

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER No. R5-2006-0078
WASTE DISCHARGE REQUIREMENTS
FOR
PORT OF STOCKTON
WEST COMPLEX DOCKS 14 AND 15 DREDGING PROJECT
ROBERTS ISLAND NO. 1 DREDGED MATERIAL DISPOSAL SITE
SAN JOAQUIN COUNTY

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

1. The Port of Stockton, hereafter referred to as Discharger, submitted a Report of Waste Discharge (RWD) on 7 April 2006, and amended on 24 May 2006, describing proposed dredging activities at the Discharger's West Complex docks (formerly Rough and Ready Island).
2. The dredging activities regulated in this Order include dredging at two West Complex docks; discharge of dredged sediments into a diked dredged material disposal site for dewatering; and final placement of the dewatered dredged material.
3. The Discharger proposes to discharge dredged material from the project to a dredged material disposal site on Roberts Island. The dredged material disposal site, Roberts's Island No.1 (RN1) is on the northern margin of Roberts Island, adjacent to the San Joaquin River. RN1 is shown on Attachment A, which is attached hereto and made part of this Order by reference. A second dredged material disposal site, Roberts Island No. 2, exists on Roberts Island, but is not covered by this Order.
4. RN1 consists of three areas referred to as A, B and C. Area A has been used as the primary disposal area for previous channel maintenance dredging and previous dock dredging. The proposed dredging project covered by this Order does not include Area A. Discharge will be restricted to Areas B and C.
5. In July 2000, the United States Navy conveyed about 1,500 acres of Rough and Ready Island through transfer and lease to the Discharger. The Discharger refers to this area as the West Complex. The Discharger plans to have a phased development of the site for maritime, industrial, commercial and other related operations over the next 20 years. In order to facilitate access by deep draft commercial vessel traffic, the Discharger proposes to dredge the sediments in front of the existing docks.
6. The West Complex is on the south shore of the San Joaquin River (Assessor's Parcel No. 145-02-04) in Section 1, T2N, R5E, MDB&M, at Embarcadero Avenue, in San

Joaquin County. The West Complex is bounded on all sides by water. Burns Cutoff runs along the south and west boundary; the San Joaquin River runs along the east and north. The Stockton Deep Water Ship Channel (DWSC), where the dredging operations will occur, is on the north side of the West Complex. The West Complex is situated between River Mile 37 and River Mile 40 of the DWSC. (Attachment A)

7. Dredging activities are proposed for two docks at the east end of the dock complex, Dock #14 and Dock #15. Dredging is proposed for a distance of 125 feet outward from the two docks to the intersection of the DWSC. The proposed dredging will begin at latitude 37°57'14.1" N, longitude 121°20'49.9" W and end at latitude 37°57'20.7" N, longitude 121°21'11.0" W.
8. In January 2002, the Discharger conducted a bathymetric survey of the project area. The survey found that sediments are deposited near docks 14 and 15 at a depth of approximately 20 feet below mean low, low water (MLLW). The bottom of the DWSC is approximately 35 feet below MLLW. The proposed project will deepen the river bottom, adjacent to the docks, to a new depth of 36 feet below MLLW (35 feet of dredge depth plus one foot for overdredge), which is approximately the same elevation as the DWSC.
9. Based on the bathymetric survey, the Discharger estimates the total volume of sediment, in situ, to be removed to be less than 130,000 cubic yards (80.6 acre-feet). The RWD estimates that the total slurry volume (solids and entrained water) generated by the project will be less than 653 acre-feet.
10. The slurry will be transported 6,000 to 8,000 feet via HDPE pipeline and discharged to Areas B and C of RN1 (Assessor's Parcel No. 131-23-02).
11. On 4 June 2002, the Discharger completed a magnetometer sweep of the project area in order to locate significant submerged or buried metallic objects. In November 2005, the Discharger conducted an additional survey using geophysical subsurface and side scan sonar techniques. These surveys identified widespread submerged metallic and other debris, with clear indications that objects of significant size and mass lay adjacent to the docks. Metallic anomalies buried in the sediment near the docks are believed to be associated with past U.S. Navy activity.
12. In order to facilitate hydraulic dredging, the metallic and other objects must be removed. The Discharger may use divers to assist in the identification of the magnetic anomalies. Large objects will be removed from the river bottom using a hydraulic dredge and crane. Sediment and any waste constituents that are associated with the submerged objects may be re-suspended in the water column as the objects are lifted from the river bottom, depending on the physical characteristics of the sediment (grain size, compaction) and characteristics of the water body (depth, amount of flow, tidal

influences, existing water quality). Monitoring surface water conditions during the removal of metal debris is appropriate.

DESCRIPTION OF DREDGING OPERATIONS

13. The excavation, transport and placement of dredged sediments are the primary components of the dredging process. Sediment and the associated constituents can be suspended or dissolved in nearby waters if entrainment of the dislodged sediments is incomplete.
14. The dredging operation may cause some temporary degradation to surface waters as turbidity and total suspended solids increase as bottom sediments are disturbed. In order to determine if the dredging activities are impacting the river, surface water monitoring during dredging operations is appropriate.
15. Dredging will be accomplished with a hydraulic dredge, which is equipped with a rotating cutter head to dislodge sediment along the bottom of the channel. The dislodged sediment, along with the surrounding water, will be drawn into an 18-inch diameter pipeline by suction via the hydraulic pump.
16. The Discharger estimates that the total project duration for the dredging of docks 14 and 15 will range between 26 and 53 days, depending upon the number of hours per day in which dredging operations are conducted. The Discharger estimates an additional four days may be required for debris removal at the project site.
17. The Discharger has calculated that the percentage of sediment/elutriate lost to resuspension as a result of contact with the dredge's cutter head to be 0.12 to 0.78 percent.
18. The Discharger calculates the contribution of suspended solids 30 meters downstream of the dredging operation to be about 1.9 mg/L. The Discharger has reported that the average background concentration of suspended solids for this reach of the river is 24 mg/L. This increase in suspended solids is estimated to increase turbidity from 19 to 20.9 Nephelometric Turbidity Units (NTU).
19. The Discharger conducted a chemical oxygen demand test (COD), subsequent to a standard elutriate test, on sediment samples collected from the project area. Although there is uncertainty in the use of the elutriate COD test for predicting the actual oxygen depletion in the surface water, the results may be used to provide a conservative indication of potential impacts.

20. The COD for the Dock 15 elutriate samples was reported as 95 mg/L in the upper portion of the sediment (old horizon), 67 mg/L in the middle portion of the sediment (composite horizon), and 63 mg/L in the bottom sediment (new horizon).
21. Based on the Discharger's estimate of the highest elutriate emission rate of 0.78 percent, the COD concentration released to the water column may range from 0.74 mg/L for the old sediment, to 0.5 mg/L for the composite and new sediment layers.
22. In order to mitigate potential DO impacts from the dredging operation, the Discharger will operate a portable aeration device as close as possible, to the dredge without compromising safety. The aeration device will be capable of delivering approximately 500 pounds of oxygen per day to the water column.
23. On 19 July 2005 the National Marine Fisheries Service (NMFS) issued a non-jeopardy Biological Opinion with terms and conditions for the proposed project. On 7 July 2006 a revised Biological Opinion was issued, which superceded the previous version. The revised Biological Opinion was issued as a result of the recent listing of the North American Green sturgeon on 7 April 2006. The revised Biological Opinion contained no additional terms and conditions for the proposed project.
24. The NMFS Biological Opinion reports that in general the Delta is an impaired water body having elevated levels of pesticides and other pollutants. In addition, DO levels recorded at Rough and Ready Island have shown regular occurrence of low DO events in the DWSC. Although DO depressions have occurred in all months in which migratory fish are present, the most significant events have occurred from November through March, when Central Valley steelhead are present. Levels of DO below 5.0 mg/l have been reported to delay or block fall-run Chinook salmon. Factors identified in the Biological Opinion for DO impairment include reduced river flows in the San Joaquin River at Stockton, ammonia released from the City of Stockton's upstream Wastewater Treatment Plant, upstream contributions of organic material, and increased volume of the dredged ship channel.
25. The U.S Department of the Interior Fish and Wildlife Service approved *Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes*, November 1996, recommends restricting dredging operations to a time period, window, between September 1 through November 31 each year when Chinook salmon and Central Valley steelhead are absent from the river. On 9 January 2004, the U.S. Fish and Wildlife Service issued a letter of concurrence for the proposed project, with in-water work windows between June 1 and December 30. In addition, NMFS issued a Biological Opinion, which restricts in-water work between June 1 and December 31. Dredging is a potential source of habitat destruction, mobilization of contaminated sediment and general disturbance to native

fish species. Restricting dredging operations to seasonal time frame “windows” set forth by the appropriate resource agencies to minimize the effects to critical life-stages of these endangered species is appropriate.

ROBERTS ISLAND DREDGED MATERIAL DISPOSAL SITE

26. RN1 consists of three distinct dredge disposal areas. Area A, the easternmost area, is approximately 46 acres and has historically served as the primary sediment receiving area for RN1. Area A is not authorized for use under this Order. Areas B and C occupy the central and westernmost sections of RN1. Together Areas B and C comprise about 138 acres. This Order allows discharge of dredged slurry to Areas B and C. This Order does not allow sediment or water to be delivered to Area A. (See Attachment B.)
27. The above ground capacity for RN1 Areas B and C has been calculated from a topographic survey to be 364 acre-feet. This volume excludes 2 feet of freeboard below the height of the lowest berm. Based on the berm elevations, less two feet of freeboard, the Discharger indicates that Areas B and C have sufficient capacity for the estimated 80.6 acre-feet of dredged sediment to be generated by the project. The total volume of above-ground storage at Areas B and C is not sufficient to accommodate the total volume of slurry expected to be generated, however, the Discharger believes that there will be adequate evaporation and percolation at the site to accommodate the additional volume of slurry water. This Order requires a minimum of 2 feet of freeboard, and once that level is reached, the Discharger must stop dredging. The freeboard requirement of two feet, is adequate to protect against overtopping of the berms, due to wave action.
28. This Order prohibits increasing the capacity at RN1 Areas B and C. This does not preclude the Port from performing necessary maintenance on the berms and/or reusing material from the site, in accordance with the conditions of the applicable waste discharge requirements.
29. RN1 has received dredged material from maintenance dredging of the San Joaquin DWSC as specified in General WDR Orders Numbers R5-01-115, R5 2003 0145 and R5-2004-0061. In 2001, 2003 and 2005 the U.S. Army Corps of Engineers (Corps) discharged approximately 65,000, 120,000 and 126,000 cubic yards of solid dredged material, respectively, to this site from maintenance dredging of the DWSC.
30. The Discharger has installed a network of groundwater monitoring wells in and around RN1 and has installed additional wells to monitor groundwater along a hydraulic gradient towards the center of the island. Groundwater monitoring data from these 27

wells have been provided to the Regional Board in quarterly monitoring reports as specified in the Monitoring and Reporting Program No. R5-2005-0286.

