CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 5-01-116

WASTE DISCHARGE REQUIREMENTS
GENERAL ORDER

FOR
UNITED STATES ARMY CORPS OF ENGINEERS AND
THE PORT OF SACRAMENTO
SACRAMENTO DEEP WATER SHIP CHANNEL MAINTENANCE DREDGING
ACTIVITIES CHANNEL MILE 0.0 TO 43.4
CONTRA COSTA, SACRAMENTO, SOLANO AND YOLO COUNTIES

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

1. The U.S. Army Corps of Engineers (Corps) and the Port of Sacramento (Port), hereafter jointly referred to as Discharger, have been performing annual maintenance dredging of the Sacramento Deep Water Ship Channel (Channel) under General Order Waste Discharge Requirements (WDR) Order Number 88-143. Order Number 88-143 is neither adequate nor consistent with current plans and policies of the Board. This Order updates Order 88-143 to reflect changes in constituents of concern, water quality standards, constituents on the Clean Water Act Section 303(d) list of impaired water bodies, and mixing zone policies.

2. The maintenance dredging activities regulated in this Order include disposal or discharge of dredged sediments into diked disposal sites on land (Dredged Material Disposal sites), discharges of effluent from the Dredged Material Disposal (DMD) sites into surface water, pre-dredge sampling, and water quality monitoring during dredging operations.

3. Under this General Order WDR, maintenance dredging is defined as maintenance of the Sacramento Deep Water Ship Channel (Channel) to a depth of 30 feet (plus two-foot allowable overdredge) for navigation of ship traffic to the Port of Sacramento. Maintenance dredging also includes a section of 35-foot depth from the Port of Sacramento to River Mile (RM) 35, which was deepened in a previous project. This Order is for maintenance dredging activities from the turning basin in the Port of Sacramento at River Mile 43.4, to the western boundary of Region 5 near Collinsville (approximately mile 0 of the Sacramento River's Deep Water Ship Channel). See Attachment "A", incorporated herein and made part of this Order.

4. When the Discharger decides that maintenance dredging activities are needed in a specific reach of the Sacramento Deep Water Ship Channel, the Discharger must

file a separate Notice of Intent and submit a filing fee to the Regional Board for each proposed maintenance dredging project to be eligible for coverage under this Order. The minimum contents of the Notice of Intent are detailed in Attachment "B", Application Requirements, incorporated herein and made part of this Order.

5. The dredging operations primarily involve the use of a pipeline hydraulic suction dredge or a sealed clamshell bucket dredge for maintaining needed depth for navigational access. Clamshell dredging may be used in limited cases where access is restricted or debris is too large for hydraulic dredging.

6. Following excavation, a pipeline, barge, or hopper dredge will transport the dredged material slurry for settling and disposal onto one of the DMD sites. See Attachment "A". In the DMD sites, solids settle out and the "effluent" or "return water" is often discharged back into the adjacent surface water by a pump, weir or outfall pipe. The DMD sites are designed to remove a significant portion of suspended material from the effluent, with the maximum allowable Total Suspended Solids (TSS) to be defined in an approved Operation Plan for each disposal site. The disposal site will be designed and operated with guidance provided by the U.S. Army Corps of Engineers guidance document "Confined Disposal of Dredged Material". The details of the DMD sites covered under this permit, including capacity, location, property owner, discharge location and receiving water body can be found in Attachment "C".

**Table 1: Approved Dredge Material Disposal (DMD) Sites**

| Site | Owner | Location | Discharge to Water Body |
|---|---|---|---|
| S1 | Port of Sacramento | RM 43.4 | Sacramento Channel RM 43.4 |
| S-11 | Leo Fahn, trustee for Sylvia et al | Prospect Island RM 23 to 26 | Sacramento Channel RM 26 |
| S-12 | Port of Sacramento | Prospect Island RM 20 | Sacramento Channel RM 20 |
| S-14 | US Govt.- USACE | Grand Island RM 14 | Steamboat Slough |
| S-16 | US Govt.- USACE | Rio Vista RM 9 to 11 | Sacramento River RM 11 |
| S-19 | Port of Sacramento and Robert Oppenheimer BBI | Decker Island RM 6 to 8 | Sacramento River at Horseshow Bend RM 7 |
| S-20 | Department of Water Resources, State of Calif. | Augusto Pit, Sherman Is RM 5 | Sacramento River RM 5 |
| S-31 | Port of Sacramento | Yolo bypass RM 27 to 40 | Sacramento Channel between RM 27 to 40 |
| S-32 | Port of Sacramento | RM 26.0 to 26.5 | Sacramento Channel RM 26 |
| S-35 | Dow Chemical | RM 1 | Sacramento River RM 1 |

7. The estimated rate of effluent discharge during a typical dredging operation is as follows:

Effluent Average Flow (into receiving water): 9 mgd
Effluent Maximum Flow (into receiving water): 10 mgd

8. The DMD sites will fully contain dredged material and prevent any surface runoff or erosion into waters of the state, unless specifically allowed in the NOA. This Order allows surface runoff from the DMD site may if the approved site operation plan has provisions for erosion control and monitoring. After drying, the material may be removed for reuse at other locations. Some reuse options may be restricted in the Notice of Applicability, depending on the quality of the sediment.

