements to the conveyance system are needed to respond to increased demands upon and risks to water supply reliability, water quality, and the aquatic ecosystem.

<u>Delta Ecosystem Health and Productivity</u>

Variability in the location and timing of flows, salinity, and habitat was common in the pre-European Delta. But for the past 70 years, the Delta has been managed as a tidal/freshwater system. During the same period, the ecological productivity for Delta native species and their habitats has been in decline. Removal of much of the variable pre-European heterogeneous mix of fresh and brackish habitats, necessary to support various life stages of some of the Delta native species, has had a limiting effect on the diversity of native habitat within the Delta. In addition, urban development, large upstream dams and storage reservoirs, diversions, hydraulic mining, and the development of a managed network of navigation, flood control, and irrigation canals have all affected water flow patterns and altered fish and wildlife habitat availability. Most of the original tidal wetlands and many miles of sloughs in the Delta were removed by channelization and levee construction between the 1850s and 1930s. These physical changes, coupled with higher water exports and declines in water quality from urban and agricultural discharges and changes in constituent dilution capacity from managed inflows and diversions, have stressed the natural system and led to a decline in ecological productivity.

Significant declines have been reported in economically important fish species such as Chinook salmon. Delta smelt, considered by many to be an indicator species for the health of the Delta ecosystem, is just one component species in the community-wide pelagic organism decline. Fishery resource changes may

be attributable to numerous factors, including water management systems and facilities, water quality/chemistry alterations, and nonnative species introductions.

Water Supply Reliability

The distribution of precipitation and water demand in California is unbalanced. Most of the state's precipitation falls in the north, yet substantial amounts of water demand are located south and west of the Delta, including irrigation water for southern Central Valley agriculture, and municipal and industrial uses in southern California and the Bay Area. This supply/demand imbalance led to development of two major water projects: the SWP and the CVP.

Together, the SWP and CVP systems are two of the largest and most complex water projects in the nation and provide the infrastructure for the movement of water throughout much of California. They function under a suite of Congressional authorizations, interagency agreements, regulatory requirements, and contractual obligations that govern daily operations and seasonal performance. These include various authorizing legislation, the USFWS and NMFS Biological Opinions, including the Reasonable and Prudent Alternatives, and the water right permits issued by the State Water Board, among others. Regulations for the combined SWP and CVP operations are intended to protect the beneficial uses of Delta water, which include municipal, industrial, and agricultural water uses, fish and wildlife uses, environmental protection, flood management, navigation, water quality, power, and recreation.

The water rights of the SWP and CVP are conditioned by the State Water Board to protect the beneficial uses of water within the Delta under each respective project's water rights. In addition, under the COA, DWR and Reclamation coordinate their reservoir releases and Delta exports to enable each project to achieve benefit from their water supplies and to operate in a manner protective of beneficial uses as required by their water right permits. It is the responsibility of the SWP and CVP to meet these obligations regardless of hydrologic conditions. In 2006, Governor Schwarzenegger's Executive Order S-17-06 created the Delta Vision Task Force to address some of the issues facing the Delta. In the closing days of the Task Force's work, the State Water Board presented information indicating that quantities totaling several times the average annual unimpaired flows in the Delta watershed could be available to water users based on the face value of water permits already issued. However, the hydrology, the SWP and CVP water contracts, and environmental regulations control actual quantities that could be made available for use and diversion.

The current and projected future inability of the SWP and CVP to deliver water to meet the demands of certain south of Delta CVP and SWP water contractors is a very real concern. More specifically, there is an overall declining ability to meet defined water supply delivery volumes and water quality criteria to support water users' needs for human consumption, manufacturing uses, recreation, and crop irrigation.

Delta Hydrology and Water Quality

Generally, Delta hydrodynamics are defined by complex interactions between tributary inflows, tides, in-Delta diversions, and SWP and CVP operations, including conveyance, pumping plants, and operations of

channel barriers and gates. The degree to which each variable impacts the overall hydrology of the Delta varies daily, seasonally, and from year to year, depending on the magnitude of inflows, the tidal cycle, and the extent of pumping occurring at the SWP and CVP pumping plants. Changes in water inflow and outflow throughout the Delta affect the water quality within the Delta, particularly with regard to salinity. It has been estimated that seawater is pushing 3 to 15 miles farther inland since development began in the Delta over 150 years ago (Contra Costa Water District 6 2010).

Additionally, other water constituents of concern in the Delta have been identified through ongoing regulatory, monitoring, and environmental planning processes such as CALFED, planning functions of the State Water Board, and the CWA Section 303(d) list of state water bodies that do not meet applicable water quality standards. In June 2007 (with updates in February and May 2009), EPA gave final approval of a list of 18 chemical constituents identified in the Section 303(d) list for impaired Delta waters (State Water Resources Control Board 2007). Included in this list are dichlorodiphenyltrichloroethane (DDT) and other pesticides, mercury, polychlorinated biphenyls (PCBs), and selenium.

To further compound these challenges, fundamental changes to the Delta are certain to occur; the Delta is not a static ecological system. The anticipated effects of climate change will result in elevated sea levels, altered annual and inter-annual hydrological cycles, changed salinity and water temperature regimes in and around the Delta, and accelerated shifts in species composition and distribution. These changes add to the difficulty of resolving the increasingly intensifying conflict between the ecological needs of a range of at-risk Delta species and natural communities and the need to provide adequate and reliable water supplies for people, communities, agriculture, and industry. Anticipating, preparing for, and adapting to these changes are key underlying drivers for the proposed project.

Block 20. REASON FOR DISCHARGE

The construction of the proposed project would result in the discharge of fill material. Discharge of fill material would be associated with the construction of the intake facilities on the banks of the Sacramento River; grading at intake locations, construction of the intermediate forebay, pumping plant, and at tunnels (drive, vent, and reception shafts); disposal of excavated tunnel material; and installation of the HOR Barrier. In addition, fill would be placed into the existing CCF to create two separate forebays. Both forebays are proposed to be dredged.

Block 21. TYPE OF MATERIAL BEING DISCHARGED AND AMOUNT IN CUBIC YARDS

The material proposed for discharge consists of clean soil, rock, concrete, grout, sheet piles, and reusable tunnel material. The total amount of fill material to be discharged into Waters of the U.S. during construction of the conveyance facilities, and disposal of excavated material, is estimated to be 15,022,645 cubic yards. The amount of fill material to be discharged in Waters of the U.S. at given locations for the specific facilities is estimated below in Table 1.

Table 1. Estimate of Fill into Waters of the U.S.

Facility-- Hybrid Constructability	CY Fill	Estimate Assumptions	Fill Material
Barge Unloading Facility	260000	Engineering calculation	Clean soil and rock
Work Areas	97009	1 foot deep	Clean soil, rock, concrete
Concrete Batch Plant	7464	1 foot deep	Clean soil, rock, concrete
Control Structure	9759	1 foot deep	Clean soil, rock, concrete
Forebay and Spillway	1793	1 foot deep	Clean soil, rock, concrete
Forebay Embankment	11192500	Engineering calculation	Clean soil and rock
Forebay Overflow Structure	9689	Engineering calculation	Concrete and rock
Fuel Station	1490	1 foot deep	Clean soil, rock, concrete
Intake	141675	Engineering calculation	Concrete
Intake end curves/walls	180000	Engineering calculation	Clean soil and rock
Operable Barrier	12230	Engineering calculation	Clean rock and grout
Operable barrier sheet piles		Engineering calculation	Sheet piles 32,146 sq feet
Power trans/PGE	8029	1 foot deep	Clean soil, rock, concrete
Reusable Tunnel Material	2099259	6 feet deep	Reusable tunnel material
additional dredge material from CCF	241193	additional 13 feet	Dredged material
Road Interchange	15917	1 foot deep	Clean soil, rock, concrete
Shaft Locations	53724	1 foot deep	Clean soil, rock, concrete
additional at Pumping Plant	660000	Engineering calculation	Clean soil, rock, concrete
Transmission Line	27427	1 foot deep, assume max 17.08 acre footprint	Clean soil, rock, concrete
Tunnel Conveyor Facility	3487	1 foot deep	Clean soil, rock, concrete
Canal		Excavation, no fill needed	
Forebay		Excavation, no fill needed	
Forebay Dredging Area		Excavation, no fill needed	
New Forebay		Excavation, no fill needed	
Total Fill	**15022645**		

Block 22. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED

Construction of the proposed project would result in the unavoidable fill of waters of the U.S. DWR has mapped several types of waters of the United States that are located within the project area. Descriptions of the mapped waters are provided below, including general characterizations of the associated vegetation expected to occur within each type of aquatic habitat.

Perennial Wetlands

Perennial wetlands are dominated by persistent hydrophytic vegetation. Three types of perennial wetlands were mapped in the Project Area based on the growth form of the vegetation.

- **Emergent Wetland -** Emergent wetlands are dominated by emergent marsh plants such as tules and cattails, or native or ruderal hydrophytic herbaceous forbs. Nontidal emergent wetlands occur above the waterline in ditches or other nontidal channels, at the edge of ponds or lakes, or where seepage occurs on the landside of levees. Tidal emergent wetlands occur in the

vegetated zone along tidal or muted tidal channels, in areas such as mud flats, waterside levee toes, and in-channel islands.

- **Scrub-Shrub Wetlands -** Scrub-shrub wetlands are dominated by woody vegetation that is less than 6 m tall and includes riparian shrubs such as native blackberries, dogwoods, buttonbush, and California wild rose, as well as willow and cottonwood seedlings or saplings. Scrub-shrub wetlands may occur in depressions or other nontidal areas such as the banks of ditches and the edges of ponds or lakes. This plant community also occurs in tidally influenced areas along tidal channels and on in-channel islands.
- **Forested Wetlands -** Forested wetlands are defined by woody vegetation that is 6 m tall or taller. Riparian trees in the study area include: Goodding's willow, arroyo willow, sandbar willow, and Fremont's cottonwood. Forested wetlands are found in areas with tidal and nontidal water regimes, as described for scrub-shrub wetlands.

Seasonal Wetlands

Three types of seasonal wetlands were mapped in the study area. Seasonal wetlands are usually dry for part of the year and therefore exhibit vegetation that is patchy or not persistent throughout the year. Strongly alkaline or saline conditions may also cause the soil to be barren of vegetation in some areas.

- **Vernal Pool -** Vernal pool wetlands are depressions with an impervious soil horizon close to the surface. These depressions fill with rainwater and may remain inundated through spring or early summer; they often occur in complexes of many small pools that are hydrologically interconnected. Vernal pools support distinct plant species adapted to the characteristic flooding and drying cycles of the habitat. The vernal pools in the project area are located south and west of Clifton Court Forebay and have been somewhat disturbed by past land use activities.
- **Seasonal Wetland -** A type of seasonal wetland occurs in the central Delta within plowed agricultural fields. Although a system of pumps and drainage ditches controls water levels on the subsided islands, a high water table persists in some areas. Upland crops are planted in the surrounding fields but hydrophytic ruderal forbs become established in the wet areas, and crops usually fail if planted there. The vegetation in these wetlands consists mostly of annual weedy wetland species.
- **Alkaline Wetland** - Alkaline wetlands are a type of seasonal wetland influenced by strongly alkaline or saline soils. Alkaline wetlands support alkaline or saline tolerant species such as iodine bush and alkali heath, but may also have large unvegetated areas that are seasonally ponded or saturated.

Nontidal Waters

In the Delta five types of nontidal waters were mapped as the open water portion of either naturally occurring features or unnatural features that were excavated and/or diked. Nontidal waters may occur in depressions of various sizes or in channels with either intermittent or perennially flowing water. The vegetation associated with these waters is discussed separately in the Wetlands section.

- **Agricultural Ditches -** Throughout the Delta there are many ditches constructed for the purpose of irrigating and/or draining agricultural land. The mapped ditches range in size from one to 22

meters wide. They are generally unvegetated with mud bottoms, but may support floating species such as duckweed or water hyacinth.

- **Natural Channels -** Nontidal natural channels exist on the northeast and southwest edges of the Project Area. These include a section of the Cosumnes River and several small channels linking other water features. All of these features flow intermittently. The substrate in natural channels may be mud, or sand, gravel, and cobbles. These channels are generally unvegetated, but may have inclusions of emergent wetland, scrub-shrub, or forest wetlands. However, if these inclusions were large enough to be mapped, they were included in the delineation under those specific habitat types.
- **Depressions -** Depressions are ponds that are permanently, seasonally, or artificially wet, with little to no rooted vegetation on a mud or sand bottom. They may be artificially filled or result from a high water table. Depressions are less than 20 acres in size with a depth of less than 2 meters. These water bodies are often created in grazing lands for use as stock ponds, and may be diked or otherwise artificially impounded.
- **Lakes -** Lakes have characteristics similar to depressions, but are greater than 20 acres in size and may have a wave-formed shoreline.

Tidal Waters

Tidal waters are the open water portions of aquatic features that are influenced by the rise and fall of the tides. Man-made structures such as gates or culverts may restrict tidal influence to various degrees.

- **Tidal Channels -** Tidal channels may be naturally occurring perennial riverine waterways, though most have been modified with leveed banks and often reinforced with rock revetment. Water velocity and depth fluctuates under tidal influence, and the channel bottom is generally comprised of mud or sand. Tidal channels that have been created by excavation are usually straight rather than sinuous, and usually have heavily diked or reinforced banks. These excavated channels were often created to provide for navigation, water conveyance, material for levees, or to raise the land surface on adjacent property. Tidal channels are largely unvegetated, or may support floating or submerged aquatic vegetation.
- **Conveyance channels -** Several large rock-lined conveyance channels were mapped in the study area. These constructed water features were mapped along with all other aquatic resources in the Project Area because they may be subject to some tidal effects and therefore may be considered jurisdictional by the Army Corps of Engineers. These features are unvegetated.
- **Clifton Court Forebay -** Clifton Court Forebay, a constructed reservoir, is a highly modified perennial water body which is semi-enclosed by land, and engineered to be periodically open to tidal influences via a moveable gate structure. The Forebay is characterized by an artificial rock shore (rock revetment) and an aquatic bed of varying depths. The forebay is largely unvegetated, however, emergent perennials such as cattails and tules are found in shallow areas, and submerged aquatics such as Brazilian waterweed are found in areas of moderate depth.

The proposed project will result in permanent impact to approximately 774 acres of waters of the United States and temporary impact to approximately 1,931 acres of waters. The impacts are shown in detail in Table 2 below.

Table 2. Approximate Impact Acreages

Habitat Type	Permanent Impact	Temporary Impacts Treated as Permanent[1]	Temporary Impact[2]
Agricultural Ditch	46	17	0
Alkaline Wetland	20	0	0
Clifton Court Forebay	258	0	1931
Conveyance Channel	8	3	0
Depression	29	7	0
Emergent Wetland	57	32	0
Forest	8	9	0
Lake	23	0	0
Scrub-Shrub	13	5	0
Seasonal Wetland	115	25	0
Tidal Channel	19	81	0
Vernal Pool	0.3	0	0
Total[3]	596.3	179	1931

Of the permanent impacts, 179 acres are temporary impacts treated as permanent because the temporary impacts are expected to last over one year. These impact sites will eventually be restored to pre-project conditions; however, due to the duration of effect, the impacts are treated as permanent. Impacts to 52 acres of pond and lake habitat is actually conversion from open water to a mosaic of wetlands types (e.g. seasonal wetland, scrub-shrub, riparian, emergent marsh) at four lakes that were created as a result of the construction of Interstate 5 in 1979. This conversion is a part of the planned

[1] Temporary impacts treated as permanent are temporary impacts expected to last over one year. These impact sites will eventually be restored to pre-project conditions; however, due to the duration of effect, compensatory mitigation will be included for these areas.

[2] Temporary impacts are due to dredging Clifton Court Forebay.

[3] Some of these impact totals are overestimated. For example, transmission lines have been mapped as a 150-foot wide corridor, although the actual footprint would be 100' X150' for power pole pads that are spaced 450' apart for 69kV lines and 750' apart for 230kV lines; a narrow access road may also follow the transmission line alignment. The location of some pads may be changed to avoid wetlands. Impacts to Tidal Channels are also overestimated due to errors in mapping access roads on levees; the project footprint is not intended to impact the channels.

mitigation for Phase 2, as discussed in Block 23, Compensatory Mitigation, below. All of the temporary impact is due to the dredging of Clifton Court Forebay.

Wetlands and other aquatic features provide many functions, such as providing habitat, storing and conveying water, and trapping sediment. Wetlands that are undisturbed, with natural hydrologic connections and native species, tend to have a higher functional value than disturbed wetlands. A qualitative functional assessment of the mapped wetlands in the Project Area sorted the impacted wetlands into three functional value groups:

Low functional value: most agricultural ditches, seasonal and emergent wetlands within agricultural fields, Clifton Court Forebay, and constructed conveyance channels and other highly disturbed aquatic features.

Medium functional value: emergent, forest, scrub-shrub, depressions, and alkaline wetlands that are moderately disturbed or fragmented aquatic features and agricultural ditches that have developed adjacent marsh or riparian habitat.

High functional value: tidal channels, lakes, emergent, forest, scrub-shrub, depressions, alkaline wetlands and vernal pools that are relatively undisturbed.

The qualitative functional assessment of the impacted aquatic features is summarized in Table 3. The majority of the permanent impacts (approximately 72%) are to either low or moderate functional habitats. The largest single permanent impact (258 acres) is to Clifton Court Forebay, which as described above, is a man-made feature with extremely limited habitat function. The second largest permanent impact (115 acres) is to seasonal wetlands, which occur within plowed agricultural fields.

Table 3. Qualitative Functional Assessment of Impacted Aquatic Features

Type	Total impacted acres	High Function	Medium Function	Low Function
Agricultural Ditch	*63*		7	56
Alkaline Wetland	*20*	9	9	2
Clifton Court Forebay	*258*			258
Conveyance Channel	*11*			11
Depression	*36*	29	7	
Emergent Wetland	*89*	36	26	27
Forest	*17*	11	6	
Lake	*23*	23		
Scrub-Shrub	*18*	10	6	3
Seasonal Wetland	*140*			140
Tidal Channel	*100*	100		
Vernal Pool	*0.3*	0.2		<0.1
Totals	*775.3*	218	61	497
Percent of Total		28%	8%	64%

Block 23. DESCRIPTION OF AVOIDANCE, MINIMIZATION, AND COMPENSATION

The proposed project conforms to the general rule that avoidance, minimization, and compensation are to be applied in a sequential fashion. The applicant has designed the proposed project to avoid waters of the United States where practicable and minimize any unavoidable impacts. The applicant will provide compensatory mitigation for any remaining impacts.

In 2008, the Corps and the EPA issued regulations, known as the "Mitigation Rule", governing compensatory mitigation for activities authorized by permits issued by the Corps (33 CFR §§325, 332). In 2015, the Corps' South Pacific Division issued "Regional Compensatory Mitigation and Monitoring Guidelines (Final January 12, 2015)" (Division Guidelines) to supplement the Mitigation Rule. Compensatory mitigation under the Mitigation Rule and Division Guidelines fulfill the long standing national goal of replacing the loss of wetland and other aquatic resource acreages and functions, known as the "no net loss" goal (National Wetlands Mitigation Action Plan (December 24, 2002)). To achieve the no net loss goal, the Corps and EPA have concluded that, where appropriate and practicable, compensatory mitigation "should provide, at a minimum, one for one functional replacement (i.e., no net loss of values), with an adequate margin of safety."[4] The long-term objective of the no net loss policy is to increase wetland acreages and functions nationally.

The Mitigation Rule defines compensatory mitigation as (1) restoring existing wetlands or reestablishing former wetlands; (2) creating new wetlands in upland areas; (3) enhancing the functional values of degraded wetlands; and (4) preserving existing aquatic resources. Restoration is generally the preferable form of compensatory mitigation because the likelihood of success is greater while the impacts to potentially ecologically important uplands are less, as compared to creation. Moreover, the potential gains in terms of aquatic resources functions are often greater with restoration as compared to enhancement and preservation (33 CFR §332.3(a)(2)). The Mitigation Rule and Division Guidelines stress the benefits of a watershed approach to compensatory mitigation, and the preference for compensatory mitigation to be located in the same watershed as the site of the impact site and where it is most likely to successfully replace lost functions and services (33 CFR §332.3; Division Guidelines, §3.2).

Avoidance and Minimization Measures

The proposed project has been designed to avoid impacts to waters of the United States to the maximum extent practicable. Numerous iterations of footprint locations for each of the conveyance components were evaluated to maximize the use of upland areas. Once construction begins, measures will be implemented to further avoid and minimize impacts to waters of the United States as well as to special status species. The AMMs will be implemented at all phases of the project, including siting, design, construction, and operations and maintenance. The AMMs that pertain specifically to waters of the United States are summarized in the Table 3 below.

[4] Memorandum of Agreement between the Environmental Protection Agency and the USACE concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines, 55 Fed. Reg. 9210, 9212 (1990) ("Mitigation MOA").

Table 3. Summary of the Avoidance and Minimization Measures

Number	Title	Summary
AMM1	Worker Awareness Training	Includes procedures and training requirements to educate construction personnel on the types of sensitive resources in the project area, the applicable environmental rules and regulations, and the measures required to avoid and minimize effects on these resources.
AMM2	Construction Best Management Practices and Monitoring	Standard practices and measures that will be implemented prior, during, and after construction to avoid or minimize effects of construction activities on sensitive resources (e.g., species, habitat), and monitoring protocols for verifying the protection provided by the implemented measures.
AMM3	Stormwater Pollution Prevention Plan	Includes measures that will be implemented to minimize pollutants in stormwater discharges during and after construction, and that will be incorporated into a stormwater pollution prevention plan to prevent water quality degradation related to pollutant delivery from project area runoff to receiving waters.
AMM4	Erosion and Sediment Control Plan	Includes measures that will be implemented for ground-disturbing activities to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities, and that will be incorporated into plans developed and implemented as part of the National Pollutant Discharge Elimination System permitting process for covered activities.
AMM5	Spill Prevention, Containment, and Countermeasure Plan	Includes measures to prevent and respond to spills of hazardous material that could affect waters of the United States, including navigable waters, as well as emergency notification procedures.
AMM6	Disposal and Reuse of Spoils, Reusable Tunnel Material, and Dredged Material	Includes measures for handling, storage, beneficial reuse, and disposal of excavation or dredge spoils and reusable tunnel material, including procedures for the chemical characterization of this material or the decant water to comply with permit requirements, and reducing potential effects on aquatic habitat, as well as specific measures to avoid and minimize effects on species in the areas where reusable tunnel material would be used or disposed.
AMM7	Barge Operations Plan	Includes measures to avoid or minimize effects on

		aquatic species and habitat related to barge operations, by establishing specific protocols for the operation of all project-related vessels at the construction and/or barge landing sites. Also includes monitoring protocols to verify compliance with the plan and procedures for contingency plans.
AMM10	Restoration of Temporarily Affected Natural Communities	Restore and monitor natural communities in the Plan Area that are temporarily affected by construction activities. Measures will be incorporated into restoration and monitoring plans and will include methods for stockpiling and storing topsoil, restoring soil conditions, and revegetating disturbed areas; schedules for monitoring and maintenance; strategies for adaptive management; reporting requirements; and success criteria.
AMM12	Vernal Pool Crustaceans	Includes provisions to require project design to minimize indirect effects on vernal pool habitat, avoid effects on core recovery areas, minimize ground disturbing activities or alterations to hydrology, conduct protocol-level surveys, and redesign the project to ensure that habitat loss is minimized where practicable.
AMM30	Transmission Line Design and Alignment Guidelines	Design the alignment of proposed transmission lines to minimize impacts on sensitive terrestrial and aquatic habitats when siting poles and towers. Restore disturbed areas to preconstruction conditions.
AMM34	Construction Site Security	Provide all security personnel with environmental training similar to that of onsite construction workers, so that they understand the environmental conditions and issues associated with the various areas for which they are responsible at a given time.
AMM36	Notification of Activities in Waterways	Before in-water construction or maintenance activities begin, notify appropriate agency representatives if these activities could affect water quality or aquatic species.

Measures that will be implemented to avoid and minimize impacts to aquatic species and species which utilize aquatic habitats such as California tiger salamander, giant garter snake, California red legged frog, western pond turtle, riparian woodrat, riparian brush rabbit, Suisun shrew, and salt marsh harvest mouse, will also serve to reduce project impacts to waters of the United States.

Wetland Functions

Mitigation will be provided to compensate for the loss of acreage and functions associated with unavoidable construction-related impacts to waters of the United States. Wetland functions are defined

as a process or series of processes that take place within a wetland, such as those related to the storage of water, transformation of nutrients, growth of living matter, and diversity of wetland plants. Functions can be grouped broadly as habitat, hydrologic, or water quality.

Not all wetlands perform all functions nor do they perform all functions equally well. The location and size of a wetland may determine the nature of the wetland function. For example, the geographic location may determine habitat functions, and the location of a wetland within a watershed may determine its hydrologic or water-quality functions. Many factors determine how well a wetland will perform these functions: climatic conditions, quantity and quality of water entering the wetland, and disturbances or alteration within the wetland or the surrounding ecosystem. Wetland disturbances may be the result of natural conditions, such as an extended drought, or of human activities, such as land clearing, dredging, or the introduction of nonnative species. Wetlands are among the most productive habitats in the world, providing food, water, and shelter for fish, shellfish, birds, and mammals, and serving as a breeding ground and nursery for numerous species. Many endangered plant and animal species are dependent on wetland habitats for their survival. Hydrologic functions are those related to the quantity of water that enters, is stored in, or leaves a wetland. These functions include such factors as the reduction of flow velocity, the role of wetlands as ground-water recharge or discharge areas, and the influence of wetlands on atmospheric processes. Water-quality functions include the trapping of sediment, pollution control, and the biochemical processes that take place as water enters, is stored in, or leaves a wetland.

The applicant has conducted a qualitative functional assessment to assign a relative ranking system to the wetlands and other waters for which a discharge is being proposed. Additional analysis may be conducted during development of a compensatory mitigation plan. The assessment of existing functions will be compared to the functions expected to result from the proposed mitigation for the purpose of demonstrating that the compensatory mitigation will, at a minimum, fully replace the function of the waters proposed to be filled.

Compensatory Mitigation

Compensatory mitigation will be proposed to off-set the impacts associated with the physical construction of the project. In some cases, restoration actions designed to provide habitat for species may also serve as compensatory mitigation for the loss of waters of the United States (e.g. created emergent marsh may function as both habitat for delta smelt, as well as compensatory mitigation for physical impacts to emergent marsh habitat). The proposed compensatory mitigation will be subject to specific success criteria, success monitoring, long-term preservation, and long-term maintenance and monitoring pursuant to the requirements of the Mitigation Rule. In some cases, proposed mitigation is likely to afford significantly higher function and value than that of waters proposed for discharge.

Compensation ratios, which are developed by the Corps, are guided by type, condition, and location of replacement habitat as compared to type, condition and location of impacted habitat. Compensatory mitigation usually includes restoration, creation, or rehabilitation of aquatic habitat. The Corps does not typically accept preservation as the only form of mitigation; use of preservation as mitigation typically

requires a very high ratio of replacement to impact. It is anticipated that mitigation ratios will be at a minimum of 1:1, depending on the factors listed above. Based on preliminary discussions with the Corps, it is anticipated that ratios will be developed for each affected habitat type, and further, for each functional ranking (see Table 2 above) within each habitat type.

Typically, impacted habitat is replaced with in-kind habitat; consistent with this approach, for example, the applicant expects to mitigate for permanent impacts to Clifton Court Forebay with waters created through the expansion of CCF into North CCF and South CCF. Impacts to some lower functioning habitat types, such as seasonal wetland and agricultural ditches may be mitigated out-of-kind with higher functioning habitat types.

The applicant will propose compensatory mitigation using one or more of the following methods:

- Purchase of credits for restored/created/rehabilitated habitat at an approved wetland mitigation bank;
- On-site (adjacent to the project footprint) restoration or rehabilitation of wetlands converted to uplands due to past land use activities (such as agriculture) or functionally degraded by such activities;
- On-site (adjacent to the project footprint) creation of aquatic habitat;
- Off-site (within the Delta) restoration or rehabilitation of wetlands converted to uplands due to past land use activities (such as agriculture) or functionally degraded by such activities;
- Off-site (within the Delta) creation of aquatic habitat;
- Payment into the Corps' Fee-in-Lieu program.

<u>Purchase of Credits or Payment into In-lieu Fee Program</u>
The applicant may purchase bank credits and/or make payments into an in-lieu fee program to compensate for impacts. The applicant would utilize programs that have been Corps-approved and have service areas that encompass areas impacted by the proposed project.

<u>On-Site Restoration, Rehabilitation and/or Creation</u>
Much of the Delta consists of degraded or converted habitat that is generally functioning as upland. The applicant would seek opportunities to conduct on-site restoration, rehabilitation, and/or creation in areas adjacent to project footprints. It is anticipated that some of the compensatory mitigation would fall into this category.

<u>Off-Site Restoration, Rehabilitation and/or Creation</u>
Within the immediate vicinity of the project area, much of the land has been subject to agricultural or other land uses which have degraded or even converted wetlands that existed historically. The applicant would evaluate sites within the Delta to determine their potential for restoration, rehabilitation, and/or creation. It is anticipated that most of the compensatory mitigation obligation would be satisfied through this approach.

DWR will submit to the Corps its approach to compensatory mitigation that contemplates implementation in several phases. Phase 1 mitigation would address the construction of the pumping plant at CCF, which will impact approximately 34 acres of wetlands and waters. Phase 2 mitigation would compensate for impacts associated with the construction of the north tunnels, intermediate forebay, dual main tunnels; disposal of tunnel material; dredging of CCF and construction of two forebays. These activities would result in 698.3 acres of impact. Phase 3 mitigation would cover impacts associated with the construction of the intakes and the Head of Old River Barrier, which would impact approximately 43 acres of waters and wetlands.

It is anticipated that the impacts associated with Phase 1 would be mitigated through the purchase of credits at an existing Corps-approved mitigation bank. The 34 acres of impact consists of 24 acres of emergent wetland, 7 acres of scrub-shrub, 2 acres of forest, and one acre of depression (pond). DWR proposes to purchase floodplain mosaic wetland credits (which include perennial emergent marsh, scrub shrub wetland, riparian forest, and waters of the US (non-wetland)) at a ratio of 1:1 to appropriate compensate for Phase 1 impacts. The service area for the Consumnes Floodplain Mitigation Bank, operated by Westervelt Ecological Services, incorporates the areas where impacts would occur at CCF, providing one potential option for DWR to purchase credits from an approved mitigation bank.

DWR is currently assessing two privately held tracts of land for their potential to support restoration and creation of waters to satisfy most of the compensatory mitigation necessary for Phases 2 and 3. One tract is located in the north Delta, while the other is located in the central Delta. Both are currently farmed.

Construction of wetlands at the tract in the north Delta would likely include sculpting the interior of the tract to elevations that would support a mosaic of habitat types, including woody riparian, scrub-shrub, seasonal wetland, emergent wetland, and open water. One or more breach or notch in the existing (non-project) levee at the lowest end of the island would be excavated to allow for water to enter the island. Much of the island would be subject to the ebb and flow of the tide and created habitats would mimic that of natural habitats in the area. The sculpting would be designed to ensure that no fish would be entrapped as water receded at low tide.

Construction of wetlands at the tract in the central Delta would utilize the low elevation of the interior of the island to create seasonal wetland and emergent marsh habitat through excavation. In other locations on this island, setback levees might be constructed such that the existing (non-project) levees could be removed or breached in multiple locations resulting in the creation of riparian, scrub-shrub, and emergent wetlands. If portions of the existing levee can be left intact, the result would be the creation of new in-channel islands which would be an important, high function resource within the Delta where existing in-channel islands are subject to erosion and degradation.

DWR also proposes to provide additional compensatory mitigation from within the four lakes that were created during the construction of Interstate 5. Currently each of the lakes is open water with sparse or no edge vegetation (either emergent wetland or riparian vegetation). It is envisioned that excavated

tunnel material would be used to partially fill the open water, resulting in a mosaic of open water, emergent wetland, seasonal wetland, scrub-shrub, and riparian habitats.

As mentioned above, the permanent impacts associated with work at Clifton Court Forebay would be mitigated through the expansion of CCF into North CCF and South CCF.

A comprehensive conceptual mitigation plan for the proposed project is currently being developed and will be submitted to the Corps for review and comment upon completion. At this time, it is expected that there will be two final mitigation plans; one for Phase 1, and one for Phases 2 and 3. The final mitigation plan for Phase 1 will identify the bank where credits would be purchased and include an analysis of the functional value of those credits in relationship to the functions lost at CCF through the construction of the pumping plant. The final mitigation plan for Phases 2 and 3 will identify the location, type, and amount of habitat to be created and will include all thirteen components identified in the Mitigation Rule.

Impacts Resulting from the Construction of Compensatory Mitigation

The restoration, rehabilitation, and/or creation of aquatic habitat during the construction of the compensatory mitigation would result in relatively minor environmental impacts. Expected impacts include noise and air quality during construction, the conversion of upland to aquatic habitat, and potential changes to existing channel hydraulics where levees will be breeched or lowered to create weirs.

Block 25. ADDRESSES OF ADJOINING PROPERTY OWNERS

Please see **TAB G, Adjacent Landowner Mailing List**.

Block 26. LIST OF OTHER CERTIFICATES/APPROVALS

AGENCY	TYPE OF APPROVAL	STATUS
USFWS	Biological Opinion/Take Statement	Pending
NMFS	Biological Opinion/Take Statement	Pending
CDFW	2081(b) Take Permit	Pending
CDFW	Streambed Alteration Agreement	Pending
SWRCB	New Point of Diversion	Pending
SWRCB	Water Quality Certification/WDR	Pending

D. Additional Information

In addition to the supplemental data above, the following **additional information** is provided to assist the Corps in the permit process. Much of this information was presented in Appendix E of the Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) for the Bay Delta Conservation Plan.

1. RIVERS AND HARBORS ACT SECTION 10

The Applicant has examined potential impacts to navigation both during construction and during the operation of the conveyance facilities described as the proposed project. These effects are set out in the RDEIR/SDEIS and include assessments regarding changes in water surface elevation and sedimentation associated with the proposed project.

Potential Effects to Water Surface Elevations Caused During Construction of the Intakes

The construction of Intakes 2, 3, and 5 will require the installation of coffer dams at each location. Coffer dams will be used to isolate construction areas from the Sacramento River and allow for the sites to be dewatered. The installation of the coffer dams will likely cause localized water elevation changes upstream of and adjacent to each coffer dam. These localized surface elevation changes will not exceed a 0.10 foot increase above existing conditions at any intake location even at high river flows (when surface elevation changes would be expected to be highest). Because this maximum increase in elevation would be entirely localized, downstream surface elevation changes during intake construction would be insignificant and changes to river depth and width at any location would also be insignificant. Consequently, boat passage and river use in the Sacramento River and its tributaries would not be affected.

Potential Effects to Water Surface Elevations Caused by Intakes During Operation

The hydraulic modeling scenario for this analysis assumed five intakes because that is the maximum number of intakes included under any alternative evaluated in the RDEIR/SDEIS. The modeling also assumed the highest North Delta diversion capacity allowed under any alternative. The proposed project consists of fewer intakes and lower diversion capacity (three intakes and 9,000 cfs maximum diversion capacity), and as such, would have a smaller effect on surface water elevations than the model indicates. Under the proposed project, operation of Intakes 2, 3 and 4 may potentially have localized effects on water surface elevation during certain operational regimes and at certain river flows. While intake operations and pumping levels would be dictated by many factors, Sacramento River diversions would be limited during low flows by operational rules. To further minimize the intake effects on river surface elevations, intakes were designed as on-bank structures and were placed so that river flood and flow characteristics would be minimally altered.

Based on hydrologic modelling, even at the lowest river flows (taking into account both seasonal and tidal variations) and at maximum intake operation (full diversions at each of five alternative intakes), estimates are that boat draft depths of at least 16.5 feet would be maintained within the Sacramento River. This river depth has occurred historically and has been adequate to support navigation along the Sacramento River. Additionally, under these same intake divisions/river flows, water surface elevations would be lowered by no more than 0.7 feet, which represents a localized and maximum estimate. Surface elevations downstream of the intakes would be affected less, and during higher river flow and lower intake diversions, river depths would be greater than the minimum estimate.

The minimal changes in surface water elevation anticipated under the proposed project, even assuming a maximum lowering of 0.7 feet, would not likely expose any currently unexposed natural or man-made

features that would affect or impede navigation. There would be no new snags or obstructions that would impede navigation.

Moreover, even when operating at maximum capacity, the intakes would not alter flows in a way that would affect commercial vessels or recreational watercraft. The intakes are designed to ensure pumping velocities would have minimal impacts to aquatic species. It is unlikely that changes in flow velocity would be perceptible to operators of marine vessels or recreational watercraft or otherwise affect navigation.

Potential Effects on Navigation Caused by Sedimentation, Facility Construction

Intakes

Construction for Intakes 2, 3, and 5 would require the installation of coffer dams at each location. Coffer dams would be used to isolate each construction area from the Sacramento River and to allow for the de-watering of the construction area. Construction of coffer dams require sheet pile driving that would cause an incremental increase in suspension of bed sediments. These effects would be temporary and would not have an effect on navigation. Sheet piles at the edge of the levee embankment would likely change eddy currents locally, but rock slope in the transition zone would limit those currents and potential changes to bed load dynamics. As a result, erosion and sedimentation into the Sacramento River during intake construction would be minimal.

Any potential increases in sedimentation would be further minimized by limiting the duration of in-water construction activities and through the implementation of the environmental commitments identified in the RDEIR/SDEIS pertaining to water quality. Such commitments would serve to control short-term and long-term erosion and sedimentation effects and ensure the restoration of soils and vegetation in areas affected by construction activities following construction (AMM4, as described above in Table 2). Erosion and sediment control plans would be prepared for construction activities, each taking into account site-specific conditions such as proximity to surface water, erosion potential, drainage, etc. These plans would meet all applicable regulatory requirements regarding erosion control, including BMPs for erosion and sediment control.

Implementation of Mitigation Measure SW-4 identified in the RDEIR/SDEIS (Implement Measures to Reduce Runoff and Sedimentation) will further ensure that impacts from sedimentation are minimal.

Barge Facilities

Under the proposed project, five temporary barge landings would be constructed at locations adjacent to construction work areas to facilitate the delivery of construction materials. Each of the five proposed barge landings would include in-water and over-water structures, such as piling dolphins, docks, ramps, and possibly conveyors for loading and unloading materials; and vehicles and other machinery. Construction of the five barge landings would involve placing piles at each landing.

To address potential erosion and sedimentation impacts from barge facility construction associated with the proposed project, the applicant would effectuate the development and implementation of a Barge

Operations Plan for facility construction. The components of the Barge Operations Plan are described in the RDEIR/SDEIS Appendix 3B, *Environmental Commitments*. This commitment is reflected in AMM7, *Barge Operations Plan*, as described in Table 2 above. This plan would be developed and implemented by the construction contractors per standard DWR contract specifications. Fleeting facilities would be either docking facilities built through pile and wharves or loaded and unloaded using landward positioned cranes. In either case, through AMM7 and the Environmental Commitments, impacts to sedimentation through construction related activities would be localized and minimal. Implementation of Mitigation Measure SW-4 would further ensure that impacts from sedimentation are minimal.

Clifton Court Forebay
Clifton Court Forebay would be dredged and redesigned to provide an area where water flowing from the new north Delta facilities would be isolated from water diverted from south Delta channels. Clifton Court Forebay is a "navigable water" because it is subject to the ebb and flow of the tide. The use of the forebay is limited to maintenance operations and is not open to commercial or recreational navigation.

Potential Effects on Navigation Caused by Sedimentation, During Operations
Intakes
Sediment loads are present in the Sacramento River as bed loads or distributed within the water column. The Sacramento River is sediment "starved" for most of the year since upstream reservoirs act as settling basins for suspended sediments. In most cases, sediment load is concentrated on the river bed and this bed load depends on several factors including particle size, particle density and flow velocity. To exclude bed loads from entering intake structures during operation, design criteria for the intakes require that the lowest point of the screen be placed above the river bed in such a way that there is no change in bed sediment erosion/distribution patterns. Additionally, screen locations would be placed on the outer bends of the river to minimize scour, erosion and sediment loading at those locations. Flow control baffles at intakes would be adjusted to control sedimentation near the screens as needed and air jets at screens are proposed to re-suspend sediments as needed.
Implementation of Mitigation Measure SW-4 (Implement Measures to Reduce Runoff and Sedimentation) would further ensure that impacts from sedimentation are minimal.

Potential Navigation Impacts from Construction and Operations of Head of Old River Barrier
The project proposes work at the Head of Old River including the construction of fish and flow control gates as well as a small boat lock to allow recreational boat passage. An analysis of potential impacts of this work on navigation was completed in 2005 by Jones and Stokes (*South Delta Improvements Program Vol I: Environmental Impact Statement/Environmental Impact Report*. Draft. October. (J&S 020533.02.) State Clearinghouse #2002092065. Sacramento, CA.) ("SDIP EIR/EIS"). The SDIP EIR/EIS analyzed whether the proposed barrier/gates facility and locks would cause a change in south Delta flows or water level, river flows or surface water elevations that would result in substantial changes to existing recreational or commercial boating activity and opportunities.