31. Borings through the dredged sediment at RN1 indicate sandy material ranging from about 7 to 12 feet thick. These sandy dredged sediments are underlain by a relatively thin layer of silt and/or clay, which represent either the finer grained sediments or the upper portion of the underlying peat layer. In most locations, the underlying peat layer is about three feet thick. A layer of clay and/or silt with little or no sand, ranging to 13 feet thick, lies directly under the peat layer. Beneath this layer, a layer of sand or silty sand is consistently encountered.
32. The dredged slurry placed at RN1, Areas B and C will be retained on site for dewatering through evaporation/percolation. The sediment will be removed and reused prior to 31 October 2007, the estimated start of the 2007 rainy season. To prevent potential groundwater impacts at the reuse sites, final placement will be confined to locations and conditions that are protective of water quality. Placement and reuse of the dredged sediment will be restricted to sites beneath engineered covers such as buildings, foundations, slabs, parking lots or roadways; and at least two feet above any groundwater bearing zone.
33. Although no instability of the berms surrounding RN1 is anticipated, periodic inspection of the containment berms is necessary to detect and minimize the potential for failure. In addition, berms can fail from a lack of maintenance or overtopping due to wave action. Requirements that a minimum freeboard level of two feet be maintained to prevent overtopping, and that the Discharger implement an Operation and Maintenance Plan for RN1 are appropriate.

CHARACTERISTICS OF DREDGED MATERIALS

34. The Discharger has submitted a pre-dredge sediment analysis of chemical constituents extracted from dredged sediments using the Waste Extraction Test (WET) with de-ionized water (DIWET). The DIWET data are used to predict the potential characteristics of leachate from dredged materials that are discharged to RN1. Questions have been raised about the appropriateness of using the DIWET for evaluating leachate characteristics at the Roberts Island disposal site since some material previously placed at the site has been found to be acidic. Metal constituents are usually more soluble in acidic conditions. Constituent concentrations measured in the DIWET have not always been shown to be representative of actual concentrations found in subsequent groundwater monitoring. Based on past experience at this site, we have found that the use of DIWET may overestimate the threat to water quality posed by the leachate.

35. DIWET analysis found that all constituents measured, except for arsenic and lead, were below the applicable water quality objectives. Arsenic and lead were both found to be above the Public Health Goals (PHG).
36. Arsenic levels of 4.4 µg/L and 4.8 µg/L (average 4.6 µg/L) measured with the DIWET analysis were above the PHG of 0.004 µg/L
37. Arsenic is naturally occurring in San Joaquin County groundwater. Data from the US Environmental Protection Agency (USEPA) indicate that the DIWET levels for arsenic are below background levels for arsenic found in San Joaquin County. USEPA data from San Joaquin County public water systems collected from 1980 to 1998 indicate average concentrations of arsenic of 8.95 µg/L.
38. Lead levels of 4.7 µg/L and 6.8 µg/L (average 5.8 µg/L) measured with the DIWET analysis were above the PHG of 2.0 µg/L.
39. Soluble constituents from the dredged material have the potential to migrate downwards towards the underlying groundwater. As the leachate migrates through the soil towards the groundwater, a degree of attenuation will occur based on environmental fate processes that include adsorption to clay and organic matter, chemical bonding of metals to soil particles, and filtration of suspended matter by fine textured soil particles. The degree of expected attenuation is dependent on soil characteristics specific to individual sites. An analysis conducted by Geomatrix Consultants Inc. of 16 soil samples taken in RN1 in October 2003, indicates relatively high soil cation exchange capacities (CEC) ranging from 8.3 to 32.3 meq/100 g soil.
40. Previous placements of dredged material at RN1 by the Corps between 2003 and 2005 have had DIWET levels for lead ranging from 1.9 µg/L to 93.0 µg/L (average 27.7 µg/L). Subsequent groundwater monitoring has not shown lead concentrations above water quality objectives. Based on the CEC at this site and data from material with higher levels of DIWET lead previously placed at this site, lead concentrations are not expected to impact groundwater.
41. Although DIWET testing of the material to be dredged suggests levels of lead and arsenic above water quality objectives, the dredged material is not expected to impact water quality when placed in locations authorized by this Order. Therefore, this dredged material is classified as an inert waste.
42. In order to provide an additional factor of safety to the conclusions of previous findings concerning the potential threat from lead and arsenic, this Order requires removal of dredged solids by 31 October 2007.

43. To verify groundwater protection, the Discharger is required to continue groundwater monitoring in accordance with the requirements of the Monitoring and Reporting Program.

BASIN PLAN, BENEFICIAL USES, AND REGULATORY CONSIDERATIONS

44. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Resources Control Board (State Board). These requirements implement the Basin Plan.
45. In January 2005, the Central Valley Water Board adopted Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel (DO Control Program). In November 2005, the State Water Board approved the DO Control Program with minor modifications. The DO Control Program identifies the Stockton Deep Water Ship Channel (DWSC) geometry as a major contributor to the DO impairment and recommended to the Corps that it should reduce the associated impact. The DO Control Program also requires that a report be submitted by the Corps evaluating the impact of the DWSC on the DO impairment and outlines regulatory actions that can be taken by the Water Board to address the existing or any future modifications to the DWSC geometry that may be proposed.
46. The beneficial uses of the Sacramento-San Joaquin Delta are municipal supply; domestic supply; agricultural irrigation; process; service supply; water contact recreation; non-contact water recreation; warm fresh water habitat; cold fresh water habitat; warm water migration; cold water migration; warm water spawning; wildlife habitat; and navigation.
47. Designated beneficial uses of groundwater are municipal and domestic supply, industrial service and process supplies, and agricultural supply.
48. The Basin Plan states, "...*We will adopt requirements for all significant dredging operations and upland disposal projects in the Region.*" The dredging and subsequent upland disposal of dredged material from this project is considered to be a significant dredging operation within the Central Valley Region.
49. Section 13267(b) of the California Water Code provides that: "*In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or*

discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”

50. USEPA adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters (SIP), Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan), which contains guidance on implementation of the *National Toxics Rule* and the *California Toxics Rule*. The Basin Plan contains the “Policy for Application of Water Quality Objectives” that requires consideration of published standards of other agencies in implementing narrative water quality objectives. The CTR and NTR standards may be incorporated in waste discharge requirements where appropriate to implement the Basin Plans consistent with the Policy for Application of Water Quality Objectives.
51. The Basin Plan numerical and narrative water quality objectives for surface and groundwater within the basin are achieved primarily through the adoption of waste discharge requirements. Narrative water quality objectives are implemented consistent with the Policy for Application of Water Quality Objectives contained in the Basin Plan by establishing numerical limitations based on, among other factors, published standards.
52. The Basin Plan contains narrative water quality objectives for chemical constituents, taste and odor, and toxicity. The narrative toxicity objective requires that surface waters and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in plants or animals. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect beneficial uses.
53. Water Code Section 13263 (a) requires: “*The regional board, after any necessary hearing shall prescribe requirements as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge, except discharges into a community sewer system, with relation to the conditions existing in the disposal area to receiving waters upon, or into which, the discharge is made or proposed. The requirements shall implement any relevant water quality control plans that have been*

adopted, and shall take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other discharges, the need to prevent nuisance, and the provisions of Section 13241.” This Order complies with Water Code Section 13263 (a).

54. State Board Resolution No. 68-16 (“Statement of Policy with Respect to Maintaining High Quality Waters in California”) requires that the Regional Board, in regulating the discharge of waste, must maintain high quality waters of the state until it is demonstrated that any change in quality will be consistent with the maximum benefit to the people of the State; will not unreasonably affect beneficial uses; and will not result in water quality less than that described in the Regional Board’s policies. Any activity that produces a waste or increased volume or concentration of waste, and which discharges or proposes to discharge to existing high quality waters, shall be required to meet waste discharge requirements which will result in best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur, and that the highest water quality consistent with the maximum benefit to the people of the state will be maintained.
55. The discharges authorized by this Order are consistent with State Board Resolution No. 68-16 and 40 CFR 131.12 (the federal anti-degradation policy). With respect to surface waters, this Order may result in minor changes in water quality, therefore, this Order imposes requirements that will result in best practicable treatment or control necessary to assure that pollution and nuisance will not occur and that water quality objectives in the Basin Plan will be met. This Order prohibits the discharge of waste to surface water. The prohibition includes discharge of waste to agricultural drains. With respect to groundwater, this Order establishes requirements that will result in best practicable treatment or control of the discharge to assure that pollution or nuisance will not occur, and that the discharges will not unreasonably affect beneficial uses or result in water quality less than prescribed in the Basin Plans. The groundwater limits prescribed herein are intended to ensure that the assimilative capacity of the underlying soils at the dredge disposal site will not be exceeded. In addition, the Discharger must conduct soil and groundwater monitoring. If the discharge violates the groundwater limits, then the Discharger may be required to cease the discharge, line the ponds, implement source control, change the method of disposal, or take other action to prevent groundwater degradation. This Order is consistent with the maximum benefit to the people of the State because it requires compliance with water quality objectives and allows for navigation, which is a designated beneficial use of the San Joaquin River.
56. CWC Section 13260 states that each Discharger covered under WDRs shall submit an annual fee. The filing fee accompanying the RWD is the first year’s annual fee. The annual fee is based on the threat and complexity of the discharge (Title 23, California

Code of Regulations, Section 2200). The threat and complexity of the proposed discharge has been determined to be “3C”.

