CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION R5-2019-0041

AUTHORIZING THE EXECUTIVE OFFICER TO ENTER INTO A MEMORANDUM OF UNDERSTANDING WITH THE UNITED STATES ARMY CORPS OF ENGINEERS, SAN FRANCISCO DISTRICT CONCERNING OPERATIONS AND MAINTENANCE DREDGING OF STOCKTON AND SACRAMENTO DEEP WATER SHIP CHANNELS

The California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) finds that:

1. The Stockton Deep Water Ship Channel and Sacramento Deep Water Ship Channel are dredged annually by the United States Army Corps of Engineers ("Corps"), San Francisco District ("District"). This dredging is undertaken for maintenance purposes and does not involve a significant expansion or modification of the channels.

2. The Stockton Deep Water Ship Channel extends from River-Mile 0.0 (near the unincorporated community of Collinsville in Solano County) up to and including the turning basin for the Port of Stockton at approximately River-Mile 41.0. The Sacramento Deep Water Ship Channel extends from River-Mile 0.0, near the unincorporated community of Collinsville in Solano County, up to and including the turning basin for the Port of Sacramento, approximately River-Mile 43.4.

3. On 18 May 2001, the Central Valley Water Board adopted Order 5-01- 116. As subsequently amended by Resolution No. R5-2003-0117, Order 5-01-116 prescribes waste discharge requirements for the Corps' and Port of Sacramento's dredging of the Sacramento Deep Water Ship Channel, as well as the disposal of dredged material.

4. On 23 April 2004, the Central Valley Water Board adopted Order R5-2004-0061-001. As subsequently amended by Resolution R5-2012-0077, Order R5-2004-0061-001 prescribes waste discharge requirements for dredging activities and dredged material disposal conducted by the Corps, the Port of Stockton and the Department of Water Resources in the Stockton Deep Water Ship Channel.

5. On 17 May 2018, the Corps and Central Valley Water Board executed an Interim Memorandum of Understanding (Interim MOU). The Interim MOU concerned the Corps' maintenance dredging activities in the Sacramento and Stockton Deep Water Ship Channels, including the placement of dredged material onto authorized Dredge Material Placement (DMP) sites, for the 2018 calendar year.

6. The Corps and Central Valley Water Board developed the Interim MOU to resolve the parties' disagreement regarding applicable permitting requirements and to allow the parties to fully negotiate a long-term agreement for the Corps' dredging activities without interfering with the Corps' dredging activities for the 2018 calendar year.

7. Monitoring data collected under the Central Valley Water Board's waste discharge requirements and the Interim MOU indicate that dredging and disposal activities in the Stockton and Sacramento Deep Water Ship Channels are not likely to create a condition of contamination, pollution, or nuisance as defined by California Water Code section 13050 but that continued investigation is warranted.

8. The Corps and Central Valley Water Board have negotiated the attached long-term Memorandum of Understanding (Long-term MOU, Exhibit A) for ongoing operation and maintenance dredging activities within the Stockton and Sacramento Deep Water Ship Channels. Absent termination by either party, the Long-term MOU would remain in effect for ten years from its effective date.

9. Under the Long-term MOU, the Corps agrees to, among other requirements, participate in the Central Valley Water Board's Delta Regional Monitoring Program, conduct pre-dredge sediment and leachate monitoring, dredge site receiving water monitoring, DMP site effluent and receiving water monitoring, notify the Central Valley Water Board in advance of dredging activities, and submit annual monitoring reports.

10. The Long-term MOU would further investigate regional and local water quality effects of the dredging and disposal activities contemplated within the agreement and inform future regulation of these activities.

THEREFORE, BE IT RESOLVED THAT:

1. The Central Valley Water Board hereby authorizes the Executive Officer to enter into the attached Memorandum of Understanding Between the United States Army Corps of Engineers, San Francisco District and the California Regional Water Quality Control Board, Central Valley Region Concerning Operations and Maintenance of Stockton and Sacramento Deep Water Ship Channels included as Attachment A to this Resolution.

I, PATRICK PULUPA, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of the Resolution adopted by the California Regional Water Quality Control Board, Central Valley Region, **on 6 June 2019**.

PATRICK PULUPA, Executive Officer

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE UNITED STATES ARMY CORPS OF ENGINEERS, SAN FRANCISCO DISTRICT
AND
THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, CENTRAL VALLEY REGION
CONCERNING
OPERATIONS AND MAINTENANCE DREDGING OF
STOCKTON AND SACRAMENTO DEEP WATER SHIP CHANNELS

RECITALS

WHEREAS, the Stockton Deep Water Ship Channel is a congressionally authorized navigation project constructed and/or improved pursuant to the following authorizations and/or appropriations: the Act to Improve Rivers and Harbors of 1876, 44 Cong. Ch. 267, 19 Stat. 132, 135; the Rivers and Harbors Act of 1927, Pub. L. No. 69-560, 44 Stat. 1010, 1014; and the Rivers and Harbors Act of 1950, Pub. L. No. 81-516, 64 Stat. 163, 167. For purposes of this Memorandum of Understanding ("MOU"), "Stockton Deep Water Ship Channel" means the channel extending from River- Mile 0.0 (near the unincorporated community of Collinsville in Solano County) up to and including the turning basin for the Port of Stockton at approximately River-Mile 41.0.

WHEREAS, the Sacramento Deep Water Ship Channel is a congressionally authorized navigation project constructed and/or improved pursuant to the following authorizations and/or appropriations: the Rivers and Harbors Act of 1946, Pub. L. No. 79-525; the Supplemental Appropriations Act of 1985, Pub. L. No. 99-88, 99 Stat. 293, 313; and Section 202(a) of the Water Resources Development Act of 1986, Pub. L. No. 99-662, 100 Stat. 4082, 4092. For purposes of this MOU, "Sacramento Deep Water Ship Channel" means the channel extending from River-Mile 0.0, near the unincorporated community of Collinsville in Solano County, up to and including the turning basin for the Port of Sacramento, approximately River- Mile 43.4.

WHEREAS, the Stockton Deep Water Ship Channel and Sacramento Deep Water Ship Channel are dredged annually by the United States Army Corps of Engineers ("Corps"), San Francisco District ("District"). This dredging is undertaken for maintenance purposes and does not involve a significant expansion or modification of the Stockton or Sacramento Deep Water Ship Channels ("Channels").