9. Historically, the Discharger has performed analyses of sediments to be dredged in order to determine the anticipated sediment quality during dredging operations. The sediment constituents and average concentrations found in dredge material in year 2000 maintenance dredging are listed below. Additional testing and lower detection limits will be required for further dredging operations, as described in the attached Monitoring and Reporting Program.

**Table 2: Analytical results from year 2000 sediment testing:**

| | Average Concentration | | |
|---|---|---|---|
| **Constituent** | **Solid analysis (mg/kg)** | **DI extraction (µg/l)** | **Modified elutriate test (µg/l)** |
| Arsenic | 4.1 | ND (<1 ppb) | 5.1 [1] |
| Chromium VI | | ND (<6.1 ppb) | ND (<10 ppb) |
| Copper | 22.5 | ND (<100 ppb) | 4.1 [1] |
| Lead | 5.5 | ND (<10 ppb) | 1.7 [1] |
| Mercury | 0.07 | ND (<0.5 ppb) | 0.011 ppb [1] |
| Nickel | | ND (<50 ppb) | ND (<10 ppb) |
| Selenium | | ND (<30 ppb) | ND (<10 ppb) |
| Silver | | ND (<50 ppb) | ND (<0.1 ppb) |
| Thallium | 0.15 | ND (<0.5 ppb) | |
| Zinc | 61.7 | ND (<100 ppb) | 7.0 [1] |
| Tributyltin | | | ND (<0.02 ppb) |
| Polyaromatic Hydrocarbons | | | |
| Polychlorinated biphenyls | | | |
| Organochlorine pesticides | | | |

[1] Averages include non-detect values at half the reported detection limit.

10. This Order requires the Discharger to conduct chemical and physical testing of sediments that are representative of the area to be dredged before each maintenance project. The purpose of pre-dredge sediment analysis is to determine if the dredging operation will result in the disposal of dredged sediments that are characterized by constituent concentrations below the maximum concentrations in Table A.3.

11. The Board adopted a Water Quality Control Plan, Fourth Edition, for the Sacramento River Basin and the San Joaquin River Basin (hereafter Basin Plan), containing beneficial uses, water quality objectives, and implementation programs for waters of the Basin. These requirements implement the Basin Plan.

12. The beneficial uses of the Sacramento-San Joaquin Delta as identified in Table II-1 of the Basin Plan are: municipal and domestic supply, agricultural uses, industrial process supply, industrial service supply, body contact and other non-body contact recreation, warm and cold freshwater aquatic habitat, warm and cold water fish migration habitat, warm water spawning habitat, wildlife habitat, and navigation.

13. The beneficial uses of the ground water are: municipal and domestic supply, agricultural supply, industrial process supply, and industrial service supply.

14. The U.S. EPA adopted the California Toxics Rule (CTR) on 18 May 2000, which together with the U.S. EPA National Toxics Rule (NTR), provide enforceable numeric water quality criteria for priority toxic pollutants. The *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California,* hereafter referred to as the State Implementation Plan, was adopted in March 2000 by the State Water Board. It provides implementation requirements for the CTR and NTR criteria and was followed as appropriate in the development of this permit. CTR and NTR standards may be incorporated in WDRs to implement the narrative objectives of the Basin Plan.

15. The Discharger submitted information about the probable constituents of concern and their concentrations in the dredged material, effluent, and receiving water. The Board finds that the effluent discharges are not likely to cause or contribute to a violation of applicable water quality objectives and CTR/NTR criteria, if the sediment analyses results are at or below concentrations listed in Section A.3 of this Order. When sediment analysis results exceed these concentrations, site-specific studies are needed to assure compliance with applicable water quality objectives and CTR/NTR criteria.

16. Dredging operations may cause some degradation to the waters of the State. Dredging operations cause only temporary impacts to surface waters, as dredging and effluent discharge occur only a few weeks out of the year. Since the effluent contains only water and sediment that originated in the water body, it does not constitute a new source of pollutants. However, dredging may cause temporary degradation of turbidity, total suspended solids, dissolved oxygen and elevated levels of some constituents. Dredging projects covered under this Order will not exceed any applicable water quality objectives. Maintenance dredging of the Sacramento Deep Water Ship Channel is necessary to maintain safe navigation to the Port of Sacramento and benefits the people of the State.