57. The California Department of Water Resources set standards for the construction and destruction of groundwater wells, as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and any more stringent standards adopted by the State or county pursuant to CWC section 13801, apply to all monitoring wells.
58. State regulations that prescribe procedures for detecting and characterizing the impact of waste constituents from waste management units on groundwater are found in Title 27, California Code of Regulations (CCR), Section 20005 et seq. (hereafter Title 27). Because RN1 is a waste management unit, the data analysis methods of Title 27 is appropriate for determining whether the discharge complies with the terms for protection of groundwater specified in this Order.
59. The discharge authorized herein and the treatment and storage facilities associated with the discharge are exempt from the liner requirements of Title 27 CCR. The exemption, pursuant to Title 27 CCR Section 20090(b), is based on the following:
 - a. Issuance of waste discharge requirements;
 - b. The consistency of the waste discharge requirements with the Basin Plan;
 - c. No necessity to manage wastewater according to Title 22, CCR, Division 4.5, and Chapter 11, as a hazardous waste; and
 - d. Slurry water from hydraulic dredging receives treatment in the confined disposal facility.
60. Pursuant to CWC Section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.
61. This Order does not preempt or supersede the authority of municipalities, flood control agencies, and other local agencies to prohibit, restrict, or control discharges of waste subject to their jurisdiction, but such regulation by other entities may not be less stringent than this Order.
62. On 23 June 2004, in accordance with the California Environmental Quality Act (CEQA) (PRC, Section 21000, et seq.), the Port of Stockton adopted an Environmental Impact Report (EIR) for the West Complex project. The project component, involving dredging of the river bottom adjacent to the West Complex docks to an elevation of 36 MLLW to allow for increased navigation activities at the West Complex, was specifically addressed in the EIR. The Regional Water Board, as a responsible agency, has considered the EIR prepared by the Port of Stockton as required by 14 California Code of Regulations section 15096. The Regional Water Board has included

mitigation measures and requirements described in the EIR, in this Order to address significant environmental impacts that are within the jurisdiction of the Regional Board.

The EIR identifies a single significant impact on water quality. This impact is identified as “Long-term, far-field reduction of dissolved oxygen in the San Joaquin River” and is classified as a cumulative significant impact, before mitigation. The EIR identifies the following mitigation as required to reduce the impacts on dissolved oxygen to be less than significant: “The Port shall take ownership and operational responsibility of the aeration device currently owned and operated by the USACOE [Corps]. The USACOE [Corps] jet aerator was originally installed to mitigate for deepening of the DWSC from –30 to –35 feet. The aeration facility was constructed in 1993 and has been operated, as conditions have warranted, since then. The USACOE [Corps] agreed to provide aeration that would maintain a 0.2 mg/l DO increment above background conditions, whenever at any station measured by the City of Stockton dropped below 5.2 mg/l during September 1 through November. Consequently, the USACOE [Corps] requirement depends on the San Joaquin river stream flow and existing background DO levels.”

The mitigation for dissolved oxygen, identified in the EIR, is required by this Order. Consistent with 14 CCR section 15096, the Order includes additional measures beyond those identified in the EIR to address DO, including requiring compliance with the applicable water quality objective in the receiving water for DO contained in the Basin Plan. The Order requires that the Port provide additional oxygen to mitigate for increased channel geometry as a result of dredging and operate an additional aeration device to address dissolved oxygen impacts while dredging operations are underway. The requirements to address dissolved oxygen are specified in the Aeration Requirement, Attachment C.

SITE-SPECIFIC FACTORS

63. The Delta waterways near Stockton are listed pursuant to Clean Water Act (CWA) section 303(d) as impaired for chlorpyrifos, DDT, diazinon, Group A pesticides, pathogens, mercury, and unknown toxicity. Low dissolved oxygen also causes impairment in the Stockton DWSC.
64. During dredging, sediment can be suspended in the water column if entrainment of the dislodged sediments is incomplete. The exposure of buried anaerobic sediments, ferrous iron and sulfide species to the water column can create an oxygen demand in the river. Therefore, the project may temporarily exacerbate the existing low dissolved oxygen impairment in this CWA 303(d) listed water body.

65. The Discharger will incrementally increase the volume of the DWSC by the proposed dredging. The increase in volume may, in turn, increase the hydraulic residence time, which may allow more time for biochemical oxygen demand to be expressed. In addition, the activities associated with the West Complex may contribute to an increase in the amount of oxygen demanding substances discharged to the river.
66. As part of the mitigation measures specified in the EIR, the Discharger agreed to assume the operation and maintenance of the Corps' jet aeration device to provide mitigation for existing port operations and current channel conditions. In addition, the Discharger proposes to provide additional mitigation for possible effects of the proposed project dredging. The Aeration Requirements, detailed in Attachment C, provides specific mitigation for current port operations and conditions, as well as for possible effects of increased channel geometry due to project dredging.
67. Dredging operations may also produce an oxygen demand in the vicinity of the dredging operation. In order to mitigate for the potential reduction in DO concentrations related to the actual dredging operation, the Aeration Requirements (Attachment C) specifies that the Discharger will operate a localized oxygen diffuser near the dredging operation at all times while dredging is occurring.
68. The dissolved oxygen objective in the Basin Plan is, "...6.0 mg/L in the San Joaquin River (between Turner Cut and Stockton, 1 September through 30 November; and 5.0 mg/L in all other Delta waters..." All in-water construction activities must comply with the dissolved oxygen requirements. If the ambient DO in the river should fall below the water quality objective, then suspending dredging activity until the DO rises above the objective is appropriate to protect the beneficial uses of the river.
69. Whole sediment toxicity testing of the new sediment horizon at docks 14 and 15 did not indicate a toxic response for *Chironimus tentans* and *Hyaellla azteca*. Although no toxicity was observed in the pre-dredge sediment analysis, in order to ensure that the new horizon sediment is non-toxic, additional sediment sampling for toxicity testing, immediately after dredging operations are completed, is appropriate.
70. If whole sediment toxicity is found in the new horizon, this Order requires the Discharger to undertake appropriate actions to mitigate this toxicity, and retest sediment after each mitigation until no further toxicity is observed.

PUBLIC NOTICE

71. All the above and the supplemental information and details in the attached Information Sheet, incorporated by reference herein, were considered in establishing the following conditions of discharge.

72. Interested agencies and persons were notified of the intent to prescribe an Order for this discharge and provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
73. In a public meeting, all comments pertaining to the discharges were heard and considered.

IT IS HEREBY ORDERED that the Port of Stockton, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. The discharge from dredging operations, including material disturbed by the cutter head during dredging, shall not cause or contribute to acute toxicity in the receiving waters.
2. Except for activities permitted by the U.S Army Corps of Engineers under Section 10 of the Rivers and Harbors Act and Section 404 of the CWA, soil, silt, or other organic material shall not be placed where such material could pass into surface water or surface water drainage courses.
3. The discharge of effluent, including bypass or overflow of untreated or partially treated waste from RN1 Areas B and C to surface waters and surface water drainage courses, including agricultural drains, is prohibited.
4. Discharge of waste classified either as 'hazardous,' defined in Section 20164 of Title 27, CCR, or 'designated,' as defined in Section 13173 of the California Water Code, is prohibited.
5. The discharge of petroleum products to surface waters is prohibited.
6. Activities shall not cause visible oil, grease, or foam in the work area or downstream.
7. Dredging operations shall not cause the ambient pH to fall below 6.5, exceed 8.5, or the 30-day average to change by more than 0.5 units.
8. Activities shall not cause turbidity increases in surface waters, at the point of compliance 100 feet downstream of the dredging operation, according to the following:

- (a) where natural turbidity is between 0 and 5 NTUs, increases shall not exceed 1 NTU;
 - (b) where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
 - (c) where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs;
 - (d) where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.
9. Dredging operations shall not cause ammonia to exceed the Criteria Maximum Concentration in Attachment D.
 10. Dredging operations shall not cause copper to exceed the Criteria Maximum Concentration in Attachment E.
 11. Dredging operations shall not cause arsenic concentrations to exceed the Basin Plan's chemical constituent objective for arsenic of 10 µg/L in the Sacramento-San Joaquin Delta.
 12. Dredging operations shall not cause barium concentrations to exceed the Basin Plan's chemical constituent objective for barium of 100 µg/L in the Sacramento-San Joaquin Delta.
 13. Dredging operations shall not cause mercury concentrations to exceed the CTR limit for mercury of 0.05 µg/L.
 14. Dredging operations shall not cause lead concentrations to exceed the Public Health Goal of 2.0 µg/L.
 15. Dredging operations shall not cause the ambient temperature to increase more than 5°F.
 16. Dredging operations shall not cause aquatic communities and populations, including vertebrate, invertebrate, and plant species, outside the dredge area to be degraded.
 17. Dredging operations shall not cause toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health

18. Dredging operations shall not cause total identifiable persistent chlorinated hydrocarbon pesticides to be present at concentrations detectable within the accuracy of analytical methods approved by either the USEPA or the Executive Officer.
19. Dredging operations shall be confined to the project area described in Finding No. 7. The maximum depth of dredging shall not exceed a depth of 36 feet below mean low, low water.
20. The discharge of domestic wastewater is prohibited.
21. The discharge of dredged materials other than to RN1 Areas B and C is prohibited.
22. Increasing capacity at the DMD site is prohibited.
23. Dredging operations, including debris removal are prohibited anytime the turbidity requirement specified in Discharge Prohibition A.8 is exceeded.

B. Discharge Specifications:

1. The total amount of dredged solids discharged to RN1 Areas B and C shall not exceed **130,000** cubic yards (80.6 acre-feet).
2. Neither the treatment, nor the discharge, shall cause a nuisance or condition of pollution as defined by the California Water Code, Section 13050.
3. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Objectives.
4. Objectionable odors originating at this facility disposal site shall not be perceivable beyond the limits of the property owned by the Discharger.
5. The dissolved oxygen content in the upper zone (1 foot) of all wastewater in the ponds shall not be less than 1.0 mg/L.
6. The Discharger shall maintain two feet of freeboard in RN1 Areas B and C at all times. Freeboard shall be measured vertically to the lowest point of overflow for all ponds.