WHEREAS, the Corps has previously disposed of dredged material to dredged material disposal sites, also referred to as "confined disposal facilities," on Rough and Ready Island, Roberts Island (two locations), Mandeville Island, Twitchell Island (two locations), Spud Island, Bradford Island, Sherman Island (Augusto Pit, Scour Pond I, and McCormack Pit), Grand Island, Prospect Island, and Decker Island in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties. At each dredged material disposal site, the dredged material is placed within an impounded area and allowed to settle out. Once separated from the solid material, liquid may then be removed to adjacent surface waters (pumping is required for some sites to get the water over levees). Solid material may also be removed from the dredged material disposal site and applied for beneficial upland uses.

WHEREAS, on 18 May 2001, the California Regional Water Quality Control Board ("Central Valley Water Board") adopted Order No. 5-01-116. As subsequently amended by Resolution No. R5-2003-0117 (adopted on 11 July 2003). Order No. 5-01-116 prescribes waste discharge requirements for the Corps and Port of Sacramento's dredging of the Sacramento Deep Water Ship Channel, as well as the disposal of dredged material.

WHEREAS, on 23 April 2004, the Central Valley Water Board adopted Order No. R5-2004-0061-001. As subsequently amended by Resolution No. R5-2012-0077 (adopted on 3 Aug. 2012), Order No. R5-2004-0061-001 prescribes waste discharge requirements for dredging activities and dredged material disposal conducted by the Corps, the Port of Stockton and the Department of Water Resources in the Stockton Deep Water Ship Channel. Under the Central Valley Water Board's Monitoring and Reporting Program, the Corps must sample and analyze pre-dredged sediment and leachate, dredge site receiving water, disposal site effluent, and disposal site receiving water.

WHEREAS, on 17 May 2018, the District and Central Valley Water Board executed an interim memorandum of understanding regarding the District's 2018 calendar year maintenance dredging in the Channels.

WHEREAS, prior monitoring data from the District's dredging activities in the Sacramento Deep Water Ship Channel and Stockton Deep Water Ship Channel, as well as from disposal of the resulting dredged material in previously-approved disposal sites, indicates that the activities contemplated within this MOU are not likely to create a condition of contamination, pollution or nuisance, as defined by California Water Code section 13050, but need to be investigated further to understand local and regional water quality effects.

WHEREAS, the District and the Central Valley Water Board have elected to resolve their differences regarding applicable federal and state regulatory requirements, including but not limited to Clean Water Act section 401, 33 U.S.C. § 1311, for the District's maintenance dredging through this MOU.

NOW, THEREFORE, the Signatories hereby acknowledge and declare as follows:

I. PURPOSE

In the interest of mutual cooperation and to satisfy the Signatories' disagreement regarding applicable permitting requirements for the District's dredging and disposal activities, the Signatories have developed this MOU to coordinate the water quality control measures that will be required for the District's Maintenance Dredging for Fiscal Years ("FY") 2019-2029.

II. SCOPE

This MOU is strictly limited in scope as to: (a) Maintenance Dredging in the Channels conducted by the Corps and its contractors during the FY2019-2029; (b) the transportation of resulting dredged material to Existing Dredge Material Placement (DMP) Sites for disposal; and (c) the dewatering and beneficial uses of resulting dredged material from Existing DMP Sites.

For the purposes of this MOU, "Maintenance Dredging" means underwater excavation to maintain: in the *Sacramento Deep Water Ship Channel*, a channel depth of 30 feet between

River-Miles 0.0 and 35.0, and a channel of depth of 35 feet thereafter; and in the *Stockton Deep Water Ship Channel*, a channel depth of 40 feet between River-Miles 39.4 and 40.2, and a channel depth of 35 feet in all other segments. Except for the deeper 40-foot segment between River-Miles 39.4 and 40.2 of the *Stockton Deep Water Ship Channel*, all specified depths allow an additional two feet for potential over-dredging.

For the purposes of this MOU, "Existing DMP Sites" means all dredged material placement sites previously approved by the Central Valley Water Board for disposal of material dredged from the Channels and listed in Exhibit A, Section D.

III. DISTRICT RESPONSIBILITIES

The District agrees to the following provisions immediately upon the effective date of this MOU:

A. The District agrees to all provisions within Exhibit A.

B. The District shall submit $56,000 each year on 30 June to the U.S. Geological Survey to be provided for the benefit of the Central Valley Water Board's Delta Regional Monitoring Program (Delta RMP).

IV. CENTRAL VALLEY WATER BOARD RESPONSIBILITIES

Contingent on the District satisfying all provisions in Section III, the Central Valley Water Board agrees to the following as long as this MOU remains in effect:

A. The Central Valley Water Board will not initiate administrative or civil enforcement based on the District's failure to obtain a Clean Water Act section 401 certification for activities within the scope of this MOU.

B. The Central Valley Water Board will not initiate administrative or civil enforcement regarding any monitoring or reporting obligations imposed as part of Order Nos. 5-01-116 (as amended) and R5-2004-0061-001 (as amended).

V. GENERAL PRINCIPLES

A. This MOU applies to the District's dredging maintenance activities in the Channels and does not have broader applicability beyond the currently authorized Channels' features.

B. This MOU does not modify existing agency authorities by reducing, expanding, or transferring any of the statutory or regulatory authorities and responsibilities of any of the Signatories.

C. Nothing in this MOU shall be construed as obligating any of the Signatories to the expenditure of funds in excess of appropriations authorized by law or otherwise commit any signatory to actions for which it lacks statutory authority.

D. This MOU does not, and is not, intended to create any other right or benefit,

substantive or procedural, enforceable at law or equity by a party against the United States, the State of California, any agencies thereof, any officers or employees thereof, or any other person, except as provided in the Agreement.

E. The policies and procedures contained within this MOU are intended solely to improve the working relationships of the Signatories in connection with decisions regarding the District's maintenance dredging activities in the Channels. This MOU does not restrict either the District or the Central Valley Water Board in exercising each Signatory's respective statutory responsibilities.

F. The Signatories may agree to modify this MOU, as necessary, by executing a written agreement signed and dated by an authorized representative of each party.

G. Either Signatory may terminate this MOU for any reason by providing at least 30 days' written notice to the other Signatory. The termination will take effect at the start of the following fiscal year's dredging cycle. In the event of such termination, the District's annual Delta RMP contributions, made prior to the effective date of the termination, shall not be refunded.