The changes in access to Delta waterways by boats and other vessels during construction and operation of the gates, during channel dredging activities, and attributable to changes in water levels/depths were

addressed. Most of the waterways in the immediate project vicinity are public waterways navigable by recreational craft, including rowboats, large houseboats, and cabin cruisers. These waterways are also navigable by smaller commercial vessels, including towing and salvage vessels, clamshell dredges, dredges for repair and maintenance of levees and channels, and pile-driving vessels. Boat access points in the project area include River's End Marina, located south of the confluence of the DMC with Old River; Tracy Oasis Marina Resort, located west of Tracy Boulevard, on the south side of Grant Line/Fabian and Bell Canal; and possibly at Heinbockel Harbor, located on the west side of Tracy Boulevard and the north side of Old River

According to a California Department of Parks and Recreation (DPR) survey, minimal boat launching and use occurs in the project area. The channels within the project area are too small to accommodate large commercial vessels, and because the channels are also part of an existing temporary barriers project, larger vessels cannot use these channels when the barriers are in place. A boat lock at the proposed facility would ensure boat access upstream of the gate regardless of gate operations. In this regard, upstream boat access could improve over current conditions. Additionally, from June 16 through September 30, the gates will be open and no boat lock operations will be necessary.

With respect to both recreational and commercial navigation, and based on analysis provided in the SDIP EIR/EIS, boat access impacts during facility construction would be less than significant (p. 5.8-14, 5.8-18, 5.8-21), impacts to navigation caused by water level changes during barrier operation would be less than significant (p. 5.8-15. 5.8-19, 5.8-22), impact to non-recreational boaters due to temporary dredging operation would be less than significant (p. 5.8-16, 5.8-19, 5.8-22), and impacts on recreation as a result of constructing and operating any of the alternatives would not be significant (p. 7.4-1).

Construction of the operable barrier could result in increased sedimentation near the gates. Maintenance dredging around the gate would be necessary to clear out sediment deposits. Dredging around the gates would be conducted using a sealed clamshell dredge. Depending on the rate of sedimentation, maintenance would occur every 3 to 5 years. A formal dredging plan with further details on specific maintenance dredging activities will be developed prior to dredging activities. Guidelines related to dredging activities, including compliance with in-water work windows and turbidity standards are described further in the RDEIR/SDEIS Appendix 3B, *Environmental Commitments*, under *Disposal and Reuse of Spoils, Reusable Tunnel Material (RTM), and Dredged Material*. These activities would ensure that sedimentation would not result in an adverse impact to navigation.

Potential Cumulative Effects on Navigation

As explained above and with respect to the construction and operation of these facilities, the proposed project would not result in adverse effects to navigation due to water level elevation changes or altered sedimentation patterns. It is highly unlikely that other projects would combine with these impacts of the project to result in cumulative effects on navigation. This is because the minimal effects of these elements of the project on navigation are localized and would combine only with probable future projects if the projects were located immediately adjacent to the project components. There are no other reasonably foreseeable projects proposed to be located near or adjacent to the planned facilities.

2. NEPA

The California Department of Water Resources and the U.S. Bureau of Reclamation, as state and federal lead agencies under CEQA and NEPA, respectively, released the Partially Recirculated Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) for the project in July 2015.

The RDEIR/SDEIS provides supplemental analysis and information regarding the various alternatives analyzed in the previously circulated Draft EIR/EIS and introduces three new sub-alternatives – 4A, 2D, and 5A. As explained in the RDEIR/SDEIS, the proposed project (the California WaterFix), which was developed in response to public and agency input, replaced Alternative 4 (the proposed Bay Delta Conservation Plan) as the CEQA Preferred Alternative. The proposed project is also the NEPA Preferred Alternative, a designation that was not attached to any of the alternatives presented in the Draft EIR/EIS. The entire environmental analysis for the proposed project is included in the RDEIR/SDEIS.

Also included as part of the RDEIR/SDEIS is Appendix E, *Supplemental Information for USACE Permitting Requirements*, which includes information and analysis relevant to the Corps' permitting for the proposed project. Appendix E was developed specific to informational needs to facilitate USACE decision-making under the Clean Water Act and Rivers and Harbors Act, and associated authorizations. The purpose of the Appendix is to present all information relevant to the Corps' permitting for the proposed project as efficiently as possible. Additionally, the RDEIR/SDEIS carries forward informational needs to facilitate USACE decision-making for all other alternatives considered.

Appendix E provides an overview of the material needed for the Corps' permitting process under the authority of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act and identifies the stage of the permitting process at which the material will be available and presented.

Appendix E also provides specific environmental review information for the proposed project regarding impacts to waters of the United States, a conceptual description of compensatory mitigation, compliance with Section 106 of the National Historic Preservation Act, Section 10 of the Rivers and Harbor Act, and Section 14 of the Rivers and Harbors Act (codified in 33 USC 408 and commonly referred to as "Section 408").

3. ENDANGERED SPECIES

Section 7 of the ESA provides that each federal agency must ensure, in consultation with the Secretary of the Interior and/or Commerce, that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of areas determined to be critical habitat (16 USC 1536(a)(2)). Section 7 requires federal agencies to engage in formal consultation with USFWS or NMFS for any proposed actions that are likely to adversely affect listed species.

DWR is responsible for the operations and maintenance of the State Water Project (SWP) and the Bureau of Reclamation (Reclamation), an agency of the U. S. Department of the Interior, is responsible for operations and maintenance of the Central Valley Project (CVP). DWR and Reclamation coordinate the operations of these water conveyance systems. DWR has proposed certain modifications and

improvements to the SWP, including the construction and operation of three supplemental intakes and associated conveyance facilities and a new head of Old River barrier. Once constructed, these new facilities will result in changes to the operations of both CVP and SWP. As described in this Application, the construction and operation of the new facilities will require USACE authorizations under Section 404 of the Clean Water Act and Section 10 and Section 14 of the Rivers and Harbors Act.

Reclamation will serve as the lead federal agency for the Section 7 consultation. In conjunction with DWR, Reclamation will initiate formal consultation with both the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) regarding the potential effect of the construction and operation of the new facilities on federally listed species and designated critical habitat. The Section 7 consultation regarding these new facilities is intended to cover all potential ESA-related impacts associated with construction and new operations, including impacts that may occur as a result of the issuance of USACE permits.

4. CULTURAL RESOURCES

The National Historic Preservation Act (NHPA), 16 U.S.C. §§ 470a to 470w-6, is the primary federal law governing the preservation of cultural and historic resources in the United States. The law establishes a national preservation program and a system of procedural protections which encourage the identification and protection of cultural and historic resources of national, state, tribal and local significance. Primary components of the act include:

- Articulation of a national policy governing the protection of historic and cultural resources.
- Establishment of a comprehensive program for identifying historic and cultural resources for listing in the National Register of Historic Places.
- Creation of a federal-state/tribal-local partnership for implementing programs established by the act.
- Requirement that federal agencies take into consideration actions that could adversely affect historic properties listed or eligible for listing on the National Register of Historic Places, known as the Section 106 Review Process.
- Establishment of the Advisory Council on Historic Preservation, which oversees federal agency responsibilities governing the Section 106 Review Process.
- Placement of specific stewardship responsibilities on federal agencies for historic properties owned or within their control (Section 110 of the NHPA).

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by ACHP. Revised regulations, "Protection of Historic Properties" (36 CFR Part 800), became effective August 5, 2004, and are summarized below. The responsible federal agency first determines whether it has an undertaking that is a type of activity that could affect historic properties. Historic properties are properties that are included in the National Register of Historic Places or that meet the criteria for the National Register. If so, it must identify the appropriate State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO) to consult with during the process. It should also plan to involve the public, and identify other potential

consulting parties. If it determines that it has no undertaking, or that its undertaking is a type of activity that has no potential to affect historic properties, the agency has no further Section 106 obligations.

Programmatic Agreement (PA)

The US Army Corps of Engineers (USACE), as the federal lead agency for CWA Section 404 permitting the water conveyance facility, is responsible for Section 106 compliance. When a project is complex, such that the normal Section 106 review process is not appropriate, the Section 106 implementing regulations (36 CFR 800.14(b)) allow for the development of a programmatic agreement (PA) to ensure Section 106 compliance. Relative to the currently proposed conveyance facility, preparation of a PA is applicable when effects on historic properties cannot be fully determined prior to approval of an undertaking (36 CFR 800.14(b)(1)(ii)), or when nonfederal parties are delegated major decision-making responsibilities (36 CFR 800.14(b)(1)(iii)).

USACE, in collaboration with DWR, is developing a draft Section 106 PA for the conveyance facility. The PA provides for the identification of historic properties within the Area of Potential Effect (APE) of the selected Project alternative prior to construction initiation, and the development of avoidance, protection, or mitigation measures for those historic properties that could be adversely affected by the Project. Treatment plans will be prepared to address impacts to NRHP-eligible archaeological, built environment, and Traditional Cultural Property (TCP) resources within the APE. The PA details how many of the day-to-day responsibilities for Section 106 compliance are delegated to DWR by USACE.

Tribal Consultation

An important element of the PA involves consultation with Native American tribes and members of the public who have a demonstrated interest in the undertaking, as required under 36 CFR 800.2(c)(2) and 36 CFR 800.2(d), respectively. Native American tribes are those tribal entities who are federally recognized (36 CFR 800.16(m)). Native American tribes who have not received federal recognition, or individuals of Native American descent who are not affiliated with any tribal organization, are considered members of the interested public, as are other entities such as historical societies, local governments, or businesses and individuals. The PA ensures that USACE will fully involve federally recognized tribes at a government-to-government level throughout the Section 106 process. Similarly, the PA delegates responsibility for consultation with tribes and individuals without federal recognition to DWR.

Participation in the Section 106 process by Native American tribes or individuals with an ancestral affiliation with the Project area is described in the PA. Native Americans will be invited to participate in the development and implementation of the terms of the PA, including inventory reports, evaluation plans and reports, and during the resolution of adverse effects through the development of treatment plans for those resources within the APE that are either exclusively or partially affiliated with prehistoric or ethnographic resources. Participation may take place during public meetings, at meetings organized only for Native American tribes as a group, or at meetings with single tribes or individuals; meetings may be informal or may be identified as formal government-to-government consultations, depending on the participants involved. Native American tribes, both federally recognized and those without federal

recognition, and with individuals with a demonstrated ancestral tie to the project area will be invited to be concurring parties to the PA. However, these entities are not required to be concurring parties in order to participate in the processes described in the PA, and they may request to become concurring parties at any time during the process.

5. ANALYSIS OF ALTERNATIVES

The Applicant is in the process of developing an analysis of alternatives pursuant to the Section 404(b)(1) Guidelines (40 C.F.R. section 230.10(a)-(d)). The analysis of alternatives will be submitted to the Corps separate from this application.

6. 408 AUTHORIZATION

The purpose of review under Section 408 is to ensure that an action would not impair the usefulness of a federal civil work under the Corps' authority, and would not be injurious to the public interest. Specifically related to this project, the primary issue is to maintain the integrity of the SRFCP and SJRFCP and their function for flood risk reduction. Section 408 review provides that alteration of any one part of the system would not substantially increase flood risk for any part of the system.

The elements of the requester's preferred alternative for a new water conveyance facility that may trigger Section 408 permission specific to federal civil works for flood risk reduction are:

- 3 new water intake structures on the east levee of the Sacramento River, a federal project levee (part of the SRFCP)
- channel margin habitat enhancement to mitigate for habitat effects resulting from the intakes
- tunnel construction under the San Joaquin River Deep Water Channel
- Head of Old River Barrier, an in-channel structure placed between federal project levees (part of the SJRFCP)
- barge landing on the San Joaquin River Deep Water Channel

A detailed hydraulic study per Corps' standards for Section 408 NEPA analysis is not available at this time. The informational requirements under the Section 408 process necessarily includes a detailed level of engineering design, as well as a detailed level of analysis related to effects to the Corp's civil works projects and indirect hydraulic effects. The information contained in the current CEQA/NEPA documents will not fully meet this level of detail and additional informational submittals and analysis may be necessary. As a result of these submittals, prior to final 408 permission, additional NEPA compliance by the Corps may be required. It is understood that the components of the project which would require 408 authorization cannot be approved under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act until the 408 authorization is obtained.

OBJECTID *	LABEL	Type_Name	Cowardin	Acres	Description	Relative Condition	Impacting Feature	latitude	longitude
422	FO-1	Forest	PFO	0.156	narrow band along ag ditch	M	Work Area	38.41887	-121.5125
421	FO-2	Forest	PFO	0.092	narrow band along ag ditch	M	Work Area	38.41875	-121.5125
424	SS-1	Scrub-Shrub	PSS	0.054	narrow band along ag ditch	M	Work Area	38.4178	-121.5102
423	SS-2	Scrub-Shrub	PSS	0.049	narrow band along ag ditch	M	Work Area	38.41771	-121.5102
418	SS-3	Scrub-Shrub	PSS	0.097	narrow band along ag ditch	M	Work Area	38.41768	-121.5116
419	SS-4	Scrub-Shrub	PSS	0.052	narrow band along ag ditch	M	Work Area	38.41757	-121.5117
417	FO-3	Forest	PFO	0.033	narrow band along ag ditch	M	Work Area	38.41749	-121.5111
473	AD-1	Agricultural Ditch	R4	1.841	narrow-riparian vegetation	M	Work Area	38.41742	-121.5102
415	SS-5	Scrub-Shrub	PSS	0.289	narrow band along ag ditch	M	Work Area	38.41694	-121.5128
416	FO-4	Forest	PFO	0.813	narrow band along ag ditch	M	Work Area	38.41667	-121.5141
420	FO-5	Forest	PFO	0.244	narrow band along ag ditch	M	Work Area	38.41618	-121.5156
472	AD-2	Agricultural Ditch	R4	0.143	narrow-riparian vegetation	M	Reusable Tunnel Material	38.40861	-121.5072
664	TC-1	Tidal Channel	R1UB	2.309	Sacramento River	H	Intake	38.40533	-121.5145
667	TC-2	Tidal Channel	R1UB	11.903	Sacramento River	H	Work Area	38.40511	-121.5151
453	SS-6	Scrub-Shrub	PSS	0.084	medium wide along ditch	M	Transmission Line	38.40371	-121.508
363	AD-3	Agricultural Ditch	R4	0.016	narrow-riparian vegetation	M	Transmission Line	38.40364	-121.508
452	SS-7	Scrub-Shrub	PSS	0.042	medium wide along ditch	M	Transmission Line	38.40361	-121.508
75	DE-1	Depression	PUB	0.009	cutoff slough	H	Intake	38.39952	-121.5115
449	FO-6	Forest	PFO	0.111	along cutoff slough	H	Intake	38.39952	-121.5116
76	DE-2	Depression	PUB	0.099	cutoff slough	H	Work Area	38.39951	-121.5113
450	FO-7	Forest	PFO	0.103	along cutoff slough	H	Work Area	38.3995	-121.5113
77	DE-3	Depression	PUB	0.116	cutoff slough	H	Transmission Line	38.39946	-121.5087
451	FO-8	Forest	PFO	0.127	along cutoff slough	H	Transmission Line	38.39945	-121.5087
357	AD-4	Agricultural Ditch	R4	0.046	narrow-little vegetation	L	Concrete Batch Plant	38.38247	-121.5157
358	AD-5	Agricultural Ditch	R4	0.014	narrow-little vegetation	L	Work Area	38.38223	-121.516
663	TC-4	Tidal Channel	R1UB	1.633	Sacramento River	H	Intake	38.38203	-121.5199
355	AD-6	Agricultural Ditch	R4	0.138	narrow-little vegetation	L	Intake	38.38152	-121.517
356	AD-7	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Intake	38.3815	-121.517
666	TC-3	Tidal Channel	R1UB	9.188	Sacramento River	H	Work Area	38.38021	-121.5202
361	AD-8	Agricultural Ditch	R4	0.047	narrow-little vegetation	L	Work Area	38.37974	-121.5137
359	AD-9	Agricultural Ditch	R4	0.201	narrow-little vegetation	L	Intake	38.3797	-121.5158
360	AD-10	Agricultural Ditch	R4	0.085	narrow-little vegetation	L	Work Area	38.37818	-121.5162
362	AD-11	Agricultural Ditch	R4	0.238	narrow-little vegetation	L	Transmission Line	38.37688	-121.5148
412	SS-8	Scrub-Shrub	PSS	0.291	along Sacramento River	H	Work Area	38.37304	-121.522
409	FO-9	Forest	PFO	0.385	along Sacramento River	H	Work Area	38.37188	-121.5216
487	EM-1	Emergent Wetland	PEM	0.292	along cutoff slough	H	Transmission Line	38.36516	-121.5131
354	AD-12	Agricultural Ditch	R4	0.116	narrow-riparian vegetation	M	Work Area	38.36247	-121.5116
353	AD-13	Agricultural Ditch	R4	0.061	narrow-riparian vegetation	M	Transmission Line	38.35815	-121.5168
411	SS-9	Scrub-Shrub	PSS	1.350	along Sacramento River	H	Work Area	38.35452	-121.5287
665	TC-5	Tidal Channel	R1UB	7.978	Sacramento River	H	Work Area	38.35244	-121.5313
410	SS-10	Scrub-Shrub	PSS	1.521	along Sacramento River	H	Intake	38.35216	-121.5311
471	AD-14	Agricultural Ditch	R4	0.042	narrow-little vegetation	L	Transmission Line	38.35122	-121.5166
662	TC-6	Tidal Channel	R1UB	2.107	Sacramento River	H	Intake	38.35047	-121.533
464	AD-15	Agricultural Ditch	R4	0.125	narrow-little vegetation	L	Intake	38.34944	-121.5283
413	SS-11	Scrub-Shrub	PSS	0.070	along Sacramento River	H	Intake	38.34857	-121.535
414	SS-12	Scrub-Shrub	PSS	0.090	along Sacramento River	H	Work Area	38.34846	-121.5352
466	AD-16	Agricultural Ditch	R4	0.181	narrow-little vegetation	L	Work Area	38.34799	-121.5279
467	AD-17	Agricultural Ditch	R4	0.017	narrow-little vegetation	L	Work Area	38.34655	-121.5293
465	AD-18	Agricultural Ditch	R4	0.028	narrow-little vegetation	L	Work Area	38.34622	-121.5296
84	FO-10	Forest	PFO	0.059	along Snodgrass Slough	H	Work Area	38.34514	-121.536
470	AD-19	Agricultural Ditch	R4	0.060	narrow-little vegetation	L	Transmission Line	38.34427	-121.5263
468	AD-20	Agricultural Ditch	R4	0.049	narrow-little vegetation	L	Transmission Line	38.34302	-121.5167
469	AD-21	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	38.33526	-121.5184
351	AD-22	Agricultural Ditch	R4	0.032	narrow-little vegetation	L	Transmission Line	38.32908	-121.3744
352	AD-23	Agricultural Ditch	R4	0.037	narrow-little vegetation	L	Transmission Line	38.32751	-121.5176
350	AD-24	Agricultural Ditch	R4	0.031	narrow-little vegetation	L	Transmission Line	38.32618	-121.3781
349	AD-25	Agricultural Ditch	R4	0.033	narrow-riparian vegetation	M	Transmission Line	38.32199	-121.3898
347	AD-26	Agricultural Ditch	R4	0.549	narrow-some vegetation	L	Transmission Line	38.32198	-121.3862
90	DE-4	Depression	PUB	0.001	degraded	L	Transmission Line	38.32174	-121.3944
348	AD-27	Agricultural Ditch	R4	0.009	narrow-some vegetation	L	Transmission Line	38.32165	-121.3997
346	AD-28	Agricultural Ditch	R4	0.050	narrow-some vegetation	L	Transmission Line	38.32153	-121.3957
345	AD-29	Agricultural Ditch	R4	0.068	narrow-some vegetation	L	Transmission Line	38.32149	-121.3985
89	EM-2	Emergent Wetland	PEM	0.155	in ag field	L	Transmission Line	38.32148	-121.3944
344	AD-30	Agricultural Ditch	R4	0.005	narrow-little vegetation	L	Transmission Line	38.32133	-121.4001
490	AD-31	Agricultural Ditch	R4	0.021	narrow-little vegetation	L	Transmission Line	38.32119	-121.4111
489	EM-3	Emergent Wetland	PEM	0.063	narrow band along ag ditch	M	Transmission Line	38.32106	-121.4237
488	AD-32	Agricultural Ditch	R4	0.236	narrow-little vegetation	L	Transmission Line	38.32102	-121.4305
342	AD-33	Agricultural Ditch	R4	0.491	narrow-some vegetation	L	Transmission Line	38.32094	-121.4308
343	AD-34	Agricultural Ditch	R4	0.097	narrow-some vegetation	L	Transmission Line	38.32093	-121.4358
341	AD-35	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	38.32067	-121.4389
340	AD-36	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	38.32056	-121.4442
91	EM-4	Emergent Wetland	PEM	0.020	degraded	L	Transmission Line	38.32056	-121.4704
339	AD-37	Agricultural Ditch	R4	0.008	narrow-little vegetation	L	Transmission Line	38.32054	-121.4387
485	AD-38	Agricultural Ditch	R4	1.597	narrow-little vegetation	L	Transmission Line	38.32048	-121.4684
10	FO-11	Forest	PFO	0.637	along Snodgrass Slough	H	Transmission Line	38.32034	-121.498
432	SS-13	Scrub-Shrub	PSS	0.192	medium wide along ditch	M	Transmission Line	38.32031	-121.4961
385	EM-5	Emergent Wetland	PEM	0.183	along Snodgrass Slough	H	Transmission Line	38.32029	-121.5008
8	DE-5	Depression	PUB	0.072	pond with some vegetation	M	Transmission Line	38.32028	-121.5032
9	FO-13	Forest	PFO	0.723	along Snodgrass Slough	H	Transmission Line	38.32025	-121.5009
431	SS-14	Scrub-Shrub	PSS	0.146	along ag ditch	L	Transmission Line	38.32024	-121.4961
426	EM-6	Emergent Wetland	PEM	0.225	pond with some vegetation	M	Transmission Line	38.32023	-121.5031
427	FO-12	Forest	PFO	0.345	along Snodgrass Slough	H	Transmission Line	38.32019	-121.4993

1	FO-14	Forest	PFO	0.059	along Snodgrass Slough	H	Transmission Line	38.32013	-121.5022
661	TC-7	TIdal Channel	R1UB	2.227	Snodgrass Slough	H	Transmission Line	38.31781	-121.5012
337	AD-40	Agricultural Ditch	R4	0.246	narrow-little vegetation	L	Reusable Tunnel Material	38.31509	-121.4972
338	AD-42	Agricultural Ditch	R4	0.106	narrow-little vegetation	L	Transmission Line	38.31467	-121.5105
462	AD-39	Agricultural Ditch	R4	0.573	narrow-riparian vegetation	M	Transmission Line	38.31385	-121.493
461	AD-41	Agricultural Ditch	R4	0.196	narrow-little vegetation	L	Reusable Tunnel Material	38.31381	-121.496
386	EM-7	Emergent Wetland	PEM	0.171	edge of I-5 pond	H	Reusable Tunnel Material	38.30399	-121.4886
486	EM-8	Emergent Wetland	PEM	0.163	adjacent to I-5 pond	H	Reusable Tunnel Material	38.30377	-121.4877
336	AD-43	Agricultural Ditch	R4	0.024	narrow-little vegetation	L	Transmission Line	38.30258	-121.5038
2	DE-6	Depression	PUB	11.064	I-5 pond	H	Reusable Tunnel Material	38.30185	-121.4866
3	EM-9	Emergent Wetland	PEM	0.043	edge of I-5 pond	H	Reusable Tunnel Material	38.29979	-121.4845
335	AD-44	Agricultural Ditch	R4	0.035	narrow-little vegetation	L	Transmission Line	38.29842	-121.5016
11	FO-15	Forest	PFO	0.016	narrow band-forest	M	Transmission Line	38.29449	-121.4992
430	FO-16	Forest	PFO	0.177	narrow band-forest	M	Transmission Line	38.29382	-121.499
333	AD-45	Agricultural Ditch	R4	0.014	medium-riparian	M	Transmission Line	38.29346	-121.499
429	FO-17	Forest	PFO	0.083	narrow band-forest	M	Transmission Line	38.29328	-121.4989
631	TC-8	Tidal Channel	R1UB	1.514	cutoff slough	H	Transmission Line	38.29316	-121.4986
12	FO-18	Forest	PFO	0.686	narrow band-forest	M	Transmission Line	38.29231	-121.4982
367	EM-10	Emergent Wetland	PEM	0.010	edge of I-5 pond	H	Reusable Tunnel Material	38.289	-121.4757
428	FO-19	Forest	PFO	0.504	narrow band-forest	M	Reusable Tunnel Material	38.28862	-121.4983
14	SS-15	Scrub-Shrub	PSS	0.009	edge I-5 pond	H	Reusable Tunnel Material	38.28759	-121.4757
460	AD-47	Agricultural Ditch	R4	0.005	narrow-riparian vegetation	M	Fuel Station	38.28716	-121.4902
459	AD-48	Agricultural Ditch	R4	0.046	narrow-riparian vegetation	M	Forebay/Spillway	38.28677	-121.4954
458	AD-49	Agricultural Ditch	R4	0.008	narrow-riparian vegetation	M	Forebay/Spillway	38.28672	-121.4961
456	AD-46	Agricultural Ditch	R4	0.124	narrow-riparian vegetation	M	Concrete Batch Plant	38.28653	-121.4874
15	FO-20	Forest	PFO	0.511	narrow band-forest	M	Reusable Tunnel Material	38.28645	-121.4736
13	DE-7	Depression	PUB	11.711	I-5 pond	H	Reusable Tunnel Material	38.28641	-121.4741
334	AD-50	Agricultural Ditch	R4	0.014	narrow-little vegetation	L	Tunnel Conveyor	38.28405	-121.4764
463	AD-51	Agricultural Ditch	R4	0.660	narrow-little vegetation	L	Tunnel Conveyor	38.284	-121.4806
331	AD-52	Agricultural Ditch	R4	0.234	narrow-little vegetation	L	Tunnel Conveyor	38.28389	-121.4782
332	AD-53	Agricultural Ditch	R4	0.347	medium-riparian	M	Reusable Tunnel Material	38.28278	-121.4695
16	FO-21	Forest	PFO	0.119	medium wide along ditch	M	Reusable Tunnel Material	38.28265	-121.4698
82	FO-22	Forest	PFO	0.338	along cutoff slough	H	Reusable Tunnel Material	38.28198	-121.4972
425	EM-11	Emergent Wetland	PEM	1.852	levee on one side	M	Reusable Tunnel Material	38.28165	-121.4978
7	DE-8	Depression	PUB	0.190	ponded area in marsh	H	Reusable Tunnel Material	38.28163	-121.4975
19	FO-23	Forest	PFO	0.199	narrow band-forest	M	Reusable Tunnel Material	38.28128	-121.47
6	FO-24	Forest	PFO	0.092	along Snodgrass Slough	H	Barge Unloading Facility	38.28118	-121.498
365	FO-25	Forest	PFO	0.330	levee on one side, marsh/water other	M	Reusable Tunnel Material	38.28112	-121.4974
660	TC-9	TIdal Channel	R1UB	0.593	Snodgrass Slough	H	Barge Unloading Facility	38.28103	-121.4982
330	AD-54	Agricultural Ditch	R4	0.199	narrow-little vegetation	L	Reusable Tunnel Material	38.28089	-121.4704
366	EM-12	Emergent Wetland	PEM	0.009	levee on one side, forest on other	M	Reusable Tunnel Material	38.28076	-121.4971
5	FO-26	Forest	PFO	0.057	along Snodgrass Slough	H	Reusable Tunnel Material	38.28075	-121.4973
630	TC-10	Tidal Channel	R1UB	0.008	cutoff slough	H	Reusable Tunnel Material	38.28061	-121.4967
83	FO-27	Forest	PFO	0.038	along cutoff slough	H	Reusable Tunnel Material	38.28047	-121.4963
4	FO-28	Forest	PFO	0.013	along Snodgrass Slough	H	Reusable Tunnel Material	38.28034	-121.4963
17	DE-9	Depression	PUB	5.664	I-5 pond	H	Reusable Tunnel Material	38.2803	-121.4692
18	EM-13	Emergent Wetland	PEM	0.921	edge of I-5 pond	H	Reusable Tunnel Material	38.2795	-121.4689
457	AD-57	Agricultural Ditch	R4	1.058	narrow-riparian vegetation	M	Forebay/Spillway	38.27937	-121.4899
329	AD-55	Agricultural Ditch	R4	0.021	narrow-some vegetation	L	Reusable Tunnel Material	38.27858	-121.4667
436	FO-29	Forest	PFO	1.207	along Snodgrass Slough	H	Reusable Tunnel Material	38.27618	-121.4662
328	AD-56	Agricultural Ditch	R4	0.348	narrow-some vegetation	L	Reusable Tunnel Material	38.27614	-121.468
20	LA-1	Lake	L1UB	23.241	I-5 pond	H	Reusable Tunnel Material	38.27456	-121.4646
435	FO-30	Forest	PFO	0.166	edge of I-5 pond	H	Reusable Tunnel Material	38.27328	-121.4628
327	AD-58	Agricultural Ditch	R4	0.154	medium-little vegetation	L	Work Area	38.25256	-121.4826
326	AD-59	Agricultural Ditch	R4	0.011	narrow-some vegetation	L	Work Area	38.21318	-121.5014
325	AD-60	Agricultural Ditch	R4	0.149	narrow-little vegetation	L	Work Area	38.21178	-121.4984
324	AD-61	Agricultural Ditch	R4	0.006	narrow-some vegetation	L	Work Area	38.18282	-121.5096
491	EM-14	Emergent Wetland	PEM	1.213	in ag field	L	Work Area	38.18137	-121.5069
321	AD-62	Agricultural Ditch	R4	0.038	narrow-some vegetation	L	Shaft Location/Access Road	38.14921	-121.516
322	AD-63	Agricultural Ditch	R4	0.057	narrow-some vegetation	L	Work Area	38.14921	-121.516
323	AD-64	Agricultural Ditch	R4	0.023	medium-some vegetation	L	Shaft Location/Access Road	38.14906	-121.5186
320	AD-65	Agricultural Ditch	R4	0.087	narrow-little vegetation	L	Work Area	38.12584	-121.527
572	SW-1	Seasonal Wetland	PEM	5.080	in ag field	L	Road Interchange	38.11398	-121.5364
573	SW-2	Seasonal Wetland	PEM	3.826	in ag field	L	Road Interchange	38.11382	-121.5333
626	AD-67	Agricultural Ditch	R4	0.122	narrow-little vegetation	L	Road Interchange	38.11316	-121.5378
627	AD-66	Agricultural Ditch	R4	0.224	narrow-little vegetation	L	Road Interchange	38.11304	-121.533
628	AD-68	Agricultural Ditch	R4	0.202	narrow-little vegetation	L	Road Interchange	38.11271	-121.5362
571	SW-3	Seasonal Wetland	PEM	0.016	in ag field	L	Road Interchange	38.10925	-121.5349
629	AD-69	Agricultural Ditch	R4	0.006	narrow-little vegetation	L	Shaft Location/Access Road	38.10766	-121.5394
625	AD-70	Agricultural Ditch	R4	0.006	narrow-little vegetation	L	Shaft Location/Access Road	38.10708	-121.5401
593	EM-15	Emergent Wetland	PEM	2.929	in ag field	L	Concrete Batch Plant	38.10202	-121.5414
592	EM-16	Emergent Wetland	PEM	0.155	in ag field	L	Shaft Location/Access Road	38.10118	-121.5425
578	AD-71	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Shaft Location/Access Road	38.1009	-121.5425
591	EM-17	Emergent Wetland	PEM	1.765	in ag field	L	Reusable Tunnel Material	38.10023	-121.5404
621	AD-72	Agricultural Ditch	R4	0.028	narrow-little vegetation	L	Reusable Tunnel Material	38.1002	-121.5431
570	SW-4	Seasonal Wetland	PEM	2.469	in ag field	L	Reusable Tunnel Material	38.0999	-121.5408
623	AD-73	Agricultural Ditch	R4	0.057	narrow-little vegetation	L	Shaft Location/Access Road	38.0992	-121.543
624	AD-74	Agricultural Ditch	R4	0.019	narrow-little vegetation	L	Shaft Location/Access Road	38.0983	-121.5429
569	SW-5	Seasonal Wetland	PEM	0.861	in ag field	L	Reusable Tunnel Material	38.09732	-121.4997
622	AD-75	Agricultural Ditch	R4	0.068	narrow-little vegetation	L	Reusable Tunnel Material	38.09727	-121.5429
619	AD-76	Agricultural Ditch	R4	0.448	narrow-little vegetation	L	Reusable Tunnel Material	38.09631	-121.5035
588	EM-18	Emergent Wetland	PEM	0.104	in ag field	L	Reusable Tunnel Material	38.09542	-121.543
590	EM-19	Emergent Wetland	PEM	0.808	in ag field	L	Reusable Tunnel Material	38.09534	-121.5426

529	SW-6	Seasonal Wetland	PEM	10.424	in ag field	L	Reusable Tunnel Material	38.09518	-121.5233
589	EM-20	Emergent Wetland	PEM	2.909	in ag field	L	Reusable Tunnel Material	38.09509	-121.5419
565	SW-7	Seasonal Wetland	PEM	1.789	in ag field	L	Reusable Tunnel Material	38.09452	-121.5338
613	AD-77	Agricultural Ditch	R4	0.112	narrow-some vegetation	L	Reusable Tunnel Material	38.09438	-121.5315
567	SW-8	Seasonal Wetland	PEM	8.036	in ag field	L	Reusable Tunnel Material	38.09422	-121.5359
612	AD-78	Agricultural Ditch	R4	0.124	narrow-some vegetation	L	Reusable Tunnel Material	38.09421	-121.5276
616	AD-79	Agricultural Ditch	R4	0.146	narrow-some vegetation	L	Reusable Tunnel Material	38.0942	-121.5296
620	AD-84	Agricultural Ditch	R4	0.351	narrow-little vegetation	L	Reusable Tunnel Material	38.09415	-121.511
617	AD-80	Agricultural Ditch	R4	0.167	narrow-some vegetation	L	Reusable Tunnel Material	38.09394	-121.5255
564	SW-9	Seasonal Wetland	PEM	0.319	in ag field	L	Reusable Tunnel Material	38.09381	-121.5093
618	AD-81	Agricultural Ditch	R4	0.189	narrow-little vegetation	L	Reusable Tunnel Material	38.09367	-121.5216
566	SW-11	Seasonal Wetland	PEM	9.487	in ag field	L	Reusable Tunnel Material	38.09359	-121.5027
611	AD-82	Agricultural Ditch	R4	0.123	narrow-some vegetation	L	Reusable Tunnel Material	38.09359	-121.5235
568	SW-10	Seasonal Wetland	PEM	34.256	in ag field	L	Reusable Tunnel Material	38.09356	-121.5171
615	AD-83	Agricultural Ditch	R4	0.204	narrow-some vegetation	L	Reusable Tunnel Material	38.09352	-121.5371
561	SW-13	Seasonal Wetland	PEM	0.326	in ag field	L	Reusable Tunnel Material	38.09286	-121.529
560	SW-12	Seasonal Wetland	PEM	0.900	in ag field	L	Reusable Tunnel Material	38.09283	-121.5102
562	SW-14	Seasonal Wetland	PEM	0.850	in ag field	L	Reusable Tunnel Material	38.0928	-121.5302
563	SW-16	Seasonal Wetland	PEM	1.100	in ag field	L	Reusable Tunnel Material	38.09277	-121.5141
558	SW-15	Seasonal Wetland	PEM	0.260	in ag field	L	Reusable Tunnel Material	38.09273	-121.5316
587	EM-21	Emergent Wetland	PEM	0.429	in ag field	L	Reusable Tunnel Material	38.09255	-121.5007
614	AD-85	Agricultural Ditch	R4	0.246	narrow-little vegetation	L	Reusable Tunnel Material	38.09226	-121.5057
586	EM-22	Emergent Wetland	PEM	0.290	in ag field	L	Reusable Tunnel Material	38.09212	-121.5023
556	SW-17	Seasonal Wetland	PEM	0.633	in ag field	L	Reusable Tunnel Material	38.09202	-121.5123
557	SW-18	Seasonal Wetland	PEM	3.582	in ag field	L	Reusable Tunnel Material	38.09182	-121.5184
555	SW-19	Seasonal Wetland	PEM	0.216	in ag field	L	Reusable Tunnel Material	38.09171	-121.526
559	SW-24	Seasonal Wetland	PEM	5.640	in ag field	L	Reusable Tunnel Material	38.09135	-121.5351
553	SW-20	Seasonal Wetland	PEM	0.347	in ag field	L	Reusable Tunnel Material	38.09128	-121.5138
552	SW-21	Seasonal Wetland	PEM	0.602	in ag field	L	Reusable Tunnel Material	38.09122	-121.5238
554	SW-22	Seasonal Wetland	PEM	1.299	in ag field	L	Reusable Tunnel Material	38.09116	-121.5224
551	SW-23	Seasonal Wetland	PEM	0.918	in ag field	L	Reusable Tunnel Material	38.09085	-121.5241
550	SW-25	Seasonal Wetland	PEM	0.298	in ag field	L	Reusable Tunnel Material	38.09071	-121.5215
577	AD-86	Agricultural Ditch	R4	2.794	narrow-little vegetation	L	Reusable Tunnel Material	38.09063	-121.5137
585	EM-23	Emergent Wetland	PEM	0.742	in ag field	L	Reusable Tunnel Material	38.09024	-121.5362
548	SW-26	Seasonal Wetland	PEM	0.550	in ag field	L	Reusable Tunnel Material	38.09017	-121.5208
547	SW-27	Seasonal Wetland	PEM	0.724	in ag field	L	Reusable Tunnel Material	38.09008	-121.5183
546	SW-28	Seasonal Wetland	PEM	0.313	in ag field	L	Reusable Tunnel Material	38.08979	-121.5375
549	SW-29	Seasonal Wetland	PEM	3.637	in ag field	L	Reusable Tunnel Material	38.08947	-121.5444
581	EM-24	Emergent Wetland	PEM	2.576	in ag field	L	Reusable Tunnel Material	38.08842	-121.5444
580	EM-25	Emergent Wetland	PEM	5.478	in ag field	L	Reusable Tunnel Material	38.08809	-121.5049
545	SW-30	Seasonal Wetland	PEM	3.152	in ag field	L	Reusable Tunnel Material	38.08801	-121.5169
650	TC-11	Tidal Channel	R1UB	1.211	Potato Slough	H	Reusable Tunnel Material	38.08779	-121.5447
652	TC-12	Tidal Channel	R1UB	4.965	Potato Slough	H	Barge Unloading Facility	38.08766	-121.5453
583	EM-26	Emergent Wetland	PEM	0.419	in ag field	L	Reusable Tunnel Material	38.08749	-121.5427
582	EM-28	Emergent Wetland	PEM	4.659	in ag field	L	Reusable Tunnel Material	38.08724	-121.5405
584	EM-27	Emergent Wetland	PEM	0.024	in ag field	L	Transmission Line	38.08724	-121.5425
544	SW-31	Seasonal Wetland	PEM	0.451	in ag field	L	Reusable Tunnel Material	38.08715	-121.5078
651	TC-13	Tidal Channel	R1UB	0.131	Potato Slough	H	Reusable Tunnel Material	38.08678	-121.5427
543	SW-32	Seasonal Wetland	PEM	1.640	in ag field	L	Reusable Tunnel Material	38.08615	-121.5149
542	SW-33	Seasonal Wetland	PEM	1.099	in ag field	L	Reusable Tunnel Material	38.08479	-121.506
55	EM-29	Emergent Wetland	PEM	2.868	on instream island	H	Transmission Line	38.0842	-121.5426
540	SW-34	Seasonal Wetland	PEM	0.244	in ag field	L	Reusable Tunnel Material	38.08392	-121.5077
541	SW-35	Seasonal Wetland	PEM	0.838	in ag field	L	Reusable Tunnel Material	38.08379	-121.5129
609	AD-88	Agricultural Ditch	R4	0.080	narrow-some vegetation	L	Reusable Tunnel Material	38.08332	-121.506
653	TC-14	Tidal Channel	R1UB	5.025	Potato Slough	H	Transmission Line	38.08319	-121.5427
610	AD-87	Agricultural Ditch	R4	0.594	narrow-some vegetation	L	Reusable Tunnel Material	38.0831	-121.5074
538	SW-36	Seasonal Wetland	PEM	0.608	in ag field	L	Reusable Tunnel Material	38.0829	-121.5127
539	SW-37	Seasonal Wetland	PEM	3.586	in ag field	L	Reusable Tunnel Material	38.08246	-121.51
608	AD-89	Agricultural Ditch	R4	0.040	narrow-some vegetation	L	Reusable Tunnel Material	38.08063	-121.5049
492	SW-38	Seasonal Wetland	PEM	0.430	in ag field	L	Transmission Line	38.0798	-121.5427
607	AD-90	Agricultural Ditch	R4	0.065	narrow-some vegetation	L	Reusable Tunnel Material	38.07961	-121.5064
319	AD-91	Agricultural Ditch	R4	0.040	narrow-some vegetation	L	Transmission Line	38.07956	-121.5427
579	EM-30	Emergent Wetland	PEM	0.013	in ag field	L	Reusable Tunnel Material	38.07955	-121.5025
536	SW-39	Seasonal Wetland	PEM	0.275	in ag field	L	Reusable Tunnel Material	38.07922	-121.5043
537	SW-40	Seasonal Wetland	PEM	0.942	in ag field	L	Reusable Tunnel Material	38.07922	-121.5077
535	SW-41	Seasonal Wetland	PEM	0.608	in ag field	L	Reusable Tunnel Material	38.0784	-121.5081
606	AD-92	Agricultural Ditch	R4	0.097	narrow-some vegetation	L	Reusable Tunnel Material	38.07821	-121.5056
318	AD-93	Agricultural Ditch	R4	0.155	narrow-some vegetation	L	Transmission Line	38.07798	-121.5428
534	SW-42	Seasonal Wetland	PEM	0.611	in ag field	L	Reusable Tunnel Material	38.07764	-121.5077
533	SW-43	Seasonal Wetland	PEM	0.227	in ag field	L	Reusable Tunnel Material	38.07756	-121.5071
532	SW-44	Seasonal Wetland	PEM	0.165	in ag field	L	Reusable Tunnel Material	38.07735	-121.5038
605	AD-94	Agricultural Ditch	R4	0.092	narrow-some vegetation	L	Reusable Tunnel Material	38.07699	-121.5052
493	SW-45	Seasonal Wetland	PEM	0.226	in ag field	L	Transmission Line	38.07697	-121.5425
531	SW-46	Seasonal Wetland	PEM	0.076	in ag field	L	Reusable Tunnel Material	38.07674	-121.504
317	AD-95	Agricultural Ditch	R4	0.056	medium-some vegetation	L	Transmission Line	38.07644	-121.5427
604	AD-96	Agricultural Ditch	R4	0.065	narrow-little vegetation	L	Reusable Tunnel Material	38.07612	-121.505
316	AD-97	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	38.07561	-121.5427
315	AD-98	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	38.07494	-121.5427
494	SW-47	Seasonal Wetland	PEM	0.279	in ag field	L	Transmission Line	38.07419	-121.5427
530	SW-48	Seasonal Wetland	PEM	1.255	in ag field	L	Reusable Tunnel Material	38.07397	-121.504
310	AD-100	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	38.07383	-121.5427
314	AD-99	Agricultural Ditch	R4	0.117	narrow-some vegetation	L	Transmission Line	38.07234	-121.5427
496	SW-49	Seasonal Wetland	PEM	0.053	in ag field	L	Transmission Line	38.07118	-121.5428