7. RN1 Areas B and C shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
8. Newly constructed or rehabilitated levees at the confined disposal facility shall be designed and constructed under the direct supervision of the appropriate California Registered Professional.
9. The Discharger shall diffuse 2,500 pounds of oxygen per day, as specified in Attachment C.
10. In order to mitigate potential DO impacts from the dredging operation, the Discharger will operate a portable aeration device as close as possible to the dredge without compromising safety. The Discharger will operate the aerator so as to diffuse oxygen at a minimum rate of 500 pounds per 24 hrs while dredging operations are underway. This aeration shall be in addition to the 2,500 pounds per day of oxygen required in Discharge Specification B.9.
11. During the removal of large objects from the river bottom using a hydraulic dredge and crane, the crane will be operated with gentle, discrete movements to minimize disturbance of sediments while removing debris. As appropriate, the hydraulic dredge will remove water and/or sediment from the immediate vicinity of the object in order to reduce suspension of sediment.
12. Discharger shall comply with all Department of Fish and Game 1600 requirements for the project as required.
13. At any time from 1 December to August 31 when the ambient dissolved oxygen concentration within the impaired reach of the San Joaquin River is less than 5.2 mg/l, or at any other time when the ambient dissolved oxygen concentration is less than 6.2 mg/l, the Discharger shall provide additional aeration during all dredging and/or debris removal operations in the project area, as specified below.
 - The discharger shall diffuse additional oxygen in to the water column at a rate of 1,000 lbs/day during all dredging activities.
 - The discharger shall diffuse additional oxygen into the water column at a rate of 2,000 lbs/day during all activities involving the removal of buried or partially buried debris from the sediment at the project area.
 - The amounts of additional dissolved oxygen aeration specified here is in addition to the 500 lbs/day of aeration required in Discharge Specification B.10, which is required at all times during any dredging and debris removing operations.

C. Groundwater Limitation:

Release of waste constituents from RN1 Areas B and C shall not, in combination with other sources cause the following in groundwater:

1. Adversely impact beneficial uses or exceed water quality objectives.
2. The discharge, in combination with other site-derived sources, shall not cause underlying groundwater to contain waste constituents statistically greater than background water quality.

D. RN1 Site-Soil Limitation and Reuse Specification

The dredged sediment shall be removed for authorized reuse no later than 31 October 2007. Placement and reuse of the dredged sediment will be restricted to use as foundation material beneath engineered covers such as buildings, foundation slabs, parking lots or roadways; and at least two feet above any significant groundwater bearing zone.

No later than 30 days prior to reuse, the Discharger shall submit a detailed plan for the proposed reuse, which shall include specifications of cover, location, elevations and sediment volumes. Reuse may not occur until approval is granted by the Executive Officer. The Discharger shall notify all parties reusing material of the characteristics of that material, and that reuse must comply with all requirements of this Order. Following reuse, the Discharger shall submit, along with engineering specifications of cover, a report documenting the locations, elevations and volumes of sediment reused.

E. Provisions

All of the following reports shall be submitted pursuant to California Water Code Section 13267 and shall be prepared by registered professionals as described by Provision No. E. 8:

1. Prior to discharging waste to RN1 Areas B and C, the Discharger shall develop and implement an Operations Plan that describes site operations and procedures to be followed before, during, and after dredging sediment placement including storm water management and dust control. The Operations Plan must be submitted for Executive Officer approval and shall include emergency procedures for potential risks, including levee failures and overflow events.
2. Prior to discharging waste to RN1 Areas B and C, the Discharger shall develop and implement an Emergency Spill/Operation Plan (ESOP) that describes

dredging operations and procedures to be followed when removing debris from the river bottom. The ESOP must be submitted for approval by the Executive Officer prior to debris removal and shall include emergency procedures for potential risks associated with debris removal, including spills of petroleum or other wastes from the identified magnetic anomalies. The ESOP shall also specify all necessary materials, staffing, and equipment required to implement the Plan.

3. The Discharger shall continue to submit a *Quarterly Groundwater Monitoring Report for RNI*. For each groundwater monitoring parameter/constituent identified in the MRP, the report shall present a summary of monitoring data, as specified in the MRP.

If any established background concentrations have been exceeded, then a specific plan for source control and a corrective action program and time schedule to assure compliance with the Discharge Specifications and Groundwater Limitations of this Order shall also be included.

4. If sediment toxicity monitoring, as described in the MRP, finds that the new river bottom sediment contains toxic areas or if the Executive Officer determines that the sediment is a threat to water quality, then within **90 days** following notification of a toxic sediment condition, the Discharger must submit a Sediment Toxicity Assessment/Remediation Workplan for the Executive Officer's approval.

The workplan shall determine the responsible toxicant(s) in the sediment, characterize the extent of contamination in the new river bottom sediments, and describe in detail remedial corrective action(s) such that under environmental conditions the exposed sediment layer does not pose a threat to water quality. The workplan must contain a detailed time schedule to assure compliance with the Discharge Prohibitions and Receiving Water Limitations of this Order. The schedule must include proposed dates for each major step of the process (e.g., hiring an engineer, completing preliminary plans, completing final plans, executing contracts for major components, complying with CEQA, commencing construction, completing construction, etc.).

The Discharger shall provide notification of the availability of the Sediment Toxicity Assessment/Remediation Workplan for all parties who have expressed an interest in writing.

5. The Discharger shall comply with the Aeration Requirement, Attachment C, which specifies the rate of oxygen that the Discharger must diffuse into the water column of the San Joaquin River on a daily basis. Failure to diffuse the prescribed rates of oxygen is a violation of this Order.

6. Within 90 days after adoption of the WDRs, the Port shall submit a report describing the aeration system and how it will comply with the aeration requirements in Attachment C of the WDRs. The report shall include, but not be limited to:
 - description and layout of the aeration equipment to be used
 - operations plan, including how ambient DO concentrations will be monitored for the purpose of triggering operation of the aerators.
 - results of in-water performance testing to determine actual oxygen quantities dissolved into the water column
 - based on performance testing data provide estimates of oxygen outputs under reasonable worst-case ambient and saturated DO conditions.
 - corrective measures and plans for retesting if equipment fails to meet requirements

The content and format of the report shall be coordinated beforehand with Water Board staff.

7. Within a year after adoption of the WDRs, the discharger shall perform a detailed follow-up evaluation of the amount of oxygen being dissolved into the water column by the aeration system. The content and format of this report is to be coordinated beforehand with Water Board staff. If the aeration system is meeting its design inputs, the need for future performance evaluation may be evaluated, but no more frequently than annually. If the aeration system is not meeting requirements, the Discharger will be required to describe corrective measures and plans for retesting.
8. Quarterly (September to November, December to February, March to May, June to August) beginning after approval of an acceptable aeration system by the Executive Officer, the Discharger will submit a report summarizing the operation of the aeration system. These reports must include a summary of the ambient dissolved oxygen data used during the quarter to determine operation of the aeration devices and other relevant data, and information on subsequent operation, including run-times and calculation of associated oxygen inputs. If changes to the aeration system are made during the quarter, a description of those changes must be provided in the next quarterly report. If changes to the aeration system are significant, retesting of the system effectiveness may be required. The content and format of these reports shall be coordinated beforehand with Water Board staff.
9. Pursuant to Section 13267 of the California Water Code, the Discharger may be required to submit other technical reports as directed by the Executive Officer.

10. The Discharger shall comply with the attached Monitoring and Reporting Program No. R5-2006-0078, which is part of this Order, and any revision thereto as ordered by the Executive Officer.
11. In accordance with California Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall contain a statement of qualifications of the responsible licensed professional(s) as well as the professional's signature and/or stamp of the seal.
12. By 15 December 2007, the Discharger shall submit, along with engineering specifications of cover, a report documenting the locations, elevations and volumes of sediment reused.
13. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are by reference a part of this Order. This document and its individual paragraphs are commonly referenced as "Standard Provision(s)."
14. The Discharger shall notify the Regional Board within 24 hours by telephone whenever a violation or an adverse condition occurs as a result of the dredging or disposal operations. Written confirmation shall follow within two (2) weeks and shall describe the nature, time and cause of such non-compliance, along with a report of corrective actions and a timetable for their implementation. An "adverse condition" is defined as any action or incident that may result in a risk to public health and safety, condition of nuisance, violation of water quality standards or violation of condition or prohibition of this Order.
15. The Discharger shall not alternate any material or change the character, location, or volume of the discharge as described in the RWD.
16. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action, or imposing civil monetary liability, or in revision or rescission of this Order. The Regional Board considers the Discharger

to have continuing responsibility for correcting any problems which may arise in the future as a result of the dredging activities and of the subsequent use of RN1.

17. This Order does not relieve the Discharger from the responsibility to obtain other necessary local, State, and Federal permits to construct facilities necessary for compliance with this Order, nor does this Order prevent imposition of additional standards, requirements, or conditions by any other regulatory agency.
18. A copy of this Order shall be kept as a reference for personnel operating the dredge or conducting operations related to this project at RN1 Areas B and C. Key operating personnel shall be familiar with the contents of the Order.
19. Standing water remaining in RN1 for over 72 hours shall be managed to prevent the breeding of mosquitoes. The Discharger shall coordinate and cooperate with the local mosquito and vector control district to ensure adequate management practices.
20. Prior to dredging, the Discharger shall submit a report describing the aeration system and an operations plan for compliance with the near-field short-term dissolved oxygen mitigation required during dredging activities, as specified in Discharge Specifications B.9 and B.13. The report shall include, but not be limited to:
 - a description and layout of the aeration equipment to be used
 - an operations plan, describing how ambient DO concentrations will be monitored for the purpose of triggering operation of the aerators
 - corrective measures and plans for retesting if equipment fails to meet requirements

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region on 4 August 2006.

PAMELA C. CREEDON, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2006-0078
FOR
PORT OF STOCKTON
WEST COMPLEX DOCKS 14 AND 15 DREDGING PROJECT
ROBERTS ISLAND NO. 1 DREDGED MATERIAL DISPOSAL SITE
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) includes requirements for monitoring the dredging operations, RN1 facility, dredged materials, hydrology, agricultural reclamation ditch, and San Joaquin River newly exposed sediment. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless, and until, a revised MRP is issued by the Executive Officer. Regional Board staff shall approve specific sample station locations prior to implementation of sampling activities.

All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

Field test instruments (such as those used to test pH, turbidity and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are calibrated prior to each monitoring event;
3. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of this MRP.

DREDGING OPERATION MONITORING

Sampling shall be conducted any time dredging operations are performed, including site preparation and debris removal. Grab samples shall be taken at approximately 2/3 of the distance to the bottom. Water samples shall be taken from the following stations:

<u>Station</u>	<u>Description</u>
R-1	In an area undisturbed by the dredging operation, and not to exceed 5,000 feet up-current from the dredge operation.
R-2	Within 100 feet down-current of the dredge suction head.