H. The Signatories agree to use their best efforts to resolve disputes related to this MOU in an informal fashion, through consultation and communication, or other forms of non-binding alternative dispute resolution mutually acceptable to the Signatories.

I. This MOU will remain in force for 10 years from the effective date unless terminated by either Signatory.

J. This MOU is not a final Federal agency action by the District, and does not, and is not intended to create any right, benefit, or responsibility, substantive or procedural, enforceable at law or equity by any person or party against the United States, its agencies, its officers, or any other person.

K. This MOU is to be construed in a manner consistent with all existing laws and regulations.

L. This MOU neither expands nor limits those powers and authorities vested in the Signatories by applicable laws, statutes, and regulations.

M. This MOU does not alter or modify compliance with any applicable Federal or State laws or regulations.

N. This MOU does not direct or apply to any party outside of the signatory agencies. The terms of this MOU are not intended to be enforceable by any party other than the Signatories hereto.

O. All provisions in this MOU are subject to the availability of funds.

ACCORDINGLY, the Signatories have signed this Memorandum of Understanding on the dates set forth below, to be effective for all purposes as of the date last signed, subject to the full execution of the Agreement. The signatures may be executed using counterpart original documents.

DEPARTMENT OF THE ARMY

BY: _____
Travis J. Rayfield
Lieutenant Colonel, US Army
District Engineer

DATE:

CENTRAL VALLEY REGIONAL
WATER QUALITY CONTROL BOARD

BY: _____
Patrick Pulupa
Executive Officer

DATE:

ACCORDINGLY, the Signatories have signed this Memorandum of Understanding on the dates set forth below, to be effective for all purposes as of the date last signed, subject to the full execution of the Agreement. The signatures may be executed using counterpart original documents.

DEPARTMENT OF THE ARMY

BY: *Original Signed By*
Travis J. Rayfield
Lieutenant Colonel, US Army
District Engineer

DATE:

CENTRAL VALLEY REGIONAL
WATER QUALITY CONTROL BOARD

BY: *Original Signed By*
Patrick Pulupa
Executive Officer

DATE:

SECTION A: DREDGING AND DREDGE MATERIAL PLACEMENT SITE PROVISIONS

I. PRE-DREDGE NOTIFICATION AND SAMPLING

A. Dredge Operation Plan

i. Per this Memorandum of Understanding (MOU), the United States Army Corps of Engineers (District) agrees to submit a complete Dredge Operation Plan to the Central Valley Regional Water Quality Control Board (Central Valley Water Board) for each proposed dredging season.

ii. Prior to annual maintenance dredging operations, the District agrees to notify the Central Valley Water Board by submitting a Dredge Operation Plan by at least 30 days prior to the start of dredging each year. Central Valley Water Board staff will review the Plan within 15 working days of the submission and provide an Acceptance Letter.

iii. The Acceptance Letter will include constituents of concern or other monitoring to be added to the Monitoring and Reporting Program based on previous reporting data. Placement and reuse restrictions for sediment from reaches that exceed discharge criteria values may also be included.

iv. A complete Dredge Operation Plan includes the following:

1. Name and location of Dredge Material Placement (DMP) sites to be used;
2. Operation plan for DMP sites, with discharge points if applicable;
3. Map of proposed dredging area(s);
4. List of reaches expected to be dredged;
5. Design specifications;
6. Expected volumes of dredged material to be placed at each DMP site;
7. Available capacity (cubic meters volume) of the DMP sites;
8. Expectation of discharge of effluent to receiving waters;
9. Calculations for minimum holding times required for dredge slurry before effluent discharge to receiving waters, if applicable;
10. Description of dredge material handling equipment;
11. Method of transporting dredged materials to placement sites;
12. Expected dredging rate in cubic yards per day;
13. Schedule with hours of operation and estimated days to complete project; and
14. Best management practices to be implemented during dredging operations to prevent impacts to water quality.

B. Pre-Dredge Sediment Sample and Analysis Plan

i. In order to characterize the dredged sediment from the Sacramento and Stockton Deep Water Ship Channels, the District agrees to perform a pre-dredge sediment and leachate sampling and analysis every five (5) years, occurring in years two (2020) and seven (2025) of this MOU. Sediment sample locations should be selected

in order to provide representative analytical results for reaches that will be dredged in subsequent dredging seasons.

ii. Constituents included for analysis during pre-dredge sampling are specified in SECTION B: Monitoring and Reporting Program.

iii. Pre-dredge sampling and analysis will be conducted in accordance with an approved sampling and analysis plan. The District agrees to submit the pre-dredge sampling and analysis plan to the Central Valley Water Board by 31 December in years 1 (2019) and 6 (2024). If the District does not receive comments or approval from Central Valley Water Board staff within 15 working days of the submission, the District may proceed with sampling. A complete pre-dredge sampling and analysis plan includes the following:

1. Estimated number of sediment samples (35 minimum);
2. Planned location of samples;
3. Estimated volume of dredged material to be removed from each sampled reach on annual basis;
4. Test method and procedure used for each analysis;
5. Detection and reporting limits for each analysis method;
6. Sample collection technique; and
7. Quality Assurance/Quality Control.

II. GENERAL PROVISIONS REGARDING DREDGING AND OPERATION OF DREDGE MATERIAL PLACEMENT SITES

A. The District, in conducting the activities within the scope of this MOU, shall not create a condition of contamination, pollution or nuisance, as defined by California Water Code section 13050.

B. The discharge from dredging operations, including material disturbed by either the cutter head or bucket during dredging, shall not cause or contribute to acute toxicity in the receiving waters.

C. The District will not discharge ‘hazardous waste’ or ‘designated waste’. For the purposes of this MOU, the term ‘hazardous waste’ is as defined in Title 23, California Code of Regulations, Section 2510 et seq., and ‘designated waste’ is as defined in California Water Code Section 13173.

D. The District will not discharge dredged materials other than to a DMP site specifically designed for its containment, or to a site approved by the Regional Board for direct placement and/or beneficial reuse.