17. The effluent discharges are consistent with the antidegradation provisions of 40 CFR 131.12 and SWRCB Resolution 68-16

18. The action to update waste discharge requirements for these DMD facilities is exempt from the provisions of the California Environmental Quality Act (CEQA), in accordance with Title 14, California Code of Regulations (CCR), Section 15301. Annual maintenance dredging activities are exempt from the provisions of the CEQA in accordance with Title 14, CCR, Section 15304(g).

19. Pre-dredge testing and site-specific studies (when necessary) provide assurance that dredged sediments will not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives and CTR/NTR criteria. The dredge sediments will be classified as Inert Waste as defined in Title 27 Subchapter 2 Section 20230 of the California Code of Regulations. Inert wastes do not need to be discharged at classified waste management units, therefore Title 27 waste discharge requirements are not required for this project. Pursuant to Title 27, Section 20230 of the California Code of Regulations, the Board can prescribe individual or general waste discharge requirements.

20. The U.S. Army Corps of Engineers have issued a Section 10 permit (Rivers & Harbors Act) for dredging operations and a Clean Water Act Section 404 permit for the discharge of the "effluent" to surface waters. Therefore, these dredging operations are exempt from NPDES regulations, but require a Clean Water Act Section 401 Water Quality Certification to be issued by the Board. A Section 401 Water Quality Certification will be issued in conjunction with each approved "Notice of Applicability".

## PROCEDURAL REQUIREMENTS

21. The following agencies also have jurisdiction over this dredging and disposal project:
California Department of Fish and Game
National Marine Fisheries Service
United States Fish and Wildlife Service
United States Army Corps of Engineers
State Lands Commission

22. The Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

23. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

24. Any person adversely affected by this action of the Board may petition the State Water Resources Control Board to review the action. The petition must be received by the State Board within 30 days of the date of issuance of this Order. Copies of the law and regulations applicable to filing the petition will be provided on request.

IT IS HEREBY ORDERED that Order No. 88-143 is rescinded and that the Army Corps of Engineers and the Port of Sacramento, their 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. APPLICABILITY

1. All dredging discharges covered by this Order shall be limited to maintenance dredging activities associated with the Sacramento Deep Water Ship Channel as identified in Finding Nos. 2 and 3 above.

2. Before the maintenance dredging project can be considered for coverage by this order, a complete Notice of Intent (as detailed in Attachment B) and filing fee must be submitted to the Regional Board

3. The *Discharge Applicability Table* to follow, establishes sediment concentrations that will not cause exceedances of water quality objectives under general conditions. Sediments with values below the concentrations in Table A.3 may be discharged to DMD sites listed in this Order for maintenance dredging and disposal projects in the Sacramento Deep Water Ship Channel. If analytical results are above the values listed in Table A.3, the Discharger may submit a technical report describing site-specific factors that could be taken into consideration by the Executive Officer in determining compliance with Section F Provisions of this Order. Section F describes the requirements of the technical report, with additional information also provided in Attachment "D". The discharge of sediments that exceed the concentrations in Table A.3 is considered a violation of this Order unless granted a site-specific exemption.

   Part 1 of the Discharge Applicability Table applies to solids analysis and extractable constituents from the pre-dredge sediment analysis. The maximum soluble concentrations in Part 1 are chosen to protect groundwater and surface water beneficial uses from leachate and surface runoff. The values are based on applicable water quality objectives and CTR/NTR criteria. The solid phase maximum concentrations in Part 1 are chosen to protect humans and wildlife from potential exposure to the sediments and their constituents once they are placed in an upland environment. Part 2 of the Discharge Applicability Table applies to pre-dredge analysis of the modified elutriate test, which simulates expected conditions of the effluent from the DMD site and expected conditions near the dredging location. The maximum concentrations in Part 2 are chosen

to protect the receiving water beneficial uses and are based on applicable water quality objectives and CTR/NTR criteria. Detailed information on the values used in this Order is available in the Information Sheet.

4. Before commencing pre-dredge sampling and analysis, the Discharger shall have the sampling and analysis plan reviewed and approved by Regional Board Staff. If the Discharger does not receive comments or approval from Board staff within 10 working days, the Discharger may proceed with sampling if the Sampling and Analysis Plan is equivalent to the latest approved Sampling and Analysis Plan.

5. If the Executive Officer finds that the proposed discharge qualifies for coverage under this Order, a Notice of Applicability shall be issued to the Discharger. Individual dredging projects are not covered under this Order until issued a Notice of Applicability by the Executive Officer.