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

DREDGING OPERATION MONITORING TABLE

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Frequency</u>
Dissolved Oxygen ¹	mg/L	Grab/Meter	Once every 4 hours
pH	Standard units	Grab/Meter	Once every 4 hours
Temperature	°F or °C	Measurement	Once every 4 hours
Turbidity	NTU	Grab/Meter	Once every 4 hours
Ammonia	mg/L	Grab ¹	Daily

1. Dissolved oxygen, pH, temperature and turbidity monitoring shall be conducted at two feet below the water surface, mid-depth and within two feet of the river bottom. The depth for each sample shall be recorded.

Continuous monitoring of dissolved oxygen, pH, temperature and turbidity shall be conducted within 200 feet of either end of the dredging project area. Continuous measurements of these parameters shall be taken at two feet below the water surface, at mid-depth, and within two feet of the river bottom.

In addition to the daily monitoring described in the Dredge Operation Monitoring Table, the Discharger shall collect and analyze a grab sample for pH, dissolved oxygen, temperature and turbidity when a magnetic anomaly is being removed from the sediment and lifted out of the river. The magnetic anomaly monitoring shall be collected every hour that in-water work removing the metallic debris is performed.

If monitoring indicates a violation of turbidity objectives, the discharger shall immediately collect samples to be analyzed for acute toxicity, and the following constituents:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>
OC Pesticides ¹	µg/L	Grab
Arsenic	µg/L	Grab
Barium	µg/L	Grab
Copper	µg/L	Grab
Iron	µg/L	Grab
Lead	µg/L	Grab
Mercury	µg/L	Grab
Zinc	µg/L	Grab

1. Organochlorine pesticides, which include DDT, Endrin, Aldrin, Dieldrin and Endosulfan.

DREDGED MATERIAL DISPOSAL FACILITY, RN1, MONITORING

Monitoring shall commence immediately after dredged materials are discharged into the Dredged Material Disposal facility, RN1 areas B and C. Monitoring shall continue until RN1 Areas B and C are empty of water. RN1 shall be monitored as specified below:

RN1 MONITORING TABLE

<u>Constituent or Condition</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Influent Flow	Gallons	Meter/Gauge	Daily ¹
Freeboard	0.1 feet	Measurement	Daily ¹
Odors	--	Observation	Daily ¹
Dissolved Oxygen ^{2,3}	mg/L	Grab	Weekly
pH	Standard units	Grab	Weekly
Levee condition ⁴	--	Observation	Weekly

- 1 Inspections for freeboard measurements and odors shall be performed daily during the normal business week (i.e. Monday through Friday).
- 2 Samples shall be collected at a depth of one foot from each pond in use, opposite the inlet. Samples shall be collected between 0700 and 0900 hours. Monitoring for dissolved oxygen may cease any time that freeboard measurements indicate that level of water in the confined disposal facility is less than 0.5 feet.
- 3 If odors are detected during the daily site inspection, then the Discharger shall conduct daily monitoring for dissolved oxygen until the odors are abated.
- 4 Containment levees shall be observed for signs of seepage or surfacing water along the exterior toe of the levees. If surfacing water is found, then a sample shall be collected and tested for pH and total dissolved solids.

Before dewatering, the Discharger shall collect six water samples from the ponded water at RN1 to be analyzed for constituents listed in the Groundwater Monitoring Table.

After dewatering, the Discharger shall conduct sediment monitoring in RN1. The pH of the sediment in RN1 shall be monitored on a monthly basis after the initial placement, until the material is removed. At least two soil samples shall be collected per ten acres, i.e. 120 acres equals at least 12 sample sites, from RN1 and tested for pH. The two soil samples shall be collected from six inches and eighteen inches below the ground surface at locations approved by Regional Board staff.

If saturated soil conditions are found during soil sampling, then the Discharger shall collect a grab sample of the water and analyze the sample as described in the Groundwater Monitoring table.

The information gathered above from dredged material disposal facility monitoring shall be submitted in monthly reports.

AGRICULTURAL RECLAMATION DITCH MONITORING

A. Hydrology Monitoring

Prior to discharge of dredged material, a stilling well shall be installed in the agricultural reclamation ditch bordering the RN1 cells in which the dredged slurry will be placed. Water level, pH, and EC shall be continuously monitored at the stilling well with a transducer and data recorder for two weeks before dredging, during dredging operations, and for at least one month after dredging stops. The information gathered from hydrology monitoring shall be submitted in monthly reports.

B. Water Quality Monitoring

If standing water is found in both the agricultural reclamation ditch down-gradient of the RN1 cells in which dredged slurry has been placed and RN1 cells, then a water sample shall be collected from the RN1 cells and from each ditch containing standing water. The sample(s) shall be tested as described in the Groundwater Monitoring section of this order. Reclamation ditch monitoring shall be conducted on a weekly basis when the above conditions are present. The information gathered from reclamation ditch monitoring shall be submitted in monthly reports.

SAN JOAQUIN RIVER SEDIMENT MONITORING

No later than **24** hours after dredging operations are completed, the Discharger shall collect two grab samples from the river bottom. One grab sample shall be from the same location as the original core sample listed in the Report of Waste Discharge.

Sediment toxicity monitoring shall be conducted in accordance with US EPA's *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates* (EPA/600/R-99/064) using the following test species, *Hyalella azteca* (method 100.1) and *Chironomus tentans* (method 100.2). Toxicity to either test species is defined as a statistically significant difference in organism survival or growth between the new sediment layer sample and the control sample using the one-tailed t-test. The discharger may use a reference site, which has been approved by the Regional Board staff, as the control sample provided that sediment from the reference site is not toxic to the test species and can meet the test acceptability criteria established for the test method. If the control sample, either laboratory control or reference site control, does not meet the test acceptability criteria for the test method, then the Discharger shall repeat the sediment toxicity test within one week using a newly collected sample.

The Discharger shall report the results of the sediment toxicity monitoring to the Regional Board no later than **48** hours after receiving the laboratory test results. The Discharger shall provide copies of the laboratory data including test acceptability criteria with the report. The Discharger must also send copies of the report to interested parties who request the report in writing.

GROUNDWATER MONITORING

Prior to sampling, groundwater elevations shall be measured and the wells shall be purged at least three well volumes until pH and electrical conductivity have stabilized. Depth to groundwater shall be measured to the nearest 0.01 feet. Water table elevations shall be calculated and used to determine groundwater gradient and direction of flow. Samples shall be collected using approved EPA methods. Groundwater monitoring shall include, at a minimum, the following:

GROUNDWATER MONITORING TABLE

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling and Reporting Frequency</u>
Groundwater elevation	0.01 Feet	Measurement	Quarterly
pH	S.U.	Grab	Quarterly
Electrical Conductivity (EC) at 25 °C	µmhos/cm	Grab	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly
Nitrates as Nitrogen	mg/l	Grab	Quarterly
Ammonia as Nitrogen	mg/l	Grab	Quarterly
Aluminum	µg/l	Grab	Quarterly
Arsenic	µg/l	Grab	Quarterly
Barium	µg/l	Grab	Quarterly
Boron	µg/l	Grab	Quarterly
Calcium	µg/l	Grab	Quarterly
Copper	µg/l	Grab	Quarterly
Chloride	mg/l	Grab	Quarterly
Iron	µg/l	Grab	Quarterly
Lead	µg/l	Grab	Quarterly
Manganese	µg/l	Grab	Quarterly
Potassium	µg/l	Grab	Quarterly
Sodium	µg/l	Grab	Quarterly
Sulfate	mg/l	Grab	Quarterly
Zinc	µg/l	Grab	Quarterly

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., effluent, equalization basin, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Regional Board.

A. Monthly Monitoring Reports

Daily, weekly, and monthly monitoring data shall be reported in monthly monitoring reports. Monthly reports shall be submitted to the Regional Board on the **1st day of the second month following sampling** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include:

1. Results of dredging operations, RN1, hydrology, reclamation ditch, and soil monitoring;
2. A comparison of monitoring data to the discharge specifications and an explanation of any violation of those requirements. Data shall be presented in tabular format;
3. Copies of laboratory analytical report(s);
4. A calibration log verifying calibration of all hand-held monitoring instruments and devices used to comply with the prescribed monitoring program;
5. A description of all magnetic anomalies and debris removed from the river; and
6. A comparison of the monitoring data with discharge prohibitions, limitations and specifications. The Discharger shall provide explanations of any violation(s) of the requirements and detailed descriptions of all steps taken to minimize the impacts including any corrective actions taken to prevent reoccurrence of the violation in the future.

B. Quarterly Monitoring Reports

The Discharger shall maintain a quarterly sampling schedule for groundwater monitoring such that samples are obtained approximately every three months. Quarterly monitoring reports shall be submitted to the Board by the **1st day of the second month after the quarter** (i.e. the January-March quarterly report is due by May 1st) each year. The Quarterly Report shall include the following:

1. Results of groundwater monitoring. The results of regular monthly monitoring reports for March, June, September and December may be incorporated into their corresponding quarterly monitoring report;
2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting

Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged;

3. Calculation of groundwater elevations, an assessment of groundwater flow direction and gradient on the date of measurement, comparison of previous flow direction and gradient data, and discussion of seasonal trends if any;
4. A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable);
5. A comparison of the monitoring data to the groundwater limitations and an explanation of any violation of those requirements;
6. Summary data tables of historical and current water table elevations and analytical results;
7. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum; and
8. Copies of laboratory analytical report(s) for groundwater monitoring.

A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered by:

PAMELA C. CREEDON, Executive Officer

4 August 2006

Date

**ORDER NO. R5-2006-0078
INFORMATION SHEET**

PORT OF STOCKTON
WEST COMPLEX DOCKS 14 AND 15 DREDGING PROJECT
ROBERTS ISLAND NO. 1 DREDGED MATERIAL DISPOSAL SITE
SAN JOAQUIN COUNTY

Background Information

In July 2000, the United States Navy conveyed approximately 1,500 acres of Rough and Ready Island through transfer and lease to the Port of Stockton (Discharger). The Discharger refers to this area as the West Complex. The Discharger plans to have a phased development of the site for maritime, industrial, commercial and other related operations over the next 20 years. In order to provide access by modern deep draft commercial vessel traffic, the Discharger proposes to dredge the river bottom adjacent to docks No. 14 and 15. The project would remove sediment and debris to a depth of 35 feet below mean low, low water with one additional foot for overdredge.