497	SW-50	Seasonal Wetland	PEM	0.025	in ag field	L	Transmission Line	38.07076	-121.5429
495	SW-51	Seasonal Wetland	PEM	0.022	in ag field	L	Work Area	38.06999	-121.5444
500	SW-52	Seasonal Wetland	PEM	0.242	in ag field	L	Work Area	38.06967	-121.5441
498	SW-53	Seasonal Wetland	PEM	0.130	in ag field	L	Work Area	38.06966	-121.5423
499	SW-54	Seasonal Wetland	PEM	0.009	in ag field	L	Work Area	38.06964	-121.5424
311	AD-103	Agricultural Ditch	R4	0.025	narrow-some vegetation	L	Work Area	38.06963	-121.5423
313	AD-101	Agricultural Ditch	R4	0.045	narrow-some vegetation	L	Work Area	38.06963	-121.5427
312	AD-102	Agricultural Ditch	R4	0.129	narrow-some vegetation	L	Work Area	38.06963	-121.5437
501	SW-55	Seasonal Wetland	PEM	0.372	in ag field	L	Work Area	38.06933	-121.544
502	SW-56	Seasonal Wetland	PEM	0.458	in ag field	L	Work Area	38.06903	-121.544
306	AD-104	Agricultural Ditch	R4	0.012	narrow-some vegetation	L	Work Area	38.06891	-121.5423
308	AD-105	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Work Area	38.06891	-121.5427
307	AD-106	Agricultural Ditch	R4	0.064	narrow-some vegetation	L	Work Area	38.0689	-121.5437
504	SW-58	Seasonal Wetland	PEM	0.392	in ag field	L	Work Area	38.06877	-121.5437
503	SW-57	Seasonal Wetland	PEM	0.177	in ag field	L	Work Area	38.06877	-121.5443
305	AD-107	Agricultural Ditch	R4	0.006	narrow-some vegetation	L	Work Area	38.0681	-121.541
309	AD-108	Agricultural Ditch	R4	0.027	narrow-some vegetation	L	Transmission Line	38.06747	-121.5416
304	AD-109	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	38.0671	-121.5413
645	TC-15	Tidal Channel	R1UB	1.479	San Joaquin	H	Barge Unloading Facility	38.06682	-121.5403
646	TC-16	Tidal Channel	R1UB	0.878	San Joaquin	H	Barge Unloading Facility	38.06649	-121.5408
644	TC-17	Tidal Channel	R1UB	3.412	San Joaquin	H	Barge Unloading Facility	38.06589	-121.5419
388	FO-31	Forest	PFO	0.815	on instream island	H	Transmission Line	38.06347	-121.539
647	TC-18	Tidal Channel	R1UB	5.975	San Joaquin	H	Transmission Line	38.06124	-121.5411
56	EM-31	Emergent Wetland	PEM	7.570	on instream island	H	Transmission Line	38.06102	-121.5401
303	AD-110	Agricultural Ditch	R4	0.073	narrow-some vegetation	L	Transmission Line	38.05504	-121.5437
505	SS-16	Scrub-Shrub	PSS	2.317	duck club?	M	Transmission Line	38.05388	-121.5437
506	SW-59	Seasonal Wetland	PEM	2.104	in ag field	L	Transmission Line	38.04881	-121.5437
302	AD-111	Agricultural Ditch	R4	0.039	narrow-some vegetation	L	Transmission Line	38.04796	-121.5437
508	SW-60	Seasonal Wetland	PEM	2.848	in ag field	L	Transmission Line	38.04677	-121.5437
300	AD-112	Agricultural Ditch	R4	0.038	narrow-some vegetation	L	Transmission Line	38.04559	-121.5437
507	SW-61	Seasonal Wetland	PEM	0.891	in ag field	L	Transmission Line	38.04522	-121.5437
301	AD-113	Agricultural Ditch	R4	0.087	wide-some vegetation	L	Transmission Line	38.04448	-121.5437
510	EM-32	Emergent Wetland	PEM	0.080	in ag field	L	Transmission Line	38.04411	-121.5435
509	AD-114	Agricultural Ditch	R4	0.030	narrow-some vegetation	L	Transmission Line	38.04406	-121.5436
441	EM-33	Emergent Wetland	PEM	0.003	duck club?	M	Transmission Line	38.04331	-121.5435
443	EM-34	Emergent Wetland	PEM	0.592	duck club?	M	Work Area	38.04287	-121.5433
444	EM-36	Emergent Wetland	PEM	0.537	duck club?	M	Work Area	38.04287	-121.5436
518	FO-32	Forest	PFO	1.055	duck club?	M	Work Area	38.04282	-121.5425
442	EM-35	Emergent Wetland	PEM	0.261	duck club?	M	Work Area	38.04274	-121.5443
299	AD-115	Agricultural Ditch	R4	0.126	narrow-riparian vegetation	M	Work Area	38.04266	-121.5425
656	TC-19	Tidal Channel	R1UB	0.689	Middle River	H	Barge Unloading Facility	38.04265	-121.5318
440	EM-37	Emergent Wetland	PEM	0.152	duck club?	M	Work Area	38.0424	-121.5427
68	DE-10	Depression	PUB	1.132	duck club?	M	Work Area	38.04227	-121.5442
70	DE-11	Depression	PUB	1.889	duck club?	M	Work Area	38.04202	-121.5437
69	DE-12	Depression	PUB	2.741	duck club?	M	Work Area	38.042	-121.543
437	EM-38	Emergent Wetland	PEM	0.017	duck club?	M	Work Area	38.04182	-121.5422
439	EM-39	Emergent Wetland	PEM	0.020	duck club?	M	Work Area	38.04175	-121.5441
67	DE-13	Depression	PUB	0.345	duck club?	M	Transmission Line	38.04104	-121.5438
298	AD-116	Agricultural Ditch	R4	0.167	narrow-riparian vegetation	M	Work Area	38.04061	-121.541
71	DE-14	Depression	PUB	0.188	duck club?	M	Transmission Line	38.03997	-121.5439
297	AD-117	Agricultural Ditch	R4	0.005	narrow-little vegetation	L	Work Area	38.03965	-121.5347
519	FO-33	Forest	PFO	0.301	narrow band along ag ditch	M	Work Area	38.03869	-121.5396
438	EM-40	Emergent Wetland	PEM	5.875	duck club?	M	Transmission Line	38.03851	-121.5437
296	AD-118	Agricultural Ditch	R4	0.195	narrow-riparian vegetation	M	Work Area	38.03777	-121.5389
295	AD-119	Agricultural Ditch	R4	0.023	narrow-riparian vegetation	M	Transmission Line	38.03613	-121.5438
513	EM-41	Emergent Wetland	PEM	0.575	duck club?	M	Transmission Line	38.03571	-121.5437
294	AD-120	Agricultural Ditch	R4	0.029	narrow-some vegetation	L	Transmission Line	38.03235	-121.5438
293	AD-121	Agricultural Ditch	R4	0.024	narrow-some vegetation	L	Transmission Line	38.02982	-121.5438
512	EM-42	Emergent Wetland	PEM	0.309	duck club?	M	Transmission Line	38.02946	-121.5439
292	AD-122	Agricultural Ditch	R4	0.031	narrow-riparian vegetation	M	Transmission Line	38.02933	-121.5439
511	EM-43	Emergent Wetland	PEM	2.462	duck club?	M	Transmission Line	38.02822	-121.5438
291	AD-123	Agricultural Ditch	R4	0.035	narrow-riparian vegetation	M	Transmission Line	38.02716	-121.5438
447	DE-15	Depression	PUB	0.312	duck club?	M	Transmission Line	38.02685	-121.5438
445	EM-44	Emergent Wetland	PEM	4.272	duck club?	M	Transmission Line	38.02508	-121.5439
446	DE-16	Depression	PUB	0.158	duck club?	M	Transmission Line	38.02358	-121.544
290	AD-124	Agricultural Ditch	R4	0.029	narrow-riparian vegetation	M	Transmission Line	38.02313	-121.5439
455	FO-34	Forest	PFO	0.084	narrow band along ag ditch	M	Transmission Line	38.02308	-121.5439
288	AD-125	Agricultural Ditch	R4	0.008	narrow-little vegetation	L	Transmission Line	38.02272	-121.5441
289	AD-126	Agricultural Ditch	R4	0.035	narrow-little vegetation	L	Transmission Line	38.02073	-121.5439
287	AD-127	Agricultural Ditch	R4	0.034	narrow-riparian vegetation	M	Transmission Line	38.01865	-121.5439
454	FO-35	Forest	PFO	0.196	narrow band along ag ditch	M	Transmission Line	38.01856	-121.5439
286	AD-128	Agricultural Ditch	R4	0.030	narrow-little vegetation	L	Transmission Line	38.01644	-121.544
515	SW-62	Seasonal Wetland	PEM	3.330	in ag field	L	Transmission Line	38.01385	-121.544
284	AD-129	Agricultural Ditch	R4	0.039	narrow-some vegetation	L	Transmission Line	38.0126	-121.5439
514	SW-63	Seasonal Wetland	PEM	0.141	in ag field	L	Transmission Line	38.01235	-121.5438
285	AD-130	Agricultural Ditch	R4	0.095	medium-some vegetation	L	Transmission Line	38.01168	-121.5439
517	SW-64	Seasonal Wetland	PEM	0.555	in ag field	L	Transmission Line	38.01012	-121.544
516	SW-65	Seasonal Wetland	PEM	0.124	in ag field	L	Transmission Line	38.0099	-121.5438
283	AD-131	Agricultural Ditch	R4	0.024	narrow-little vegetation	L	Transmission Line	38.00978	-121.544
659	TC-24	Tidal Channel	R1UB	4.194	Middle River	H	Work Area	38.00878	-121.5229
448	EM-45	Emergent Wetland	PEM	0.071	on instream island	H	Transmission Line	38.00761	-121.5438
658	TC-20	Tidal Channel	R1UB	4.633	Connection Slough	H	Transmission Line	38.00707	-121.544

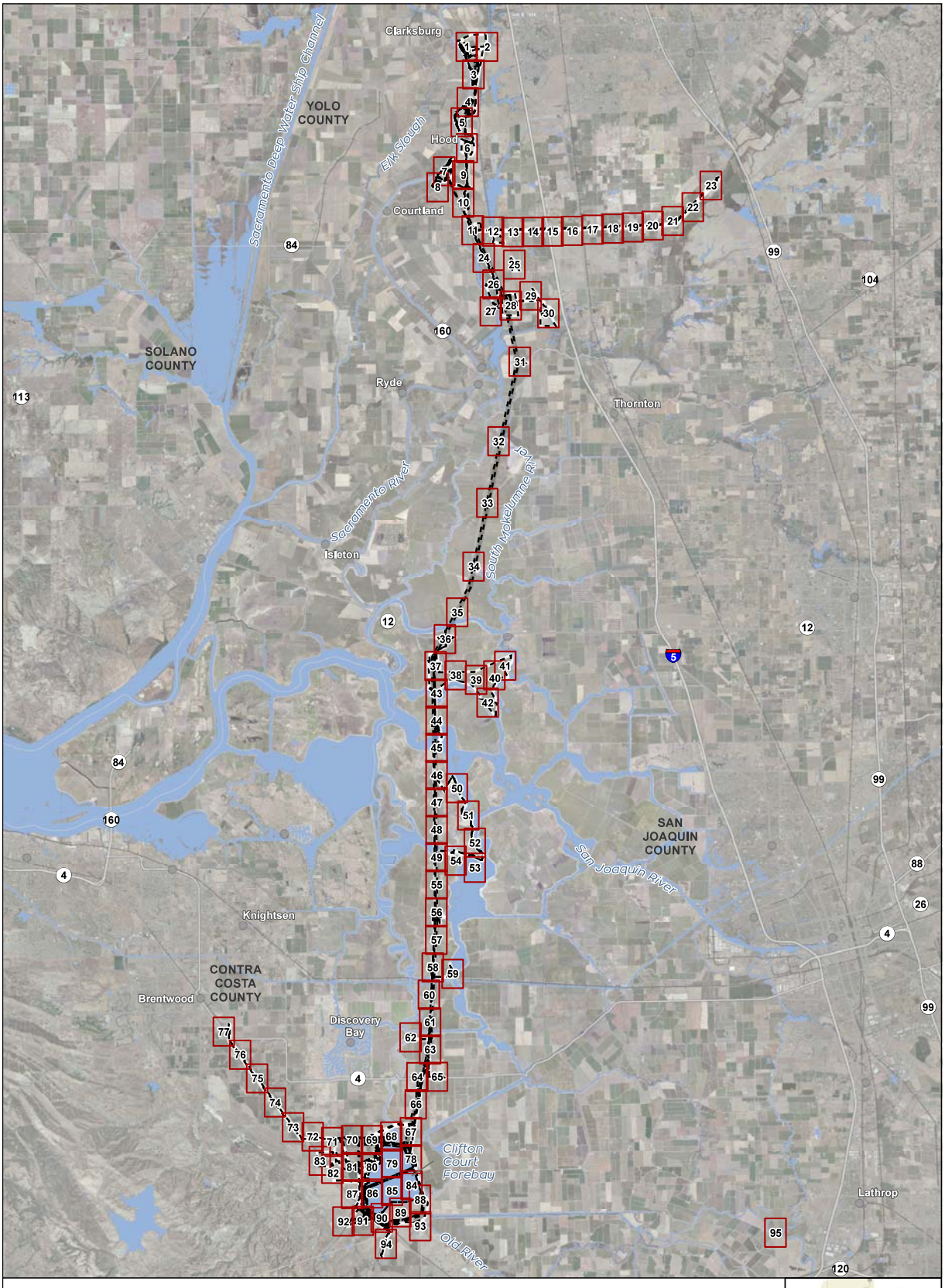
387	EM-46	Emergent Wetland	PEM	0.198	on instream island	H	Transmission Line	38.00563	-121.544
74	FO-36	Forest	PFO	1.321	on instream island	H	Transmission Line	38.00552	-121.544
655	TC-21	Tidal Channel	R1UB	1.643	Connection Slough	H	Barge Unloading Facility	38.00424	-121.5431
654	TC-22	Tidal Channel	R1UB	0.631	Connection Slough	H	Barge Unloading Facility	38.00396	-121.5445
657	TC-23	Tidal Channel	R1UB	0.693	Connection Slough	H	Barge Unloading Facility	38.00394	-121.544
596	SW-66	Seasonal Wetland	PEM	0.076	in ag field	L	Work Area	38.00295	-121.5442
595	SW-67	Seasonal Wetland	PEM	0.385	in ag field	L	Work Area	38.00289	-121.5445
603	AD-132	Agricultural Ditch	R4	0.017	narrow-some vegetation	L	Transmission Line	37.99962	-121.5441
602	AD-133	Agricultural Ditch	R4	0.017	narrow-some vegetation	L	Transmission Line	37.99245	-121.5441
601	AD-134	Agricultural Ditch	R4	0.017	narrow-some vegetation	L	Transmission Line	37.98589	-121.5442
600	AD-135	Agricultural Ditch	R4	0.011	narrow-some vegetation	L	Transmission Line	37.98324	-121.5443
599	AD-136	Agricultural Ditch	R4	0.017	narrow-little vegetation	L	Transmission Line	37.97936	-121.5442
594	SW-68	Seasonal Wetland	PEM	0.034	in ag field	L	Transmission Line	37.97901	-121.5441
576	EM-47	Emergent Wetland	PEM	0.075	in ag field	L	Shaft Location/Access Road	37.97198	-121.5392
598	AD-137	Agricultural Ditch	R4	0.017	narrow-little vegetation	L	Transmission Line	37.95108	-121.546
597	AD-138	Agricultural Ditch	R4	0.017	narrow-little vegetation	L	Transmission Line	37.94785	-121.5463
575	AD-139	Agricultural Ditch	R4	0.314	medium-little vegetation	L	Transmission Line	37.94578	-121.5464
574	AD-140	Agricultural Ditch	R4	0.467	medium-little vegetation	L	Work Area	37.94305	-121.5455
637	TC-25	Tidal Channel	R1UB	1.972	Italian Slough-probably not impacted	H	Transmission Line	37.94012	-121.5469
72	EM-48	Emergent Wetland	PEM	0.113	narrow band along levee	L	Transmission Line	37.93997	-121.5469
73	EM-49	Emergent Wetland	PEM	0.061	narrow band along levee	L	Transmission Line	37.93982	-121.547
282	AD-141	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	37.93876	-121.547
281	AD-142	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	37.93749	-121.5471
280	AD-143	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	37.93604	-121.5473
279	AD-144	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	37.93419	-121.5474
278	AD-145	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	37.93127	-121.5477
276	AD-146	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	37.92859	-121.5479
526	SW-69	Seasonal Wetland	PEM	0.440	in ag field	L	Transmission Line	37.92785	-121.548
527	SW-70	Seasonal Wetland	PEM	0.179	in ag field	L	Transmission Line	37.92729	-121.5482
275	AD-147	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	37.92618	-121.5481
520	SW-71	Seasonal Wetland	PEM	2.412	in ag field	L	Transmission Line	37.92467	-121.5482
277	AD-148	Agricultural Ditch	R4	0.046	narrow-little vegetation	L	Transmission Line	37.92293	-121.5481
274	AD-149	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	37.92226	-121.5484
521	SW-72	Seasonal Wetland	PEM	1.946	in ag field	L	Transmission Line	37.92134	-121.5485
273	AD-150	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Transmission Line	37.92043	-121.5486
522	SW-73	Seasonal Wetland	PEM	2.832	in ag field	L	Transmission Line	37.91923	-121.5487
484	AD-151	Agricultural Ditch	R4	0.074	narrow-little vegetation	L	Transmission Line	37.91842	-121.6778
272	AD-152	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	37.91804	-121.5488
483	AD-153	Agricultural Ditch	R4	0.056	narrow-little vegetation	L	Transmission Line	37.91798	-121.6777
523	SW-74	Seasonal Wetland	PEM	1.496	in ag field	L	Transmission Line	37.91737	-121.5488
271	AD-154	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	37.91673	-121.5489
524	SW-75	Seasonal Wetland	PEM	1.257	in ag field	L	Transmission Line	37.91618	-121.5489
270	AD-155	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	37.91563	-121.549
525	SW-76	Seasonal Wetland	PEM	1.206	in ag field	L	Transmission Line	37.91506	-121.549
269	AD-156	Agricultural Ditch	R4	0.023	narrow-some vegetation	L	Transmission Line	37.91454	-121.5491
649	TC-26	Tidal Channel	R1UB	1.436	North Victoria Canal	H	Transmission Line	37.91355	-121.5492
268	AD-157	Agricultural Ditch	R4	0.090	medium-little vegetation	L	Transmission Line	37.9125	-121.5493
389	EM-50	Emergent Wetland	PEM	0.049	narrow band along levee	L	Barge Unloading Facility	37.91233	-121.5618
648	TC-27	Tidal Channel	R1UB	5.730	Old River	H	Barge Unloading Facility	37.91106	-121.5623
267	AD-158	Agricultural Ditch	R4	0.468	narrow-little vegetation	L	Work Area	37.91076	-121.5499
264	AD-159	Agricultural Ditch	R4	0.002	narrow-little vegetation	L	Barge Unloading Facility	37.90951	-121.5502
265	AD-160	Agricultural Ditch	R4	0.001	narrow-little vegetation	L	Work Area	37.9095	-121.5502
266	AD-161	Agricultural Ditch	R4	0.657	narrow-little vegetation	L	Transmission Line	37.90639	-121.5499
263	AD-162	Agricultural Ditch	R4	0.022	narrow-little vegetation	L	Work Area	37.89906	-121.5501
262	AD-163	Agricultural Ditch	R4	0.093	narrow-little vegetation	L	Transmission Line	37.89904	-121.5518
261	AD-164	Agricultural Ditch	R4	0.080	narrow-little vegetation	L	Work Area	37.89447	-121.55
260	AD-165	Agricultural Ditch	R4	0.111	narrow-little vegetation	L	Work Area	37.89104	-121.55
259	AD-166	Agricultural Ditch	R4	0.529	wide-some vegetation	L	Work Area	37.89026	-121.5462
255	AD-167	Agricultural Ditch	R4	0.106	wide-little vegetation	L	Road Interchange	37.89024	-121.5405
257	AD-169	Agricultural Ditch	R4	0.118	wide-little vegetation	L	Road Interchange	37.89023	-121.5412
258	AD-168	Agricultural Ditch	R4	0.147	wide-little vegetation	L	Transmission Line	37.89023	-121.5543
58	EM-51	Emergent Wetland	PEM	0.076	narrow band along levee	L	Transmission Line	37.89015	-121.5543
60	EM-52	Emergent Wetland	PEM	0.120	narrow band along levee	L	Transmission Line	37.88995	-121.5544
59	EM-53	Emergent Wetland	PEM	0.014	narrow band along levee	L	Work Area	37.88994	-121.5575
256	AD-170	Agricultural Ditch	R4	0.127	wide-little vegetation	L	Road Interchange	37.8899	-121.5405
252	AD-171	Agricultural Ditch	R4	0.045	wide-little vegetation	L	Road Interchange	37.8899	-121.5413
254	AD-172	Agricultural Ditch	R4	0.105	wide-little vegetation	L	Transmission Line	37.88987	-121.5544
253	AD-173	Agricultural Ditch	R4	0.017	wide-little vegetation	L	Work Area	37.88986	-121.5575
482	AD-174	Agricultural Ditch	R4	0.069	narrow-little vegetation	L	Transmission Line	37.88959	-121.659
251	AD-175	Agricultural Ditch	R4	0.430	narrow-little vegetation	L	Transmission Line	37.88806	-121.5549
250	AD-176	Agricultural Ditch	R4	0.058	narrow-little vegetation	L	Transmission Line	37.8827	-121.5562
249	AD-177	Agricultural Ditch	R4	0.009	narrow-little vegetation	L	Work Area	37.88267	-121.5574
248	AD-178	Agricultural Ditch	R4	0.007	narrow-little vegetation	L	Transmission Line	37.88255	-121.556
247	AD-179	Agricultural Ditch	R4	0.016	narrow-little vegetation	L	Work Area	37.88255	-121.5563
246	AD-180	Agricultural Ditch	R4	0.083	narrow-little vegetation	L	Work Area	37.88253	-121.5574
481	AD-181	Agricultural Ditch	R4	0.099	narrow-riparian vegetation	M	Transmission Line	37.88192	-121.6521
245	AD-182	Agricultural Ditch	R4	0.035	narrow-little vegetation	L	Transmission Line	37.87902	-121.557
480	AD-183	Agricultural Ditch	R4	0.098	narrow-little vegetation	L	Transmission Line	37.87592	-121.6464
244	AD-184	Agricultural Ditch	R4	0.104	medium-little vegetation	L	Transmission Line	37.8753	-121.5579
479	AD-185	Agricultural Ditch	R4	0.024	narrow-little vegetation	L	Transmission Line	37.87469	-121.6457
242	AD-186	Agricultural Ditch	R4	0.058	narrow-little vegetation	L	Transmission Line	37.86917	-121.5592
478	AD-187	Agricultural Ditch	R4	0.019	narrow-riparian vegetation	M	Transmission Line	37.86658	-121.6384

241	AD-188	Agricultural Ditch	R4	0.057	narrow-little vegetation	L	Transmission Line	37.86634	-121.5668
240	AD-189	Agricultural Ditch	R4	0.069	narrow-little vegetation	L	Transmission Line	37.86625	-121.5724
643	TC-28	Tidal Channel	R1UB	1.310	Old River	H	Transmission Line	37.86589	-121.5735
57	SS-17	Scrub-Shrub	PSS	0.143	along ag ditch	L	Transmission Line	37.86543	-121.5748
235	AD-190	Agricultural Ditch	R4	0.173	narrow-some vegetation	L	Transmission Line	37.86471	-121.5769
234	AD-191	Agricultural Ditch	R4	0.049	narrow-little vegetation	L	Transmission Line	37.86375	-121.5797
230	AD-193	Agricultural Ditch	R4	0.069	narrow-little vegetation	L	Transmission Line	37.86363	-121.5605
233	AD-192	Agricultural Ditch	R4	0.088	narrow-little vegetation	L	Transmission Line	37.86321	-121.5813
228	AD-194	Agricultural Ditch	R4	0.116	narrow-little vegetation	L	Transmission Line	37.86208	-121.5846
243	AD-195	Agricultural Ditch	R4	0.196	medium-some vegetation	L	Transmission Line	37.8614	-121.5865
477	AD-196	Agricultural Ditch	R4	0.078	narrow-little vegetation	L	Transmission Line	37.86134	-121.6335
476	AD-197	Agricultural Ditch	R4	0.058	narrow-little vegetation	L	Transmission Line	37.8606	-121.6329
383	SS-18	Scrub-Shrub	PSS	0.318	narrow band along levee	L	Shaft Location/Access Road	37.86022	-121.5815
238	AD-198	Agricultural Ditch	R4	0.006	narrow-little vegetation	L	Transmission Line	37.8602	-121.5906
237	AD-199	Agricultural Ditch	R4	0.028	narrow-little vegetation	L	Transmission Line	37.86017	-121.5905
236	AD-200	Agricultural Ditch	R4	0.025	narrow-little vegetation	L	Transmission Line	37.86	-121.6101
475	AD-201	Agricultural Ditch	R4	0.033	narrow-little vegetation	L	Transmission Line	37.85999	-121.6323
217	AD-203	Agricultural Ditch	R4	0.315	narrow-little vegetation	L	Reusable Tunnel Material	37.85995	-121.5934
215	AD-204	Agricultural Ditch	R4	0.122	narrow-little vegetation	L	Concrete Batch Plant	37.85992	-121.5909
216	AD-208	Agricultural Ditch	R4	0.047	narrow-little vegetation	L	Reusable Tunnel Material	37.85991	-121.5867
218	AD-205	Agricultural Ditch	R4	0.275	narrow-little vegetation	L	Concrete Batch Plant	37.85991	-121.5886
231	AD-207	Agricultural Ditch	R4	0.045	narrow-little vegetation	L	Transmission Line	37.85991	-121.6133
401	AW-1	Alkaline Wetland	PSS	0.242	degraded	L	Transmission Line	37.85991	-121.6135
239	AD-206	Agricultural Ditch	R4	0.045	narrow-little vegetation	L	Transmission Line	37.85991	-121.614
225	AD-202	Agricultural Ditch	R4	0.025	narrow-little vegetation	L	Transmission Line	37.8599	-121.6097
232	AD-209	Agricultural Ditch	R4	0.101	medium-little vegetation	L	Transmission Line	37.8599	-121.6099
395	AW-2	Alkaline Wetland	PSS	8.680	some grazing	M	Transmission Line	37.8599	-121.6187
224	AD-211	Agricultural Ditch	R4	0.023	narrow-little vegetation	L	Reusable Tunnel Material	37.85988	-121.6051
227	AD-210	Agricultural Ditch	R4	0.034	narrow-little vegetation	L	Reusable Tunnel Material	37.85988	-121.6053
222	AD-213	Agricultural Ditch	R4	0.091	medium-some vegetation	L	Reusable Tunnel Material	37.85987	-121.6011
220	AD-212	Agricultural Ditch	R4	0.045	narrow-little vegetation	L	Reusable Tunnel Material	37.85987	-121.6012
214	AD-214	Agricultural Ditch	R4	0.052	narrow-little vegetation	L	Reusable Tunnel Material	37.8598	-121.5955
204	AD-215	Agricultural Ditch	R4	0.005	narrow-little vegetation	L	Concrete Batch Plant	37.8597	-121.5909
209	AD-216	Agricultural Ditch	R4	0.018	narrow-little vegetation	L	Concrete Batch Plant	37.8597	-121.591
208	AD-217	Agricultural Ditch	R4	0.003	narrow-little vegetation	L	Reusable Tunnel Material	37.85968	-121.5953
226	AD-218	Agricultural Ditch	R4	0.014	narrow-little vegetation	L	Reusable Tunnel Material	37.85958	-121.6053
200	AD-219	Agricultural Ditch	R4	0.172	narrow-little vegetation	L	Reusable Tunnel Material	37.85942	-121.6072
384	SS-19	Scrub-Shrub	PSS	0.073	narrow band along levee	L	Shaft Location/Access Road	37.85866	-121.5828
229	AD-220	Agricultural Ditch	R4	0.182	narrow-little vegetation	L	Transmission Line	37.85851	-121.5616
199	AD-221	Agricultural Ditch	R4	0.217	narrow-little vegetation	L	Reusable Tunnel Material	37.85808	-121.6053
206	AD-222	Agricultural Ditch	R4	0.177	narrow-little vegetation	L	Concrete Batch Plant	37.85804	-121.5909
223	AD-223	Agricultural Ditch	R4	0.179	narrow-little vegetation	L	Reusable Tunnel Material	37.85804	-121.6051
211	AD-224	Agricultural Ditch	R4	0.440	narrow-little vegetation	L	Concrete Batch Plant	37.85803	-121.591
202	AD-225	Agricultural Ditch	R4	0.472	narrow-little vegetation	L	Concrete Batch Plant	37.85784	-121.5873
528	SS-20	Scrub-Shrub	PSS	0.300	along intermittent ditch	L	Tunnel Conveyor	37.85775	-121.5801
212	AD-227	Agricultural Ditch	R4	0.646	narrow-little vegetation	L	Reusable Tunnel Material	37.85766	-121.5956
198	AD-226	Agricultural Ditch	R4	0.531	narrow-little vegetation	L	Tunnel Conveyor	37.8576	-121.5809
219	AD-228	Agricultural Ditch	R4	0.476	narrow-little vegetation	L	Reusable Tunnel Material	37.85751	-121.6015
207	AD-229	Agricultural Ditch	R4	0.238	narrow-little vegetation	L	Reusable Tunnel Material	37.85748	-121.5954
85	EM-54	Emergent Wetland	PEM	0.182	narrow band along levee	L	Shaft Location/Access Road	37.85717	-121.5752
368	SS-21	Scrub-Shrub	PSS	0.089	blackberry?	M	Shaft Location/Access Road	37.85712	-121.5745
40	CCF-1	Clifton Court Foreba	R1UB	0.358	rock-lined forebay	L	Tunnel Conveyor	37.85709	-121.5804
86	EM-55	Emergent Wetland	PEM	0.063	degraded	L	Tunnel Conveyor	37.85703	-121.5767
54	FO-37	Forest	PFO	0.078	along Huston Canal	H	Shaft Location/Access Road	37.85688	-121.5675
50	SS-23	Scrub-Shrub	PSS	0.031	blackberry?	M	Shaft Location/Access Road	37.85674	-121.571
371	SS-22	Scrub-Shrub	PSS	0.469	willow/arundo	M	Fuel Station	37.8567	-121.5665
197	AD-230	Agricultural Ditch	R4	0.018	narrow-marsh vegetation	M	Concrete Batch Plant	37.85669	-121.5872
196	AD-231	Agricultural Ditch	R4	0.094	narrow-marsh vegetation	M	Reusable Tunnel Material	37.85668	-121.5859
49	SS-24	Scrub-Shrub	PSS	0.104	blackberry?	M	Shaft Location/Access Road	37.85662	-121.5699
375	EM-56	Emergent Wetland	PEM	0.086	wetland grass/ruderal	M	Fuel Station	37.85658	-121.5669
370	SS-25	Scrub-Shrub	PSS	0.193	sandbar willow	H	Forebay Embankment	37.85651	-121.5679
373	FO-38	Forest	PFO	0.354	mixed willows	H	Fuel Station	37.85647	-121.5666
53	DE-17	Depression	PUB	0.009	constructed channel	L	Fuel Station	37.85643	-121.5668
52	DE-18	Depression	PUB	0.015	constructed channel	L	Forebay Embankment	37.85633	-121.5682
374	EM-57	Emergent Wetland	PEM	0.864	wetland grass/ruderal	M	Shaft Location/Access Road	37.8563	-121.5673
203	AD-233	Agricultural Ditch	R4	0.410	narrow-little vegetation	L	Reusable Tunnel Material	37.8562	-121.585
48	EM-58	Emergent Wetland	PEM	0.632	wide band along Old River	H	Transmission Line	37.85614	-121.562
372	FO-39	Forest	PFO	0.424	mixed willows	H	Shaft Location/Access Road	37.85609	-121.5667
210	AD-234	Agricultural Ditch	R4	0.141	narrow-little vegetation	L	Reusable Tunnel Material	37.85592	-121.591
205	AD-235	Agricultural Ditch	R4	0.057	narrow-little vegetation	L	Reusable Tunnel Material	37.85591	-121.5909
51	DE-19	Depression	PUB	0.483	constructed channel	L	Shaft Location/Access Road	37.85589	-121.5671
369	SS-26	Scrub-Shrub	PSS	6.049	sandbar willow/blackberry/arundo	H	Shaft Location/Access Road	37.85579	-121.5657
376	FO-40	Forest	PFO	1.056	mixed willows	H	Shaft Location/Access Road	37.85567	-121.5661
639	TC-29	Tidal Channel	R1UB	3.786	Old River	H	Transmission Line	37.85551	-121.5623
213	AD-236	Agricultural Ditch	R4	0.137	narrow-little vegetation	L	Reusable Tunnel Material	37.85545	-121.5956
377	FO-41	Forest	PFO	0.252	mixed willows	H	Shaft Location/Access Road	37.8554	-121.5653
191	AD-237	Agricultural Ditch	R4	0.175	narrow-little vegetation	L	Reusable Tunnel Material	37.85529	-121.5932
193	AD-239	Agricultural Ditch	R4	0.055	narrow-little vegetation	L	Reusable Tunnel Material	37.85529	-121.596
192	AD-238	Agricultural Ditch	R4	0.961	narrow-little vegetation	L	Reusable Tunnel Material	37.85529	-121.5989
201	AD-240	Agricultural Ditch	R4	0.666	narrow-little vegetation	L	Reusable Tunnel Material	37.85527	-121.5878
378	FO-42	Forest	PFO	0.162	mixed willows	H	Shaft Location/Access Road	37.85508	-121.565
640	TC-30	Tidal Channel	R1UB	2.491	Old River	H	Barge Unloading Facility	37.85496	-121.5641