E. The discharge of solid waste, liquid waste, leachate, or waste constituents shall neither cause nor contribute to any contamination, pollution, or nuisance to surface waters, ponded water, or surface water drainage courses, including, but not limited to:

i. floating, suspended, or deposited macroscopic particulate matter or foam;

ii. increases in bottom deposits or aquatic growth;

iii. exceedances of water quality objectives for temperature, turbidity, or color that causes nuisance or adversely affects beneficial uses;

iv. the creation or contribution of visible, floating, suspended, or deposited oil or other products of petroleum origin; and

v. the introduction or increase in concentration of toxic or other contaminants/pollutants resulting in impairment of beneficial uses of waters of the State.

F. The District will not discharge wastes directly to surface waters or surface water drainage courses other than effluent from the DMP sites. Surface runoff from the site may occur if the approved site operation plan has provisions for erosion control and monitoring.

G. The District will not allow the bypass or overflow of untreated or partially treated waste from the confined placement facility.

H. The District will not discharge dredge return water from hopper dredges to surface waters.

I. The District will not discharge sanitary waste to the DMP sites.

J. The District will not discharge dredge material or conduct other construction activities within 200 feet of the pond situated on the southern boundary of the Scour Pond I DMP site. The 200-foot buffer zone will be measured from the pond's high-water level.

III. SPECIFICATIONS REGARDING DREDGING AND OPERATION OF DREDGE MATERIAL PLACEMENT SITES

A. To the extent feasible, all Maintenance Dredging will be performed using Hydraulic Pipeline Cutterhead Dredges, as described in Chapter 2.22 of the Corps' Engineer Manual for Engineering and Design of Dredging and Dredged Material Management dated 31 July 2015 ("Engineer Manual"). Mechanical Dredges, per Chapter 2.26 of the Engineer Manual, will be used in Maintenance Dredging only where limited access or large debris prevents use of a Hydraulic Pipeline Cutterhead Dredge. In such instances, the District will use only sealed buckets and clamshells

B. The discharge of dredged materials will only be to the sites identified in SECTION D: Approved Dredge Material Placement Sites; or to a DMP site with Waste Discharge Requirements approved for accepting dredge materials from the Stockton and/or Sacramento Deep Water Ship Channel; or to a site specifically approved by the Regional Board for direct placement and/or beneficial reuse.

C. The rate of effluent discharge from DMP sites will not exceed the following:

i. Effluent average daily flow (into receiving water): 9 mgd.

ii. Effluent maximum daily flow (into receiving water):10 mgd

D. In the following receiving water limitations, the discharge is defined as the effluent from the DMP sites and/or sediment released to the receiving waters from the dredge cutting head. The District shall not cause the following Receiving Water Limits to be exceeded in the receiving water:

   i. Concentrations of dissolved oxygen to fall below 5.0 mg/l in Delta waters, nor to fall below 7.0 mg/l in Delta waters west of the Antioch Bridge, nor to fall below 6.0 mg/l at the San Joaquin River inside the reach from Turner Cut to Stockton during the period of 1 September through 30 November.

   ii. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

   iii. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

   iv. Toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal or aquatic life.

   v. Aesthetically undesirable discoloration.

   vi. Fungi, slimes, or other objectionable growths.

   vii. The normal ambient pH to fall below 6.5, exceed 8.5.

   viii. Deposition of material that causes nuisance or adversely affects beneficial uses.

   ix. The fecal coliform concentration in any 30-day period to exceed a geometric mean of 200 MPN/100 ml or cause more than 10 percent of total samples to exceed 400 MPN/100 ml.

   x. The normal ambient temperature to increase more than 5°F.

   xi. The discharge shall not cause an increase in turbidity exceeding the following limits in the receiving water

      1. Where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), downstream turbidity shall not exceed 2 NTUs;
      2. 1.0 NTUs where natural turbidity is between 1 and 5 NTUs;
      3. 20 percent where natural turbidity is between 5 and 50 NTUs;
      4. 10 NTUs where natural turbidity is between 50 and 100 NTUs;
      5. 10 percent where natural turbidity is greater than 100 NTUs.

   xii. Taste or odor-producing substances to impart undesirable tastes or odors to domestic or municipal water supplies, or to fish flesh or other edible products of aquatic origin or to cause nuisance or otherwise adversely affect beneficial uses.

   xiii. Violation of any applicable water quality objective for receiving waters adopted by the Regional Board or the SWRCB, pursuant to the Clean Water Act and regulations adopted thereunder.

E. The Discharge Criteria Table in SECTION C: Screening Values, establishes pre-dredge sediment concentrations that will not exceed preliminary remediation goals for ecological

or residential reuse, or background concentrations in the Delta soil and aqueous concentrations that will not cause exceedances of water quality objectives.

F. Sediments with values below the concentrations in the Discharge Criteria Table will be discharged to DMP sites listed in this MOU for maintenance dredging and disposal projects in the Sacramento and Stockton Deep Water Ship Channels. If analytical results are above the values listed in the Discharge Criteria Table, the District will include a technical report describing site-specific factors, such as attenuation, that demonstrate the discharge will not impact beneficial uses. The technical report will be included with the submission of the Pre-Dredge Sediment and Leachate Analytical Report. In the consequent Acceptance Letter, the Executive Officer will provide a site-specific exemption to allow for the placement of sediments or restrict the discharge and/or beneficial reuses of sediments.

G. The discharge to the DMP site will consist solely of inert waste as defined by Title 27, Chapter 3, Section 20230 of the California Code of Regulations.

H. The discharge to the DMP site will consist solely of sediment and water produced from dredging operations.

I. Appropriate soil erosion control measures will be made and maintained to prevent discharge of sediment to surface waters or surface water drainage courses from disturbed areas at the DMP sites. Surface runoff from the site may occur if the accepted site operation plan has provisions for erosion control and monitoring.

J. All stockpiled dredge materials will be managed to prevent erosion of sediment to surface water drainage courses.

K. Objectionable odors originating at DMP sites will not be perceivable beyond the limits of the activity area.

L. Newly constructed or rehabilitated levees or berms that hold back water will be designed and constructed under the direct supervision of a California Registered Civil Engineer or Engineering Geologist.

M. All retention dikes or levees will be so constructed and maintained to prevent sloughing that causes turbidity in excess of Basin Plan Objectives.

N. The dredge discharge will remain within the DMP sites' area at all times, except for specified effluent discharges. After drying, the solid material may be removed for beneficial reuse at other locations.