Disposal Site

The dredged material would be placed in a nearby upland disposal site on Roberts Island. The Roberts Island No. 1 site (RN1) is located on the northern margin of Roberts Island, adjacent to the San Joaquin River. A second dredged material disposal site, Roberts Island No.2, exists on Roberts Island, but is not covered by this Order.

The Roberts Island No. 1 site consists of three areas referred to as A, B and C. Area A is the primary disposal area for previous channel maintenance dredging of the Stockton Deep Water Ship Channel (DWSC) and one previous dock dredging of the West Complex. The proposed dredging project covered by this Order does not include Area A. Discharge of dredged material is only authorized to Areas B and C. The dredged material must be removed by 31 October 2007.

The proposed project will generate approximately 653 acre-feet of dredged slurry (sediment and water). The Discharger has calculated the above ground capacity to be 364 acre-feet and that the total available capacity at RN1, with infiltration and evaporation, is sufficient to contain all water and solids without discharge to surface waters. This Order requires that 2 feet of freeboard be maintained in RN1, Areas B and C. If the freeboard limit is reached, the Discharger must stop dredging. No discharge from RN1 to surface water is authorized.

Dissolved Oxygen

Dissolved Oxygen (DO) levels in the Stockton DWSC have regularly fallen to critical levels in the central and eastern portions of the channel, especially during the late summer and early fall. The factors responsible for these low DO levels include low San Joaquin River inflows, warm water temperatures, high biochemical demand, reduced tidal circulation, increased hydraulic

residence time and intermittent reverse flows in the San Joaquin River past Stockton. The DWSC is considered impaired for DO and is on the Clean Water Act (CWA) 303(d) list for impaired water bodies. Low DO can have adverse impacts on fisheries and other beneficial uses of the waters in the Delta. To protect these beneficial uses, the State has established DO objectives of 5.0 mg/L for the entire Delta throughout the year, and a more restrictive DO objective of 6.0 mg/L for the DWSC from September through November when endangered salmonid species are likely to be present.

Increasing the depth of the DWSC through dredging will incrementally increase the hydraulic residence time in the DWSC, which may allow more time for biochemical oxygen demand to be expressed. In addition, the activities associated with the West Complex may contribute to an increase in the amount of oxygen demanding substances discharged to the river.

In June 2004, the Discharger approved an Environmental Impact Report (EIR) for a larger project, which included dredging all seven docks at the West Complex. Mitigation measures in the EIR specify that the Discharger shall assume the operation and maintenance of the US Army Corps of Engineer's (Corps) jet aeration device to provide mitigation for existing conditions. In addition, the Discharger proposes to provide additional mitigation for possible effects of the proposed project dredging.

The Aeration Agreement detailed in Attachment B specifies that the Discharger provide long-term mitigation for both current conditions, as well as for possible impacts of increased channel geometry due to dredging of the docks at the West Complex. In addition, dredging operations may also produce an oxygen demand in the vicinity of the dredging operation. In order to mitigate for the potential reduction in DO concentrations related to the actual dredging operation, the Aeration Agreement specifies that the Discharger will operate a localized oxygen diffuser near the dredging operation at all times while dredging is occurring.

Potential Groundwater Impacts

The soil samples collected from sediment at Docks 14 and 15 were analyzed for trace metals using the Waste Extraction Test with de-ionized water (DIWET). The DIWET is an analytical method used to evaluate the potential for long-term impacts to groundwater from placement of waste in a neutral environment. Questions have been raised about the appropriateness of using the DIWET for evaluating leachate characteristics at the Roberts Island disposal site since material previously placed at the site has been found to be acidic. Metal constituents are usually more soluble in acidic conditions.

Constituent concentrations measured in the DIWET have not always been shown to be representative of actual concentrations found in subsequent groundwater monitoring. Based on past experience and groundwater monitoring at this site, we have found that the use of DIWET may overestimate the threat to water quality posed by the leachate.

The DIWET tests found that the sample leachate contained concentrations of lead and arsenic that exceeded water quality objectives for drinking water. All other metals tested were found at levels below water quality objectives. The lead concentrations in the soil samples ranged from 4.7 µg/L to 6.8 µg/L with an average concentration of 5.8 µg/L. The arsenic concentrations in the soil samples ranged from 4.4 µg/L to 4.8 µg/L with an average concentration of 4.6 µg/L. The Basin Plan groundwater objective prohibits the discharge of chemical constituents in concentrations that adversely affect beneficial uses. Designated beneficial uses of ground water are municipal and domestic supply, industrial service and process supplies, and agricultural supply. The Cal/EPA Office of Environmental Health Hazard Assessment has published a Public Health Goal of 2.0 µg/L for lead and 0.004 µg/L for arsenic in drinking water.

Arsenic is naturally occurring in San Joaquin County groundwater. Data from the US Environmental Protection Agency (USEPA) indicate that the DIWET levels for arsenic are below background levels of arsenic found in San Joaquin County. USEPA data from San Joaquin County public water systems collected from 1980 to 1998 indicate average concentrations of arsenic of 8.95 µg/L. Therefore, the average concentrations of arsenic, as measured by USEPA well sampling, are higher in the San Joaquin County groundwater than in sample DIWET analysis.

Soluble constituents from the dredged material have the potential to migrate downwards towards the underlying groundwater. As the leachate migrates through the soil towards the groundwater, a degree of attenuation will occur based on environmental fate processes that include adsorption to clay and organic matter, chemical bonding of metals to soil particles, and filtration of suspended matter by fine textured soil particles. The degree of expected attenuation is dependent on soil characteristics specific to individual sites. An analysis conducted by Geomatrix Consultants Inc. of 16 soil samples taken in RN1 in October 2003, indicates relatively high soil cation exchange capacities ranging from 8.3 to 32.3 meq/100 g soil.

In evaluating the potential for lead to impact groundwater quality, staff reviewed DIWET lead data from previous dredging operations as well as the available groundwater data from RN1. Measured DIWET lead concentrations have been significantly higher (average 27.7 µg/L) in several dredged spoil placements at RN1 since 2003, and subsequent groundwater data does not show lead to have impacted the groundwater. Based on the CEC at this site and data from material with higher levels of DIWET lead previously placed at this site, lead concentrations are not expected to impact groundwater. In order to provide an additional factor of safety to the conclusions of previous findings concerning the potential threat from lead and arsenic, this Order requires removal of dredged solids by 31 October 2007. To verify groundwater protection, the Discharger is required to continue groundwater monitoring.

Potential Surface Water Impacts

Dredging operations will result in the suspension of sediment, which will contribute to an increase in the surface water turbidity. The Discharger has evaluated the potential turbidity contributions from the dredging operation. The RWD indicates that the background turbidity

near the West Complex may range between 15 to 30 Nephelometric Turbidity Units (NTU) during the dredging season. The Basin Plan specifies that turbidity shall not be increased by more than 20 percent, where natural turbidity ranges between 5 and 50 NTU. The Discharger has calculated that suspended solids are estimated to increase by 1.9 mg/L, and that turbidity is estimated to increase from 19 to 20.9 NTU. Based on these calculations, the Basin Plan's turbidity objective would not be exceeded.

Discharge Prohibitions

Discharge Prohibition A.1

Discharge Prohibition A.1 prohibits the discharges from causing or contributing to acute toxicity in the receiving waters. The Basin Plan requires that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal or aquatic life. Water column effects occur when contaminants on the sediment particles are either dissolved or suspended in the water column as a result of the dredging operation. The Basin Plan states that *“all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.”* The Basin Plan requires that *“as a minimum, compliance with this objective...shall be evaluated with a 96-hour bioassay.”* This Order requires acute toxicity testing if the dredge operation monitoring for turbidity indicates that the turbidity objective has been exceeded 100 feet down-current of the dredging operation.

Discharge Prohibitions A.2 and A.3

Discharge Prohibitions A.2 and A.3 restrict the discharge of dredged material, including both solids and water, to RN1, Areas B and C. The discharge of dredged materials and untreated or partially treated waste outside Areas B and C has the potential to impact surface and groundwater quality.

Discharge Prohibition A.5 and A.6

The Basin Plan contains objectives for petroleum products, floating material and oil/grease. These discharge prohibitions, based on the Basin Plan oil/grease and floating material objectives, have been included in this Order.

Discharge Prohibition A.7

The Basin Plan includes a water quality objective for surface waters that the *“...pH shall not be depressed below 6.5 nor raised above 8.5.”* Dredging operations have the reasonable potential to affect pH as previously anaerobic sediments are oxidized in the excavation process. The Delta waters are subject to tidal influence and seasonal water pumping that may affect flow direction. Therefore, no reliable dilution is available in the receiving stream, so this Order includes in-stream limitations for pH at the Basin Plan objective values.

Discharge Prohibition A.8

The Basin Plan contains an objective for turbidity. Dredging operations have the potential to increase turbidity as material is suspended in the water column. The Basin Plan states that:

- (a) where natural turbidity is between 0 and 5 NTUs, increases shall not exceed 1 NTU;
- (b) where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
- (c) where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs; and
- (d) where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

Exceptions to the Delta specific objective will be considered when dredging operations can cause an increase in turbidity. In this case, an allowable zone of dilution within which turbidity in excess of the limits can be tolerated will be defined for the operation and prescribed in a discharge permit.” In order to allow a zone of dilution, the point of compliance with the turbidity limitation for the dredge operation, i.e. cutterhead, shall be 100 feet down-current of the dredging operation. This discharge prohibition limit is based on the Basin Plan turbidity objective.

Discharge Prohibition A.9

Sediments contain organic material and ammonia. Ammonia is known to cause toxicity to aquatic organisms in surface waters. The Basin Plan contains a narrative toxicity objective for surface water. USEPA has developed Ambient Water Quality Criteria for ammonia, which is dependent on pH and the presence of salmonids. Because salmonids may be present in the Delta during dredging operations, an in-stream limitation, based on the Ambient Water Quality Criteria for ammonia with salmonids present, as described in Attachment D, has been included in this Order consistent with the Policy for Application of Water Quality Objectives.