6. The dredging operations shall use a pipeline hydraulic suction dredge. Clamshell dredging may be used in limited cases where access is restricted or debris is too large for hydraulic dredging. Recent advances in clamshell dredging buckets have produced 'sealed' or 'environmental' buckets, which greatly reduce the amount of turbidity in the water column and the amount of water produced during the dredging operation. This Order allows the use of a sealed bucket and barge for maintenance dredging. Other dredge types may be approved by the Executive Officer upon a demonstration of their ability to meet water quality objectives.

**Table A.3**
**Discharge Applicability Table Part 1**: Applicability of sediments for upland disposal

| Constituent | Max. Concentration of solids analysis[1] (dry weight) | Max. Concentration of soluble constituents[2] |
|---|---|---|
| Arsenic | See footnote [3] | 10.0 µg/l (filtered) |
| Cadmium | 21 mg/kg | 5 µg/l (filtered) |
| Total Chromium | See footnote [3] | 50 µg/l (filtered) |
| Chromium VI | | 11 µg/l (filtered) |
| Copper | 61 mg/kg | 10 µg/l (filtered) |
| Lead | 400 mg/kg | 2.5 µg/l [4] (filtered) |
| Mercury | 0.2 mg/kg | 0.05 µg/l |
| Nickel | See footnote [3] | 52 µg/l [4] (filtered) |
| Selenium | 390 mg/kg | 5 µg/l |
| Zinc | 120 mg/kg | 100 µg/l (filtered) |
| pH | | 6.5 – 8.5 |
| **Polyaromatic hydrocarbons (PAH):** | | |
| Acenaphthene | 3,700 mg/kg | |
| Anthracene | 22,000 mg/kg | |
| Benzo(a)anthracene | 0.62 mg/kg | |
| Benzo(b)fluoranthene | 0.62 mg/kg | |
| Benzo(k)fluoranthene | 0.61 mg/kg | |
| Benzo(a)pyrene | 0.062 mg/kg | |
| Chrysene | 6.1 mg/kg | |
| Dibenzo(a,h)anthracene | 0.062 mg/kg | |
| Fluoranthene | 2,300 mg/kg | |
| Fluorene | 2,600 mg/kg | |
| Indeno(1,2,3-cd)pyrene | 0.62 mg/kg | |

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1 Maximum concentrations in Table A.3 for solids are based on USEPA Preliminary Remediation Goals (PRG) for ecological or residential use, or background concentrations found in Delta soil. The PRG screening values are based on risk assessment of common exposure pathways in an upland environment. If the solids or soluble concentrations are exceeded, beneficial reuse options may be restricted or the Discharger may submit a technical report as described in Section F.

2 Soluble concentrations shall be determined using methods specified in the Monitoring and Reporting Program. Soluble metal concentrations are for total recoverable concentrations unless otherwise noted.

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

4 Maximum concentration based on chronic aquatic toxicity with a receiving water hardness of 100 mg/l $CaCO_3$, but will be recalculated based on the CTR and on receiving water hardness determined during predredge analysis or reasonable worst case value.

**Table A.3** (Continued)
**Discharge Applicability Table Part 1**: Applicability of sediments for upland disposal

| Constituent | Max. Concentration of solids analysis[1] (dry weight) |
|---|---|
| Naphthalene | 56 mg/kg |
| Pyrene | 2,300 mg/kg |
| **Polychlorinated Biphenyls (PCB):** | |
| Aroclor 1016 | 3.9 mg/kg |
| Aroclor 1221 | 0.22 mg/kg |
| Aroclor 1232 | 0.22 mg/kg |
| Aroclor 1242 | 0.22 mg/kg |
| Aroclor 1248 | 0.22 mg/kg |
| Aroclor 1254 | 0.22 mg/kg |
| Aroclor 1260 | 0.22 mg/kg |
| **Organochlorine Pesticides:** | |
| Aldrin | 0.029 mg/kg |
| Alpha BHC | 0.090 mg/kg |
| Beta BHC | 0.032 mg/kg |
| Gamma BHC (Lindane) | 0.44 mg/kg |
| Chlordane | 1.6 mg/kg |
| 4,4-DDD | 2.4 mg/kg |
| 4,4-DDE | 1.7 mg/kg |
| 4,4-DDT | 1.7 mg/kg |
| Dieldrin | 0.011 mg/kg |
| Endosulfan | 370 mg/kg |
| Endrin | 18 mg/kg |
| Heptachlor | 0.11 mg/kg |
| Heptachlor epoxide | 0.052 mg/kg |
| Hexachlorocylopentadienne | 420 mg/kg |
| Methoxychlor | 8 mg/kg |
| Toxaphene | 0.44 mg/kg |

[1] Solids concentrations are based on USEPA Preliminary Remediation Goals (PRG) for ecological or residential use, or background Delta soil concentrations. The PRG screening values are based on risk assessment of common exposure pathways in an upland environment. If the solids concentrations are exceeded, beneficial reuse options may be restricted or the Discharger may submit a technical report as described in Section F.