O. The District agrees to maintain a minimum freeboard of two feet in all ponds as measured vertically from the water surface to the lowest point of overflow.

P. DMP sites will be managed to prevent breeding of mosquitoes. In particular,

    i. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.

ii. Weeds will be minimized through control of water depth, harvesting, or herbicides.

iii. Dead algae, vegetation, and debris will not accumulate on the water surface.

Q. A biological survey will be conducted for giant garter snakes (Thamnophis gigas) by a qualified biologist prior to all construction activities, including dredge material reuse, within the Scour Pond I DMP site. The biological survey will be performed 24 hours prior to commencing any construction activities. The survey of the project area will be repeated if a lapse in construction activity of two weeks or greater occurs. If a giant garter snake is encountered during construction, then all construction activities will cease immediately until the appropriate corrective measures are taken and a qualified biologist resurveys the site.

SECTION B: MONITORING AND REPORTING PROGRAM

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements will be taken at the monitoring locations specified below. Monitoring locations will not be changed without notification to and the approval of the Central Valley Water Board.

B. Laboratories analyzing monitoring samples will be accredited by the State Water Resources Control Board (State Water Board), Division of Drinking Water (DDW), in accordance with the provision of Water Code section 13176 and the Department of Defense Environmental Laboratory Accreditation Program (DOD ELAP) for the most current methods described in "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium" (SW-846), if available. Laboratories will include quality assurance/quality control data with their reports. The District agrees to identify laboratories, and accreditation status, that perform sample analyses in all monitoring reports submitted to the Central Valley Water Board.

C. All monitoring instruments and devices used by the District to fulfill the prescribed monitoring program will be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy.

D. Monitoring results, including noncompliance, will be reported at intervals and in a manner specified in this Monitoring and Reporting Program.

E. The results of all monitoring required by this Memorandum of Understanding (MOU) will be reported to the Central Valley Water Board and will be submitted in such a format as to allow direct comparison with the limitations and criteria of this MOU.

II. PRE-DREDGE SEDIMENT AND LEACHATE MONITORING

A. Pre-dredge sediment sampling and analyses will be performed to determine sediment constituent concentrations for those items listed in the Constituent Analysis Table for solid phase analysis. Soluble metal constituents listed in the Constituent Analysis Table for aqueous analysis will be measured after performing a Title 22 Waste Extraction Test (WET) procedure. The WET procedure may be modified to use deionized water in place of the citrate buffer. Another extraction procedure may be used with approval by the Executive Officer. In some cases, the Waste Extraction Test with citrate buffer may be required to show that the dredge material is not classified as hazardous waste. Approved analytical methods are listed in the Constituent Analysis Table at the end of this Section.

B. Pre-dredge sediment sampling will occur every five (5) years, occurring in years two (2020) and seven (2025) of this MOU. Historically, some reaches of the channels have smaller amounts of sediment deposited and other sections have had massive sediment deposits. Sediment sample locations should be selected in order to provide representative analytical results for reaches that will be dredged in the subsequent five-year period. Analysis of tributyltin and oil and grease will be completed if dredging is anticipated within 500 yards of the Port of Stockton or a marina.

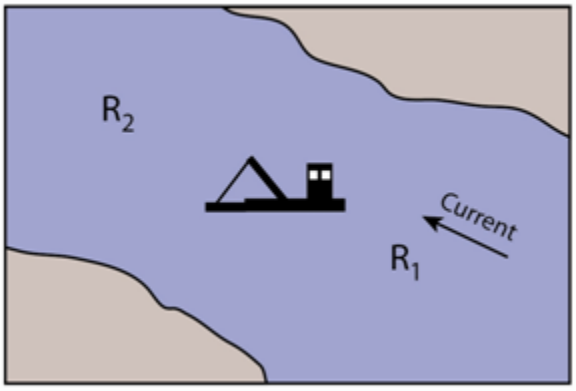
DREDGE SITE MONITORING

In field monitoring will be completed at two depths: 1) five feet below the surface of the water, 2) approximately 2/3 of the distance to the bottom. Monitoring will be conducted from the following stations:

Station	Description
R-1	Up-current of the dredging location and undisturbed by the dredging operation, and not to exceed 3,000 feet from the dredge.
R-2	Within 50 feet down-current of the dredge suction head or clamshell.

In environments without significant current, R-1 should be located at a distance that is unaffected by the dredging operation and R-2 will be taken within 50 feet of the dredge. Figure 1 shows the relative locations of R-1 and R-2.

Figure 1: Dredge Site Sampling Locations



Samples will be analyzed from Stations R-1 and R-2 as follows:

Constituent / Analysis	Unit	Sampling Frequency	Sample Type
Dissolved Oxygen[1]	mg/l	Weekly	Meter
pH	STU	Weekly	Meter
Temperature	°F	Weekly	Meter
Turbidity	NTU	Weekly	Meter

[1]Dissolved oxygen measurements shall be collected from two feet above the river bottom

DREDGE MATERIAL PLACEMENT SITE MONITORING

Monitoring will commence immediately after dredging materials are discharged into the Dredge Material Placement (DMP) site. Monitoring will continue until the DMP site is completely empty of water. The DMP site will be sampled for the parameters specified below:

Constituent	Unit	Sampling Frequency	Sample Type
Freeboard	0.1 feet	Daily[1]	Measurement
Odors[2]	-	Daily[1]	Observation
Dissolved Oxygen[3]	mg/l	Weekly	Meter
pH	STU	Weekly	Meter
Levee condition[4]	-	Weekly	Observation

[1]Inspections for freeboard measurements and odor will be performed daily during the normal business week (i.e. Monday through Friday).
[2]If odors are detected during the daily site inspection, then daily monitoring for dissolved oxygen will be conducted until the odors are abated.
[3]Samples will be collected at a depth of one foot from each pond in use, opposite the inlet location. Monitoring for dissolved oxygen may cease any time that daily freeboard measurements indicate the level of water confined in the disposal facility is less than 0.5 feet.
[4]Contanment levees will be observed for signs of seepage or surface water along the exterior toe of the levees. If surface water is found, a sample will be collected and tested for pH and total dissolved solids.

BIOLOGICAL SURVEY

The Scour Pond I DMP site will be surveyed for giant garter snakes (*Thamnophis gigas*) by a qualified biologist 24 hours prior to construction activities. Additional surveys of the project area will be conducted if a lapse in construction activity of 2 weeks or greater occurs after the initial survey is completed.