Discharge Prohibition A.10

The Basin Plan contains a chemical constituent objective for copper of 10 µg/L in the Sacramento-San Joaquin Delta. In addition, the California Toxics Rule (CTR) contains criteria for protection of freshwater aquatic life that vary with hardness. Below a hardness of 120 mg/L as CaCO₃, the 4-day average CTR criterion is more stringent than the Basin Plan objective. Applying the Policy for Application of Water Quality Objectives, an in-stream limitation for copper, down-current from the cutterhead, based on the Basin Plan chemical constituents objective and the CTR criteria, as described in Attachment E, has been included in this Order.

Discharge Prohibition A.11

The Basin Plan contains a chemical constituent objective for arsenic of 10 µg/L in the Sacramento-San Joaquin Delta. Therefore, an in-stream limitation for arsenic, based on the Basin Plan chemical constituents objective, has been included in this Order.

Discharge Prohibition A.12

The Basin Plan contains a chemical constituent objective for barium of 100 µg/L in the Sacramento-San Joaquin Delta. Therefore, an in-stream limitation for barium, based on the Basin Plan chemical constituents objective, has been included in this Order.

Discharge Prohibition A.13

The CTR limit for mercury is 0.05 µg/L for sources of drinking water. Applying the Policy for Application of Water Quality Objectives, an in-stream limitation for mercury, based on the CTR and presented in total concentration, has been included in this Order.

Discharge Prohibition A.14

The Basin Plan prohibits chemicals from being present in surface waters in toxic concentrations. The Cal/EPA Office of Environmental Health Hazard Assessment has published a Public Health Goal of 2.0 µg/L for lead in drinking water. Beneficial uses of the Sacramento-San Joaquin Delta include municipal and domestic supply, which includes drinking water uses. Applying the Policy for Application of Water Quality Objectives, an in-stream limitation for lead, based on the Public Health Goal and presented in total concentration, has been included in this Order.

Discharge Prohibition A.18

The Basin Plan contains a pesticide objective for OC pesticides. The Basin Plan states, “*Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by either the EPA or the Executive Officer.*” This Order contains an in-stream limitation, based on the Basin Plan pesticide objective prohibiting OC pesticides at concentrations detectable within the accuracy of analytical methods.

Discharge Specifications

Discharge Specification B.6

It is appropriate to require a minimum of two feet of freeboard at all times to minimize the potential for overflows.

Discharge Specifications B.9 and B.10

Dredging operations in the Stockton DWSC have the potential to exacerbate the existing low dissolved oxygen impairment in this CWA 303(d) listed water body. In order to mitigate for this potential, aeration devices shall be operated on a continual basis by the discharger to supply 2,500 pounds of oxygen per day as specified in Attachment B, and during the dredging operation to supply 500 pounds of oxygen per day while dredging operations are underway.

Discharge Specification B.11

The Discharger has conducted magnetometer and side sonar scans of the project area in order to locate significant submerged or buried metallic objects. These surveys have identified widespread submerged metallic debris buried in the sediment near the docks, which are believed to be associated with past U.S. Navy activity. In order to remove these metallic anomalies with a

minimum disturbance of sediments, this Order specifies that the removal of these objects be accomplished with gentle discreet movements of the lifting crane, removal of adjacent sediment with hydraulic suction, and the assistance of divers when appropriate.

RN1 – Soil Limitations

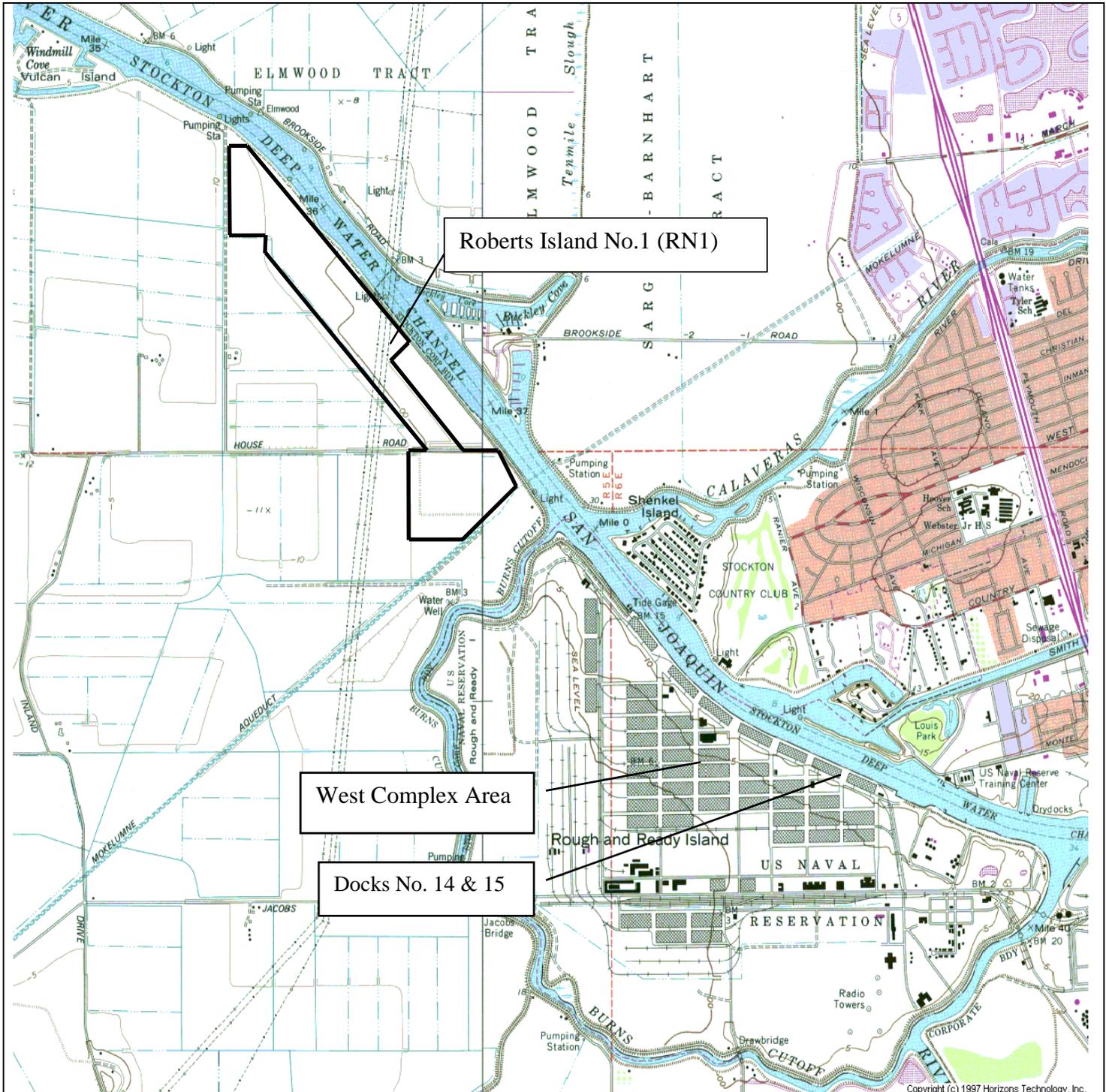
RN1– Soil Limitation D.1

In order to ensure there will be no-long term effects from the placement of dredged sediment at RN1, this Order limits the placement of dredged spoils on RN1 to a temporary period ending 31 October 2007. In addition, placement and reuse of this material shall be limited to uses in which there is no reasonable potential for impacts to groundwaters. Therefore, placement and reuse is limited to use as foundation material beneath engineered covers, such as buildings, foundation slabs, parking lots or roadways; and at least two feet above any significant groundwater bearing zone.

Monitoring and Reporting Program

Section 13267 of the California Water Code (CWC) authorizes the Regional Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. The emphasis has been on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment of civil administrative liability where appropriate.

The Monitoring and Reporting Program (MRP) requires monitoring for the dredging operation, confined disposal facility, dredged sediment and the newly exposed sediment horizon in the San Joaquin River. The MRP also requires extensive on-going ground water monitoring to assure that any leachate from the dredged material is not impacting groundwater quality.



Drawing Reference:
United States Department of the
Interior Geological Survey
East Stockton 7.5' Quadrangle
Section 1, T2N, R5E, MDB&M

SITE PLAN
PORT OF STOCKTON
WEST COMPLEX DOCKS 14 AND 15
DREDGING PROJECT



Not to scale



- Legend:
- Boundary of Roberts No.1
 - Limits of proposed dredge sediment
 - - Placement- Areas B and C

Roberts No. 1 Dredge Placement Areas
Roberts No. 1 Dredge Sediment Placement Site
Roberts Island, Stockton, California

AERATION REQUIREMENTS

As a condition of this Order and as mitigation for the proposed project, the Port of Stockton (Port) shall provide aeration to address the following dissolved oxygen (DO) water quality impacts:

- Immediate effects of dredging
- Long-term effects of increased channel geometry

Immediate Effects of Dredging and Dredge Water Returns

To address the potential localized impacts of the dredging operations on DO, the Port shall provide 500 pounds per day of DO to the water, as close to the dredge as possible without compromising safety.

Long-Term Effects of Increased Channel Geometry¹

As mitigation for the long-term effects of increased channel geometry on the existing DO impairment, the Port shall operate the existing aerator constructed by the United States Army Corps of Engineers (Corps) and/or other aerator, as needed, to provide:

1. During the months of September through November, 2,500 pounds per day of DO, up to a maximum of 227,500 pounds per year whenever background DO concentrations drop below the Basin Plan objective of 6 mg/l.
2. During the months of December through August, 2,500 pounds per day of DO, up to a maximum of 250,000 pounds per year whenever background DO concentrations drop below 5.2 mg/l.

In addition, when the Port is required to provide aeration as specified above, the Port must also:

3. Provide an additional 840 pounds per day of DO, up to a maximum of 84,000 pounds per year, to contribute one-third of the oxygen deficit based on the current level of development.²
4. Provide 750 pounds per day of DO, up to a maximum of 75,000 pounds per year, to mitigate for the additional DWSC volume in the vicinity of the Port of Stockton West Complex dredging project.³

¹ The methodology for measuring ambient DO concentrations (for the purpose of triggering the aeration system) must adequately account for the impact that aerators operated by the Port or others in the vicinity will have on ambient DO conditions.

² The current level of development is based on an assumed daily deficit of 10,000 pounds per day of DO (Jones and Stokes, Aeration Technology Feasibility Report for the San Joaquin River Deep Water Ship Channel, 2004). This aeration requirement may, or may not satisfy future aeration responsibilities assigned to the Port of Stockton as part of future regulatory actions addressing the DO impairment.