47	FO-43	Forest	PFO	1.549	on instream island	H	Transmission Line	37.85479	-121.5625
185	AD-241	Agricultural Ditch	R4	0.126	narrow-little vegetation	L	Reusable Tunnel Material	37.85414	-121.5909
184	AD-242	Agricultural Ditch	R4	0.257	narrow-little vegetation	L	Reusable Tunnel Material	37.85411	-121.591
221	AD-232	Agricultural Ditch	R4	2.584	medium-some vegetation	L	Reusable Tunnel Material	37.85381	-121.6017
38	CCF-2	Clifton Court Foreba	R1UB	3.906	rock-lined forebay	L	Shaft Location/Access Road	37.85312	-121.566
188	AD-246	Agricultural Ditch	R4	1.122	narrow-little vegetation	L	Reusable Tunnel Material	37.85308	-121.5997
33	EM-59	Emergent Wetland	PEM	22.422	Polygonum/Frankenia	H	Shaft Location/Access Road	37.85305	-121.5644
181	AD-243	Agricultural Ditch	R4	0.259	narrow-little vegetation	L	Reusable Tunnel Material	37.85286	-121.5889
194	AD-252	Agricultural Ditch	R4	0.623	narrow-little vegetation	L	Reusable Tunnel Material	37.85234	-121.6048
34	EM-60	Emergent Wetland	PEM	0.544	Polygonum/Frankenia	H	Shaft Location/Access Road	37.8523	-121.5631
32	SS-27	Scrub-Shrub	PSS	0.005	narrow band on levee	L	Shaft Location/Access Road	37.8518	-121.5622
81	EM-61	Emergent Wetland	PEM	3.440	narrow band along ag ditch	M	Reusable Tunnel Material	37.85155	-121.602
190	AD-245	Agricultural Ditch	R4	0.799	narrow-marsh vegetation	M	Reusable Tunnel Material	37.85154	-121.602
189	AD-247	Agricultural Ditch	R4	0.011	narrow-little vegetation	L	Reusable Tunnel Material	37.85152	-121.596
183	AD-244	Agricultural Ditch	R4	0.926	narrow-little vegetation	L	Reusable Tunnel Material	37.85135	-121.5957
178	AD-248	Agricultural Ditch	R4	0.333	narrow-little vegetation	L	Reusable Tunnel Material	37.85095	-121.5982
180	AD-249	Agricultural Ditch	R4	0.556	narrow-little vegetation	L	Reusable Tunnel Material	37.85082	-121.591
195	AD-250	Agricultural Ditch	R4	0.384	narrow-little vegetation	L	Reusable Tunnel Material	37.85056	-121.6059
186	AD-253	Agricultural Ditch	R4	0.748	narrow-little vegetation	L	Reusable Tunnel Material	37.8504	-121.594
35	DE-20	Depression	PUB	0.170	pond with some vegetation	M	Shaft Location/Access Road	37.85014	-121.562
179	AD-254	Agricultural Ditch	R4	0.396	narrow-little vegetation	L	Reusable Tunnel Material	37.85008	-121.5874
182	AD-251	Agricultural Ditch	R4	0.381	narrow-little vegetation	L	Reusable Tunnel Material	37.84934	-121.6141
187	AD-255	Agricultural Ditch	R4	0.162	narrow-little vegetation	L	Reusable Tunnel Material	37.84916	-121.5956
632	TC-31	Tidal Channel	R1UB	0.103	Italian Slough-probably not impacted	H	Reusable Tunnel Material	37.84872	-121.5869
177	AD-256	Agricultural Ditch	R4	0.026	narrow-little vegetation	L	Reusable Tunnel Material	37.84865	-121.596
174	AD-257	Agricultural Ditch	R4	0.143	narrow-little vegetation	L	Reusable Tunnel Material	37.84823	-121.6074
173	AD-258	Agricultural Ditch	R4	0.213	narrow-little vegetation	L	Reusable Tunnel Material	37.84817	-121.6074
382	EM-62	Emergent Wetland	PEM	0.063	narrow band along levee	L	Shaft Location/Access Road	37.84814	-121.5891
381	SS-29	Scrub-Shrub	PSS	0.024	narrow band along levee	L	Shaft Location/Access Road	37.84793	-121.5899
176	AD-262	Agricultural Ditch	R4	0.277	narrow-little vegetation	L	Reusable Tunnel Material	37.84791	-121.5984
170	AD-260	Agricultural Ditch	R4	0.040	narrow-little vegetation	L	Reusable Tunnel Material	37.8479	-121.6036
175	AD-261	Agricultural Ditch	R4	0.078	narrow-little vegetation	L	Reusable Tunnel Material	37.84789	-121.6205
379	SS-28	Scrub-Shrub	PSS	0.277	blackberry?	M	Shaft Location/Access Road	37.84785	-121.5862
434	EM-63	Emergent Wetland	PEM	0.330	degraded	L	Shaft Location/Access Road	37.84784	-121.5879
167	AD-263	Agricultural Ditch	R4	0.370	narrow-little vegetation	L	Reusable Tunnel Material	37.84774	-121.5988
161	AD-264	Agricultural Ditch	R4	0.181	narrow-little vegetation	L	Reusable Tunnel Material	37.84763	-121.5944
162	AD-265	Agricultural Ditch	R4	0.018	narrow-little vegetation	L	Reusable Tunnel Material	37.84763	-121.5956
61	EM-64	Emergent Wetland	PEM	0.041	degraded	L	Reusable Tunnel Material	37.84742	-121.6135
380	FO-44	Forest	PFO	0.168	narrow band along levee	L	Shaft Location/Access Road	37.84741	-121.5911
171	AD-266	Agricultural Ditch	R4	0.262	narrow-little vegetation	L	Reusable Tunnel Material	37.84712	-121.6077
634	TC-34	Tidal Channel	R1UB	2.260	Italian Slough-probably not impacted	H	Shaft Location/Access Road	37.84708	-121.588
172	AD-259	Agricultural Ditch	R4	0.588	narrow-little vegetation	L	Reusable Tunnel Material	37.84686	-121.6052
160	AD-267	Agricultural Ditch	R4	0.094	narrow-little vegetation	L	Reusable Tunnel Material	37.84649	-121.6192
46	CCF-3	Clifton Court Foreba	R1UB	821.682	rock-lined forebay	L	Forebay Dredging Area	37.84621	-121.5762
165	AD-268	Agricultural Ditch	R4	0.184	narrow-little vegetation	L	Reusable Tunnel Material	37.84615	-121.601
168	AD-272	Agricultural Ditch	R4	0.211	narrow-little vegetation	L	Reusable Tunnel Material	37.84592	-121.6038
166	AD-269	Agricultural Ditch	R4	0.420	narrow-little vegetation	L	Reusable Tunnel Material	37.84591	-121.6039
641	TC-33	Tidal Channel	R1UB	1.397	West Canal	H	Forebay Overflow Structure	37.84588	-121.5594
638	TC-32	Tidal Channel	R1UB	0.597	Italian Slough-probably not impacted	H	Forebay Overflow Structure	37.84583	-121.5596
163	AD-271	Agricultural Ditch	R4	0.604	medium-little vegetation	L	Reusable Tunnel Material	37.84583	-121.5958
169	AD-270	Agricultural Ditch	R4	1.084	medium-little vegetation	L	Reusable Tunnel Material	37.84583	-121.601
37	CCF-4	Clifton Court Foreba	R1UB	0.145	rock-lined forebay	L	Forebay Overflow Structure	37.84558	-121.5606
39	CCF-5	Clifton Court Foreba	R1UB	0.120	rock-lined forebay	L	Forebay Overflow Structure	37.84558	-121.5606
159	AD-273	Agricultural Ditch	R4	0.330	narrow-little vegetation	L	Reusable Tunnel Material	37.84461	-121.5979
158	AD-274	Agricultural Ditch	R4	0.027	narrow-little vegetation	L	Reusable Tunnel Material	37.84425	-121.5995
41	CCF-6	Clifton Court Foreba	R1UB	214.962	rock-lined forebay	L	Forebay Embankment	37.84354	-121.5758
157	AD-275	Agricultural Ditch	R4	0.039	narrow-little vegetation	L	Transmission Line	37.84314	-121.5956
156	AD-276	Agricultural Ditch	R4	0.007	narrow-little vegetation	L	Transmission Line	37.84298	-121.5956
164	AD-277	Agricultural Ditch	R4	0.818	medium-little vegetation	L	Transmission Line	37.84152	-121.5958
154	AD-278	Agricultural Ditch	R4	0.029	narrow-little vegetation	L	Transmission Line	37.84144	-121.5956
155	AD-279	Agricultural Ditch	R4	0.024	narrow-little vegetation	L	Transmission Line	37.83901	-121.5955
636	TC-35	Tidal Channel	R1UB	0.887	Italian Slough-probably not impacted	H	Transmission Line	37.83825	-121.5956
26	EM-65	Emergent Wetland	PEM	0.013	along road	L	Shaft Location/Access Road	37.838	-121.6025
633	TC-36	Tidal Channel	R1UB	0.107	Italian Slough-probably not impacted	H	Shaft Location/Access Road	37.83796	-121.6024
635	TC-37	Tidal Channel	R1UB	0.020	Italian Slough-probably not impacted	H	Shaft Location/Access Road	37.83789	-121.5956
27	DE-21	Depression	PUB	0.003	Allenrolfea	H	Transmission Line	37.83755	-121.5953
399	AW-3	Alkaline Wetland	PSS	3.074	Allenrolfea	H	Transmission Line	37.83634	-121.5956
66	AW-4	Alkaline Wetland	PSS	1.041	Allenrolfea	H	Transmission Line	37.83434	-121.5955
42	CCF-7	Clifton Court Foreba	R1UB	7.996	rock-lined forebay	L	Forebay/Spillway	37.83256	-121.5922
45	CCF-8	Clifton Court Foreba	R1UB	1107.996	rock-lined forebay	L	Forebay Dredging Area	37.8321	-121.5742
153	AD-280	Agricultural Ditch	R4	0.083	narrow-shrubs	M	Transmission Line	37.83014	-121.5955
25	AW-5	Alkaline Wetland	PEM	0.938	degraded	L	Transmission Line	37.82951	-121.5956
148	CO-1	Conveyance Channe	NA	3.846	large constructed channel	L	Control Structure	37.82945	-121.5939
152	CO-2	Conveyance Channe	NA	1.184	large constructed channel	L	Work Area	37.82944	-121.5939
145	AD-281	Agricultural Ditch	R4	0.088	narrow-little vegetation	L	Transmission Line	37.82898	-121.5543
43	CCF-9	Clifton Court Foreba	R1UB	17.897	rock-lined forebay	L	Forebay Embankment	37.82873	-121.5913
144	AD-282	Agricultural Ditch	R4	0.517	narrow-little vegetation	L	Forebay Embankment	37.82872	-121.556
400	AW-6	Alkaline Wetland	PSS	1.101	somewhat degraded	L	Transmission Line	37.82871	-121.5957
30	SS-30	Scrub-Shrub	PSS	1.516	blackberry?	M	Transmission Line	37.8284	-121.5535
36	CCF-10	Clifton Court Foreba	R1UB	11.950	rock-lined forebay	L	Canal	37.82777	-121.5923
31	SS-31	Scrub-Shrub	PSS	0.242	Arundo	L	Transmission Line	37.82755	-121.5527
364	VP-1	Vernal Pool	PEM2	0.069	degraded	L	Transmission Line	37.82753	-121.5964

79	SS-32	Scrub-Shrub	PSS	0.385	degraded	L	Transmission Line	37.82747	-121.553
433	EM-66	Emergent Wetland	PEM	0.059	in ag field	L	New Forebay	37.8274	-121.5584
392	AW-7	Alkaline Wetland	PSS	0.034	Allenrolfea	H	Work Area	37.82725	-121.5933
146	AD-283	Agricultural Ditch	R4	0.995	narrow-little vegetation	L	New Forebay	37.827	-121.5593
393	AW-8	Alkaline Wetland	PSS	0.116	narrow band along road	L	Canal	37.82686	-121.5931
62	EM-67	Emergent Wetland	PEM	0.152	pond with some vegetation	M	New Forebay	37.82654	-121.5727
87	SS-33	Scrub-Shrub	PSS	0.309	narrow band along ag ditch	M	New Forebay	37.82634	-121.5624
394	AW-9	Alkaline Wetland	PSS	0.029	narrow band along road	L	Work Area	37.82622	-121.5932
141	AD-286	Agricultural Ditch	R4	0.231	narrow-little vegetation	L	Work Area	37.82602	-121.5936
138	AD-284	Agricultural Ditch	R4	1.077	narrow-shrubs	M	New Forebay	37.8257	-121.5727
139	AD-285	Agricultural Ditch	R4	0.143	narrow-little vegetation	L	New Forebay	37.82558	-121.558
28	EM-68	Emergent Wetland	PEM	0.169	degraded	L	New Forebay	37.82552	-121.5684
29	EM-69	Emergent Wetland	PEM	0.093	degraded	L	New Forebay	37.82549	-121.5691
80	SS-34	Scrub-Shrub	PSS	0.066	degraded	L	Transmission Line	37.82505	-121.5526
140	AD-287	Agricultural Ditch	R4	0.148	narrow-little vegetation	L	Canal	37.825	-121.5924
149	CO-3	Conveyance Channe	NA	0.913	large constructed channel	L	Transmission Line	37.82435	-121.5968
142	AD-288	Agricultural Ditch	R4	0.102	narrow-little vegetation	L	Forebay Embankment	37.82425	-121.5913
88	SS-35	Scrub-Shrub	PSS	0.168	narrow band along levee	L	Transmission Line	37.82388	-121.5531
137	AD-290	Agricultural Ditch	R4	0.809	narrow-little vegetation	L	New Forebay	37.82384	-121.5661
135	AD-289	Agricultural Ditch	R4	0.780	narrow-little vegetation	L	New Forebay	37.82383	-121.5728
44	CCF-11	Clifton Court Foreba	R1UB	1.014	rock-lined forebay	L	New Forebay	37.82365	-121.5845
24	SS-36	Scrub-Shrub	PSS	0.173	degraded	L	New Forebay	37.8236	-121.5775
78	EM-70	Emergent Wetland	PEM	0.647	in ag field	L	Transmission Line	37.82347	-121.5546
23	SS-37	Scrub-Shrub	PSS	0.324	ruderal	L	New Forebay	37.82344	-121.5784
136	AD-292	Agricultural Ditch	R4	0.402	narrow-little vegetation	L	New Forebay	37.82335	-121.5596
390	SS-38	Scrub-Shrub	PSS	0.228	narrow band between levees	L	New Forebay	37.82327	-121.5789
134	AD-291	Agricultural Ditch	R4	0.071	narrow-little vegetation	L	Forebay Embankment	37.82325	-121.5908
125	AD-293	Agricultural Ditch	R4	0.019	narrow-little vegetation	L	Work Area	37.82268	-121.5957
126	AD-294	Agricultural Ditch	R4	0.243	narrow-little vegetation	L	Work Area	37.82252	-121.5942
131	AD-295	Agricultural Ditch	R4	0.135	narrow-little vegetation	L	Canal	37.82251	-121.5915
474	FO-45	Forest	PFO	0.625	narrow band along ag ditch	M	Transmission Line	37.82209	-121.5547
117	AD-296	Agricultural Ditch	R4	0.053	narrow-riparian vegetation	M	Transmission Line	37.82208	-121.5547
65	EM-71	Emergent Wetland	PEM	0.041	in ag field	L	Work Area	37.82191	-121.5959
133	AD-297	Agricultural Ditch	R4	0.035	narrow-little vegetation	L	Work Area	37.8219	-121.5921
132	AD-298	Agricultural Ditch	R4	0.020	narrow-little vegetation	L	Work Area	37.8217	-121.5923
127	AD-299	Agricultural Ditch	R4	0.052	narrow-little vegetation	L	Work Area	37.82169	-121.5928
124	AD-300	Agricultural Ditch	R4	0.327	narrow-little vegetation	L	New Forebay	37.82167	-121.5666
397	AD-301	Agricultural Ditch	R4	0.048	narrow-little vegetation	L	New Forebay	37.82149	-121.5814
123	AD-302	Agricultural Ditch	R4	0.648	narrow-little vegetation	L	New Forebay	37.82132	-121.5609
398	EM-72	Emergent Wetland	PEM	0.184	somewhat degraded	L	New Forebay	37.82125	-121.5812
114	AD-303	Agricultural Ditch	R4	0.053	narrow-little vegetation	L	Work Area	37.82124	-121.5918
111	AD-304	Agricultural Ditch	R4	0.131	narrow-little vegetation	L	Work Area	37.8211	-121.5919
128	AD-305	Agricultural Ditch	R4	0.605	narrow-little vegetation	L	New Forebay	37.82097	-121.571
396	AD-306	Agricultural Ditch	R4	0.020	narrow-little vegetation	L	New Forebay	37.82094	-121.5828
109	AD-307	Agricultural Ditch	R4	0.055	narrow-little vegetation	L	New Forebay	37.82081	-121.5583
130	AD-308	Agricultural Ditch	R4	0.752	narrow-little vegetation	L	New Forebay	37.82061	-121.576
110	AD-309	Agricultural Ditch	R4	0.054	narrow-little vegetation	L	Work Area	37.82058	-121.5911
120	AD-310	Agricultural Ditch	R4	0.256	narrow-little vegetation	L	Work Area	37.82057	-121.5957
391	AW-10	Alkaline Wetland	PSS	5.145	Allenrolfea	H	New Forebay	37.82056	-121.5839
143	AD-311	Agricultural Ditch	R4	1.415	narrow-little vegetation	L	New Forebay	37.82009	-121.5845
402	VP-2	Vernal Pool	PEM2	0.033	mostly undisturbed	H	New Forebay	37.81993	-121.5825
107	AD-312	Agricultural Ditch	R4	0.048	narrow-little vegetation	L	Forebay Embankment	37.81987	-121.5582
406	VP-3	Vernal Pool	PEM2	0.015	mostly undisturbed	H	New Forebay	37.81985	-121.5822
113	AD-313	Agricultural Ditch	R4	0.197	narrow-little vegetation	L	Work Area	37.81985	-121.5895
121	AD-314	Agricultural Ditch	R4	0.143	narrow-little vegetation	L	Forebay Embankment	37.81983	-121.5599
408	VP-4	Vernal Pool	PEM2	0.041	mostly undisturbed	H	New Forebay	37.81974	-121.5826
405	VP-5	Vernal Pool	PEM2	0.030	mostly undisturbed	H	New Forebay	37.81968	-121.5822
407	VP-6	Vernal Pool	PEM2	0.018	mostly undisturbed	H	New Forebay	37.81949	-121.5827
403	VP-7	Vernal Pool	PEM2	0.061	mostly undisturbed	H	New Forebay	37.81948	-121.5824
404	VP-8	Vernal Pool	PEM2	0.041	mostly undisturbed	H	New Forebay	37.8194	-121.5821
116	AD-315	Agricultural Ditch	R4	0.001	narrow-little vegetation	L	Work Area	37.81892	-121.5877
106	AD-316	Agricultural Ditch	R4	0.307	narrow-little vegetation	L	Work Area	37.81878	-121.588
151	CO-4	Conveyance Channe	NA	0.400	large constructed channel	L	Work Area	37.81873	-121.601
108	AD-317	Agricultural Ditch	R4	0.102	narrow-little vegetation	L	Transmission Line	37.8185	-121.5582
122	AD-320	Agricultural Ditch	R4	0.166	narrow-little vegetation	L	Transmission Line	37.81816	-121.5613
118	AD-319	Agricultural Ditch	R4	0.146	narrow-little vegetation	L	Canal	37.81813	-121.5957
112	AD-318	Agricultural Ditch	R4	0.232	narrow-little vegetation	L	Canal	37.8177	-121.5851
129	AD-321	Agricultural Ditch	R4	0.074	narrow-little vegetation	L	Forebay Embankment	37.81742	-121.5736
115	AD-322	Agricultural Ditch	R4	0.045	narrow-little vegetation	L	Work Area	37.81718	-121.5847
105	AD-323	Agricultural Ditch	R4	0.038	narrow-little vegetation	L	Work Area	37.81695	-121.5847
63	EM-73	Emergent Wetland	PEM	0.469	in depression between levees	M	Forebay Embankment	37.81674	-121.5752
64	EM-74	Emergent Wetland	PEM	0.114	in depression between levees	M	Transmission Line	37.81672	-121.5746
104	AD-325	Agricultural Ditch	R4	0.059	narrow-little vegetation	L	Work Area	37.81668	-121.5978
103	AD-324	Agricultural Ditch	R4	0.047	narrow-little vegetation	L	Canal	37.81668	-121.599
119	AD-326	Agricultural Ditch	R4	0.096	narrow-little vegetation	L	Work Area	37.81667	-121.5977
147	CO-5	Conveyance Channe	NA	0.673	large constructed channel	L	Canal	37.81661	-121.6028
99	AD-327	Agricultural Ditch	R4	0.014	narrow-little vegetation	L	New Forebay	37.81632	-121.5772
100	CO-6	Conveyance Channe	NA	2.203	large constructed channel	L	Control Structure	37.81607	-121.5728
102	CO-7	Conveyance Channe	NA	1.135	large constructed channel	L	Work Area	37.81607	-121.5728
21	EM-75	Emergent Wetland	PEM	2.368	emergent wetland in swale	M	Forebay Embankment	37.81604	-121.5765
22	EM-76	Emergent Wetland	PEM	0.755	emergent wetland in swale	M	Transmission Line	37.81595	-121.576
98	AD-328	Agricultural Ditch	R4	0.288	narrow-little vegetation	L	Forebay Embankment	37.81546	-121.5774

150	CO-8	Conveyance Channe	NA	0.133	large constructed channel	L	Work Area	37.81544	-121.6038
95	AD-329	Agricultural Ditch	R4	0.170	narrow-little vegetation	L	Canal	37.81437	-121.5784
97	AD-330	Agricultural Ditch	R4	0.074	narrow-little vegetation	L	Work Area	37.8138	-121.579
96	AD-331	Agricultural Ditch	R4	0.161	narrow-little vegetation	L	Work Area	37.81367	-121.5797
101	CO-9	Conveyance Channe	NA	0.349	large constructed channel	L	Transmission Line	37.81273	-121.5781
94	AD-332	Agricultural Ditch	R4	0.049	narrow-little vegetation	L	Transmission Line	37.8119	-121.5772
93	AD-333	Agricultural Ditch	R4	0.009	narrow-little vegetation	L	Transmission Line	37.81175	-121.5768
92	AD-334	Agricultural Ditch	R4	0.043	narrow -little vegetation	L	Transmission Line	37.81089	-121.5776
642	TC-38	Tidal Channel	R1UB	2.730	Old River	H	Operable Barrier	37.80804	-121.3293



Sources: Conveyance Planning Area rev5a (DWR 2015); Wetlands (DWR 20150621); NAIP 2014

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CALIFORNIA WATER FIX
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California Water Fix
Impacts to Waters of US
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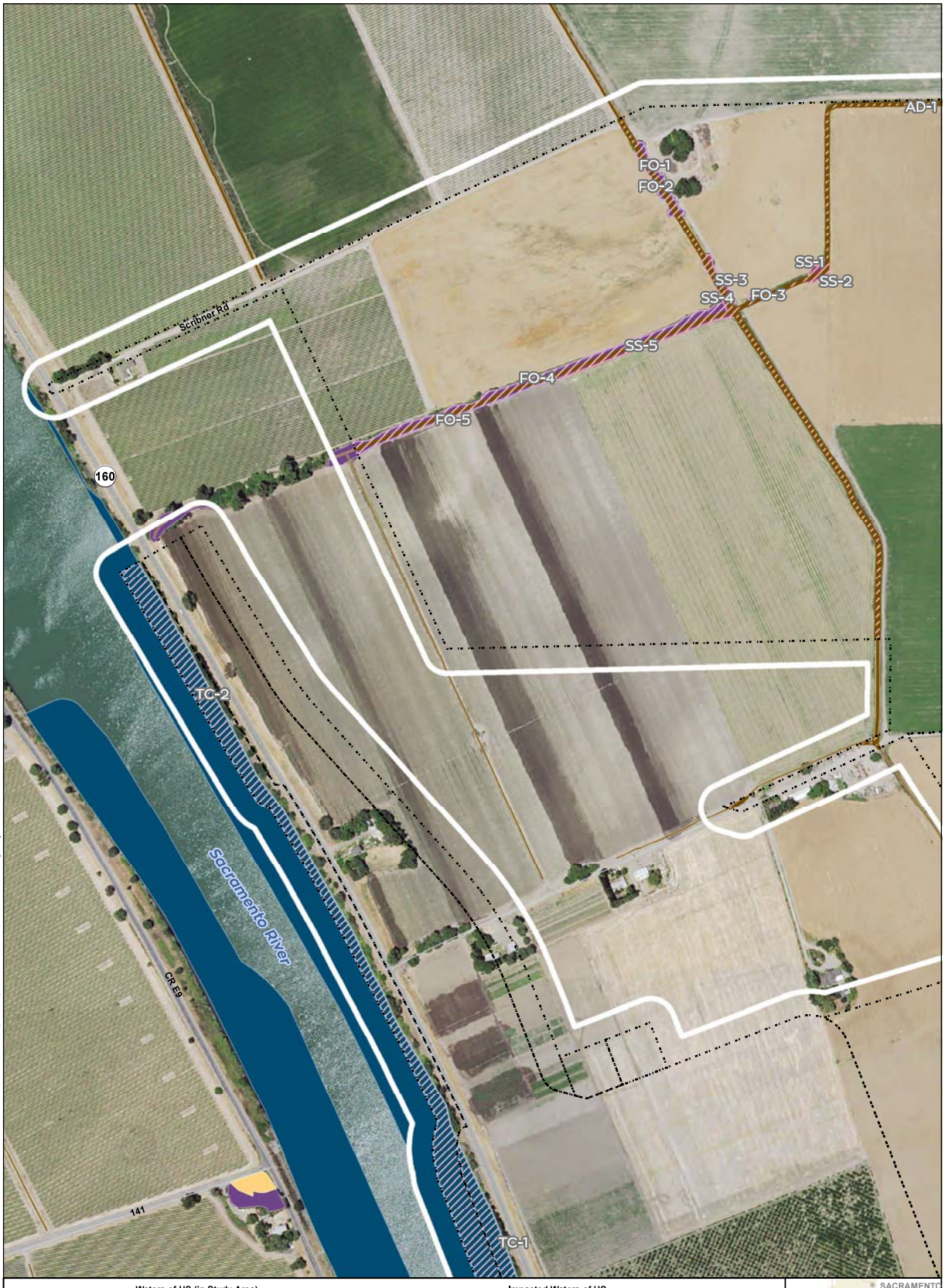

Waters of US (in Study Area)

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	33 acres	AD (Agricultural Ditch)	95 acres
EM (Emergent Wetland)	156 acres	CH (Natural Channel)	0 acres
FO (Forest)	44 acres	DE (Depression)	54 acres
SS (Scrub Shrub)	25 acres	LA (Lacustrine)	23 acres
SW (Seasonal Wetland)	183 acres	CO (Conveyance)	32 acres
VP (Vernal Pool)	0.5 acres	TC (Tidal Channel)	347 acres
		CCF (Clifton Court Forebay)	2,215 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

N

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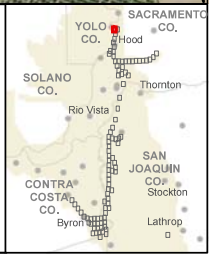
Impacted Waters of US

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	20 acres	AD (Agricultural Ditch)	63 acres
EM (Emergent Wetland)	89 acres	CH (Natural Channel)	0 acres
FO (Forest)	17 acres	CO (Conveyance)	11 acres
SS (Scrub Shrub)	18 acres	DE (Depression)	36 acres
SW (Seasonal Wetland)	140 acres	LA (Lacustrine)	23 acres
VP (Vernal Pool)	0.3 acres	TC (Tidal Channel)	100 acres
		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres



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Sources: CM1 Wetland Study Area (DWR 2015), Wetlands and Other Waters of US Impacts (DWR 20150601); NAIP 2014

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Impacts to Waters of US
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Waters of US (in Study Area)

Wetlands		Other Waters of US	
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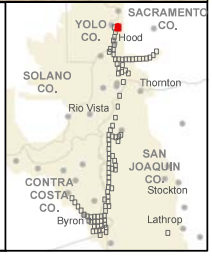

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Impacts to Waters of US
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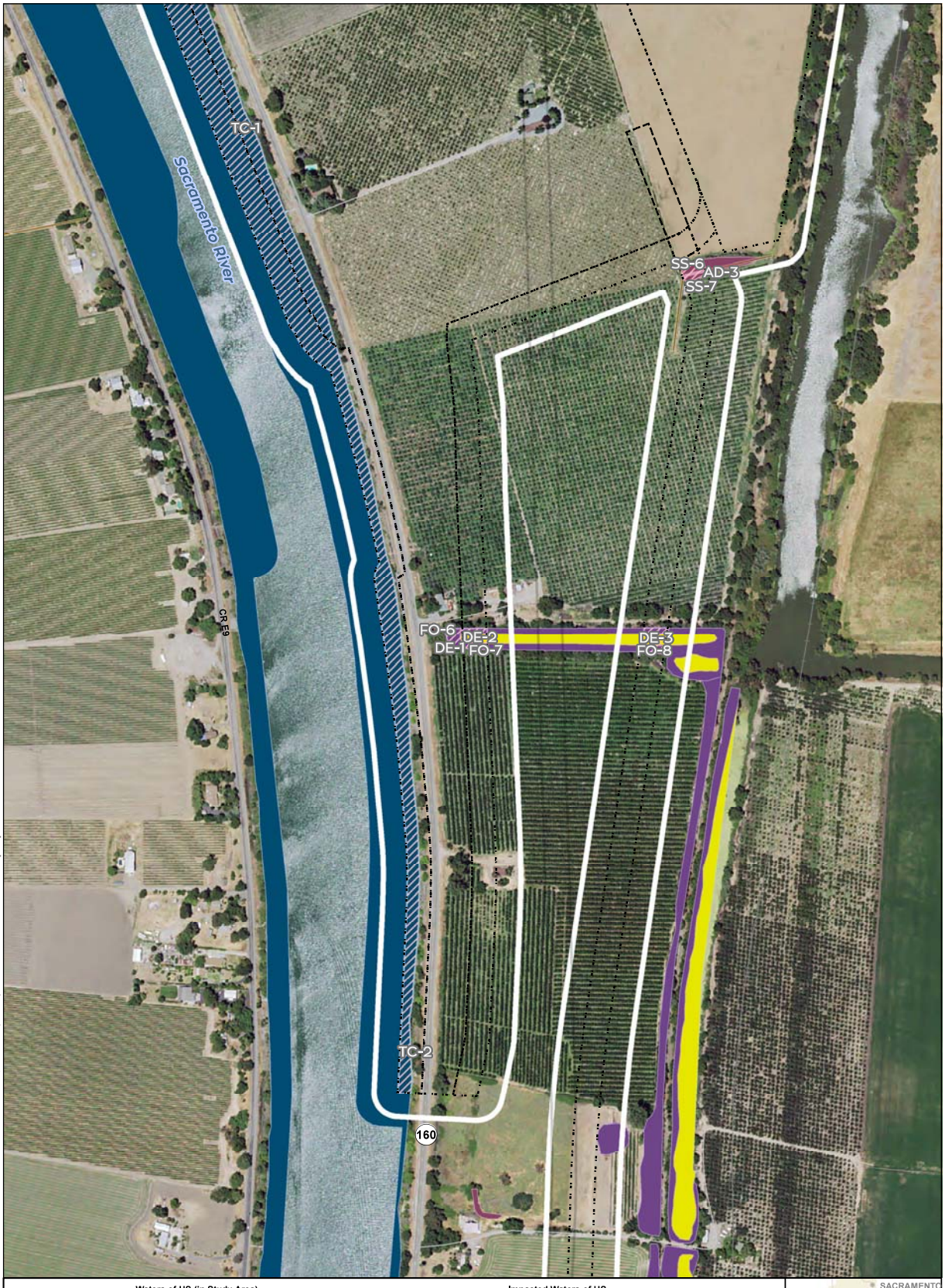

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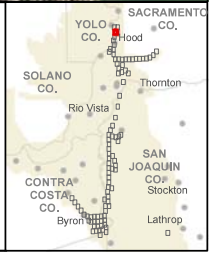

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Sources: CM1 Wetland Study Area (DWR 2015), Wetlands and Other Waters of US Impacts (DWR 20150601); NAIP 2014

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CALIFORNIA WATER FIX
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California Water Fix
Impacts to Waters of US
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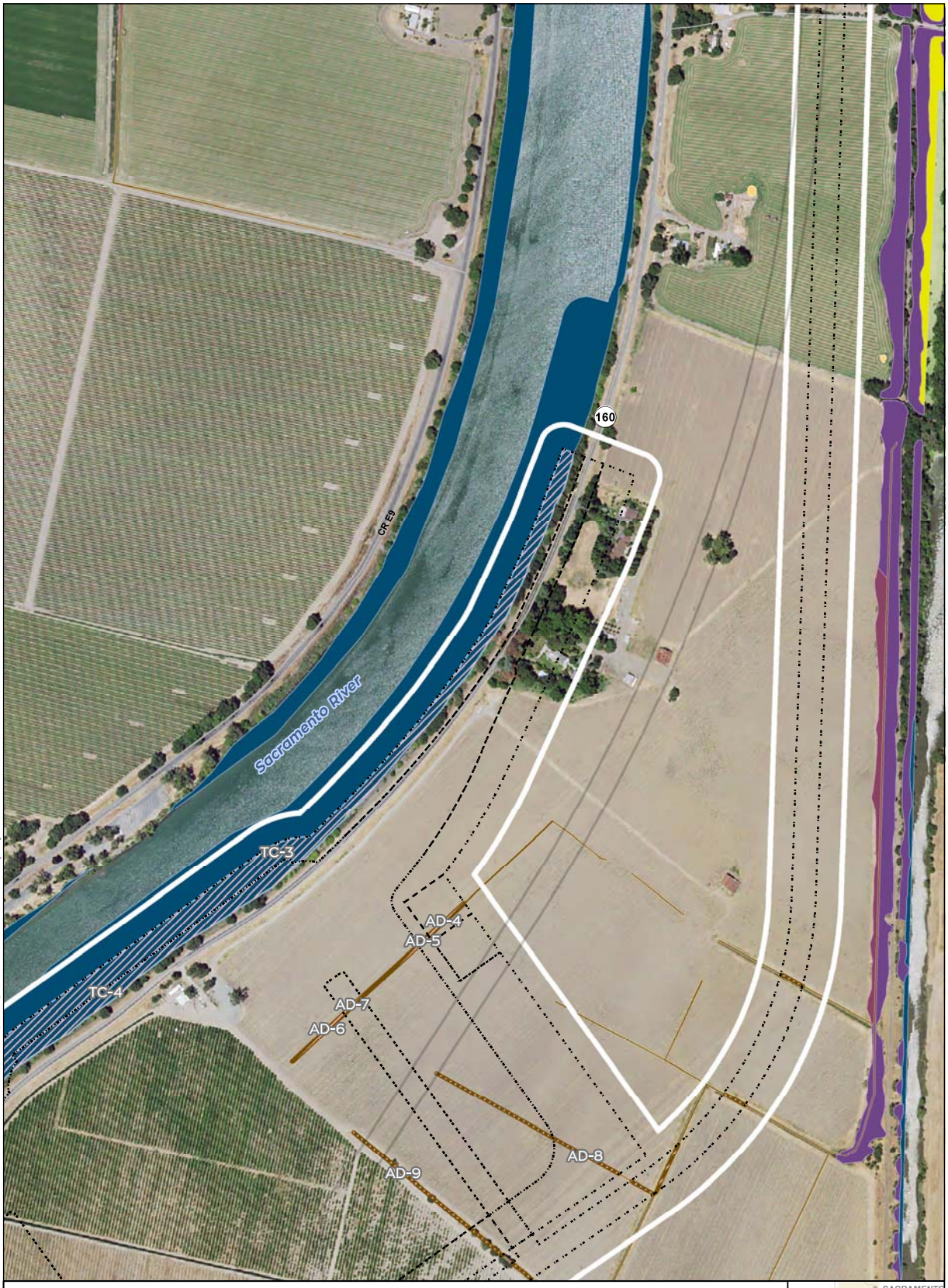

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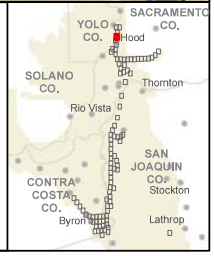

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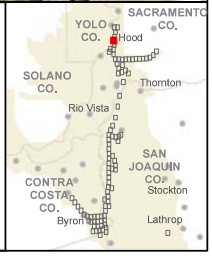

Sources: CM1 Wetland Study Area (DWR 2015), Wetlands and Other Waters of US Impacts (DWR 20150601); NAIP 2014

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CALIFORNIA WATER FIX
RELIABLE. CLEAN. WATER

Sheet 5 of 95
California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Waters of US (in Study Area)

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	33 acres	AD (Agricultural Ditch)	95 acres
EM (Emergent Wetland)	156 acres	CH (Natural Channel)	0 acres
FO (Forest)	44 acres	DE (Depression)	54 acres
SS (Scrub Shrub)	25 acres	LA (Lacustrine)	23 acres
SW (Seasonal Wetland)	183 acres	CO (Conveyance)	32 acres
VP (Vernal Pool)	0.5 acres	TC (Tidal Channel)	347 acres
		CCF (Clifton Court Forebay)	2,215 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

Impacted Waters of US

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	20 acres	AD (Agricultural Ditch)	63 acres
EM (Emergent Wetland)	89 acres	CH (Natural Channel)	0 acres
FO (Forest)	17 acres	CO (Conveyance)	11 acres
SS (Scrub Shrub)	18 acres	DE (Depression)	36 acres
SW (Seasonal Wetland)	140 acres	LA (Lacustrine)	23 acres
VP (Vernal Pool)	0.3 acres	TC (Tidal Channel)	100 acres
		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

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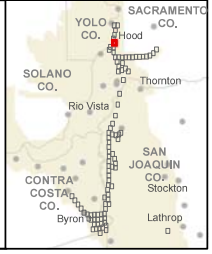

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Impacts to Waters of US
Wetland Delineation v.2

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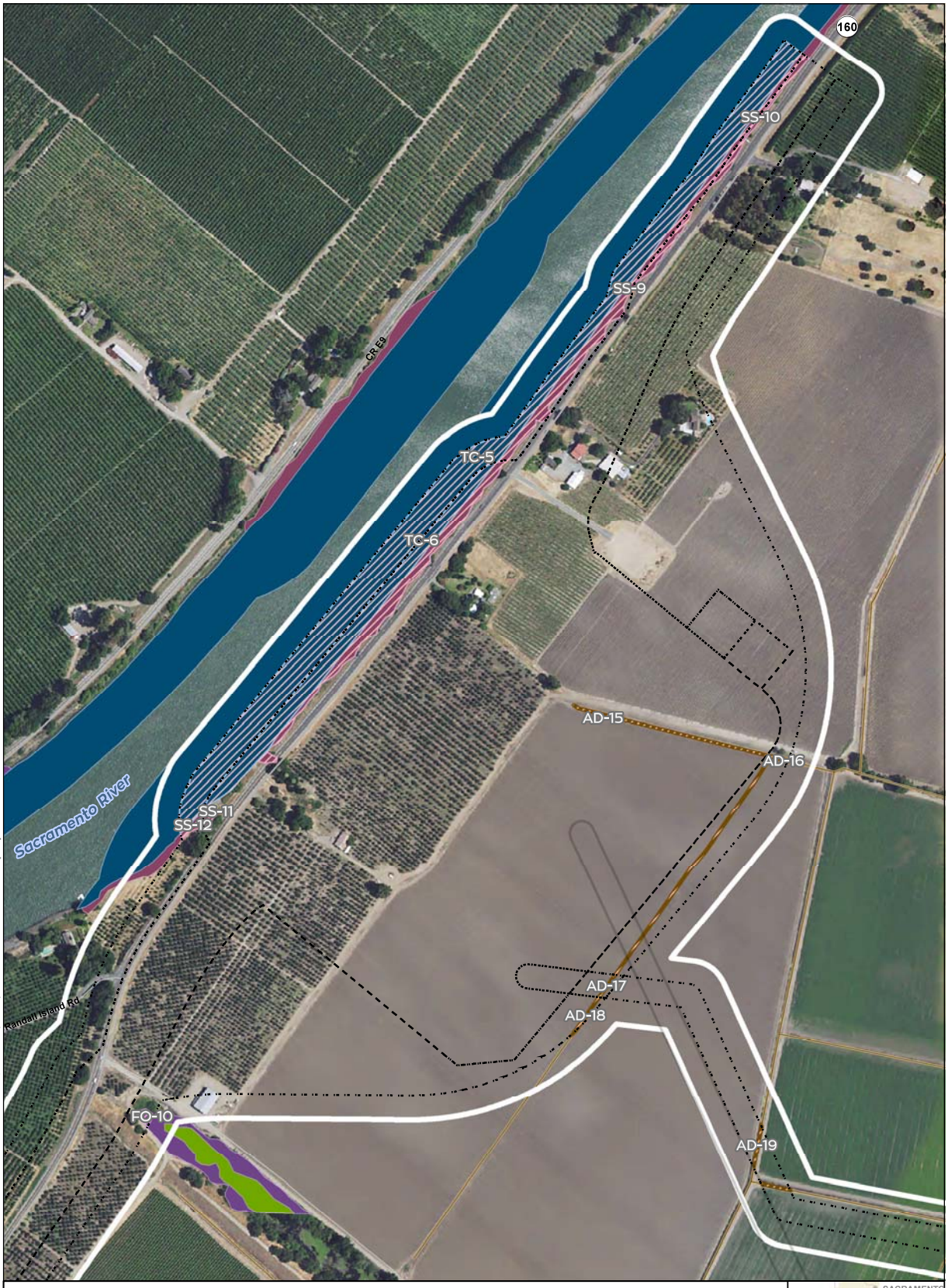

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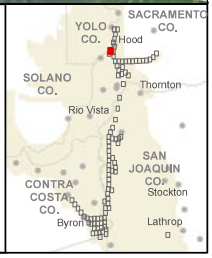

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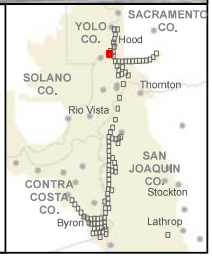

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California Water Fix
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Wetland Delineation v.2

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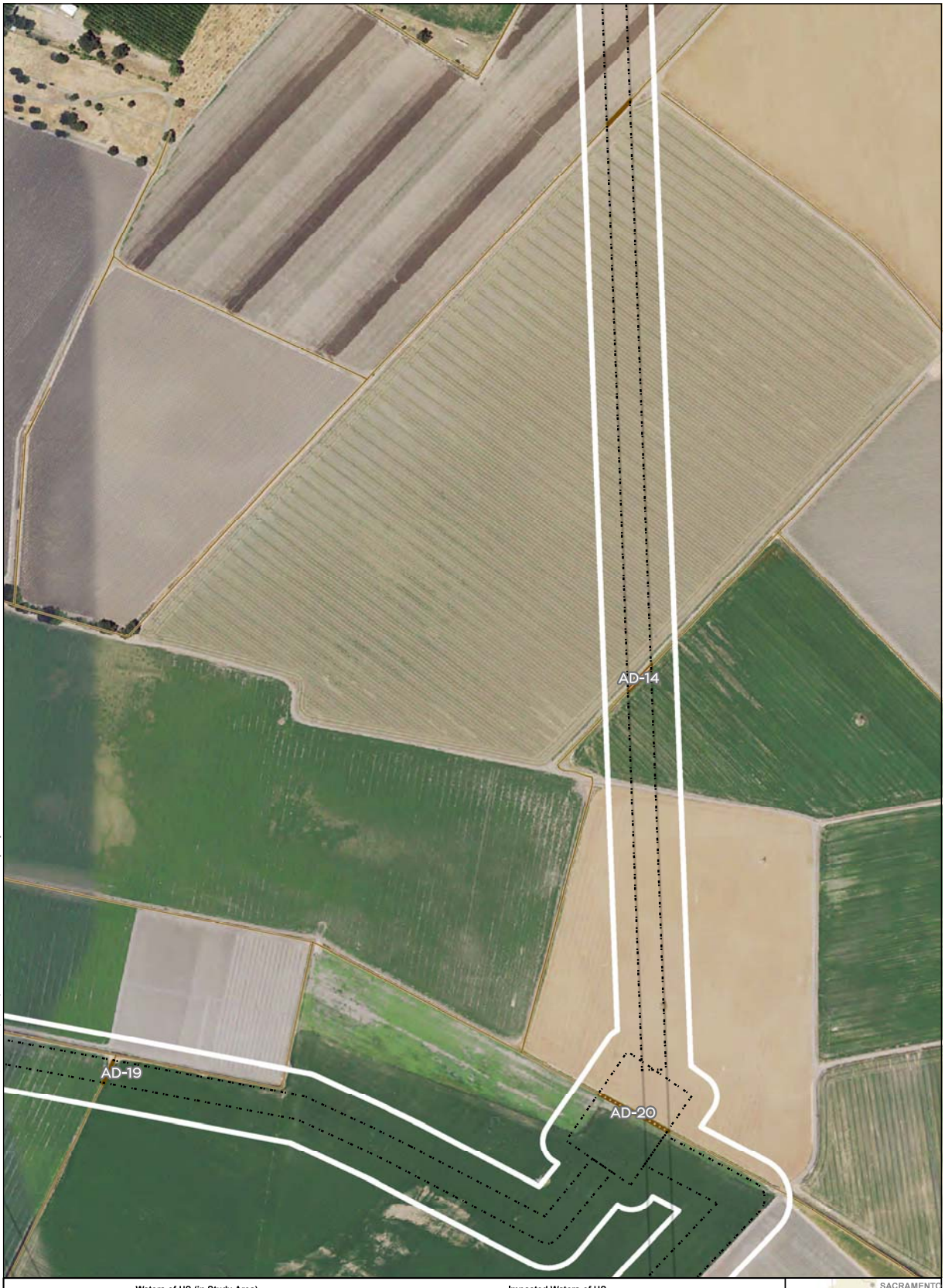

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CCF (Clifton Court Forebay)