**Table A.3** (Continued)
**Discharge Applicability Table Part 2:** Applicability of sediment elutriate and solids analysis for dredge site impacts and effluent discharges from the disposal site.

| Constituent | Max. Concentration of solids analysis[4,5] (dry weight) | Max. Concentration of soluble constituents[2,4] |
|---|---|---|
| Acute or Chronic Toxicity Bioassay | | 80% survival |
| Arsenic | | 10 µg/l (filtered) |
| Cadmium | | 5 µg/l (filtered) |
| Total Chromium | | 50 µg/l (filtered) |
| Chromium VI | | 11 µg/l (filtered) |
| Copper | | 10 µg/l (filtered) |
| Lead | | 2.5 µg/l [3](filtered) |
| Mercury | | 0.05 µg/l |
| Nickel | | 52 µg/l [3] (filtered) |
| Selenium | | 5 µg/l |
| Zinc | | 100 µg/l (filtered) |
| pH | | 6.5-8.5 |
| Specific conductivity (EC) | | 700 µmhos/cm [6] |
| Total Dissolved Solids(TDS) | | 450 mg/l [6] |
| Chloride | | 106 mg/l [6] |
| Ammonia + Ammonium | | See footnote [7] |
| BOD | | Compare to RW |
| COD | | Compare to RW |
| Tributyltin | | 0.063 µg/l |
| Oil and Grease | | 5 mg/l |

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2 Soluble concentrations shall be determined using methods specified in the Monitoring and Reporting Program. Maximum metal concentrations are for total recoverable concentrations unless otherwise noted.

3 Maximum concentration depends on hardness of receiving water. The number shown is based on a receiving water hardness of 100 mg/l $CaCO_3$ but will be recalculated based on the CTR and on receiving water hardness determined during predredge analysis, or reasonable worst case value.

4 If the elutriate results exceed Table A.3 Part 2 concentrations, then the Discharger may submit a technical report as described in Section F.

5 Solids concentrations for effluent discharge are based on an assumption of 100 mg/l suspended solids in the effluent. If the concentrations are exceeded, the Discharger may submit a technical report that demonstrates how suspended solids will be reduced so that water quality criteria are not exceeded in the effluent.

6 The effluent concentration shall not exceed values for EC, TDS or chloride or shall not be above ambient background levels of the receiving water if the receiving water exceeds the values.

7 Ammonia and ammonium concentrations will be calculated based on the pH and temperature of the receiving water according to the following formula from the California Toxics Rule:
$CCC=\{[0.0577/(1+10^{7.688-pH})] + [2.487/(1+10^{pH-7.688})]\} \times \{MIN[2.85, 1.45\times10^{0.028\times(25-T)}]\}$

**Table A.3** (Continued)
**Discharge Applicability Table Part 2**: Applicability of sediment elutriate and solids analysis for dredge site impacts and effluent discharges from the disposal site.

| Constituent | Max. Concentration of solids analysis[4,5] (dry weight) | | Max. Concentration of soluble constituents[2,4] |
|---|---|---|---|
| **Polyaromatic hydrocarbons (PAH):** | | | |
| Acenaphthene | 12,000 mg/kg | *or* | 1,200 µg/l |
| Anthracene | 96,000 mg/kg | *or* | 9600 µg/l |
| Benzo(b)fluoranthene | 44 µg/kg | *or* | 0.0044 µg/l |
| Benzo(k)fluoranthene | 44 µg/kg | *or* | 0.0044 µg/l |
| Benzo(a)pyrene | 44 µg/kg | *or* | 0.0044 µg/l |
| Chrysene | 44 µg/kg | *or* | 0.0044 µg/l |
| Dibenz(a,h)anthracene | 44 µg/kg | *or* | 0.0044 µg/l |
| Fluoranthene | 3,000 mg/kg | *or* | 300 µg/l |
| Fluorene | 13,000 mg/kg | *or* | 1,300 µg/l |
| Indeno(1,2,3-cd)pyrene | 44 µg/kg | *or* | 0.0044 µg/l |
| Naphthalene | 6,200 mg/kg | *or* | 620 µg/l |
| Pyrene | 9,600 mg/kg | *or* | 960 µg/l |
| **Polychlorinated Biphenyls (PCB):** | 1.7 µg/kg (Total sum) | *or* | 0.00017 µg/l (Sum of PCBs in elutriate) |
| **Organochlorine Pesticides:** | | | |
| Aldrin | | | ND (<0.005 µg/l) |
| Alpha BHC | | | ND (<0.01 µg/l) |
| Beta BHC | | | ND (<0.005 µg/l) |
| Gamma BHC (Lindane) | | | ND (<0.02 µg/l) |
| Chlordane | | | ND (<0.1 µg/l) |
| 4,4-DDD | | | ND (<0.05 µg/l) |

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[2] Soluble concentrations shall be determined using methods specified in the Monitoring and Reporting Program.