Beginning October 2 each year and continuing until placement activities are completed within the Expanded Scour Pond I DMP site, the site will be surveyed for giant garter snakes once every 14 days by a qualified biologist.

DREDGE MATERIAL PLACEMENT SITE EFFLUENT MONITORING

The effluent from the sedimentation basin or DMP site will be monitored at the overflow weir or discharge pipe during discharge into surface waters. Effluent sampling and analysis will be performed within the first 24-hours of discharge to determine aqueous constituent concentration for those items listed in the aqueous column of the Constituent Analysis Table. Subsequent samples will be collected from the effluent discharge and analyzed according to the following schedule:

Constituent / Analysis	Unit	Sampling Frequency	Sample Type
Dissolved Oxygen	mg/l	Daily	Meter
pH	STU	Daily	Meter
Temperature	°F	Daily	Meter
Turbidity	NTU	Daily	Meter
Suspended Solids	mg/l	Weekly	Grab
Constituents of concern[1]	µg/l	Weekly	Grab/Meter
Methylmercury[2]	ng/l	Weekly	Grab
Total Mercury[2]	ng/l	Weekly	Grab

[1] Monitoring required for constituents that exceed screening values during previous Dredge Season.

[2] Methylmercury and total mercury have been identified by the Central Valley Water Board as constituents of concern. Monitoring may cease per Executive Officer approval if effluent results demonstrate compliance with Delta Methylmercury TMDL.

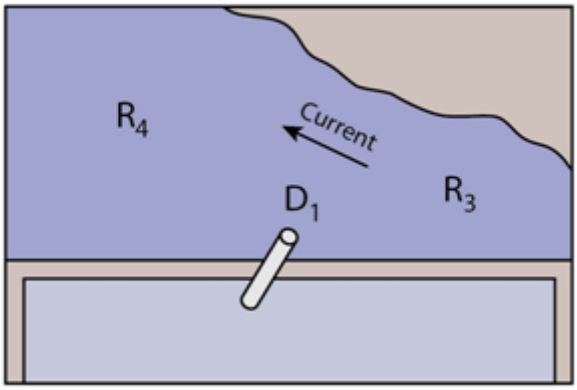
RECEIVING WATER MONITORING FOR DMP SITE DISCHARGE

Grab samples will be taken at two depths: 1) five feet below the surface of the water, 2) approximately 2/3 of the distance to the bottom. The two grab samples from each station will be composited together in equal volumes resulting in one sample from each station for analysis. Water samples will be taken from the following stations:

Station	Description
R-3	Up-current of the discharge location and undisturbed by the effluent discharge from the DMP site, and not to exceed 300 feet from the point of discharge.
R-4	Within 50 feet down-current of the discharge point, and on the same side of the river as the discharge point

Figure 2 shows the relative locations of D-1, R-3, and R-4.

Figure 2: DMPS Sampling Locations



Samples will be collected and analyzed from Stations R-3 and R-4 as follows:

Constituent / Analysis	Unit	Sampling Frequency	Sample Type
pH	STU	Daily	Meter
Dissolved Oxygen[1]	mg/l	Daily	Meter
Temperature	°F	Daily	Meter
Turbidity	NTU	Daily	Meter
Suspended Solids	mg/l	Weekly	Grab
Constituents of concern[2]	µg/l	Weekly	Grab/Meter
Methylmercury[3]	ng/l	Weekly	Grab
Total Mercury[3]	ng/l	Weekly	Grab

[1] Dissolved oxygen measurements shall be collected from two feet above the river bottom.
[2] Monitoring required for constituents that exceed screening values during previous Dredge Season.
[3] Methylmercury and total mercury have been identified by the Regional Board as constituents of concern. Monitoring may cease per Executive Officer approval if effluent results demonstrate compliance with Delta Methylmercury TMDL.

REPORTING

The District agrees to immediately notify the Central Valley Water Board by telephone whenever an exceedance or adverse condition occurs as a result of the dredging and disposal operation or the discharge of effluent. Written confirmation will follow within 2 weeks.

For the purposes of this MOU, an “Adverse Condition” means any actions or incidents capable of posing a risk to public health and safety, creating a condition of pollution or nuisance as defined by Water Code section 13050, or causing or contributing to a violation of applicable water quality standards. An “Adverse Condition” includes (without limitation):

a) Actual or imminent failure of containment dikes at Existing DMP Sites (see, e.g., Engineering Manual at Ch. 4.6.4.5 et seq.);

b) Unplanned releases or discharges of dredged material and “return water” from an existing DMP site; and

c) Discharges to surface water not typically associated with routine dredging activity (e.g., fuel spills, pipeline failures).

In the event of an Adverse Condition, the Executive Officer of the Central Valley Water Board may require the District to perform sampling and analysis for parameters reasonably related to the Adverse Condition and remediate the Adverse Condition.

The District agrees to compile and summarize the data from the dredge season and submit an Annual Report to Board staff within 120 days of project completion.

The District agrees to compile and summarize the data from the pre-dredge sediment sampling and analysis and submit a Pre-Dredge Sediment and Leachate Analytical Report by 1 November of years 3 (2021) and 7 (2026) of the MOU. The submission should include a technical report describing site specific factors for consideration for the placement of sediment that exceed discharge criteria values.

If dredge material from a project has restrictions on beneficial reuse options, the owner of the DMP site will be responsible for tracking and documenting the location of that material while it is in the site. If the material is removed from the site, the owner will notify Board staff within 10 days and provide a description of how the material was appropriately reused. If the material is sold or used in another location, the owner of the DMP site will inform the recipient of the restrictions and his or her responsibility for proper use of the material.