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temporary	1,931 acres

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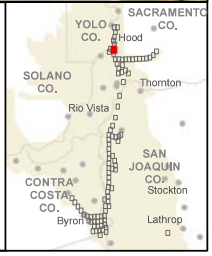

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Impacts to Waters of US
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Conveyance Footprint
Surface Impact
Subsurface Impact

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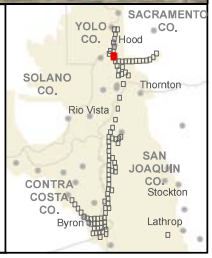

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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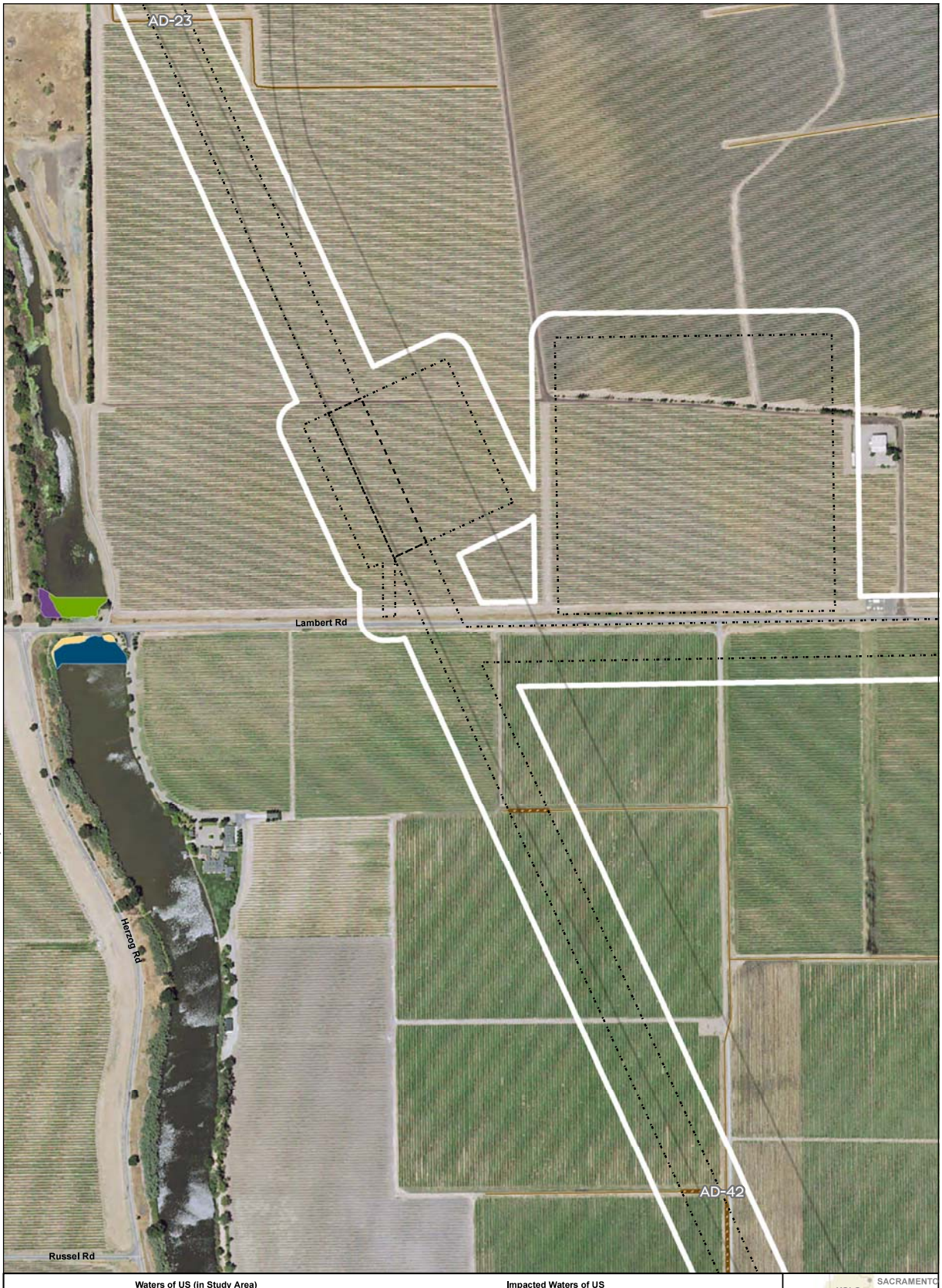

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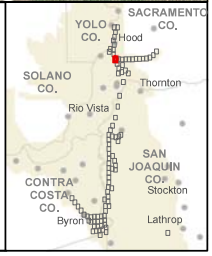

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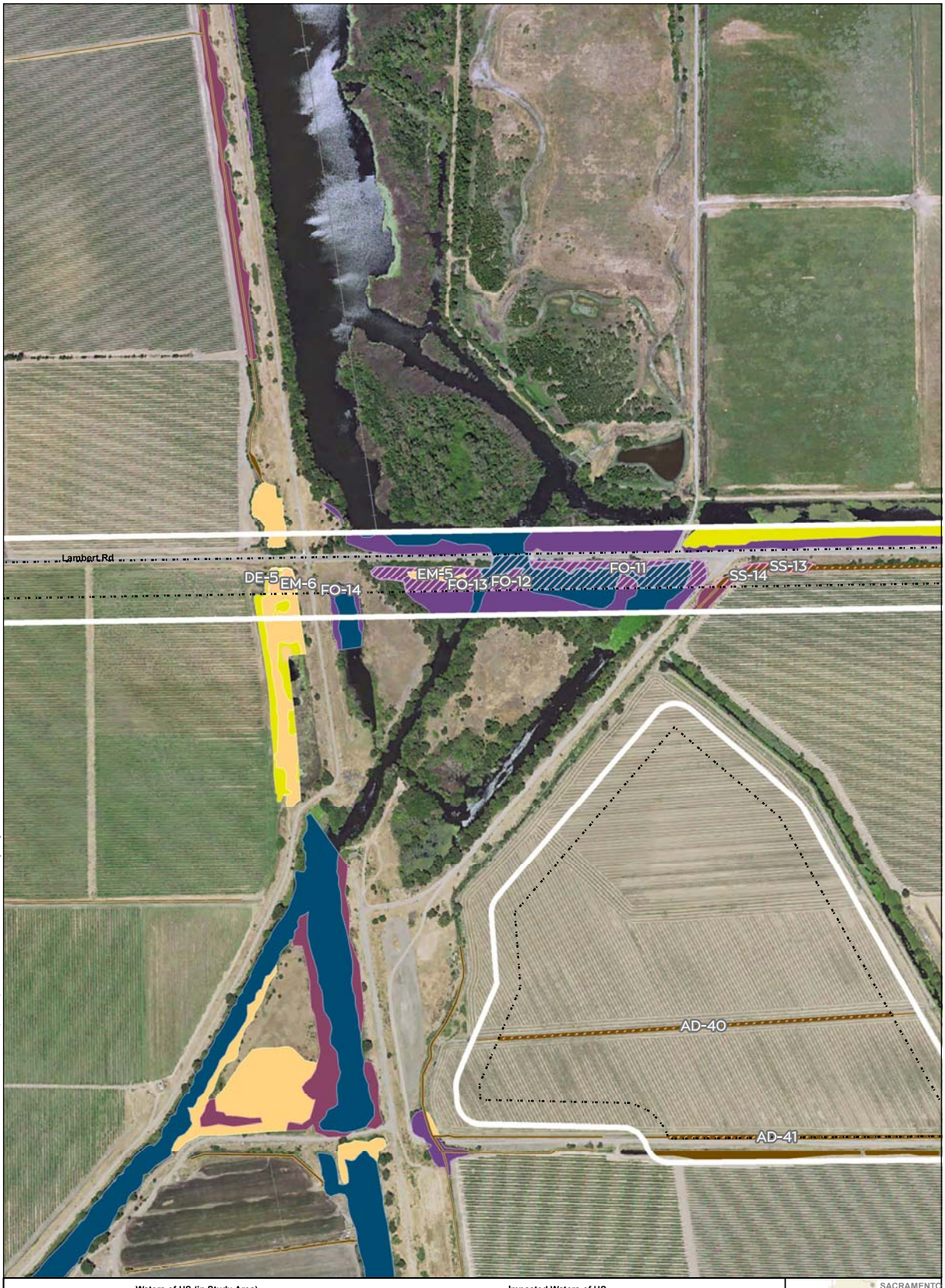

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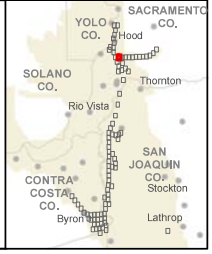

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Sheet 12 of 95
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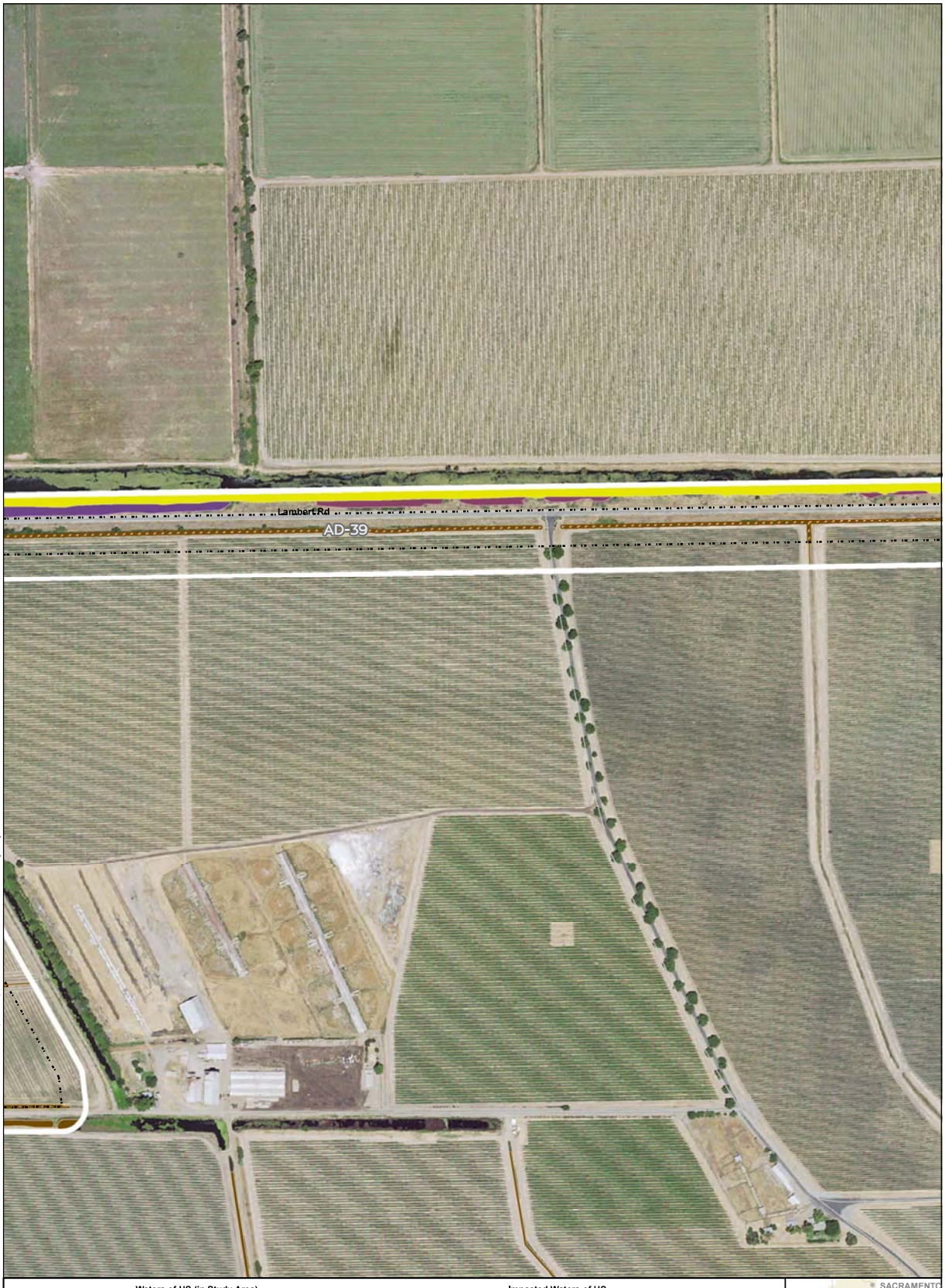
Wetland Delineation v.2



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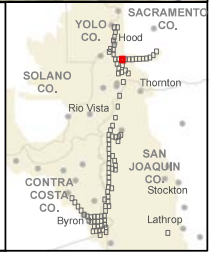

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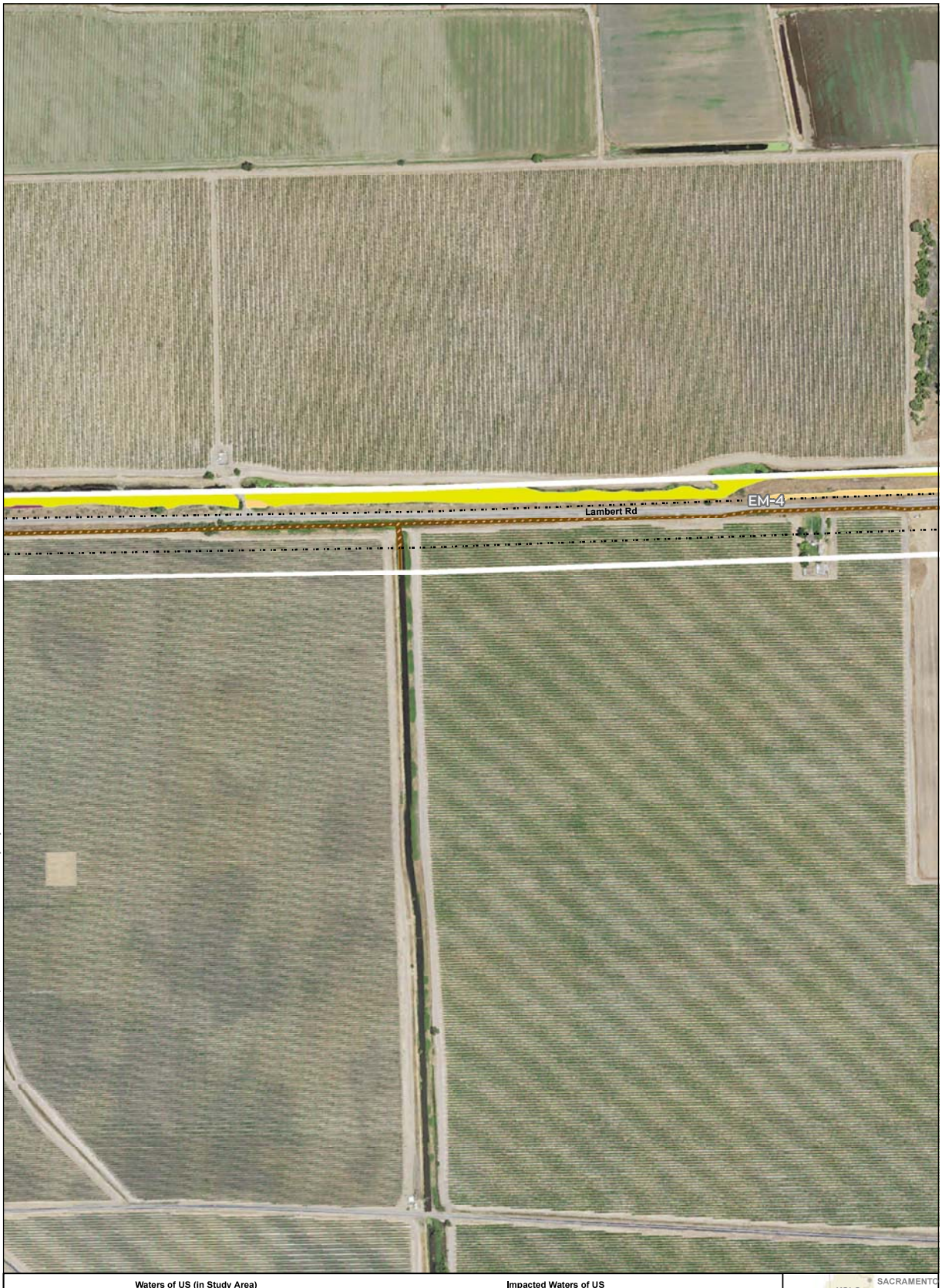

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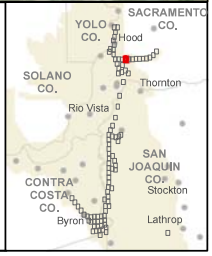

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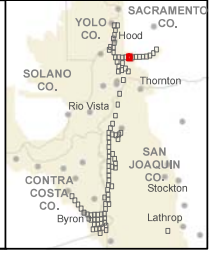

Sources: CM1 Wetland Study Area (DWR 2015), Wetlands and Other Waters of US Impacts (DWR 20150601); NAIP 2014

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CALIFORNIA WATER FIX
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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Waters of US (in Study Area)

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	33 acres	AD (Agricultural Ditch)	95 acres
EM (Emergent Wetland)	156 acres	CH (Natural Channel)	0 acres
FO (Forest)	44 acres	DE (Depression)	54 acres
SS (Scrub Shrub)	25 acres	LA (Lacustrine)	23 acres
SW (Seasonal Wetland)	183 acres	CO (Conveyance)	32 acres
VP (Vernal Pool)	0.5 acres	TC (Tidal Channel)	347 acres
		CCF (Clifton Court Forebay)	2,215 acres

Impacted Waters of US

Wetlands		Other Waters of US	
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SW (Seasonal Wetland)	140 acres	LA (Lacustrine)	23 acres
VP (Vernal Pool)	0.3 acres	TC (Tidal Channel)	100 acres
		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

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Feet
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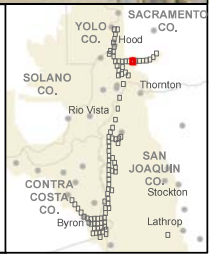

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Wetland Delineation v.2

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Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

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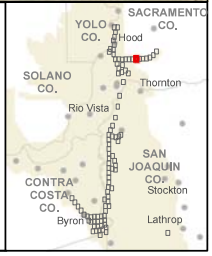

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Impacts to Waters of US
Wetland Delineation v.2

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Surface Impact
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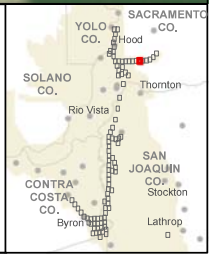

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Surface Impact
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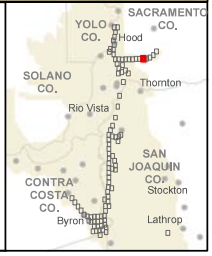

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CALIFORNIA WATER FIX
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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

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Feet
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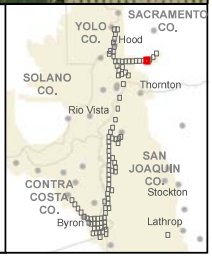

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Surface Impact
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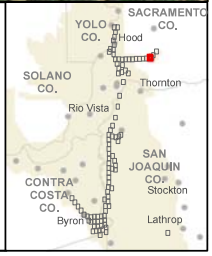

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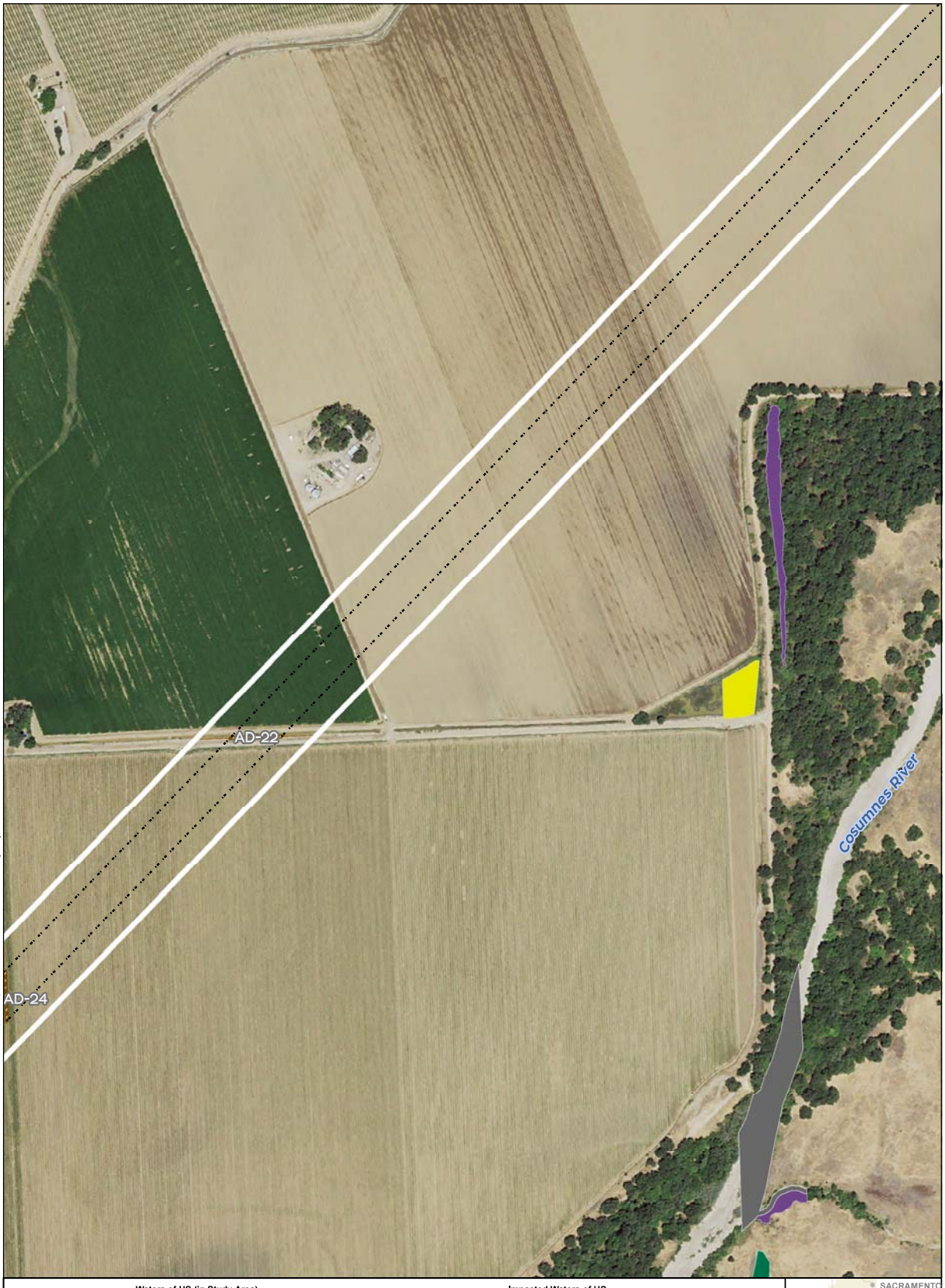
Sheet 21 of 95
California Water Fix
Impacts to Waters of US
Wetland Delineation v.2



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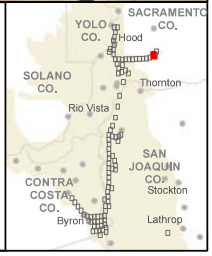

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Impacts to Waters of US
Wetland Delineation v.2

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Surface Impact
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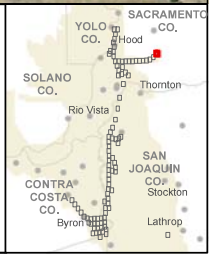

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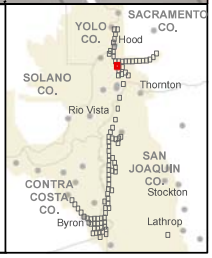

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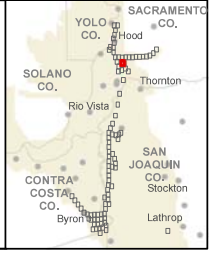

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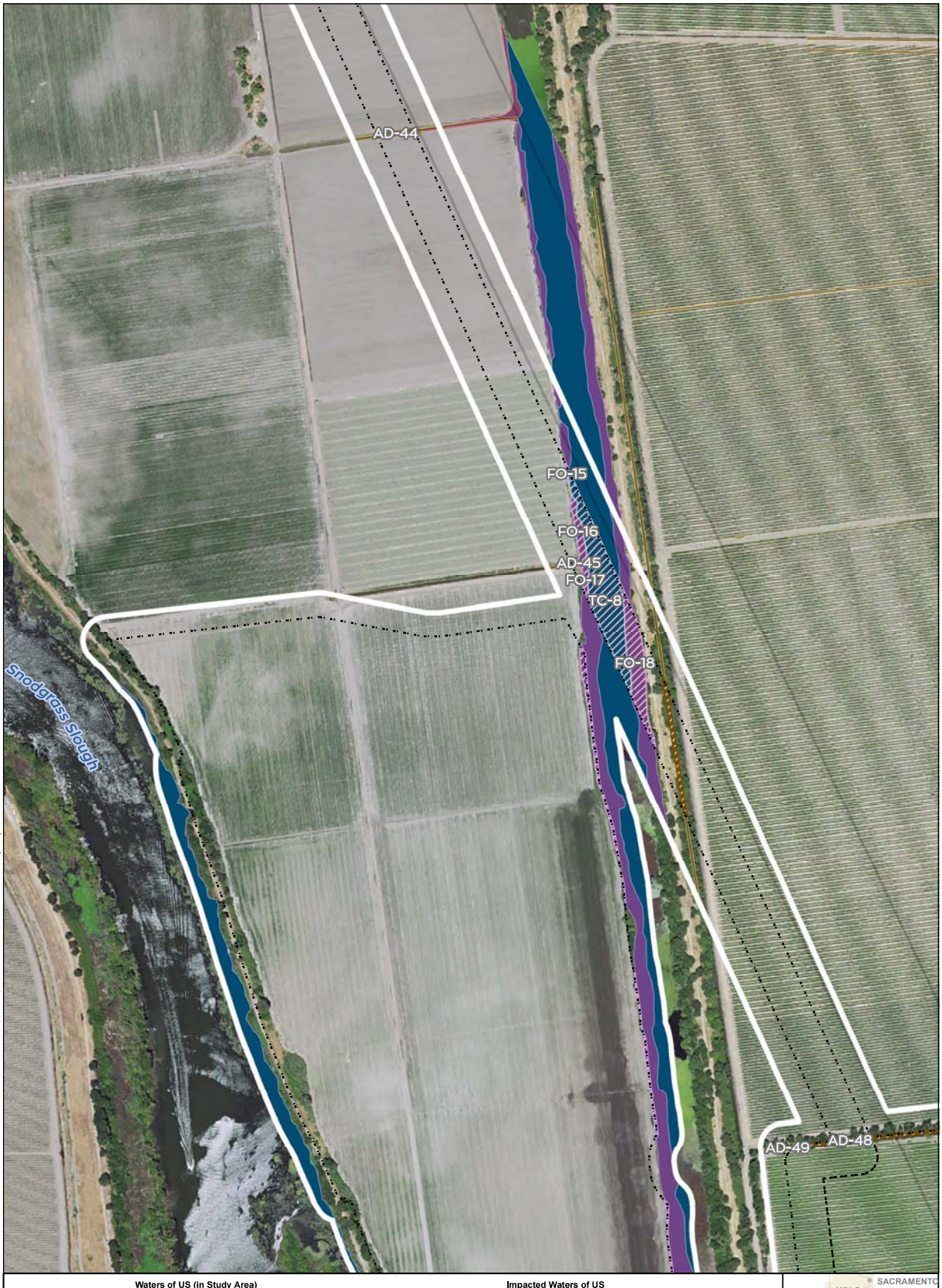

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		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

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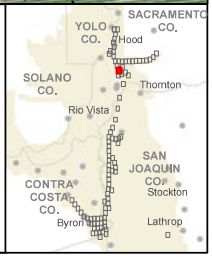

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CALIFORNIA WATER FIX
RELIABLE. CLEAN. WATER

Waters of US (in Study Area)

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	33 acres	AD (Agricultural Ditch)	95 acres
EM (Emergent Wetland)	156 acres	CH (Natural Channel)	0 acres
FO (Forest)	44 acres	DE (Depression)	54 acres
SS (Scrub Shrub)	25 acres	LA (Lacustrine)	23 acres
SW (Seasonal Wetland)	183 acres	CO (Conveyance)	32 acres
VP (Vernal Pool)	0.5 acres	TC (Tidal Channel)	347 acres
		CCF (Clifton Court Forebay)	2,215 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

Impacted Waters of US

Wetlands		Other Waters of US	
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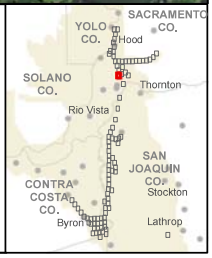

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Impacts to Waters of US
Wetland Delineation v.2

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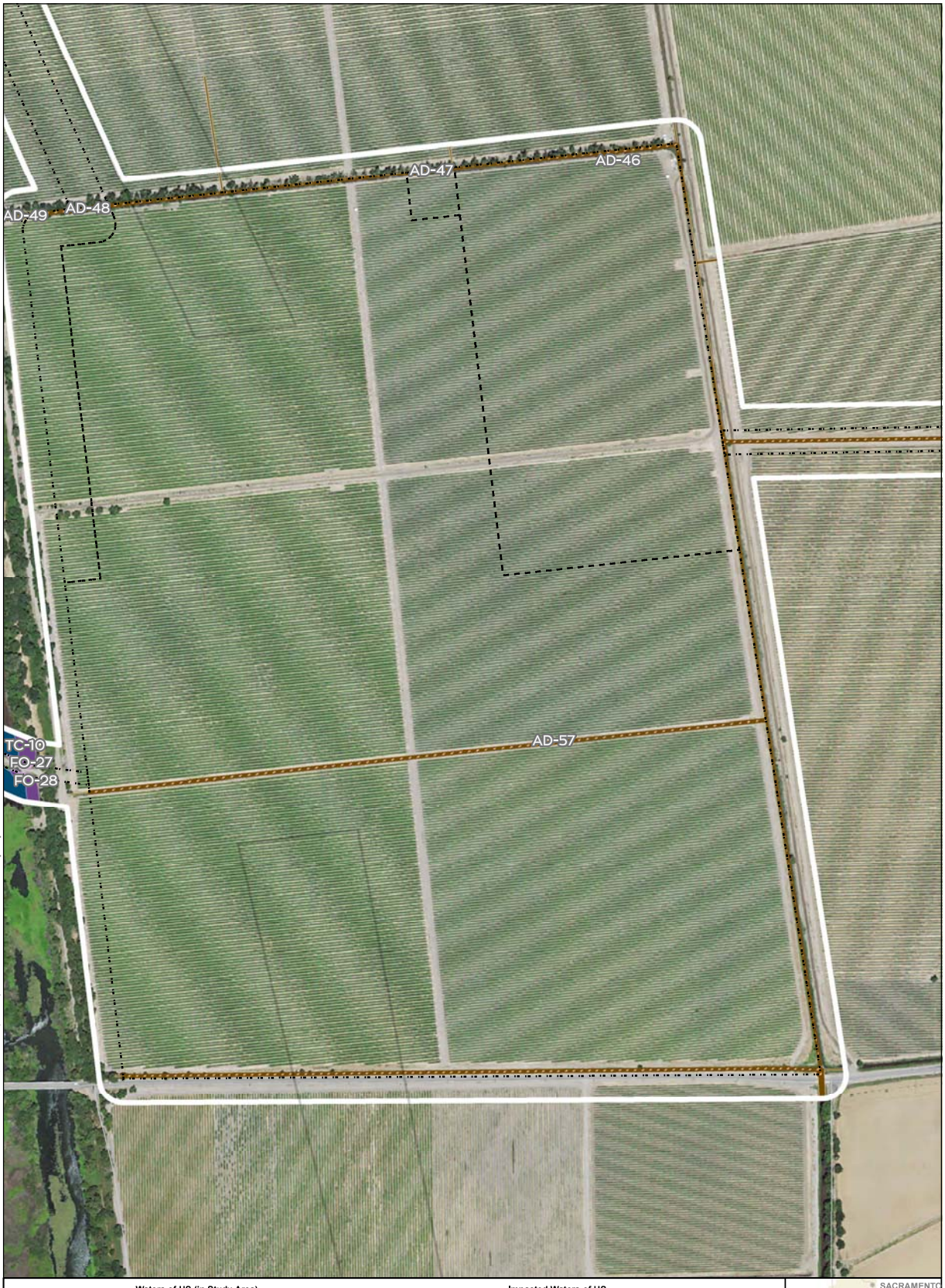

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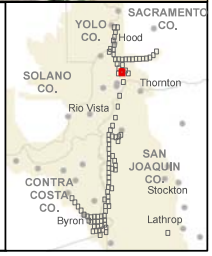

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Impacts to Waters of US
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Subsurface Impact

Impacted Waters of US

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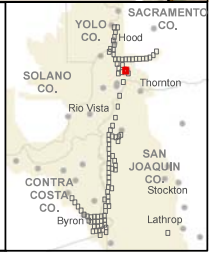

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Impacts to Waters of US
Wetland Delineation v.2

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Project Area

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Conveyance Footprint

Surface Impact

Subsurface Impact

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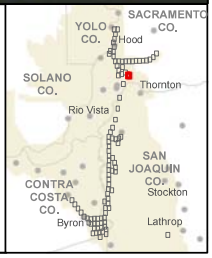

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Impacts to Waters of US
Wetland Delineation v.2

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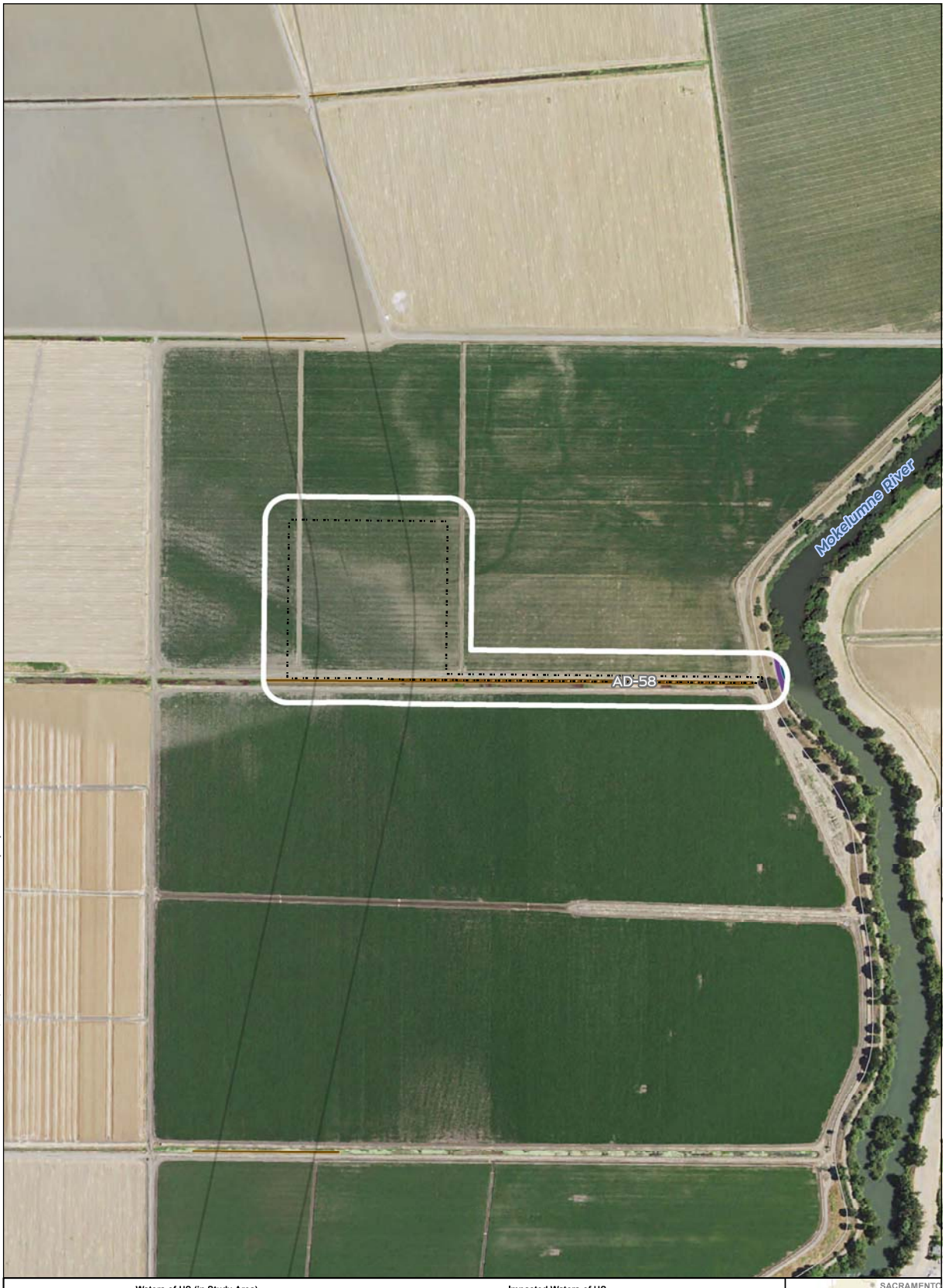

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Surface Impact
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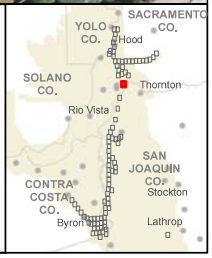

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Subsurface Impact

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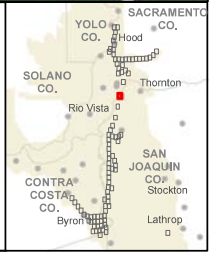

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

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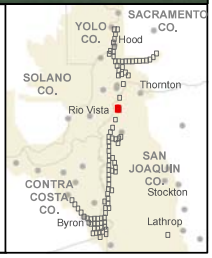

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Impacts to Waters of US
Wetland Delineation v.2

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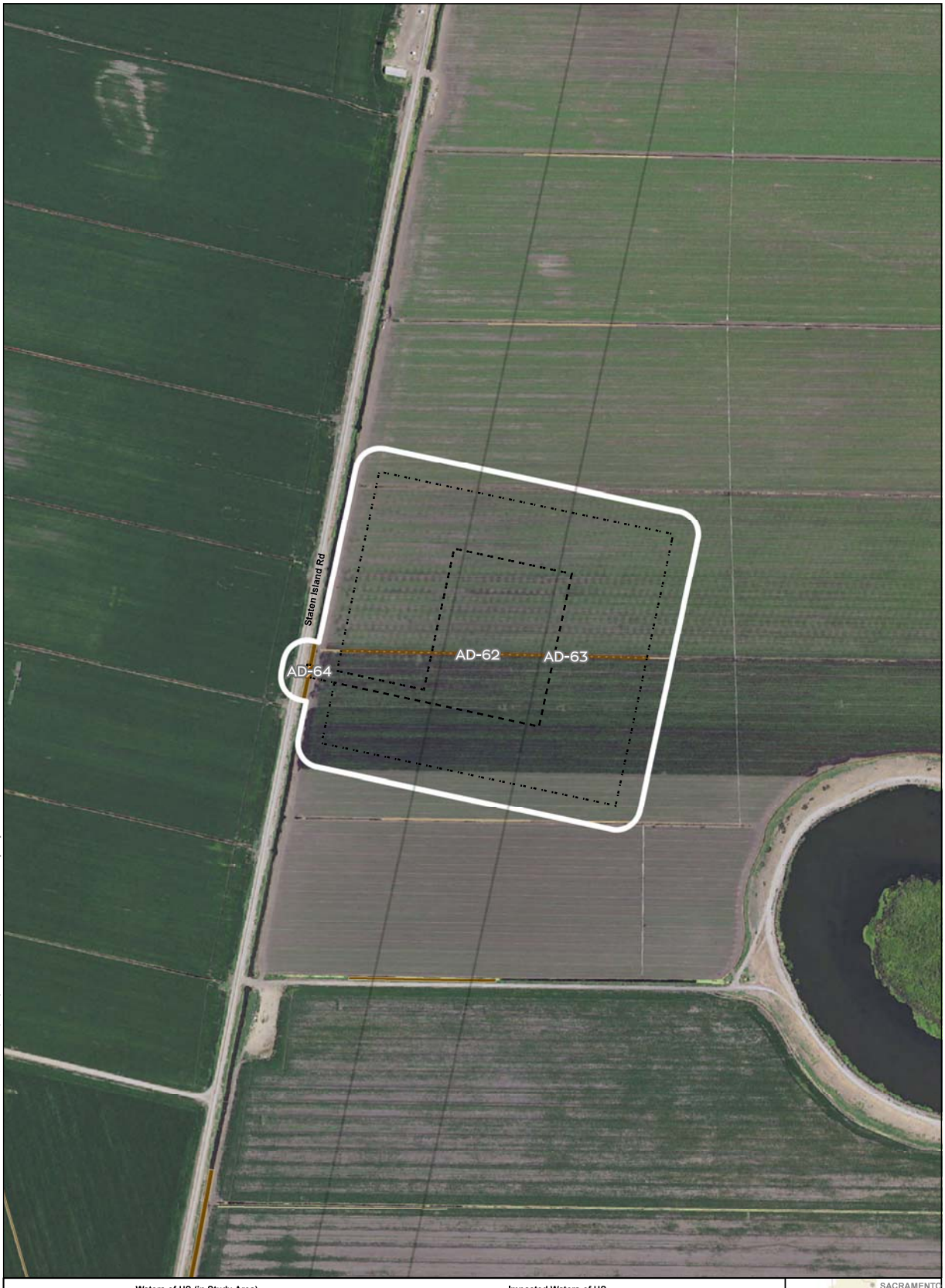