[4] If the elutriate results exceed Table A.3 Part 2 concentrations, then the Discharger may submit a technical report as described in Section F.

[5] Solids concentrations for effluent discharge are based on an assumption of 100 mg/l suspended solids in the effluent. If the concentrations are exceeded, the Discharger may submit a technical report that demonstrates how suspended solids will be reduced so that water quality criteria are not exceeded in the effluent.

**Table A.3** (Continued)
**Discharge Applicability Table Part 2 Continued**: Applicability of sediment elutriate and solids analysis for dredge site impacts and effluent discharges from the disposal site.

| Constituent | Max. Concentration of solids analysis[4,5] (dry weight) | Max. Concentration of soluble constituents[2,4] |
|---|---|---|
| **Organochlorine Pesticides** (continued): | | |
| 4,4-DDE | | ND (<0.05 µg/l) |
| 4,4-DDT | | ND (<0.01 µg/l) |
| Dieldrin | | ND (<0.01 µg/l) |
| Endosulfan I | | ND (<0.02 µg/l) |
| Endosulfan II | | ND (<0.01 µg/l) |
| Endosulfan sulfate | | ND (<0.05 µg/l) |
| Endrin | | ND (<0.01 µg/l) |
| Endrin aldehyde | | ND (<0.01 µg/l) |
| Heptachlor | | ND (<0.01 µg/l) |
| Heptachlor epoxide | | ND (<0.01 µg/l) |
| Hexachlorocyclopentadiene | | ND (<0.01 µg/l) |
| Methoxychlor | | ND (<0.1 µg/l) |
| Toxaphene | | ND (<0.5 µg/l) |
| **Organophosphorous Pesticides:** | | |
| Chlorpyrifos | | 0.014 µg/l |
| Diazinon | | 0.05 µg/l |
| Dimethioate | | 1.0 µg/l |
| Malathion | | 0.43 µg/l |
| Parathion | | 0.013 µg/l |
| Phorate | | 0.7 µg/l |

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2 Soluble concentrations shall be determined using methods specified in the Monitoring and Reporting Program.

4 If the elutriate results exceed Table A.3 Part 2 concentrations, then the Discharger may submit a technical report as described in Section F.

5 Solids concentrations for effluent discharge are based on an assumption of 100 mg/l suspended solids in the effluent.

## B. PROHIBITIONS

1. The discharge of 'hazardous waste' or 'designated waste' is prohibited. For the purposes of this Order, the term 'hazardous waste' is as defined in Title 23, California Code of Regulations, Section 2510 et seq., and 'designated waste' is as defined in California Water Code Section 13173.

2. The discharge of dredged materials to a site other than a Dredged Material Disposal site specifically designed for their containment is prohibited.

3. The discharge shall not cause the release of pollutants, or waste constituents in a manner that could cause a condition of nuisance, contamination, or pollution of groundwater to occur.

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

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

    b. increases in bottom deposits or aquatic growth;

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

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

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

5. The direct discharge of wastes to surface waters or surface water drainage courses other than effluent from the DMD site is prohibited. Surface runoff from the DMD site may be permitted if the approved site operation plan has provisions for erosion control and monitoring.

6. The discharge of dredge return water from hopper dredges to surface waters is prohibited.

7. The discharge of sanitary waste to the DMD sites is prohibited.

## C. DISCHARGE SPECIFICATIONS

(For discharge of dredged materials into Dredged Material Disposal Site)

1. The discharge of dredged materials shall only be to the sites identified in Finding No. 6 of this Order, or to a DMD Site with Waste Discharge Requirements approved for accepting dredge materials from the Sacramento Deep Water Ship Channel or to a DMD site approved by the Executive Officer with a waiver of Waste Discharge Requirements.

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

3. The discharge of any materials generated during dredging operations shall not cause a nuisance or condition of pollution as defined by the California Water Code.

4. The discharge shall not cause concentrations of any materials that are deleterious to animals, aquatic, human or plant life in adjacent water bodies.

5. The discharge shall not cause the pollution or contamination of any water supply.

6. The discharge shall not alter the apparent color of adjacent water bodies such that it causes nuisance or adversely affects beneficial uses.