³ This 750 pounds per day of DO is based upon an assumed 7.5 % increase in DWSC volume as a result of the proposed dredging of docks 14 through 20. (The average DWSC width of 600 feet is multiplied by the average depth of 25 feet, and multiplied by a length of 1.5 miles from Rough and Ready Island monitoring station to Channel Point, to yield a current estimated DWSC volume of 4.4 million cubic yards. The 326,000 cubic yards of the proposed dredge, divided by 4.4 million cubic yards current volume, indicates an approximate 7.5% increase in channel volume.) This 7.5% increase is applied to an assumed daily deficit of 10,000 pounds per day, to yield 750 pounds per day of DO. These aeration requirements account for the dissolved oxygen mitigation for dredging of all the docks, 14 through 20, at the West Complex.

Order No. R5-2006-0078
Attachment C

The maximum aeration required as a condition for this Order and as mitigation for this project is 4,090 pounds per day, with a maximum annual cap of 636,500 pounds per year, as shown in Table C-1. The quantities shown reflect the rate of oxygen transfer that must be *dissolved* into the water column of the DWSC, not just “bubbled through.” These oxygen input requirements apply over the range of ambient DO conditions (below trigger values) and water quality conditions that exist in the DWSC.

Use of the existing Corps’ aerator, or any other aerator, is contingent upon the Port providing data that demonstrates its effectiveness at dissolving the required amounts of oxygen to the water column. If these requirements are not met, other means of delivering the required oxygen shall be provided and evidence of its effectiveness provided to the Regional Board. See the Provisions of this Order for specific study and reporting requirements.

This mitigation does not release the Port from responsibility to contribute, along with others⁴, to fixing the existing DO impairment. Aeration provided by the Port under the terms of this Order, or in excess of this Order, will be applied towards any future assignment of responsibility. If future assignment of responsibility is less, the aeration requirements of this Order will not be reduced unless this Order is modified or superceded.

The aeration requirements in this Order are based on the most current information to date, which suggests the DO impairment is the result of oxygen deficits of up to approximately 10,000 lbs/day and totaling 1,000,000 lbs/year. The phased DO Control Program adopted by the Regional Board in January 2005 identified increased DWSC geometry as one of three contributing factors to the existing DO impairment. The 3,340 lbs/day (840 lbs/day plus 2,500 lbs/day) of aeration required in this Order is approximately one-third of the assumed daily deficit of 10,000 pounds per day of DO. The 750 lbs/day is based upon an assumed 7.5 % increase in DWSC volume in the vicinity of the proposed dredge projects applied to the assumed daily deficit of 10,000 lbs/day. This accounts for the dissolved oxygen mitigation needed for dredging of all the docks, 14 through 20, at the West Complex. These aeration requirements may, or may not satisfy future aeration responsibilities assigned to the Port of Stockton as part of future revisions to the DO Control Program.

The quantities of aeration in this Order must be provided first, irrespective of the participation to provide aeration by any other entity (e.g. the Port pays for the first incremental part of any aeration provided up to the daily and annual caps described above).

⁴ Additional responsibility for entities responsible for: (1) increased channel geometry; (2) reduced flow and; (3) loads of oxygen demanding substances; may be identified in a future regulatory action by the Regional Board.

Order No. R5-2006-0078
Attachment C

Table C-1 Daily and Annual Aeration Rate Requirements Summary

		Long-term Aeration (pounds per day)					
		Corps Aerator and/or Other aerators as needed					
Aeration items ¹		-1-	-2-	-3-	-4-		
Month	DO Objective (mg/L)	COE	Port of Stockton	Port of Stockton	Port Expansion Mitigation Port of Stockton	Total	
						Daily	Monthly
January	5		2,500	840	750	4,090	126,790
February	5		2,500	840	750	4,090	114,520
March	5		2,500	840	750	4,090	126,790
April	5		2,500	840	750	4,090	122,700
May	5		2,500	840	750	4,090	126,790
June	5		2,500	840	750	4,090	122,700
July	5		2,500	840	750	4,090	126,790
August	5		2,500	840	750	4,090	126,790
September	6	2,500		840	750	4,090	122,700
October	6	2,500		840	750	4,090	126,790
November	6	2,500		840	750	4,090	122,700
December	5		2,500	840	750	4,090	126,790
Annual Cap² (pounds per year)		227,500	250,000	84,000	75,000	636,500	
Notes: 1) Aeration items numbered as described earlier for elements of the long-term effects of increased channel geometry 2) Annual cap is based on 100 days times the daily aeration required (except for the COE aeration that is based on 91 days); annual cap is based upon a dissolved oxygen deficit of 10,000 pounds per day or 1,000,000 pounds per year; the actual cap may be higher if daily or annual deficits are higher; total daily aeration requirements do not sum to the total annual cap							

pH-Dependent Limits for Ammonia
Criterion Maximum Concentration, Maximum 1-hour Average

pH	Ammonia Concentration Limit (mg N/l)
6.5	32.6
6.6	31.3
6.7	29.8
6.8	28.0
6.9	26.2
7.0	24.1
7.1	21.9
7.2	19.7
7.3	17.5
7.4	15.3
7.5	13.3
7.6	11.4
7.7	9.64
7.8	8.11
7.9	6.77
8.0	5.62
8.1	4.64
8.2	3.83
8.3	3.15
8.4	2.59
8.5	2.14
8.6	1.77
8.7	1.47
8.8	1.23
8.9	1.04
9.0	0.885

$$CMC_{salmonids\ present} = \left(\frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}} \right)$$

Where: CMC = criteria maximum concentration

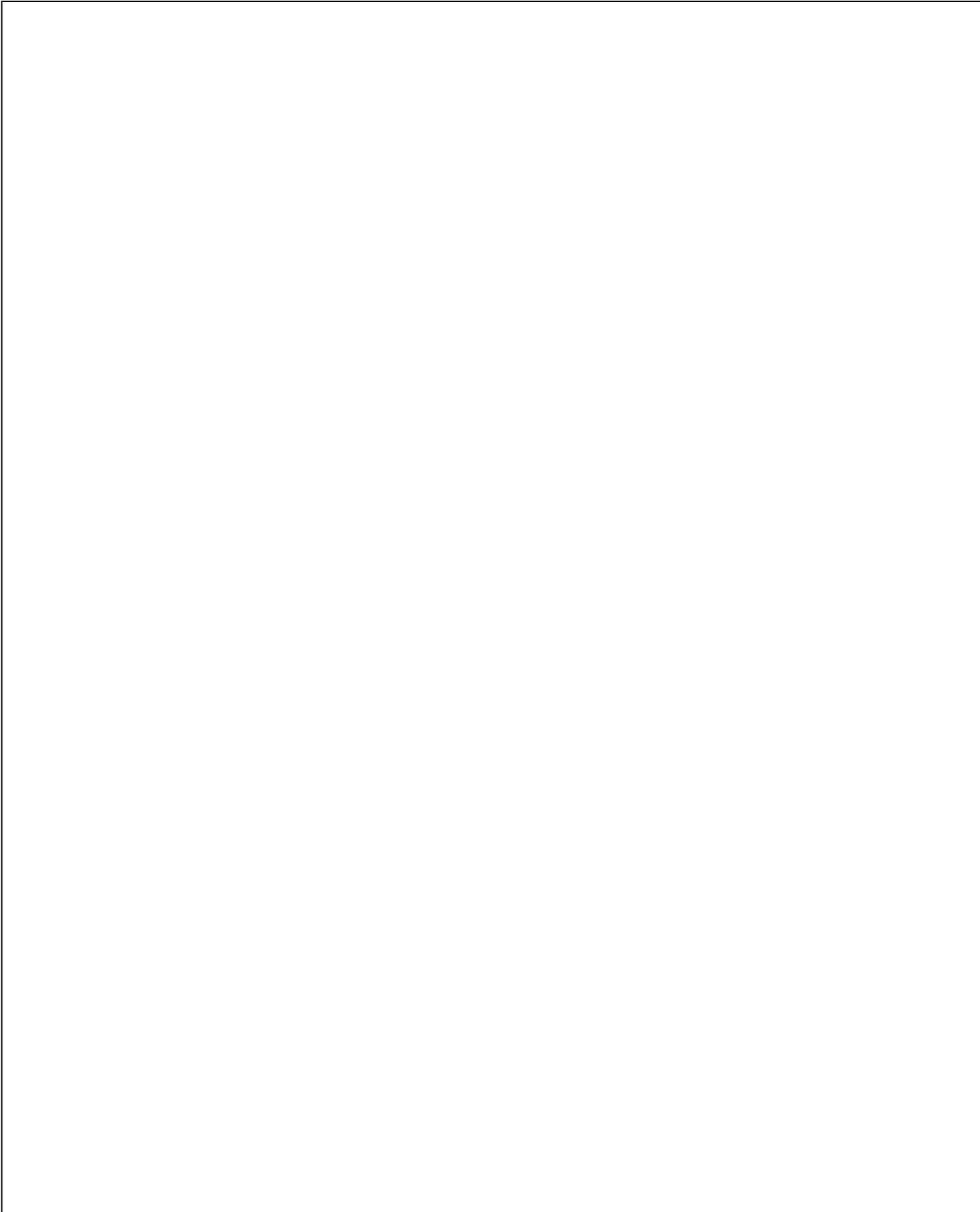
ORDER NO. R5-2006-0078
ATTACHMENT D

**Hardness-Dependent Limits for Copper
Criterion Maximum Concentration**

Hardness (mg/l as CaCO ₃)	Copper Concentration Limitation ^{1,2}
<25	Must Calculate
25	2.7
30	3.2
35	3.7
40	4.1
45	4.5
50	5.0
55	5.4
60	5.8
65	6.2
70	6.6
75	7.0
80	7.4
85	7.8
90	8.2
95	8.6
100	9.0
110	9.7
120 ⁽²⁾	10
130	10
140	10
150	10
160	10
170	10
180	10

¹ Criteria Maximum Concentration = $(e\{0.8545[\ln(\text{hardness})] - 1.702\} \times 0.960)$

² The Basin Plan contains a chemical constituent objective for copper of 10 µg/l in the Sacramento-San Joaquin Delta. For surface water that contains a hardness greater 120 mg/l as CaCO₃ the Basin Plan chemical constituent objective for copper shall apply.



ORDER NO.R5-2006-0078
ATTACHMENT E