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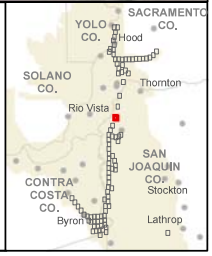

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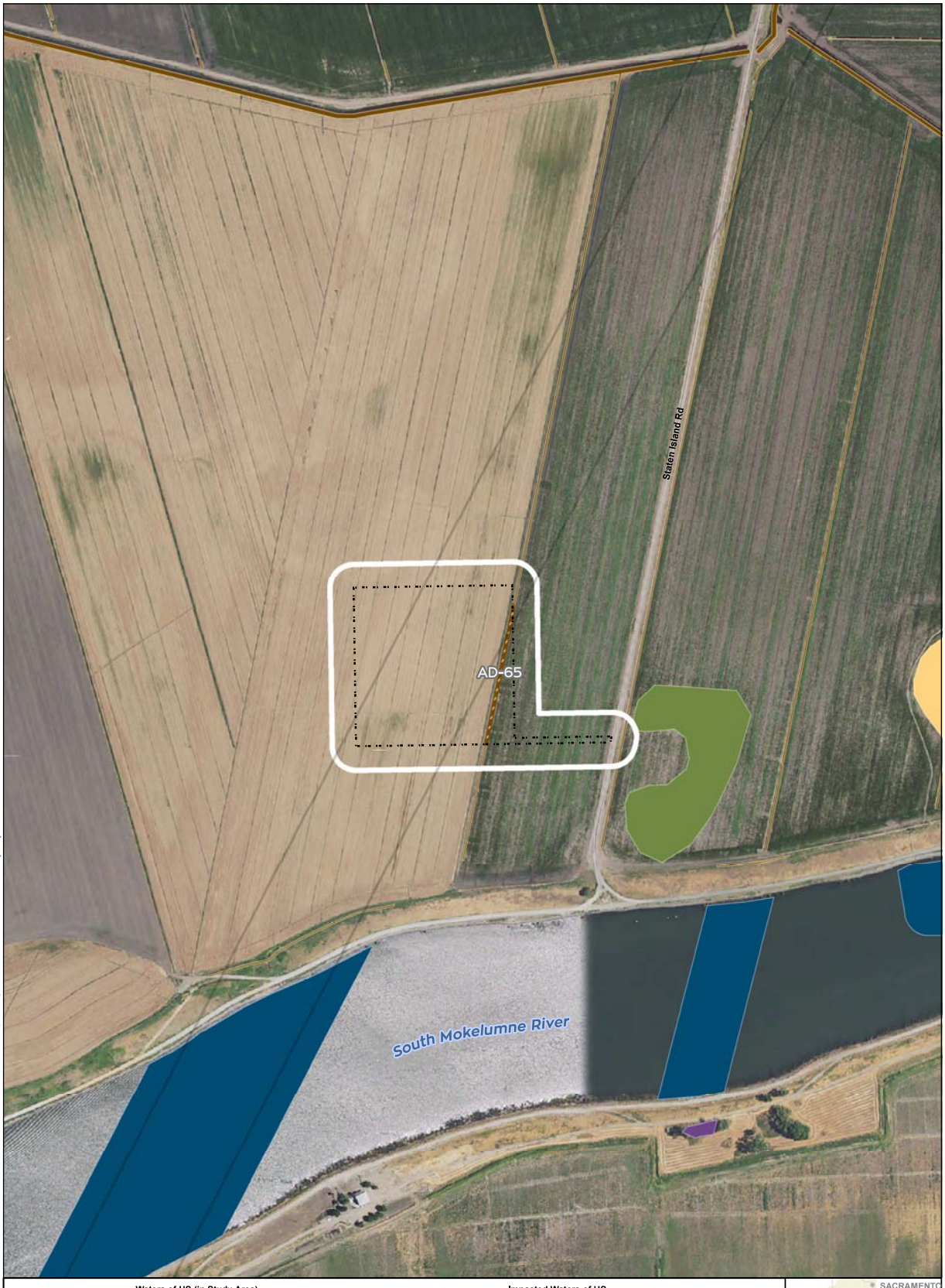

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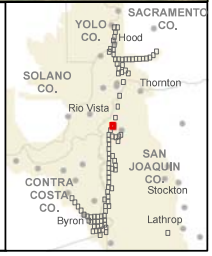

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Wetland Delineation v.2

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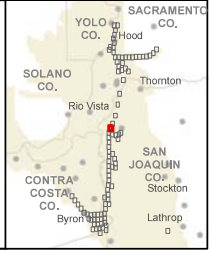

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SS (Scrub Shrub)	25 acres	LA (Lacustrine)	23 acres
SW (Seasonal Wetland)	183 acres	CO (Conveyance)	32 acres
VP (Vernal Pool)	0.5 acres	TC (Tidal Channel)	347 acres
		CCF (Clifton Court Forebay)	2,215 acres

Impacted Waters of US

Wetlands		Other Waters of US	
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		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

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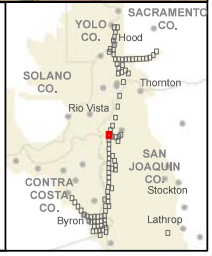

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

Waters of US (in Study Area)

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Surface Impact
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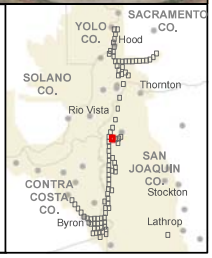

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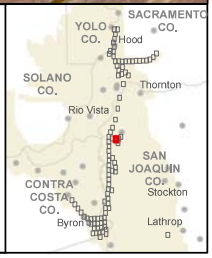

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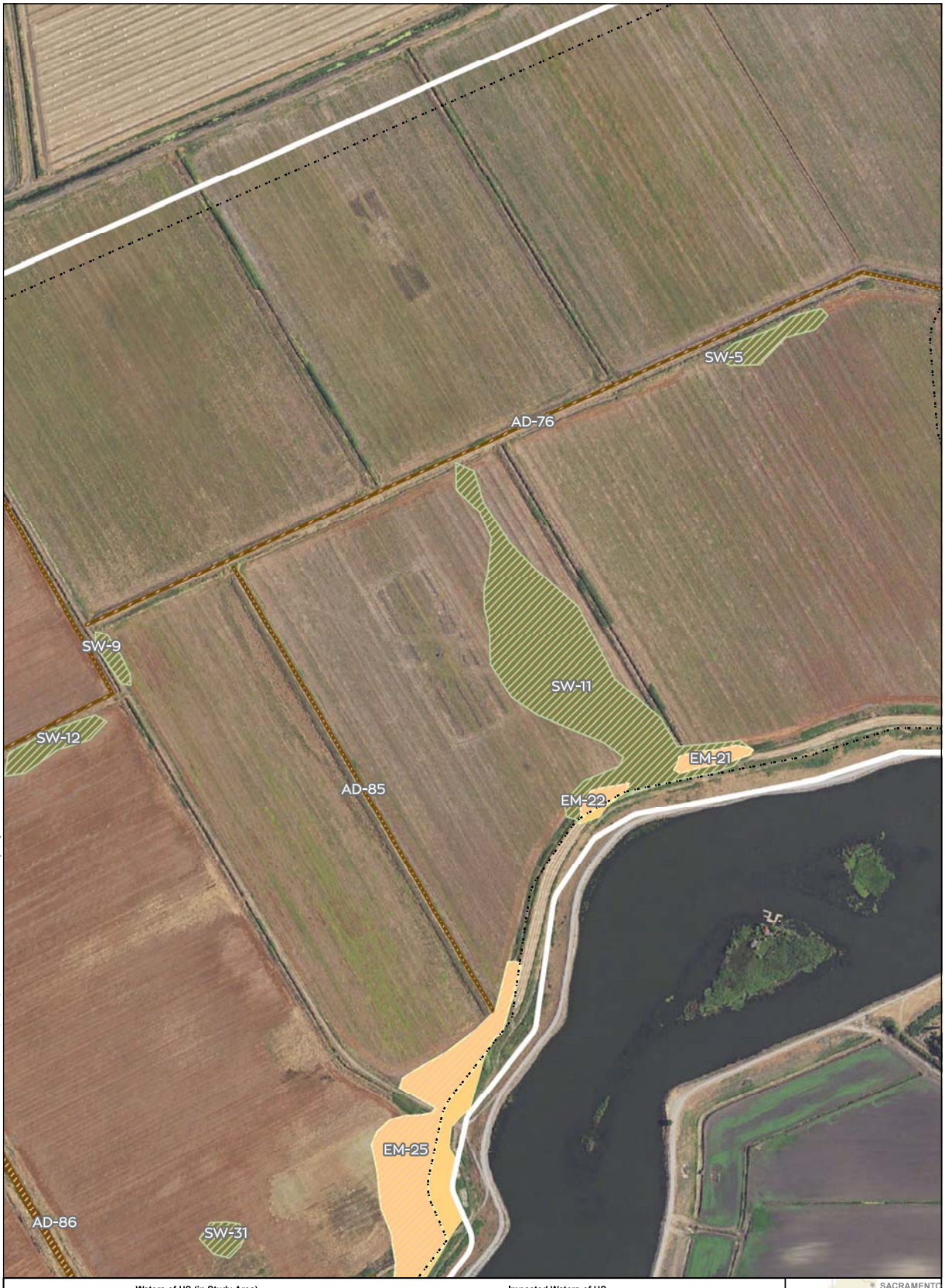
California Water Fix
Impacts to Waters of US
Wetland Delineation v.2



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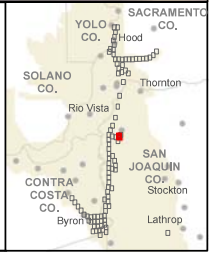

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Impacts to Waters of US
Wetland Delineation v.2

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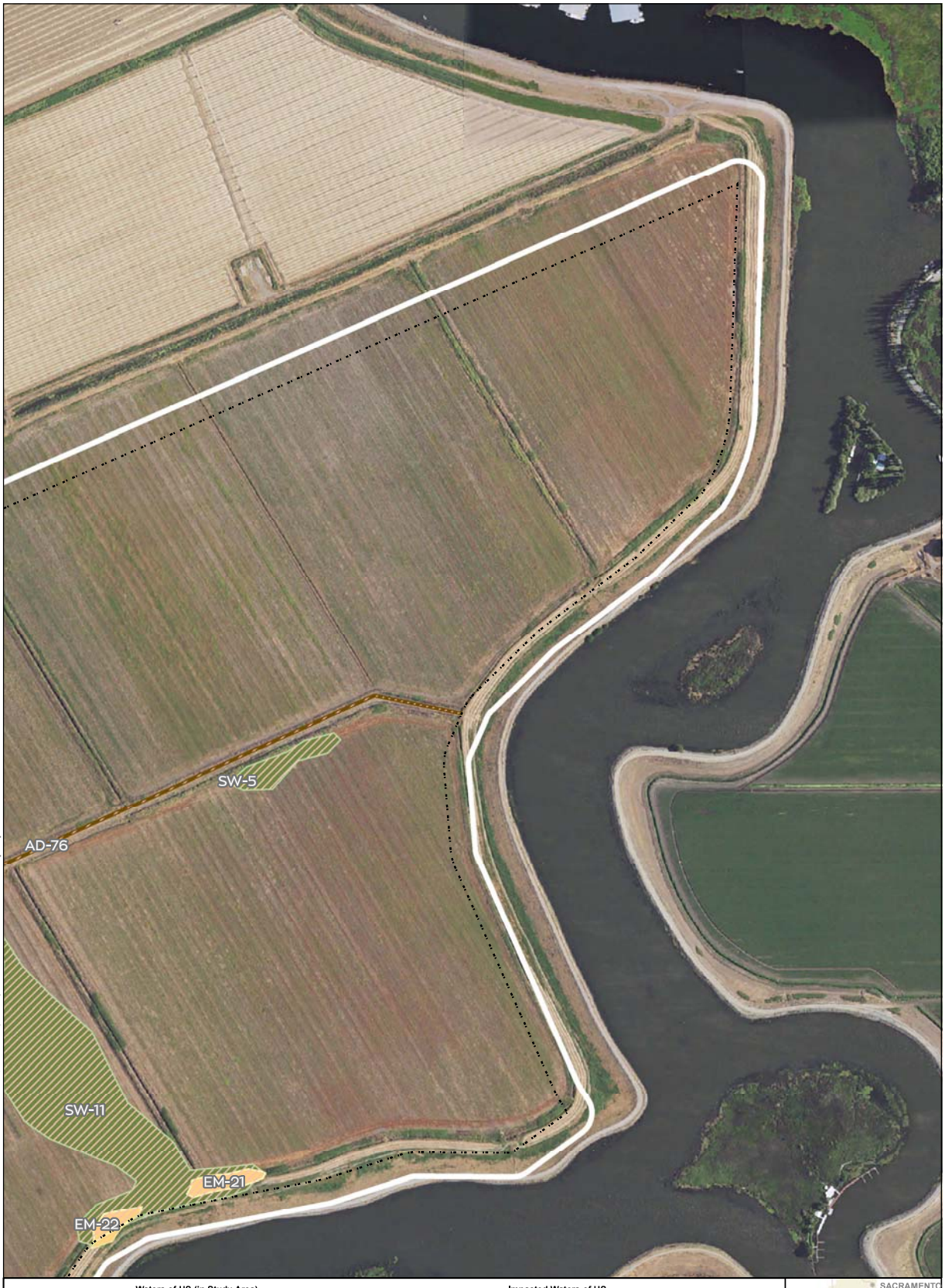

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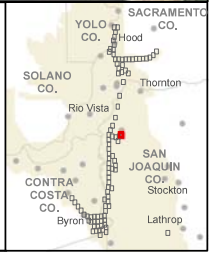

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Impacts to Waters of US
Wetland Delineation v.2

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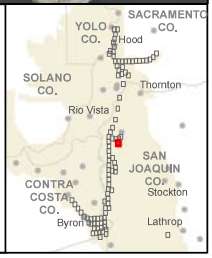

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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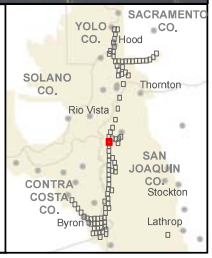

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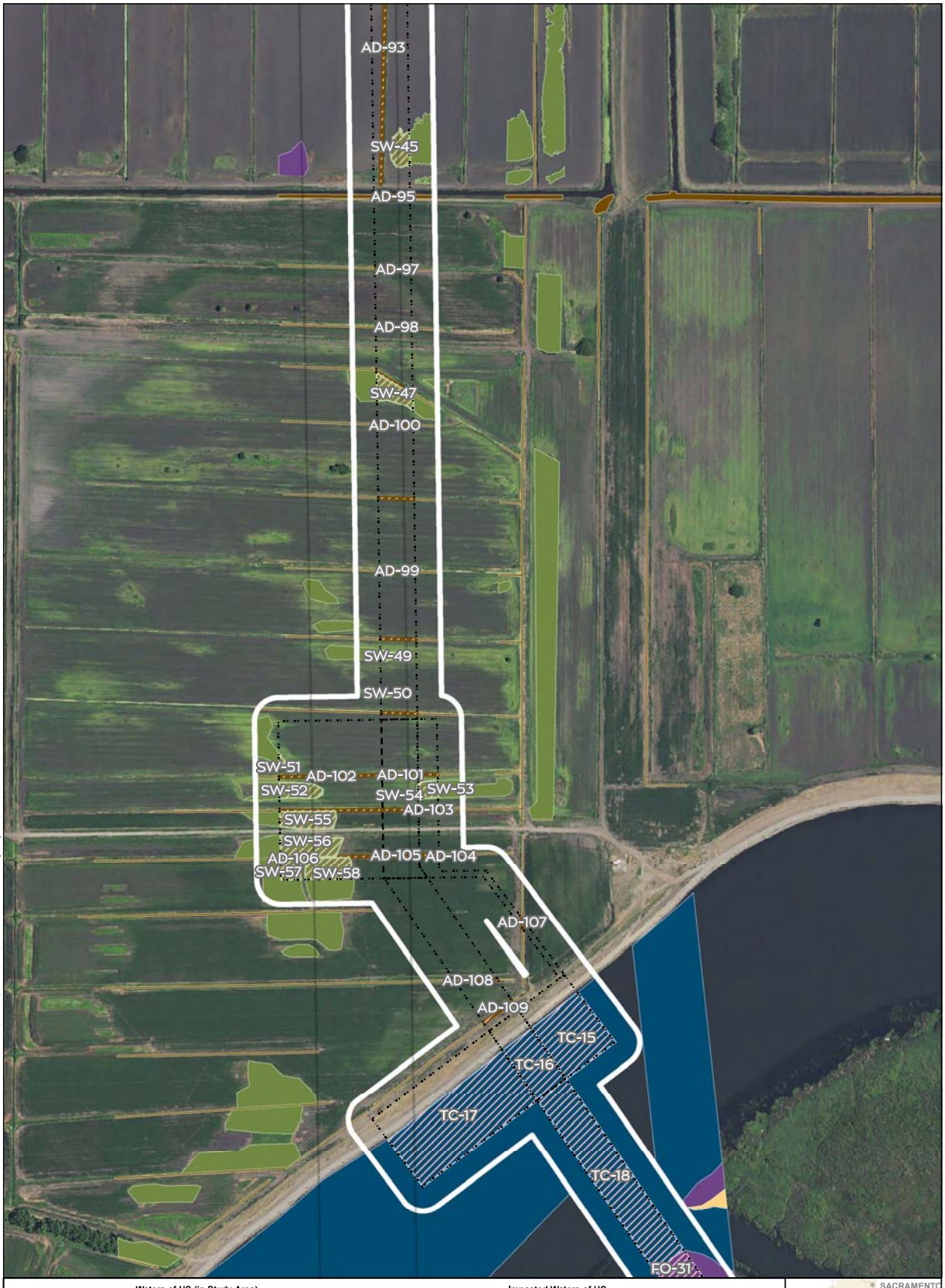

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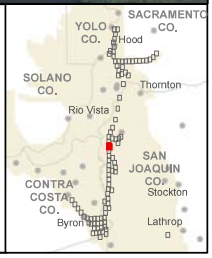

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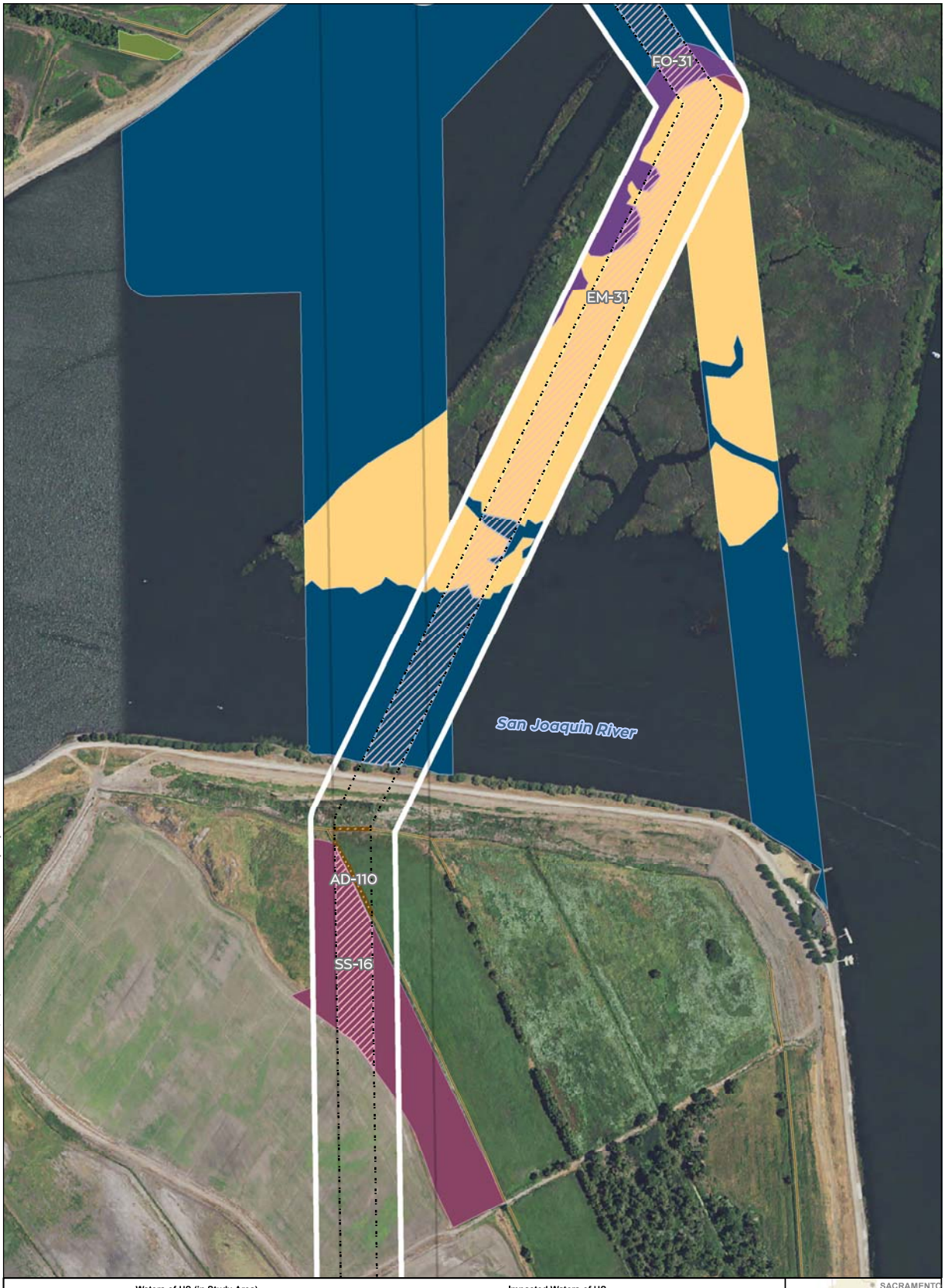

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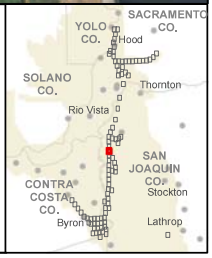

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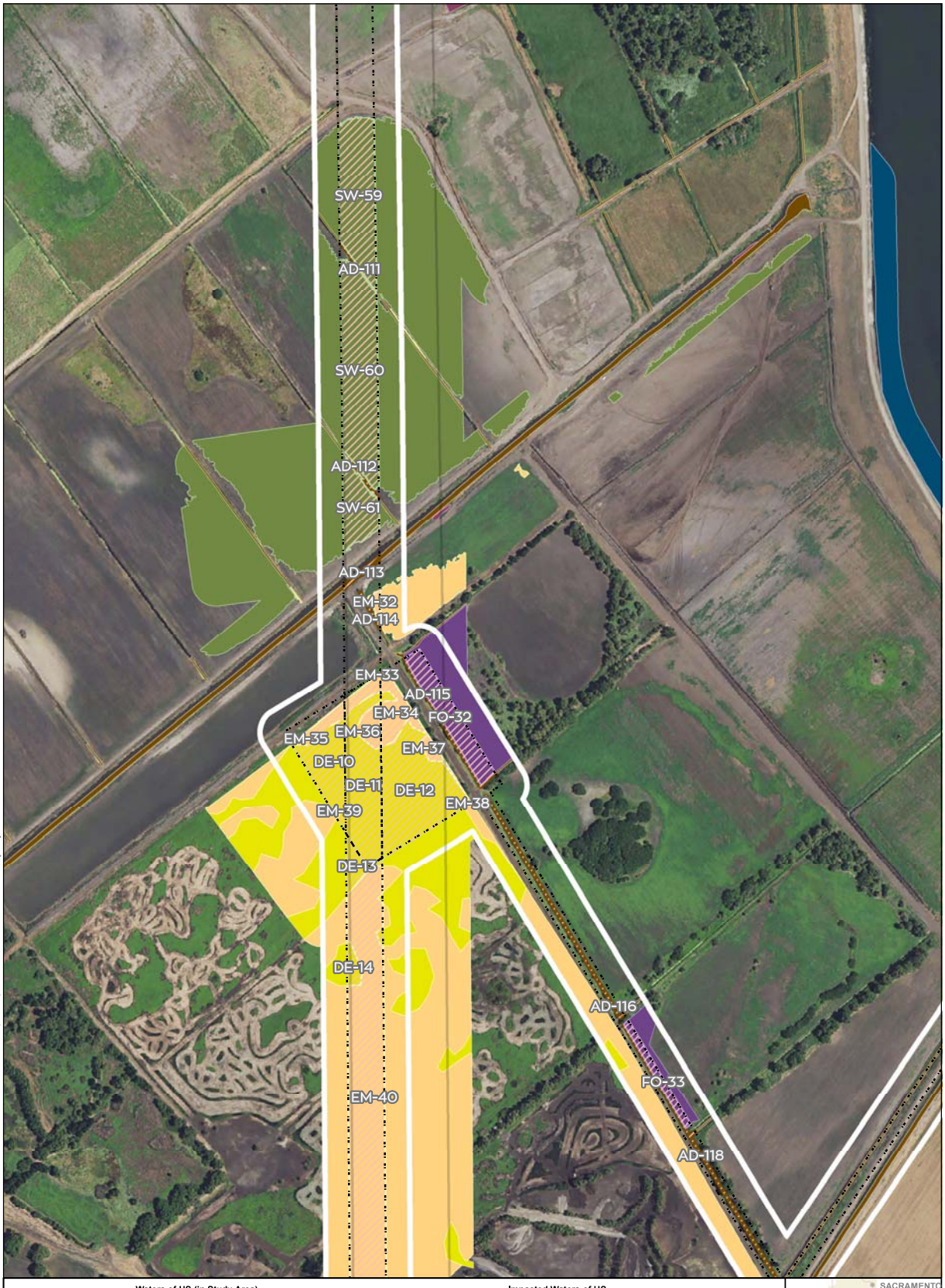

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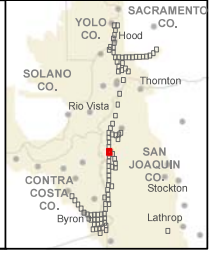

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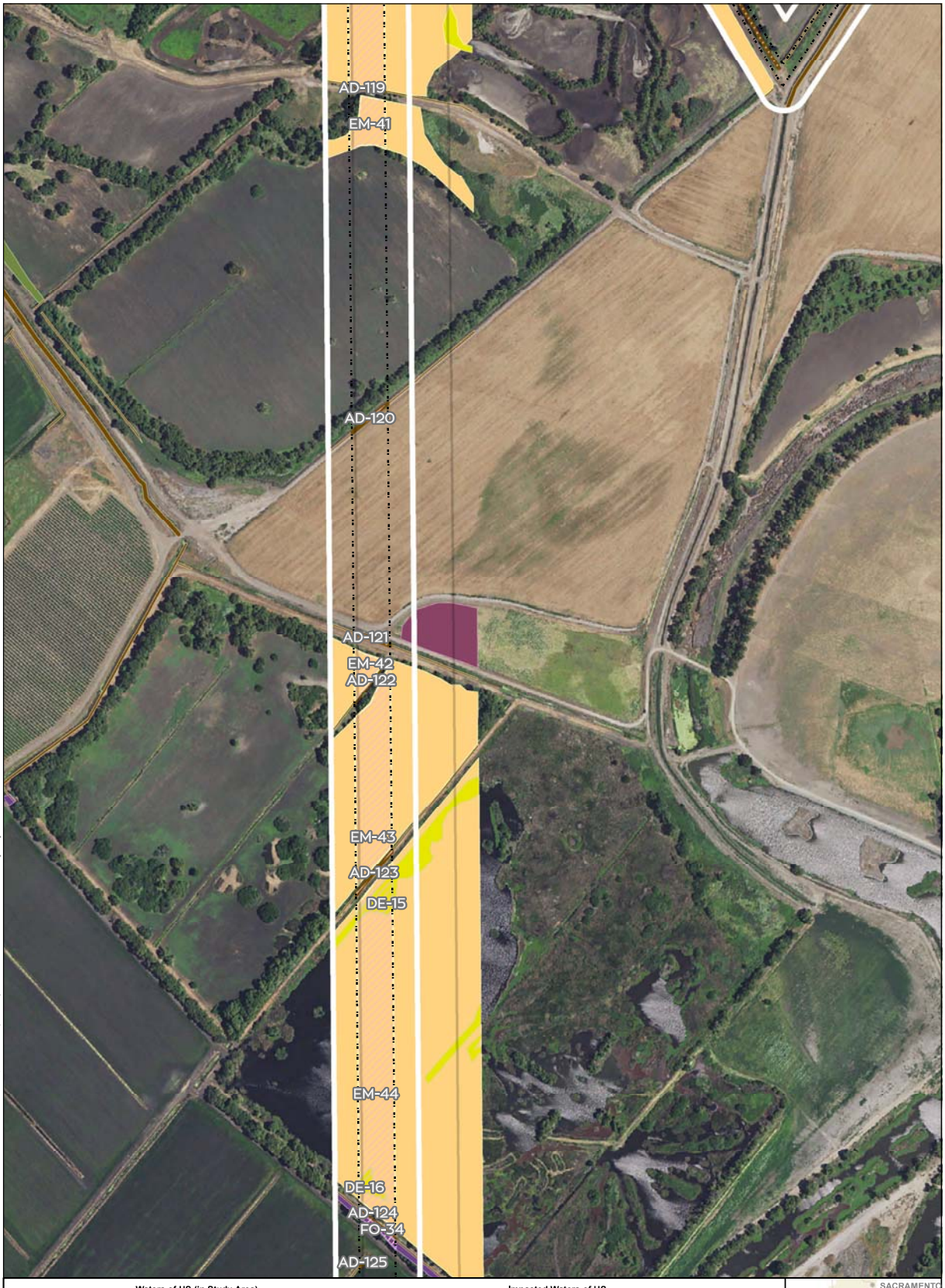
Wetland Delineation v.2



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Surface Impact
Subsurface Impact

Impacted Waters of US

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	20 acres	AD (Agricultural Ditch)	63 acres
EM (Emergent Wetland)	89 acres	CH (Natural Channel)	0 acres
FO (Forest)	17 acres	CO (Conveyance)	11 acres
SS (Scrub Shrub)	18 acres	DE (Depression)	36 acres
SW (Seasonal Wetland)	140 acres	LA (Lacustrine)	23 acres
VP (Vernal Pool)	0.3 acres	TC (Tidal Channel)	100 acres
		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

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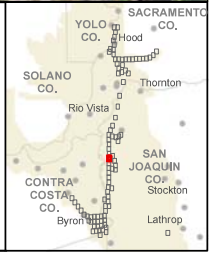

Sources: CM1 Wetland Study Area (DWR 2015), Wetlands and Other Waters of US Impacts (DWR 20150601); NAIP 2014

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

Waters of US (in Study Area)

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	33 acres	AD (Agricultural Ditch)	95 acres
EM (Emergent Wetland)	156 acres	CH (Natural Channel)	0 acres
FO (Forest)	44 acres	DE (Depression)	54 acres
SS (Scrub Shrub)	25 acres	LA (Lacustrine)	23 acres
SW (Seasonal Wetland)	183 acres	CO (Conveyance)	32 acres
VP (Vernal Pool)	0.5 acres	TC (Tidal Channel)	347 acres
		CCF (Clifton Court Forebay)	2,215 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

Impacted Waters of US

Wetlands		Other Waters of US	
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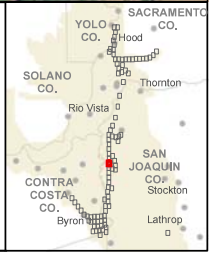

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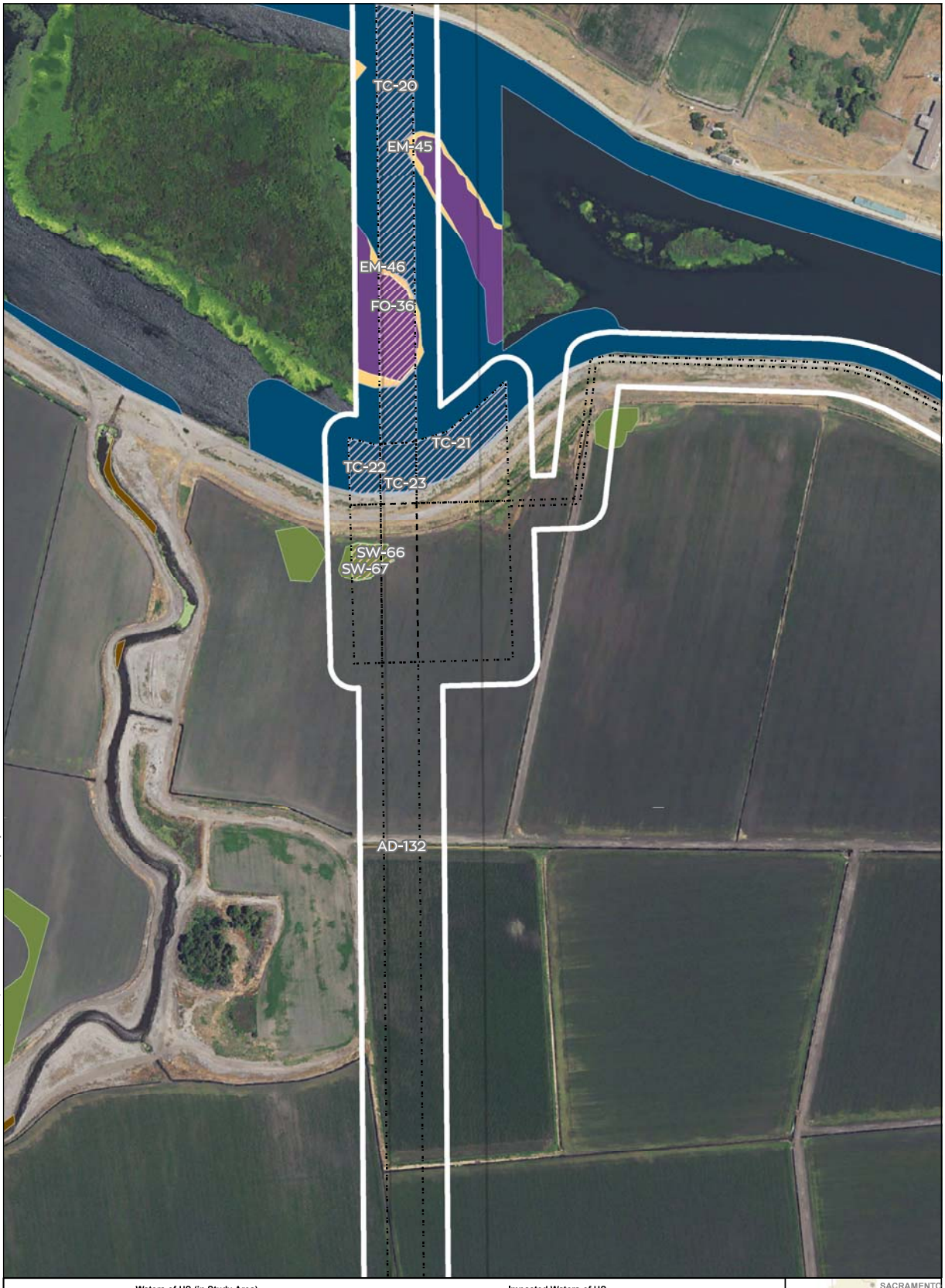
Impacts to Waters of US
Wetland Delineation v.2



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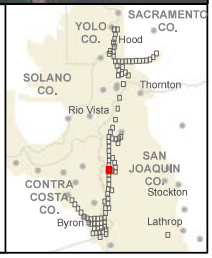

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California Water Fix
Impacts to Waters of US
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Waters of US (in Study Area)

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Surface Impact
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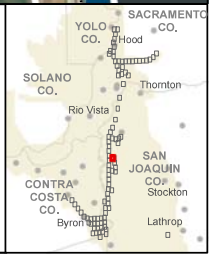

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Impacts to Waters of US
Wetland Delineation v.2

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Surface Impact
Subsurface Impact

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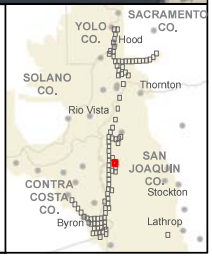

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Impacts to Waters of US
Wetland Delineation v.2

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Surface Impact
Subsurface Impact

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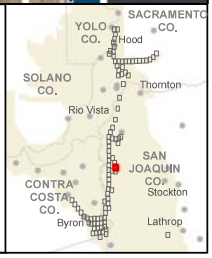

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Impacts to Waters of US
Wetland Delineation v.2

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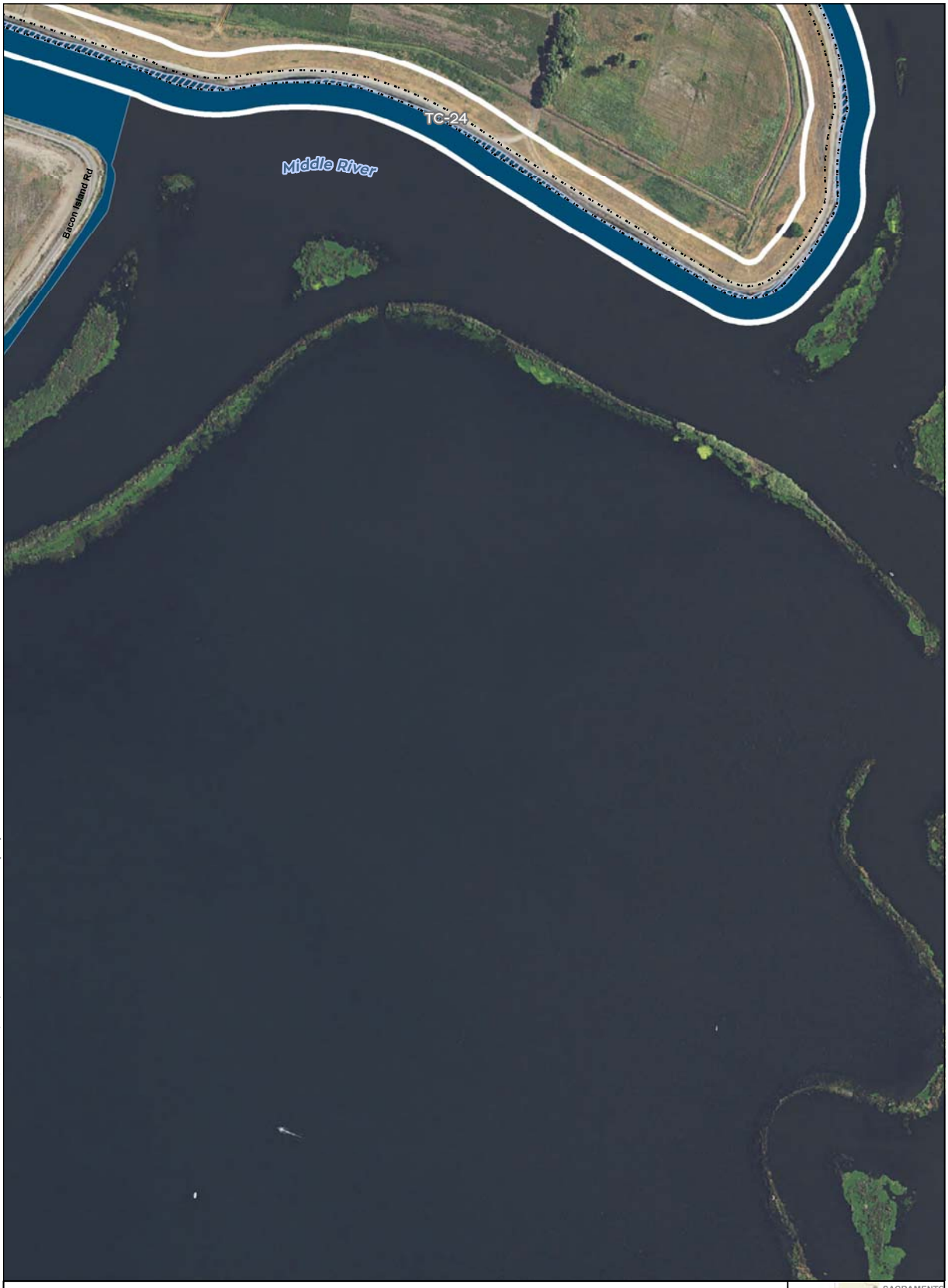

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Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

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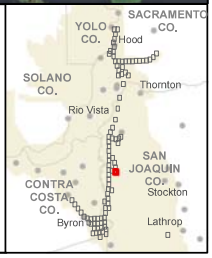

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Surface Impact
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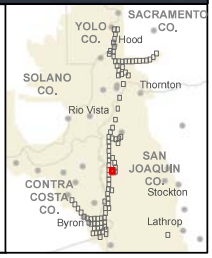

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California Water Fix
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Wetland Delineation v.2

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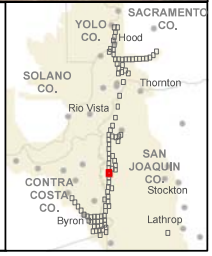