7. The discharge to the DMD site shall consist solely of sediment and water produced from dredging operations.

8. Appropriate soil erosion control measures shall be made and maintained to prevent discharge of sediment to surface waters or surface water drainage courses from disturbed areas at the DMD sites. Surface runoff from the DMD site may be permitted if the approved site operation plan has provisions for erosion control and monitoring.

9. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the activity area.

10. Newly constructed or rehabilitated levees at the DMD sites shall be designed and constructed under the direct supervision of a California Registered Civil Engineer.

11. All retention dikes or levees shall be so constructed and maintained to prevent sloughing that causes turbidity in excess of Receiving Water Limitations No. 10.

12. The discharge shall remain within the designated disposal area at all times, except for effluent discharges specified in Section D Effluent Limitations. After drying, the solid material may be removed for beneficial reuse at other locations subject to restrictions specified in the Notice of Applicability. Surface runoff from the DMD site may be permitted if the approved site operation plan has provisions for erosion control and monitoring.

## D. EFFLUENT LIMITATIONS

(Return flows from the Dredged Material Disposal Site to the specified receiving water)

1. The effluent discharge from the Dredge Material Disposal sites are subject to the following flow limitations:

   The average daily flow shall not exceed 9 mgd.
   The maximum daily flow shall not exceed 10 mgd.

2. The discharge shall not have a pH less than 6.5 nor greater than 8.5.

3. In areas where the receiving water is on the 303(d) list as an impaired water body for nutrient enrichment or low dissolved oxygen, concentrations of dissolved oxygen in the effluent shall not fall below 5.0 mg/l.

4. In areas where the receiving water is on the 303(d) list as an impaired water body for low dissolved oxygen, the effluent shall not contain oxygen depleting constituents (BOD, COD, and ammonia) that are above the ambient levels in the receiving water upstream from the effluent discharge point.

5. The effluent shall not exceed water quality objectives or CTR/NTR criteria for any constituent that is on the 303(d) list for the receiving water where the effluent is discharged, unless a mixing zone is granted in the NOA. If the water entrained during dredging (receiving water) contains constituents that exceed water quality objectives, the effluent shall not exceed ambient levels in the receiving water.

6. In some DMD sites, the effluent is discharged directly into agricultural drainage ditches. Since agricultural drainage ditches are eventually discharged into rivers and sloughs in the Delta, the 303(d) constituents of the eventual surface water destination will be applied to the drainage ditch.

7. The following constituents are on the current 303(d) list for impaired water bodies in the area of the Delta that includes the Sacramento Deep Water Ship Channel:

   Mercury
   DDT
   Chlorpyrifos
   Diazinon

Group A Pesticides (Aldrin, Dieldrin, chlordane, Endrin, heptachlor, heptachlor expoxide, hexachlorocyclohexane (including Lindane), Endosulfan, and Toxaphene)
Unknown toxicity

8. The effluent shall not contain any constituent at concentrations that could cause acutely toxic conditions to aquatic life nor adversely impact biologically sensitive or critical habitats.

9. Survival of aquatic organisms in 96-hour bioassays of undiluted effluent shall be no less than:
   Minimum for any one bioassay..... 70%
   Median for any three or more consecutive bioassays ..... 90%

10. The point of compliance for effluent limitations is the point just before the effluent enters the receiving water.

## E. RECEIVING WATER LIMITATIONS:

Receiving water limitations (RWL) implement Water Quality Objectives in applicable water quality control plans. As such, they are a required part of this Order.

A mixing zone is defined as a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality objectives and CTR/NTR criteria may be exceeded without causing adverse effects to the overall water body. A mixing zone may be allowed if there is assimilative capacity in the receiving water. If the Discharger proposes a mixing zone for any constituent, they shall show justification that the receiving water has assimilative capacity and that dilution is likely to occur within the mixing zone. The mixing zone has a maximum length of 300 feet and shall not exceed 50% of the cross-section of the receiving water. Acutely toxic conditions are not permitted at any place inside the mixing zone. Chronic aquatic criteria and all other water quality objectives and CTR/NTR criteria must be met at the edge of the mixing zone in the receiving water. In addition the mixing zone shall not:

- adversely impact beneficial uses.
- compromise the integrity of the entire water body.
- cause acutely toxic conditions to aquatic life passing through the mixing zone.
- restrict the passage of aquatic life.
- adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws.
- produce undesirable or nuisance aquatic life.
- result in floating debris, oil, or scum.
- produce objectionable color, odor, taste or turbidity.

- cause objectionable bottom deposits.
- cause nuisance.
- dominate the receiving water body or overlap a mixing zone from different outfalls.
- be allowed at or near any drinking water intake.
- be allowed for any constituents in agricultural drainage ditches due to the lack of assimilative capacity, unless the Discharger can demonstrate that the discharge improves water quality in the agricultural drainage ditch.