Constituent Analysis Table		
Constituent	**Analytical Method**	
	Solid Phase Analysis	**Aqueous Analysis[1]**
Metals		
Arsenic	6010D/6020B	6020B
Barium	-	6020B
Cadmium	6010D/6020B	6020B
Total Chromium	6010D/6020B	6020B
Copper	6010D/6020B	6020B
Lead	6010D/6020B	6020B
Mercury	7471B	7470A (LOQ < 25ng/L)[2]
Nickel	6010D/6020B	6020B
Selenium	6010D/6020B	6010D/6020B/7740/7741[2]
Zinc	6010D/6020B	6020B
Other Parameters/Constituents		
pH	-	9045D
Specific Conductance	-	9050A
Total Dissolved Solids	-	160.1/2540C
Chloride	-	300.0
Ammonia + Ammonium	-	STD 4500-NH3
Biochemical Oxygen Demand (5-day @ 20°C)	-	405.1/SM 5210B
Chemical Oxygen Demand	-	410.4/SM 5220B
Tributyltin[3]	-	8323
Oil and Grease[3]	-	1664B/8440
Methyl Mercury	-	1630
Hardness	-	2340B
Grain Size Analysis	ASTM D422	-
Organophosphorus Pesticides		
Chlorpyrifos	-	8141B
Diazinon	-	8141A
Dimethioate	-	8141A
Malathion	-	8141A
Parathion	-	8141A
Phorate	-	8141A

[1] Aqueous metal concentrations are for dissolved (filtered) concentrations unless otherwise noted.
[2] Aqueous concentrations for Mercury and Selenium are for total recoverable concentrations.
[3] Tributyltin and Oil and Grease must be analyzed if dredging occurs within 500 yards of the Port of Stockton or a marina.

Constituent Analysis Table (cont.)		
Constituent	**Analytical Method**	
	Solid Phase Analysis	**Aqueous Analysis**
Organochlorine Pesticides		
Aldrin	8081B	8081B
Alpha BHC	8081B	8081B
Beta BHC	8081B	8081B
Gamma BHC (Lindane)	8081B	8081B
Chlordane	8081B	8081B
4,4-DDD	8081B	8081B
4,4-DDE	8081B	8081B
4,4-DDT	8081B	8081B
Dieldrin	8081B	8081B
Endosulfan	8081B	8081B
Endosulfan II	-	8081B
Endosulfan sulfate	-	8081B
Endrin	8081B	8081B
Endrin aldehyde	-	8081B
Heptachlor	8081B	8081B
Heptachlor epoxide	8081B	8081B
Hexachlorcyclopentadienne	8081B	8081B
Methoxychlor	8081B	8081B
Toxaphene	8081B	8081B
Polychlorinated Biphenyls (PCB)		
Aroclor 1016	8082A	8082A
Aroclor 1221	8082A	8082A
Aroclor 1232	8082A	8082A
Aroclor 1242	8082A	8082A
Aroclor 1248	8082A	8082A
Aroclor 1254	8082A	8082A
Aroclor 1260	8082A	8082A

Constituent Analysis Table (cont.)		
Constituent	**Analytical Method**	
	Solid Phase Analysis	**Aqueous Analysis**
Polyaromatic Hydrocarbons (PAH)		
Acenaphthene	8310 or 8270D	8310 or 8270D
Anthracene	8310 or 8270D	8310 or 8270D
Benzo(a)anthracene	8310 or 8270D	8310 or 8270D
Benzo(b)fluoranthene	8310 or 8270D	8310 or 8270D
Benzo(k)fluoranthene	8310 or 8270D	8310 or 8270D
Benzo(a)pyrene	8310 or 8270D	8310 or 8270D
Chrysene	8310 or 8270D	8310 or 8270D
Dibenzo(a,h)anthracene	8310 or 8270D	8310 or 8270D
Fluoranthene	8310 or 8270D	8310 or 8270D
Fluorene	8310 or 8270D	8310 or 8270D
Indeno(1,2,3-cd)pyrene	8310 or 8270D	8310 or 8270D
Naphthalene	8310 or 8270D	8310 or 8270D
Pyrene	8310 or 8270D	8310 or 8270D

SECTION C: SCREENING VALUES

This Section includes screening values for pre-dredge sediment and leachate analysis and effluent discharge analysis.

Maximum concentrations in the Discharge Criteria Table for solids are based on USEPA Preliminary Remediation Goals (PRG) for ecological or residential use, or background concentrations found in Delta soil. The PRG screening values are based on risk assessment of common exposure pathways in an upland soil environment. The solid phase maximum concentrations are chosen to protect humans and wildlife from potential exposure to the sediments and their constituents once they are placed in an upland environment. If solids concentrations are exceeded, placement and beneficial reuse options may be restricted.

The maximum aqueous concentrations are chosen to protect groundwater and the receiving water beneficial uses from leachate and surface runoff. The values are based on applicable water quality objectives.

Concentrations will be determined using methods specified in Section B: Monitoring and Reporting Program.

Discharge Criteria Table				
Analyte	**Maximum Concentration**			
	Solids Analysis	**Unit**	**Aqueous Analysis**	**Unit**
Metals				
Arsenic	11.6[1]	mg/kg	10	µg/L
Barium	-	-	100	µg/L
Cadmium	21	mg/kg	5	µg/L
Total Chromium	92.9[1]	mg/kg	50	µg/L
Copper	61	mg/kg	10[2]	µg/L
Lead	400	mg/kg	2.5[2]	µg/L
Mercury, Total	0.2	mg/kg	12	ng/L
Methylmercury	-	-	0.06	ng/L
Nickel	64.5[1]	mg/kg	52[2]	µg/L
Selenium	390	mg/kg	5	µg/L
Zinc	120	mg/kg	100	µg/L
Other Parameters				
pH	-	-	6.5-8.5	S.U.
Specific conductivity	-	-	700	µmhos/cm
Total Dissolved Solids	-	-	450	mg/L
Chloride	-	-	106	mg/L
Ammonia (NH_3 as N)	-	-	C_{CCC}[3,4]	mg-N/L
BOD	-	-	< Background[4]	mg/L
COD	-	-	< Background[4]	mg/L
Tributyltin	-	-	0.063	µg/L
Oil and Grease	-	-	5	mg/L

[1] The mean solids concentration of the sediment will not exceed the mean solids concentration of background soils from the Delta based on a statistical comparison using an approved Title 27 statistical method.

[2] Maximum concentration depends on hardness of receiving water. The number shown is based on a receiving water hardness of 100 mg/L $CaCO_3$, but will be recalculated based on receiving water hardness or reasonable worst-case value

[3] Ammonia concentrations will be calculated based on the pH and temperature of the receiving water according to the following formula from the 1999 USEPA National Recommended Ambient Water Quality Criteria for Ammonia:

$$C_{CCC} = \left\{\left(\frac{0.0577}{1+10^{7.688-pH}}\right)+\left(\frac{2.487}{1+10^{pH-7.688}}\right)\right\} \times \left\{\text{MIN}\left[2.85, 1.45\times 10^{0.028(25-T)}\right]\right\}$$

[4] Ambient background concentrations will be based on the receiving water upstream of the effluent discharge location.