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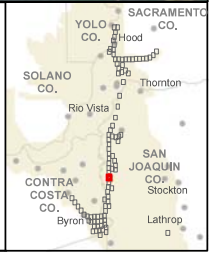

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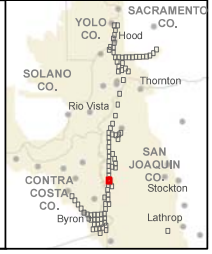

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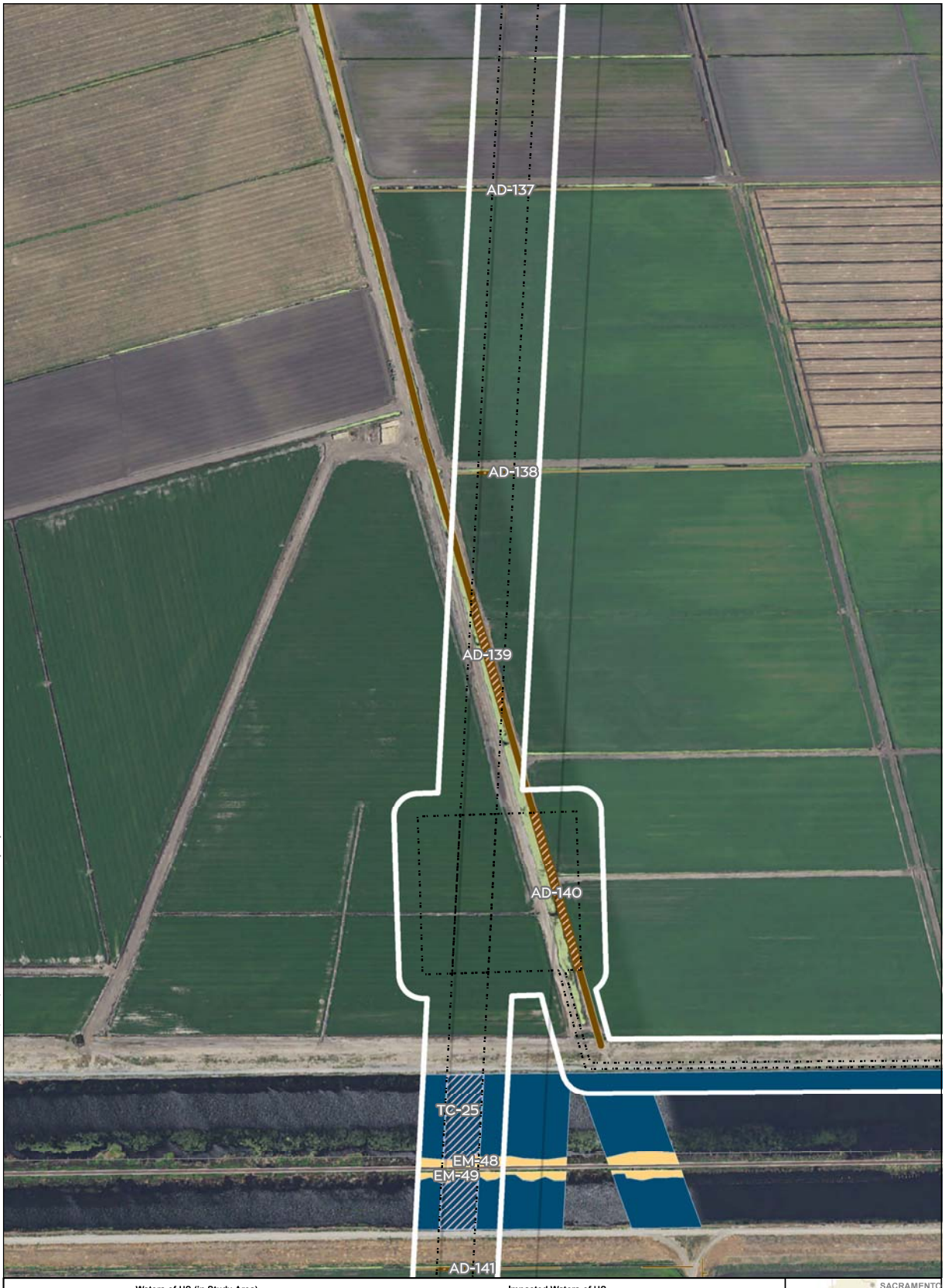

Waters of US (in Study Area)

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	33 acres	AD (Agricultural Ditch)	95 acres
EM (Emergent Wetland)	156 acres	CH (Natural Channel)	0 acres
FO (Forest)	44 acres	DE (Depression)	54 acres
SS (Scrub Shrub)	25 acres	LA (Lacustrine)	23 acres
SW (Seasonal Wetland)	183 acres	CO (Conveyance)	32 acres
VP (Vernal Pool)	0.5 acres	TC (Tidal Channel)	347 acres
		CCF (Clifton Court Forebay)	2,215 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

Impacted Waters of US

Wetlands		Other Waters of US	
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VP (Vernal Pool)	0.3 acres	TC (Tidal Channel)	100 acres
		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

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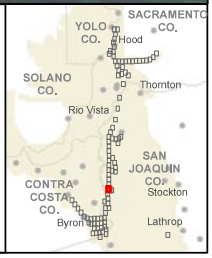

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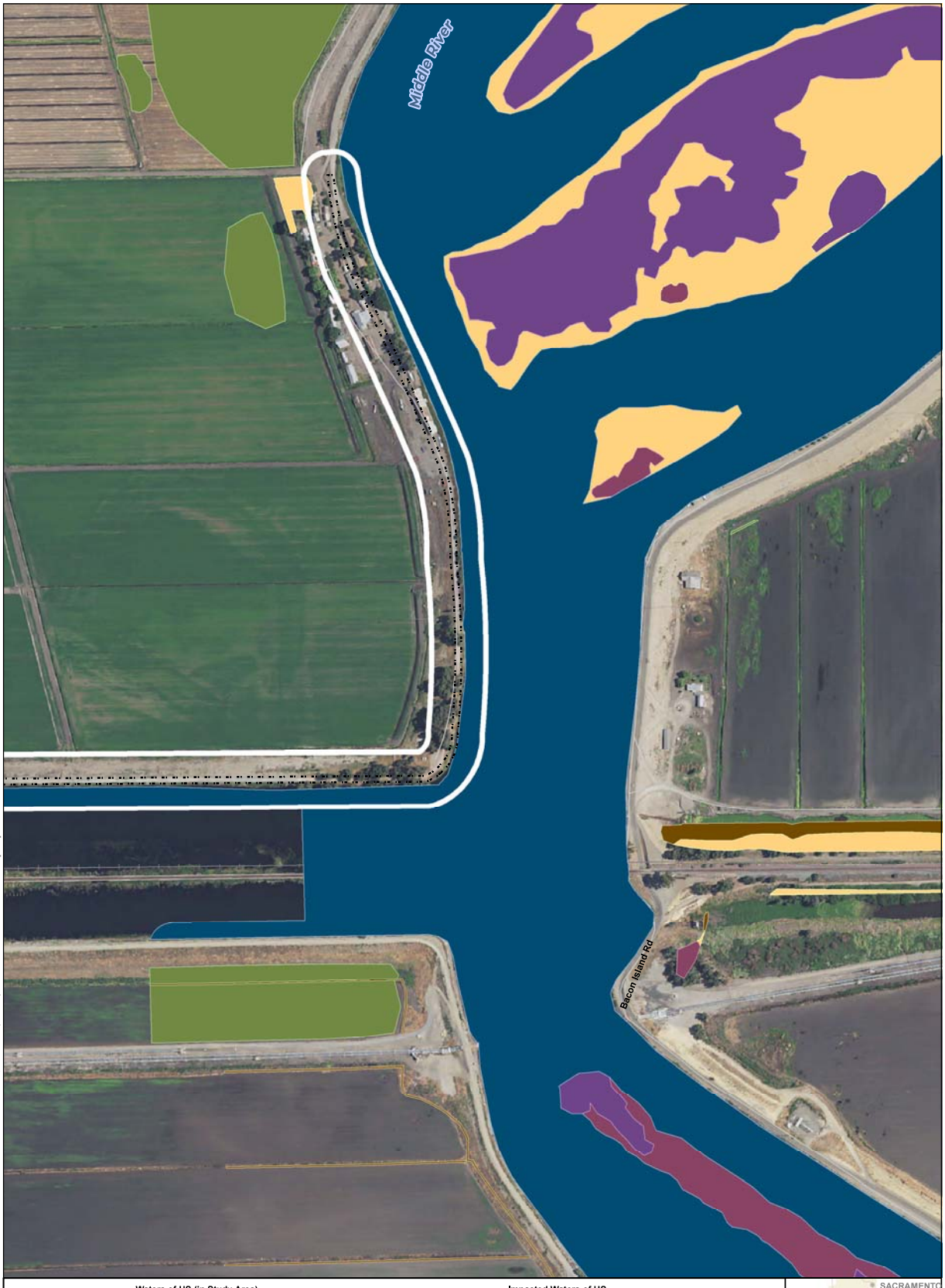
California Water Fix
Impacts to Waters of US
Wetland Delineation v.2



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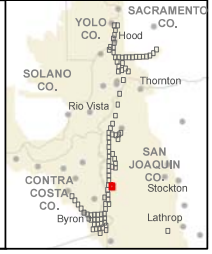

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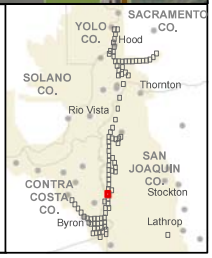

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Sheet 60 of 95
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Impacts to Waters of US
Wetland Delineation v.2

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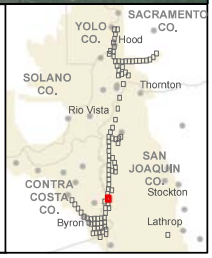

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Impacts to Waters of US
Wetland Delineation v.2

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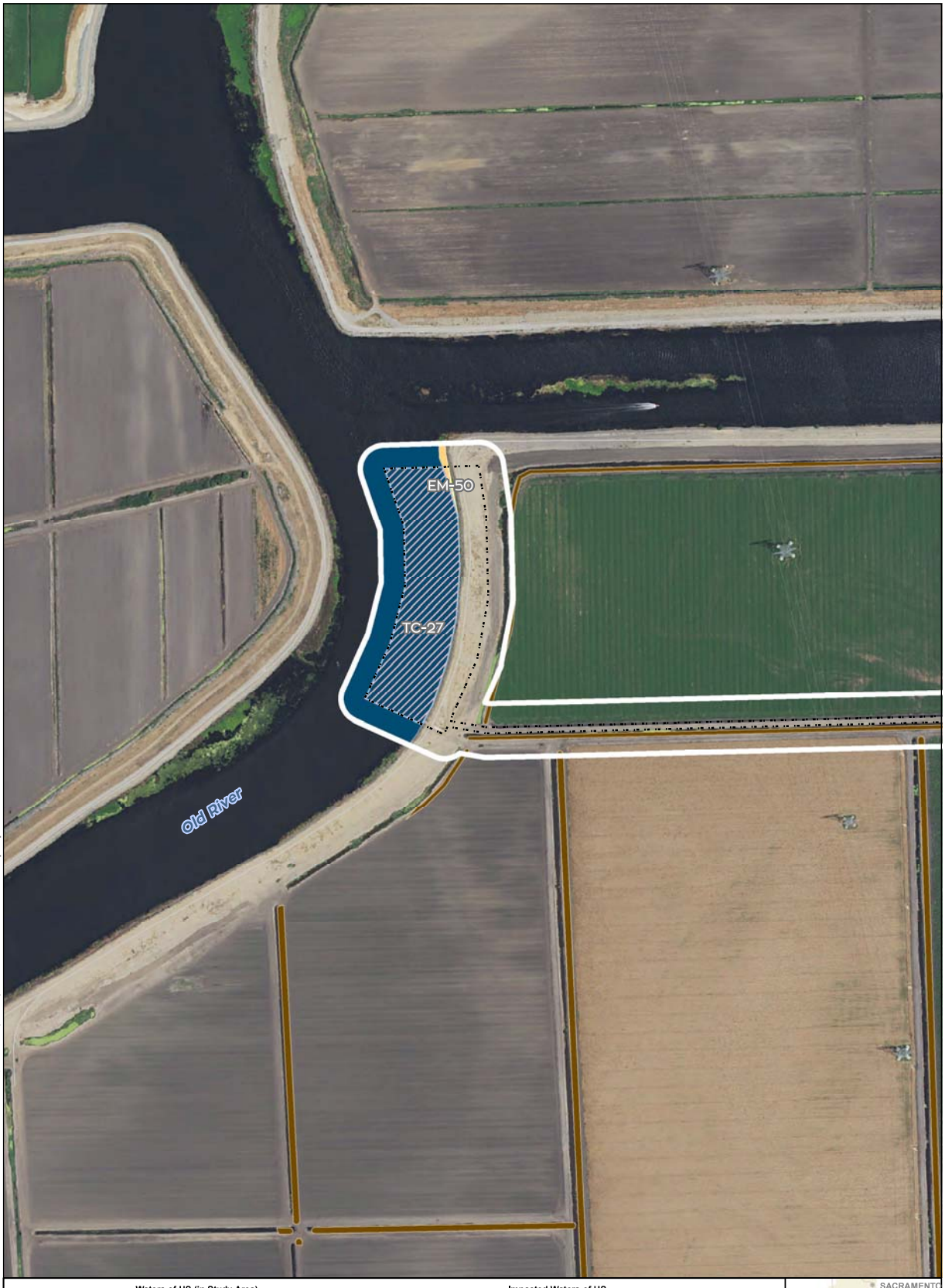

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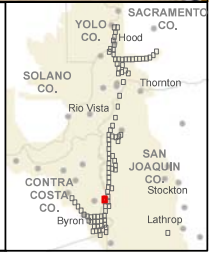

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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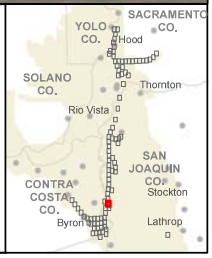

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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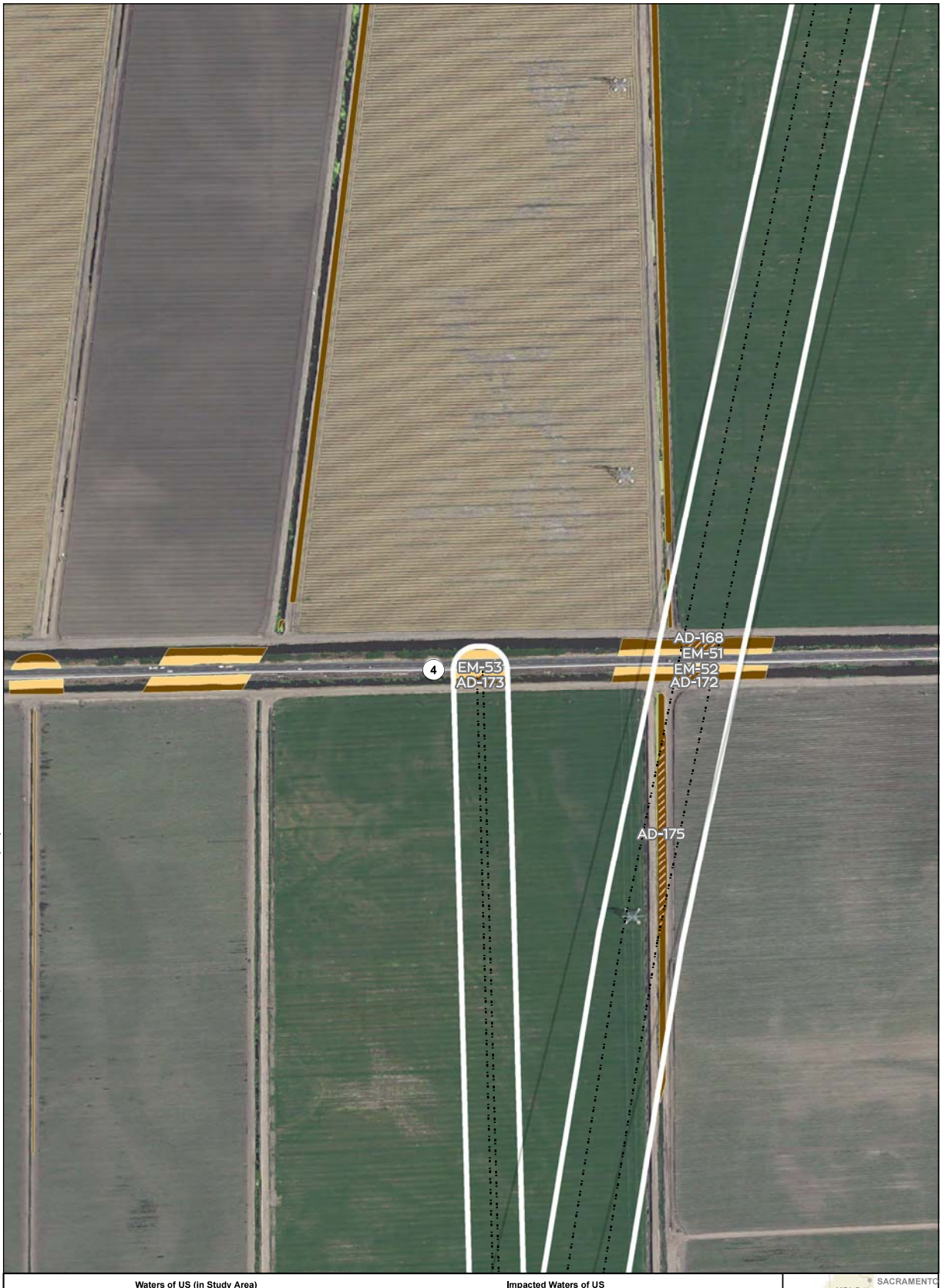

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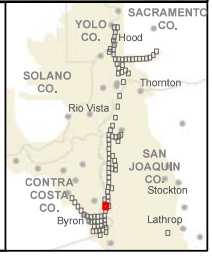

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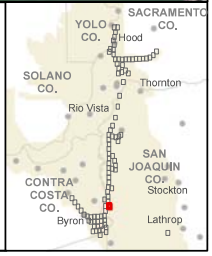

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Impacts to Waters of US
Wetland Delineation v.2

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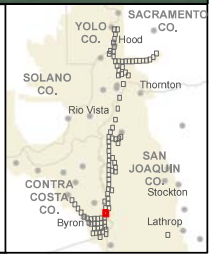

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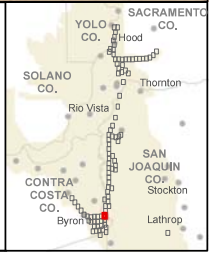

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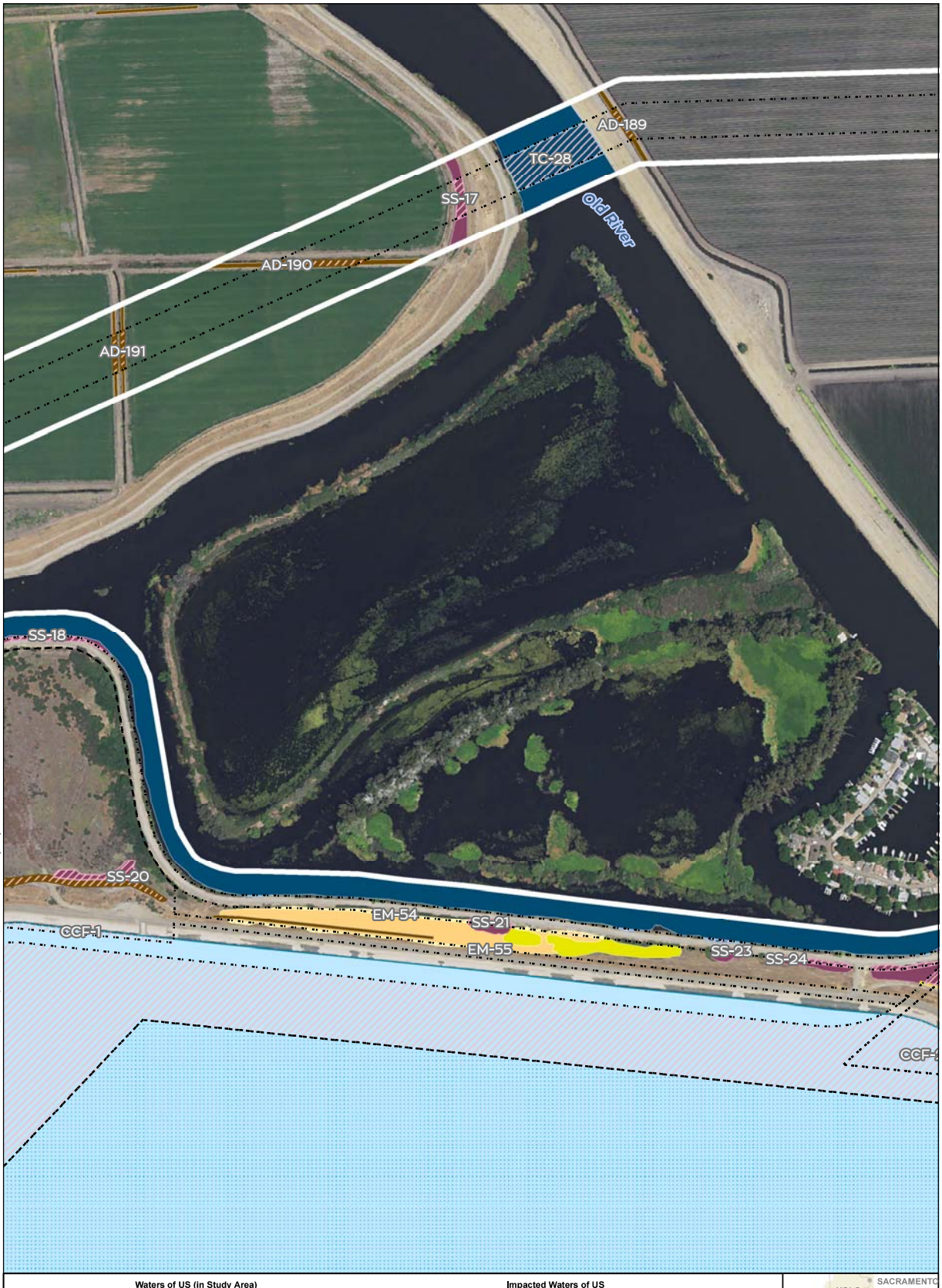

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SW (Seasonal Wetland)	140 acres	LA (Lacustrine)	23 acres
VP (Vernal Pool)	0.3 acres	TC (Tidal Channel)	100 acres
		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

N

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Feet
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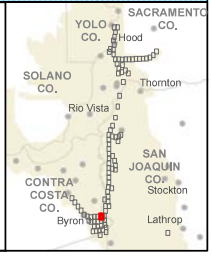

Sources: CM1 Wetland Study Area (DWR 2015), Wetlands and Other Waters of US Impacts (DWR 20150601); NAIP 2014

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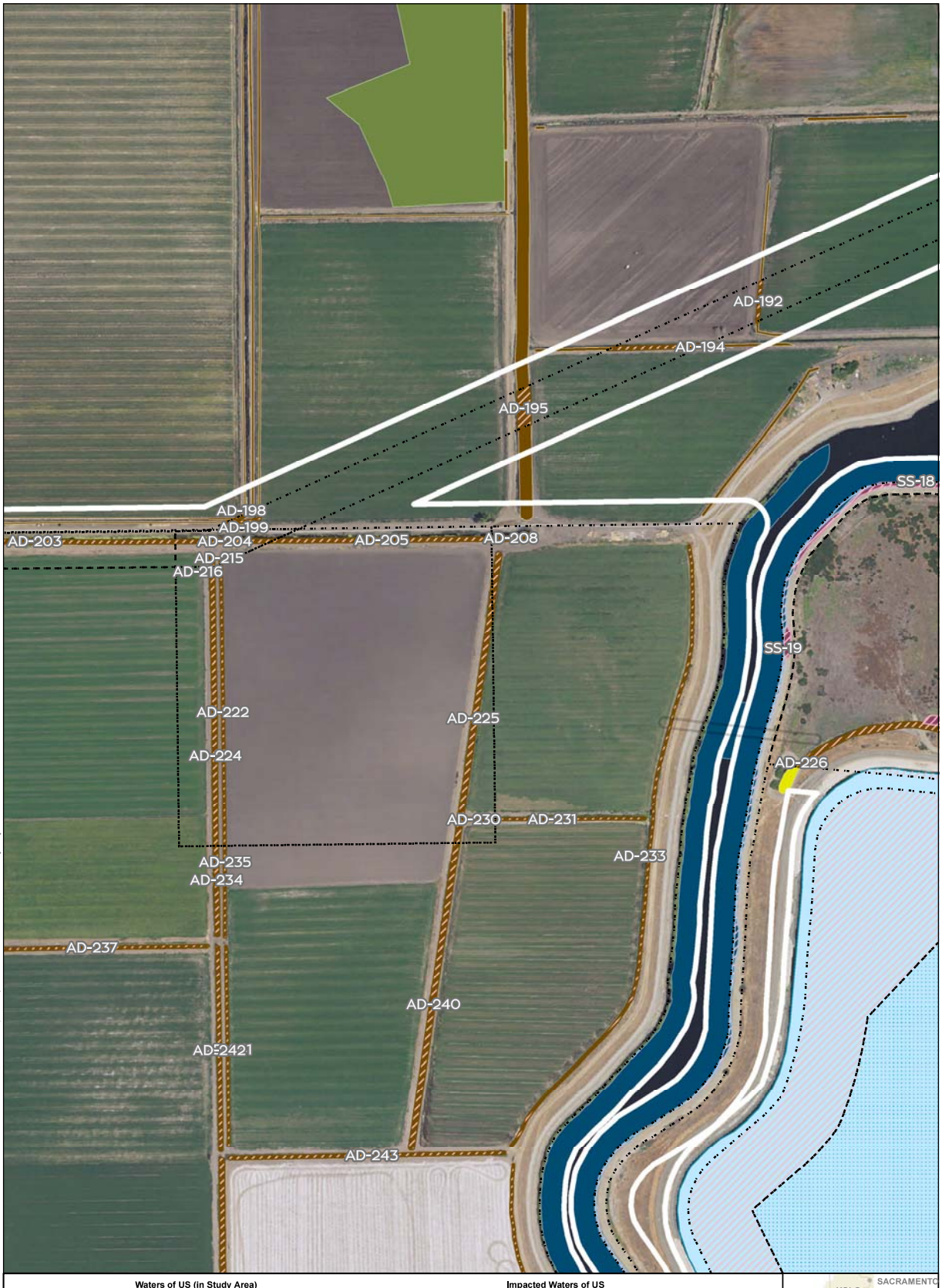

Waters of US (in Study Area)

Wetlands

AW (Alkaline Wetland)	33 acres
EM (Emergent Wetland)	156 acres
FO (Forest)	44 acres
SS (Scrub Shrub)	25 acres
SW (Seasonal Wetland)	183 acres
VP (Vernal Pool)	0.5 acres

Other Waters of US

AD (Agricultural Ditch)	95 acres
CH (Natural Channel)	0 acres
DE (Depression)	54 acres
LA (Lacustrine)	23 acres
CO (Conveyance)	32 acres
TC (Tidal Channel)	347 acres
CCF (Clifton Court Forebay)	2,215 acres

Project Area

Study Area

Conveyance Footprint

Surface Impact

Subsurface Impact

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Feet

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Impacted Waters of US

Wetlands

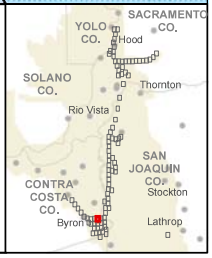
AW (Alkaline Wetland)	20 acres
EM (Emergent Wetland)	89 acres
FO (Forest)	17 acres
SS (Scrub Shrub)	18 acres
SW (Seasonal Wetland)	140 acres
VP (Vernal Pool)	0.3 acres

Other Waters of US

AD (Agricultural Ditch)	63 acres
CH (Natural Channel)	0 acres
CO (Conveyance)	11 acres
DE (Depression)	36 acres
LA (Lacustrine)	23 acres
TC (Tidal Channel)	100 acres

CCF (Clifton Court Forebay)

permanent	258 acres
temporary	1,931 acres



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Impacts to Waters of US
Wetland Delineation v.2

Waters of US (in Study Area)

Wetlands		Other Waters of US	
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Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

Impacted Waters of US

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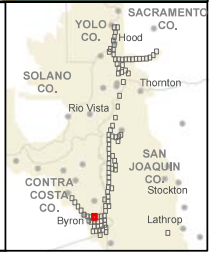

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Impacts to Waters of US
Wetland Delineation v.2

Waters of US (in Study Area)

Wetlands		Other Waters of US	
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Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

Impacted Waters of US

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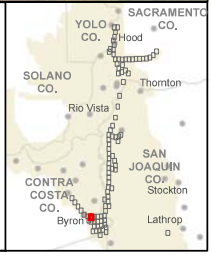

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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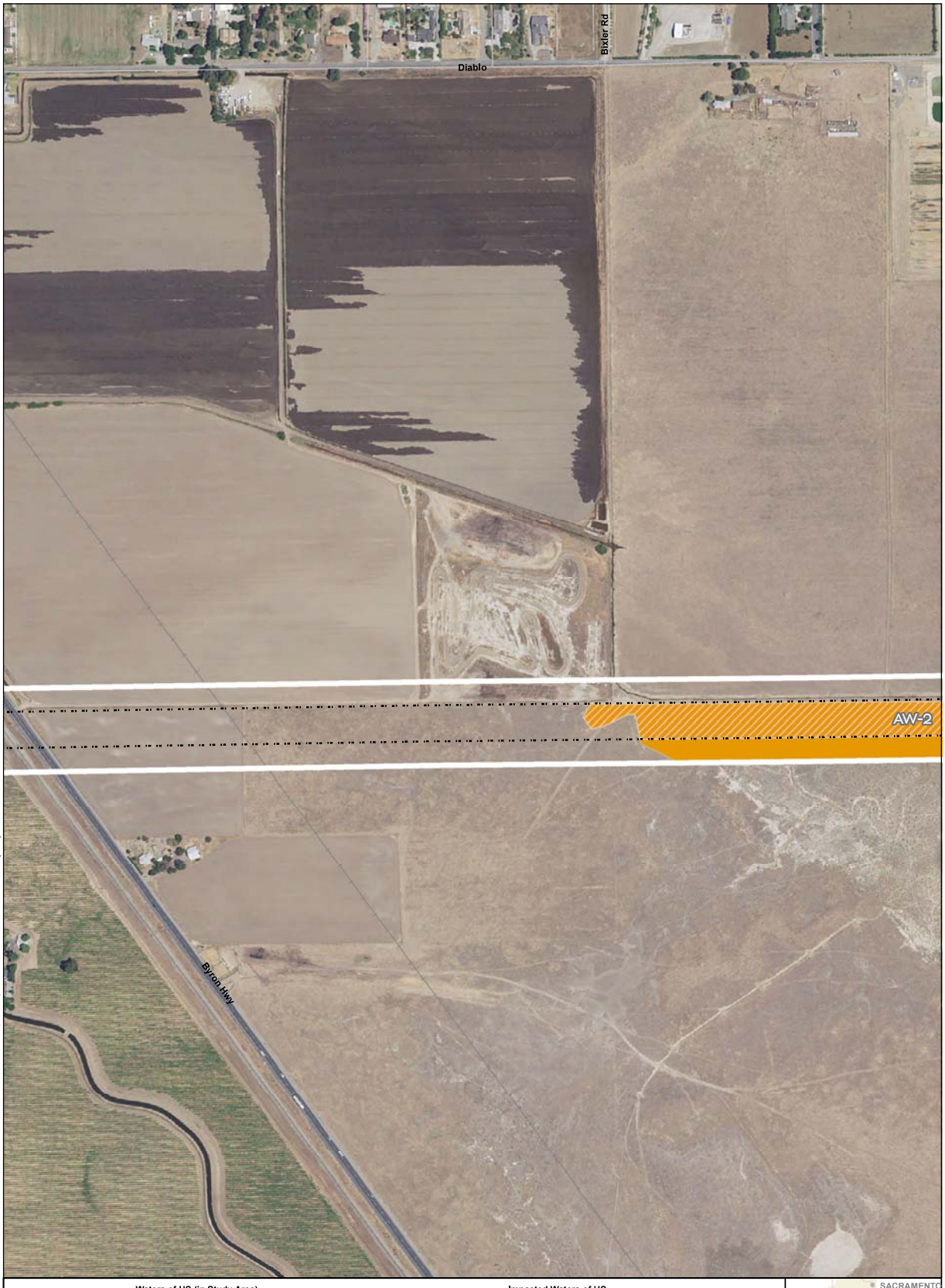

Waters of US (in Study Area)

Wetlands		Other Waters of US	
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Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

Impacted Waters of US

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VP (Vernal Pool)	0.3 acres	TC (Tidal Channel)	100 acres
		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

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Feet
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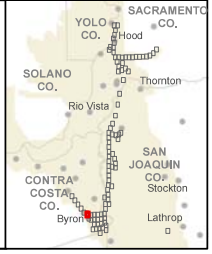

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Wetlands		Other Waters of US	
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Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

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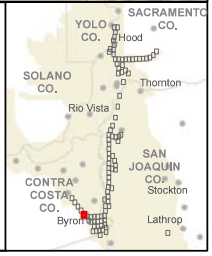

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Waters of US (in Study Area)

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Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

Impacted Waters of US

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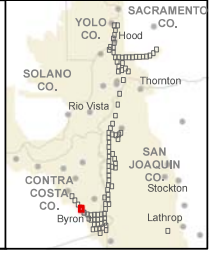

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Waters of US (in Study Area)

Wetlands		Other Waters of US	
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Impacted Waters of US

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		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

N

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Feet
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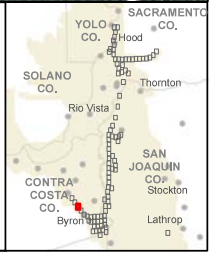

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Sheet 75 of 95
California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

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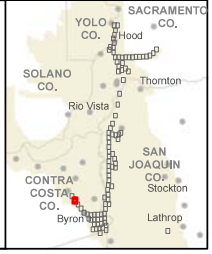

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California Water Fix
Impacts to Waters of US
Wetland Delineation v.2

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Study Area

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Surface Impact
Subsurface Impact

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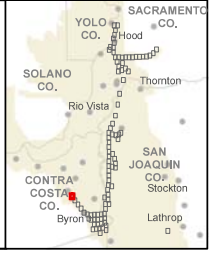

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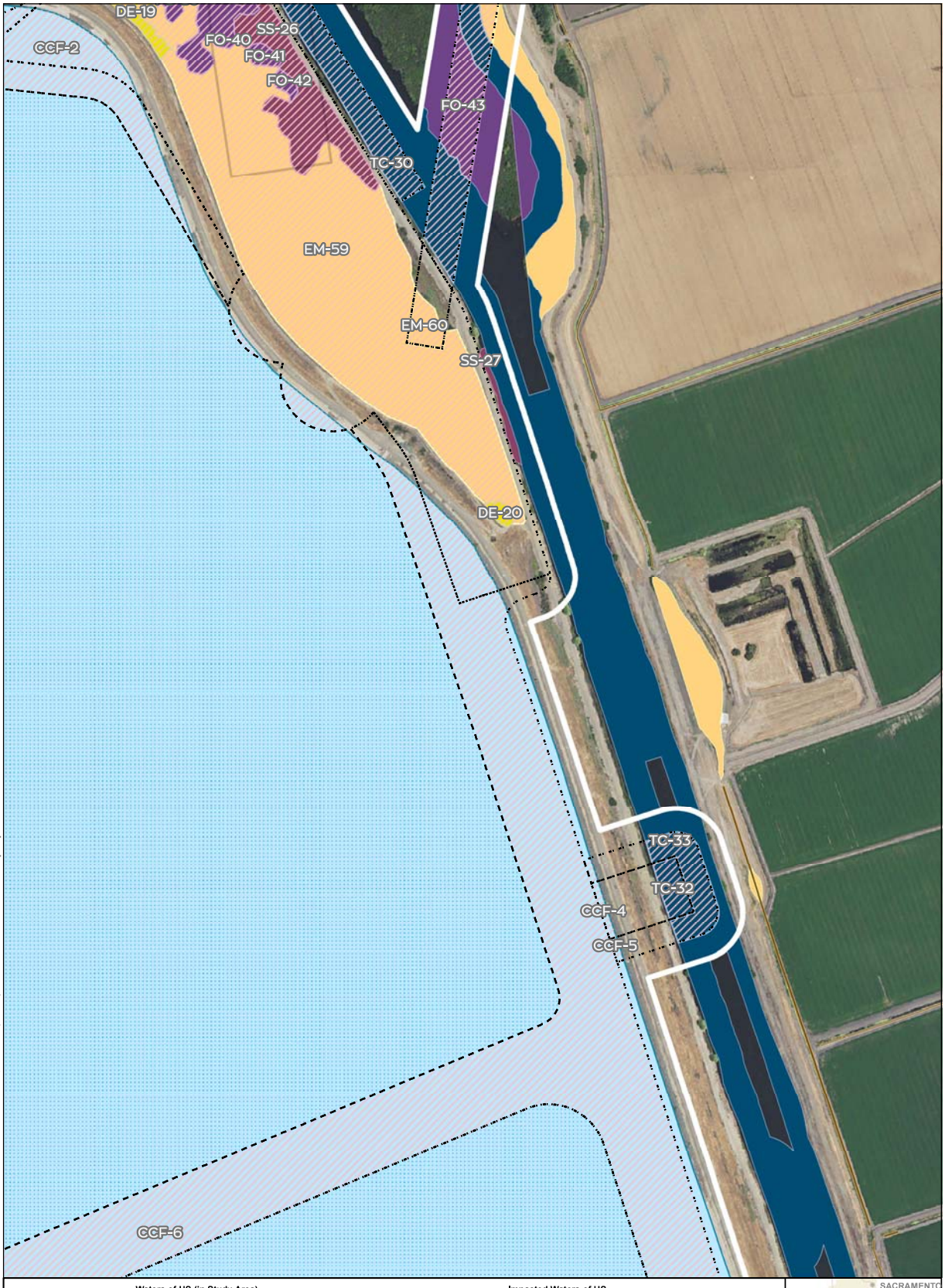
California Water Fix
Impacts to Waters of US
Wetland Delineation v.2



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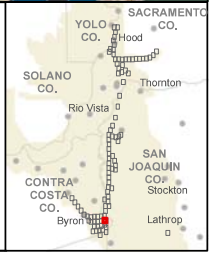

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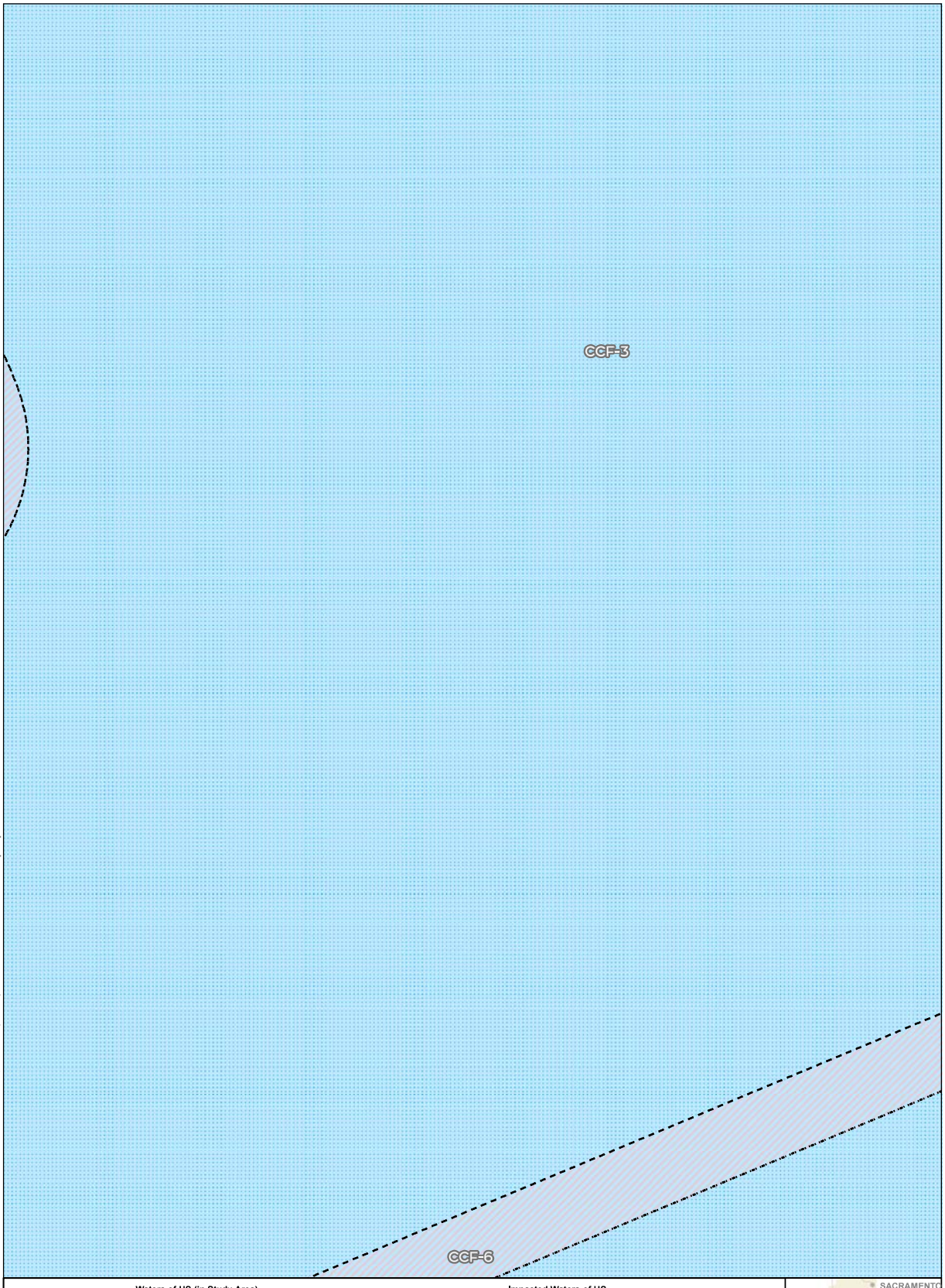

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Wetlands		Other Waters of US	
AW (Alkaline Wetland)	33 acres	AD (Agricultural Ditch)	95 acres
EM (Emergent Wetland)	156 acres	CH (Natural Channel)	0 acres
FO (Forest)	44 acres	DE (Depression)	54 acres
SS (Scrub Shrub)	25 acres	LA (Lacustrine)	23 acres
SW (Seasonal Wetland)	183 acres	CO (Conveyance)	32 acres
VP (Vernal Pool)	0.5 acres	TC (Tidal Channel)	347 acres
		CCF (Clifton Court Forebay)	2,215 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

Impacted Waters of US

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	20 acres	AD (Agricultural Ditch)	63 acres
EM (Emergent Wetland)	89 acres	CH (Natural Channel)	0 acres
FO (Forest)	17 acres	CO (Conveyance)	11 acres
SS (Scrub Shrub)	18 acres	DE (Depression)	36 acres
SW (Seasonal Wetland)	140 acres	LA (Lacustrine)	23 acres
VP (Vernal Pool)	0.3 acres	TC (Tidal Channel)	100 acres
		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

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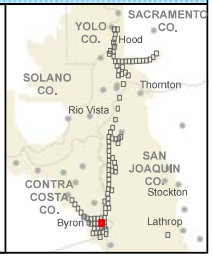

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Impacts to Waters of US
Wetland Delineation v.2

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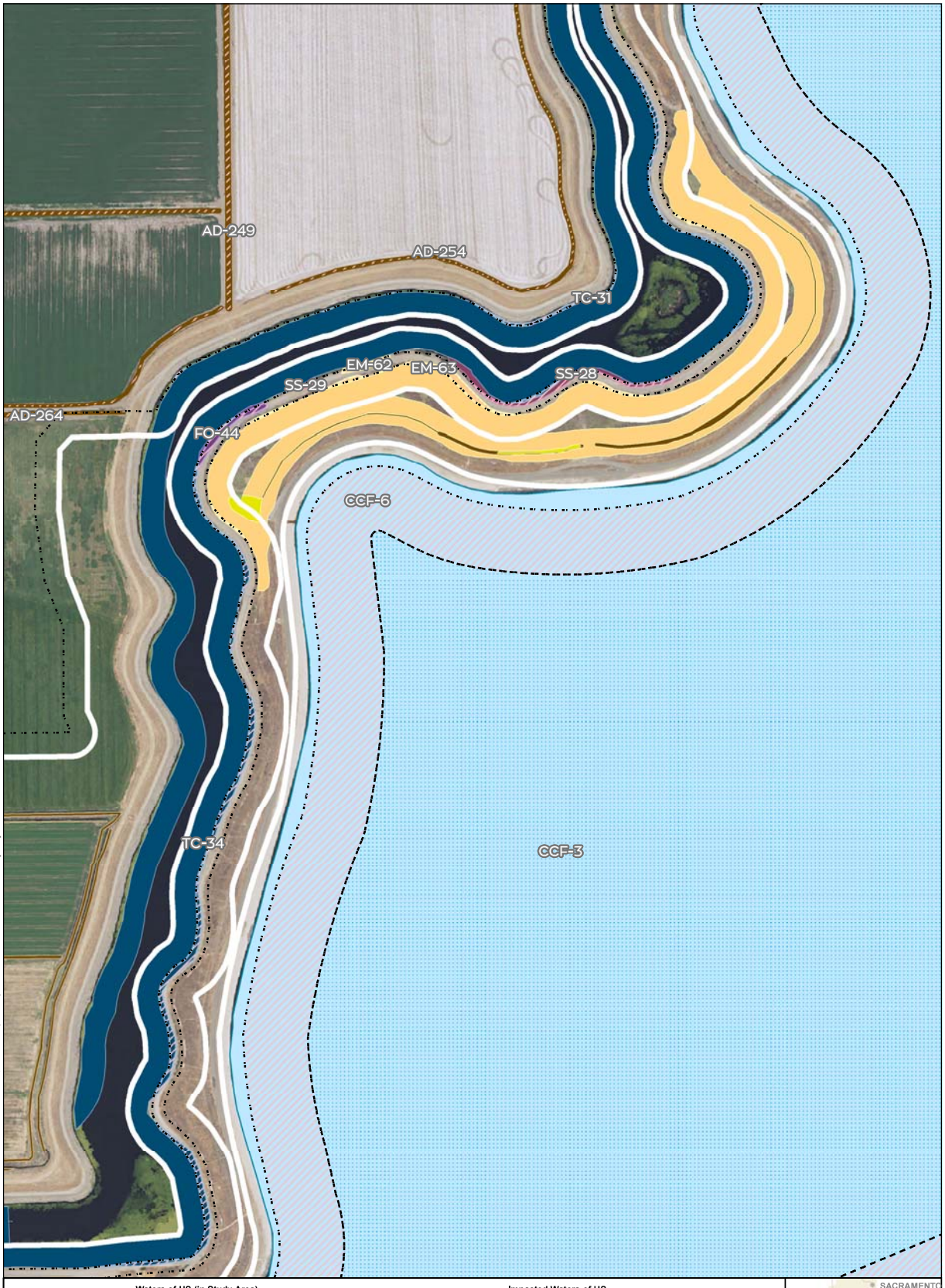

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Surface Impact
Subsurface Impact

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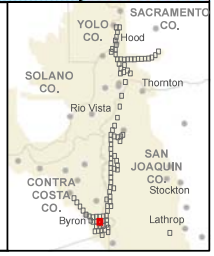

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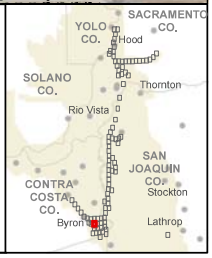

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Waters of US (in Study Area)

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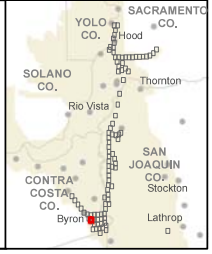

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Surface Impact
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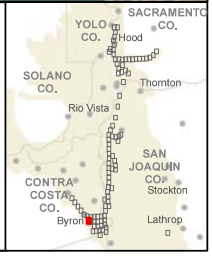

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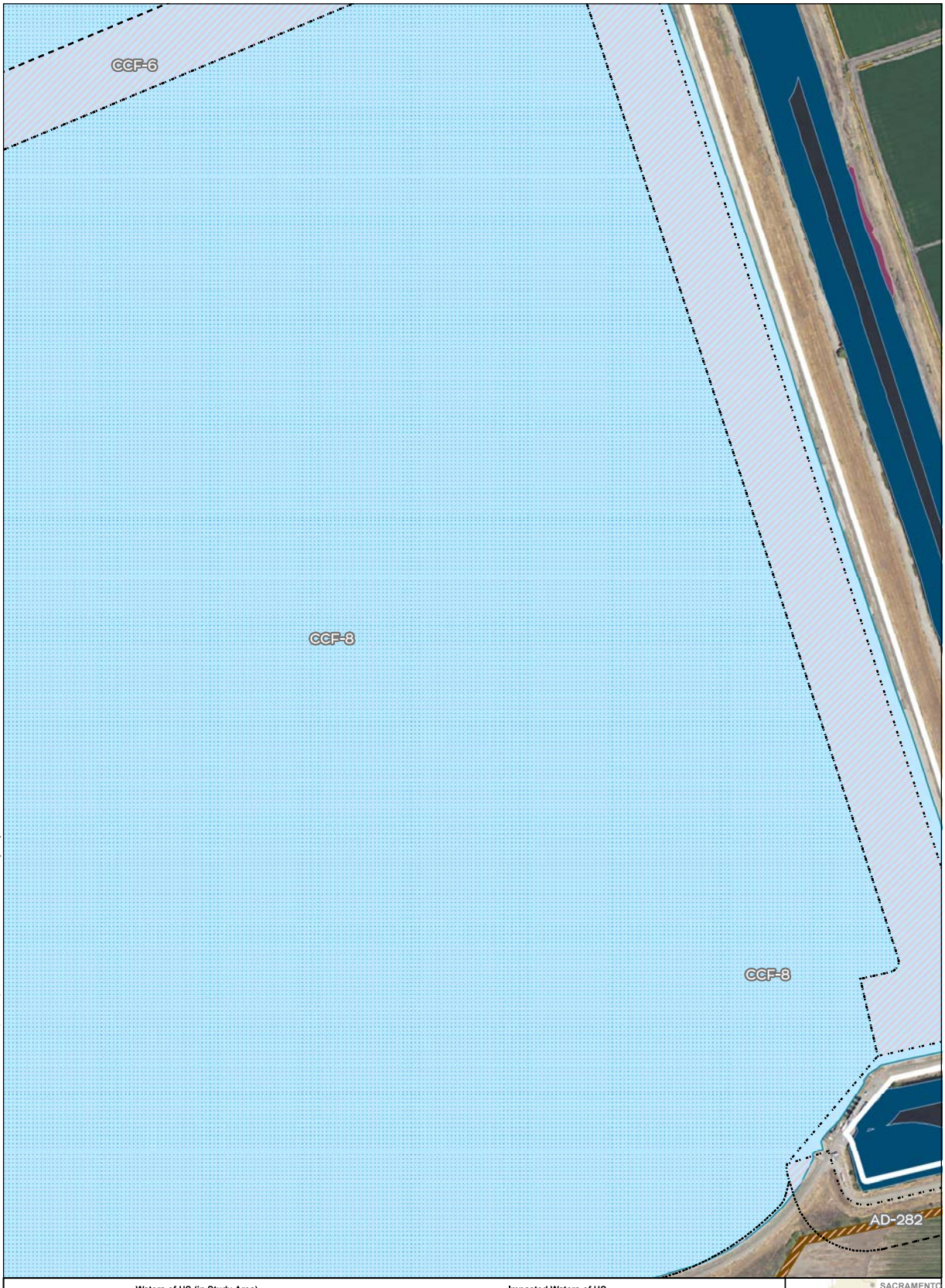

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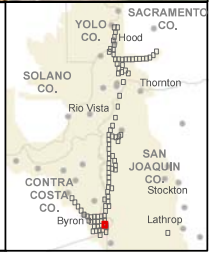

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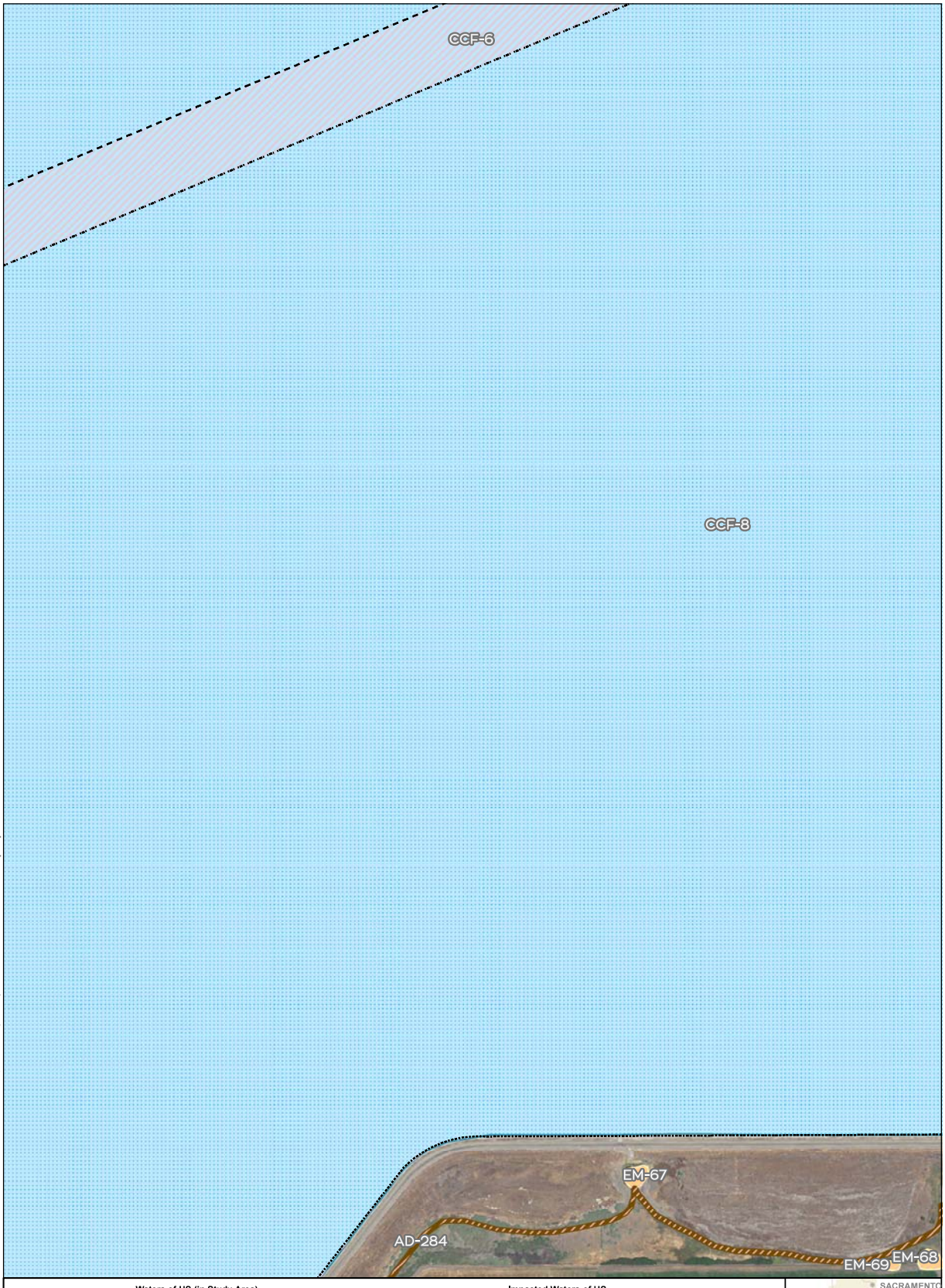

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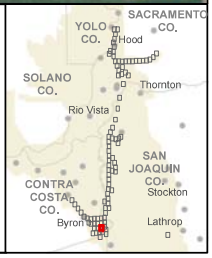

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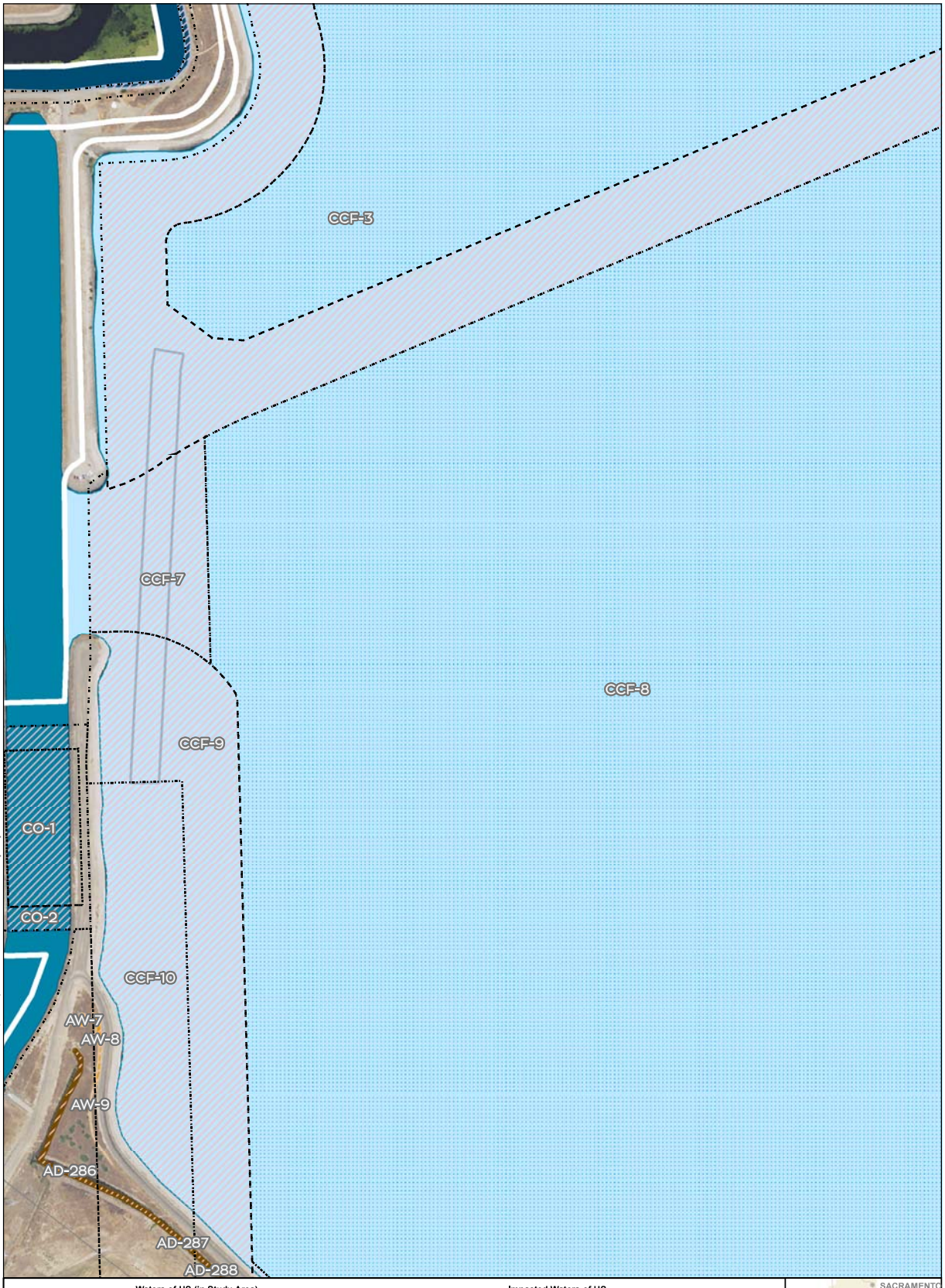

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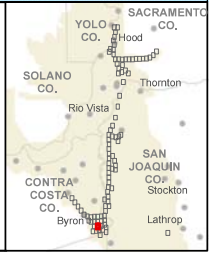

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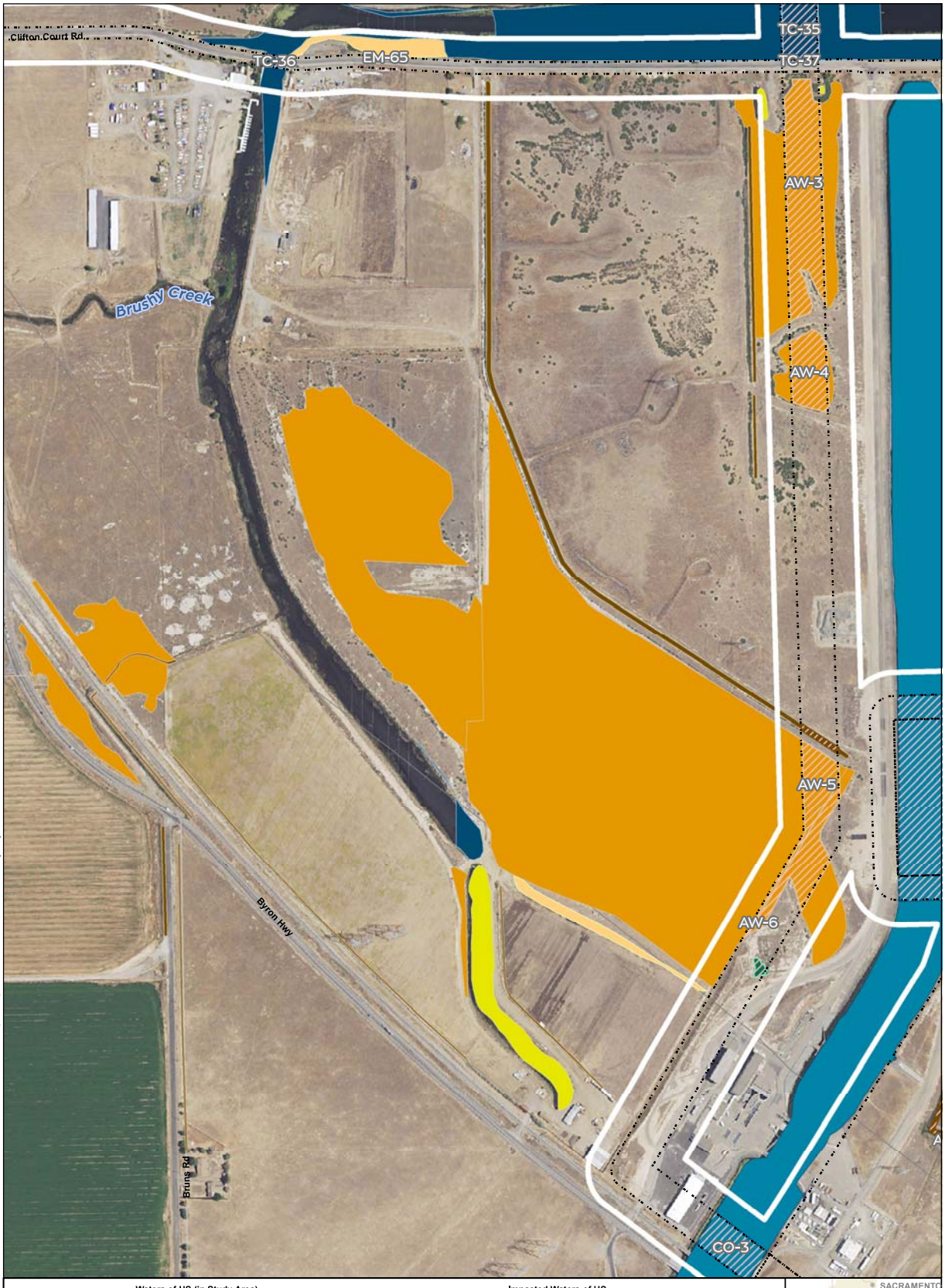

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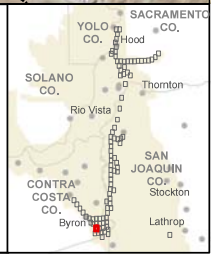

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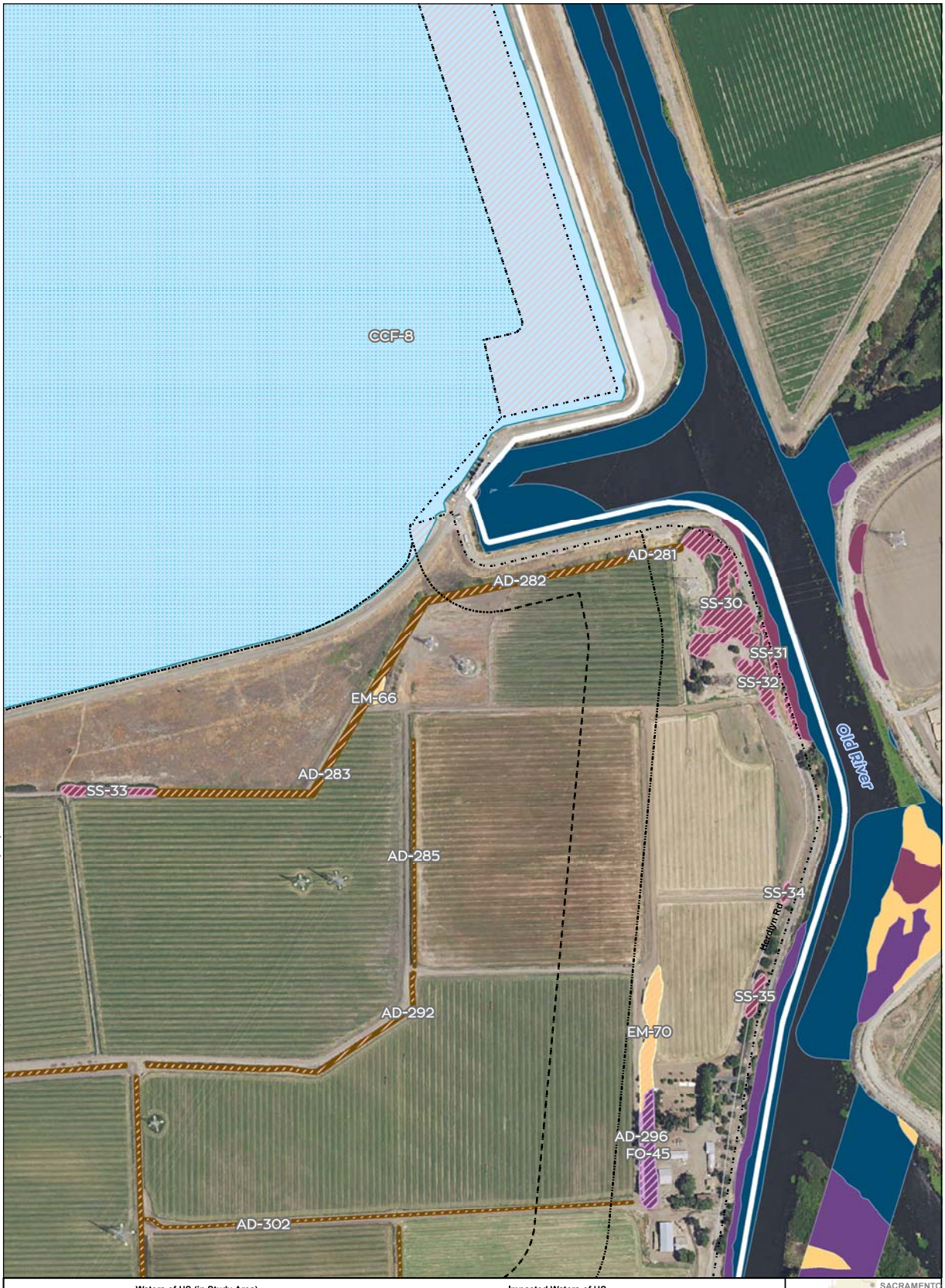

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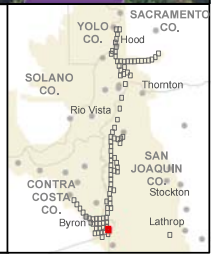

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Impacted Waters of US

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AW (Alkaline Wetland)	20 acres	AD (Agricultural Ditch)	63 acres
EM (Emergent Wetland)	89 acres	CH (Natural Channel)	0 acres
FO (Forest)	17 acres	CO (Conveyance)	11 acres
SS (Scrub Shrub)	18 acres	DE (Depression)	36 acres
SW (Seasonal Wetland)	140 acres	LA (Lacustrine)	23 acres
VP (Vernal Pool)	0.3 acres	TC (Tidal Channel)	100 acres
		CCF (Clifton Court Forebay)	
		permanent	258 acres
		temporary	1,931 acres

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Feet
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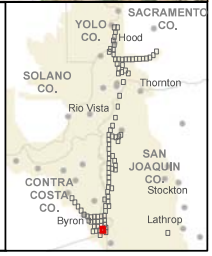

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Sources: CM1 Wetland Study Area (DWR 2015), Wetlands and Other Waters of US Impacts (DWR 20150601); NAIP 2014

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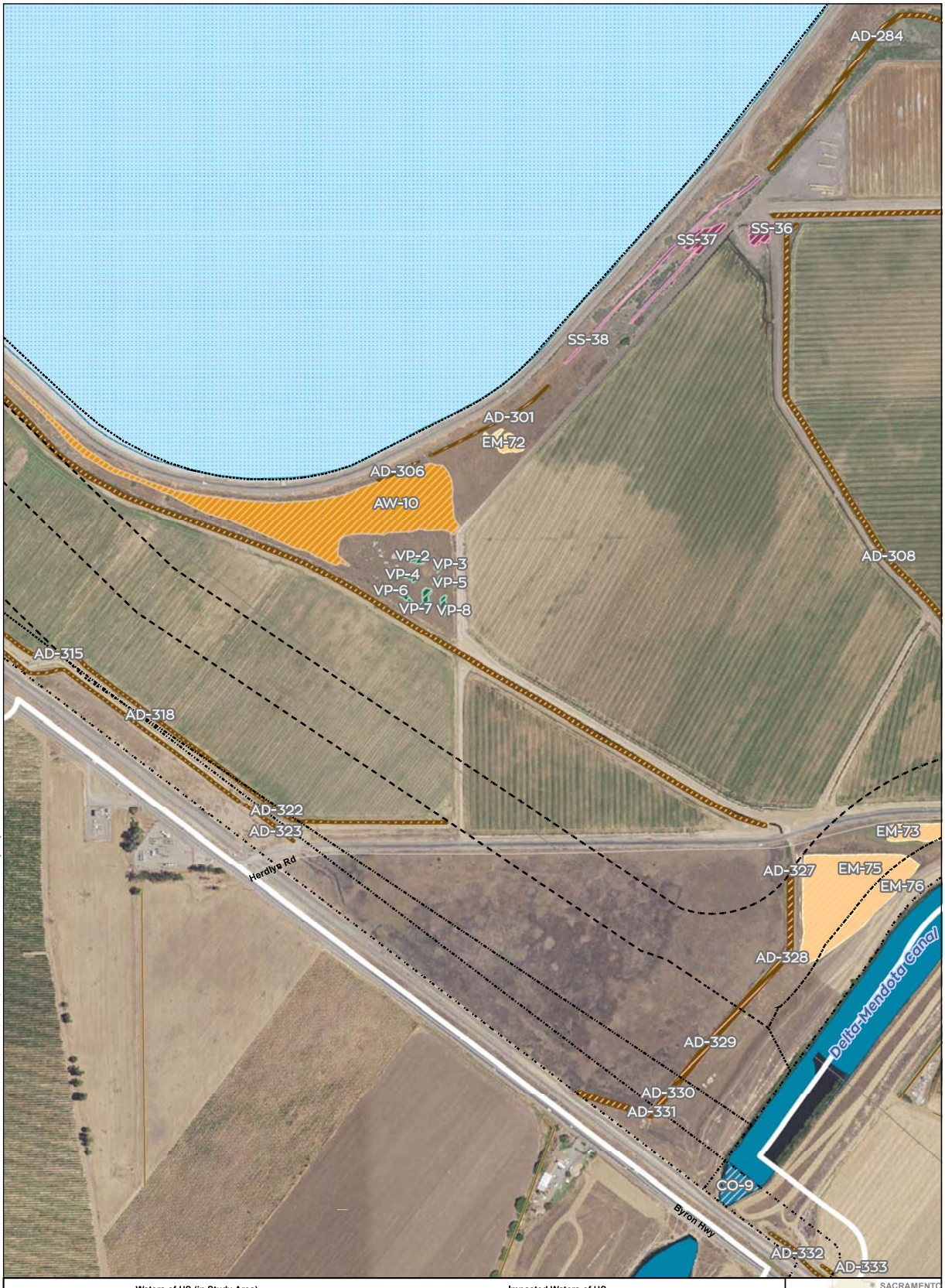
Impacts to Waters of US
Wetland Delineation v.2



Waters of US (in Study Area)

Wetlands		Other Waters of US	
AW (Alkaline Wetland)	33 acres	AD (Agricultural Ditch)	95 acres
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SS (Scrub Shrub)	25 acres	LA (Lacustrine)	23 acres
SW (Seasonal Wetland)	183 acres	CO (Conveyance)	32 acres
VP (Vernal Pool)	0.5 acres	TC (Tidal Channel)	347 acres
		CCF (Clifton Court Forebay)	2,215 acres

Project Area
Study Area

Conveyance Footprint
Surface Impact
Subsurface Impact

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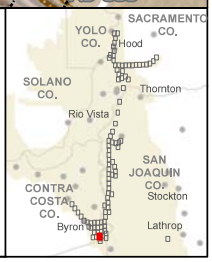

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Impacts to Waters of US
Wetland Delineation v.2

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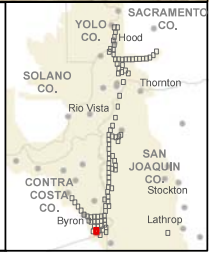

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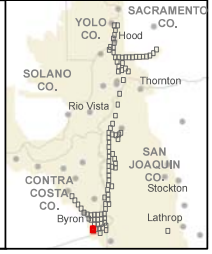

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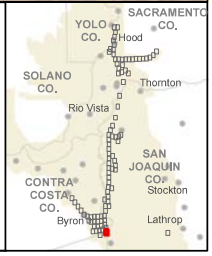

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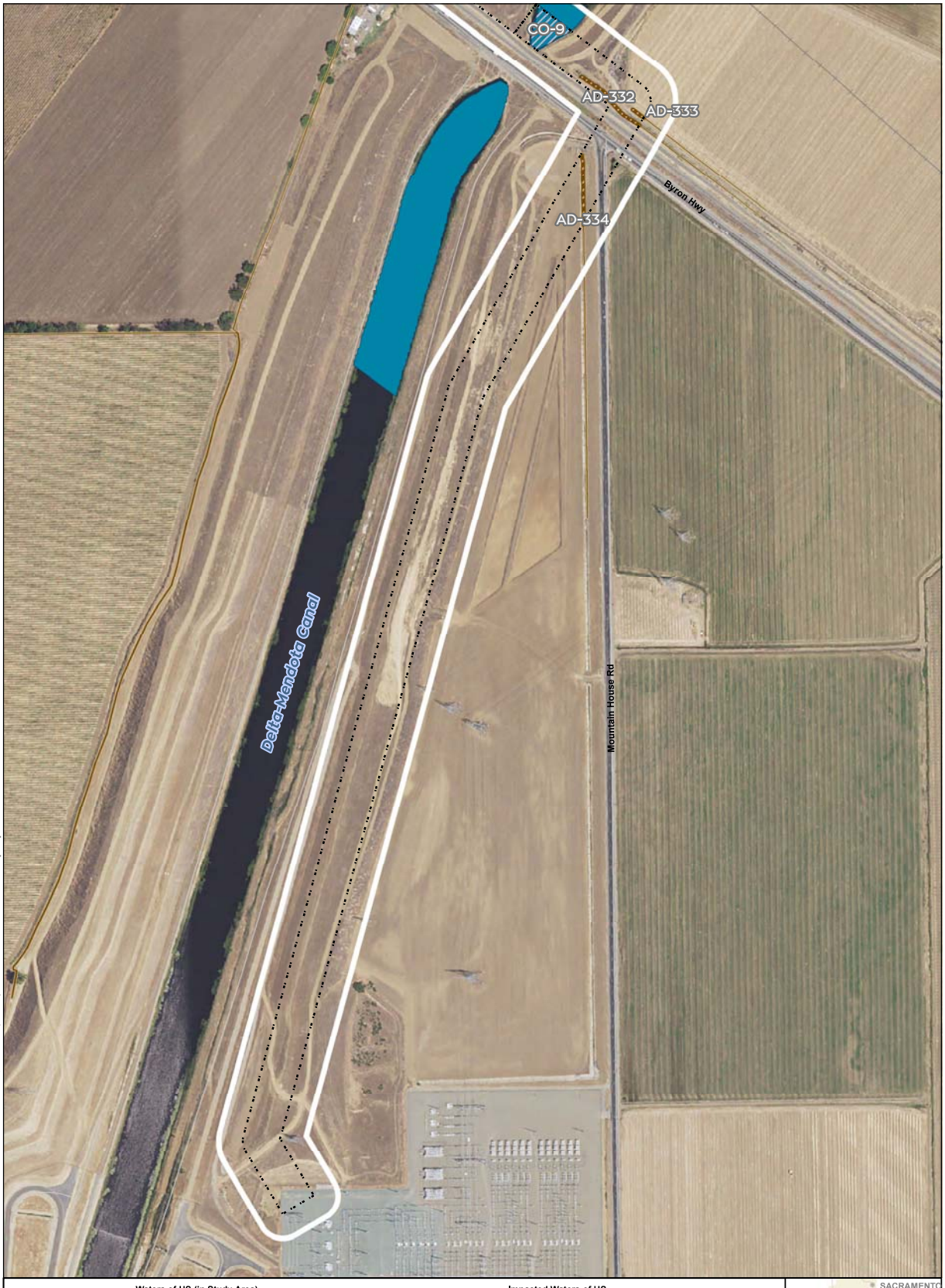

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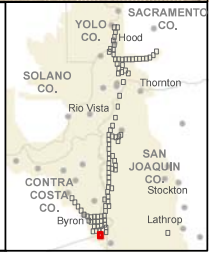

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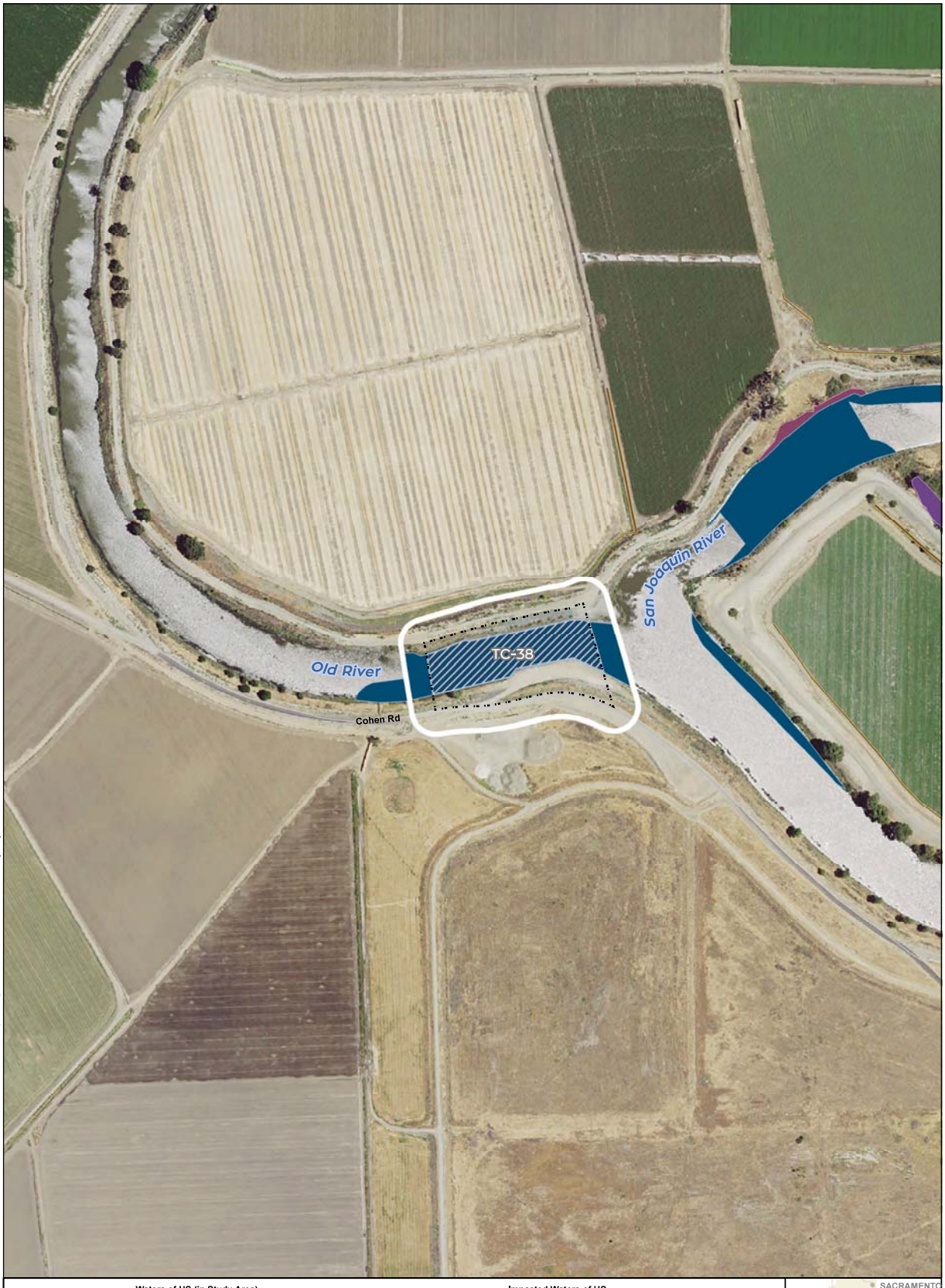

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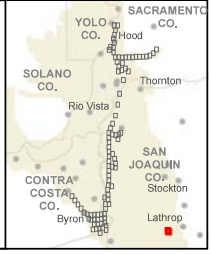

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Delta Habitat Conservation & Conveyance Program (DHCCP)

Conceptual Engineering Report

July 1, 2015