Discharge Criteria Table (cont.)				
Analyte	**Maximum Concentration**			
	Solids Analysis	**Unit**	**Aqueous Analysis**	**Unit**
Organophosphorus Pesticides				
Chlorpyrifos	-	-	0.014	µg/L
Diazinon	-	-	0.05	µg/L
Dimethioate	-	-	1.0	µg/L
Malathion	-	-	0.43	µg/L
Parathion	-	-	0.013	µg/L
Phorate	-	-	0.7	µg/L
Organochlorine Pesticides				
Aldrin	0.029	mg/kg	ND (<0.005)	µg/L
Alpha BHC	0.09	mg/kg	ND (<0.01)	µg/L
Beta BHC	0.032	mg/kg	ND (<0.005)	µg/L
Gamma BHC (Lindane)	0.44	mg/kg	ND (<0.02)	µg/L
Chlordane	1.6	mg/kg	ND (<0.1)	µg/L
4,4-DDD	2.4	mg/kg	ND (<0.05)	µg/L
4,4-DDE	1.7	mg/kg	ND (<0.05)	µg/L
4,4-DDT	0.011	mg/kg	ND (<0.01)	µg/L
Dieldrin	370	mg/kg	ND (<0.01)	µg/L
Endosulfan	18	mg/kg	ND (<0.02)	µg/L
Endosulfan II	-	-	ND (<0.01)	µg/L
Endosulfan sulfate	-	-	ND (<0.05)	µg/L
Endrin	0.11	mg/kg	ND (<0.01)	µg/L
Endrin aldehyde	-	-	ND (<0.01)	µg/L
Heptachlor	0.11	mg/kg	ND (<0.01)	µg/L
Heptachlor epoxide	0.052	mg/kg	ND (<0.01)	µg/L
Hexachlorcyclopentadienne	420	mg/kg	ND (<0.01)	µg/L
Methoxychlor	8	mg/kg	ND (<0.1)	µg/L
Toxaphene	0.44	mg/kg	ND (<0.5)	µg/L

Discharge Criteria Table (cont.)				
Analyte	**Maximum Concentration**			
	Solids Analysis	**Unit**	**Aqueous Analysis**	**Unit**
Polychlorinated Biphenyls (PCB)				
Aroclor 1016	3.9	mg/kg	0.00017 (Total sum[5])	µg/L
Aroclor 1221	0.22	mg/kg		µg/L
Aroclor 1232	0.22	mg/kg		µg/L
Aroclor 1242	0.22	mg/kg		µg/L
Aroclor 1248	0.22	mg/kg		µg/L
Aroclor 1254	0.22	mg/kg		µg/L
Aroclor 1260	0.22	mg/kg		µg/L
Polyaromatic Hydrocarbons (PAH)				
Acenaphthene	3700	mg/kg	1200	µg/L
Anthracene	22000	mg/kg	9600	µg/L
Benzo(a)anthracene	0.62	mg/kg	0.0044	µg/L
Benzo(b)fluoranthene	0.62	mg/kg	0.0044	µg/L
Benzo(k)fluoranthene	0.61	mg/kg	0.0044	µg/L
Benzo(a)pyrene	0.062	mg/kg	0.0044	µg/L
Chrysene	6.1	mg/kg	0.0044	µg/L
Dibenzo(a,h)anthracene	0.062	mg/kg	0.0044	µg/L
Fluoranthene	2300	mg/kg	300	µg/L
Fluorene	2600	mg/kg	1300	µg/L
Indeno(1,2,3-cd)pyrene	0.62	mg/kg	0.0044	µg/L
Naphthalene	56	mg/kg	620	µg/L
Pyrene	2300	mg/kg	960	µg/L

[5] The sum of PCBs in the effluent will total less than 0.00017 µg/L.

SECTION D: APPROVED DREDGE MATERIAL PLACEMENT SITES

This Section includes a table of the primary historical Dredged Material Placement (DMP) sites previously used for dredged material placement that are approved for the future placement of dredged material.

Additional DMP sites or dewatering ponds for dredged slurry may be authorized for use following Executive Officer approval. In order to receive approval, the District must submit a request letter including;

1. Characterization of the background soils at the proposed DMP site;
2. Ambient concentrations of constituents of concern at the proposed DMP site;
3. Depth to groundwater;
4. Location of any sensitive features;
5. Name and location of receiving waters if effluent discharge will occur;
6. Beneficial uses of groundwater and receiving waters;
7. Relevant basin plan objectives and 303(d) impairment constituents;
8. Names and addresses of adjacent property owners; and
9. Other pertinent information as requested by Central Valley Water Board Staff.

APPROVED DREDGED MATERIAL PLACEMENT SITES

Placement Site	Location	Discharge Receiving Water Body
Rough and Ready (MO1)	San Joaquin River RM 40	San Joaquin River
Roberts Island 1	Roberts Island RM 36.5	San Joaquin River
Roberts Island 2	Roberts Island RM 34.5	San Joaquin River
Spud Island	Spud Island RM 31.5	San Joaquin River
Bradford Island	Bradford Island	San Joaquin River
Scour Pond I	Sherman Island	San Joaquin River
McCormack Pit	Sherman Island	San Joaquin River
Mandeville Island	Mandeville Island	San Joaquin River
Antioch Dunes	Antioch	San Joaquin River
Twitchell Island North	Twitchell Island	San Joaquin River
Twitchell Island South	Twitchell Island	San Joaquin River
S1	Sacramento Channel RM 43.4	Sacramento Channel
S-11	Prospect Island RM 23	Sacramento Channel
S-12	Prospect Island RM 20	Sacramento Channel
S-14 (Grand Island)	Grand Island RM 14	Steamboat Slough
S-16 (Rio Vista)	Rio Vista RM 9	Sacramento River
S-19 (Decker)	Decker Island RM 6	Sacramento River
S-20 (Augusto Pit)	Sherman Island RM 5	Sacramento River
S-31	Yolo Bypass RM 27	Sacramento Channel
S-32	Sacramento Channel RM 26	Sacramento Channel
S-35	Sacramento River RM 1	Sacramento River