If the Discharger proposes a mixing zone that meets the requirements of this Order, the Executive Officer may approve the mixing zone in the Notice of Applicability.

In the following limitations, the discharge is defined as the effluent from the DMD sites and/or sediment released to the receiving waters from the dredge cutting head. The Discharger shall not cause the following Receiving Water Limits to be exceeded in the receiving water or at the edge of the allowed mixing zone, if applicable:

1. Concentrations of dissolved oxygen to fall below 5.0 mg/l in Delta waters east of the Antioch Bridge, nor to fall below 7.0 mg/l in Delta waters west of the Antioch Bridge. The DMD sites located west of the Antioch bridge include: S-20 (Augusto Pit, Sherman Island) and S-35.

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

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

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

5. Aesthetically undesirable discoloration.

6. Fungi, slimes, or other objectionable growths.

7. The normal ambient pH to fall below 6.5, exceed 8.5 or change by more than 0.5.

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

9. The normal ambient temperature to increase more than $5^{o}$ F.

10. The discharge shall not cause an increase in turbidity exceeding the following limits in the receiving water:
    a. 1.0 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs;
    b. 20 percent where natural turbidity is between 5 and 50 NTUs;
    c. 10 NTUs where natural turbidity is between 50 and 100 NTUs;
    d. 10 percent where natural turbidity is greater than 100 NTUs.

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

12. Violation of any applicable water quality objective for receiving waters adopted by the Board or the SWRCB, or to CTR/NTR criteria promulgated by the USEPA, pursuant to the Clean Water Act and regulations adopted thereunder.

## F. PROVISIONS

1. If the concentration(s) of the predredge sediment samples exceed those specified in Applicability Section A.3, then the Discharger may submit a technical report with the NOI to the Executive Officer demonstrating the Discharger's ability to comply with this Order while exceeding the applicability numbers in the A.3 Discharge Applicability Table. The dredging project may not proceed until the technical report is reviewed by the Executive Officer and a Notice of Applicability has been granted. If the Executive Officer finds that the technical report is consistent with the conditions of this Order, new values will be substituted for the numbers listed in Table A.3, but only for the discharge covered by the NOA. Attachment "D" gives additional information on the content of the Technical Report.

2. If the maximum concentration of the solids analysis listed in Applicability Table A.3 Part 1 are exceeded, restrictions may be placed on some beneficial reuse options. The Discharger may propose appropriate EPA PRG values (Preliminary Remediation Goals) or risk analysis calculations that address the likely exposure pathways of the specific DMD location and use of the dredged material once it is placed on land.

3. If maximum concentration for soluble constituents listed in Applicability Table A.3 Part 1 are exceeded, the Discharger may propose site-specific calculations, based on site-specific attenuation and dilution factors, to demonstrate that the dredged material will not produce leachate that will exceed water quality objectives for the groundwater. If direct surface runoff

poses a potential threat to surface water, beneficial reuse may be restricted to areas with no direct surface runoff to surface waters

4. During the predredge analysis, if the modified elutriate test results exceed the maximum concentrations listed in Part 2 of the Discharge Applicability Table (A.3), the Discharger may submit a technical report that provides justification for a mixing zone in the receiving water. The mixing zone can be used if the Executive Officer finds that it meets the conditions of this Order. Mixing zone calculations shall use the maximum effluent flow listed in the WDR and the average receiving water flow expected for the time of the discharge.

5. Calculations need be submitted only for the constituent exceeding concentrations in the Discharge Applicability Table (A.3). Within 7 days after the Discharger submits copies of the technical report prepared for compliance with Provision F, Board staff shall mail copies of the technical report to interested parties or agencies that request a copy. Interested parties will have two weeks to review the report and provide comments to the Executive Officer for consideration prior to issuance of a Notice of Applicability. Separate NOIs may be submitted for different reaches of the project.

6. The Discharger shall submit an Operation Plan for each DMD Site. This Operation Plan shall describe site operations and procedures to be followed before, during, and after maintenance dredging sediment disposal. The DMD Site's Operation Plan must be submitted with the Notice of Intent. The Site Operation Plan shall include emergency procedures for potential risks, including levee failures.

7. 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.

8. The Discharger shall comply with the attached Monitoring and Reporting Program No. 5-01-116, which is part of this Order, and any revision thereto as ordered by the Executive Officer. Violations may result in enforcement action, including Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of the Notice of Applicability.

9. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

10. In the event of any change in control or ownership of land or control of dredging and disposal operations described herein, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

11. The Discharger shall notify the Board when each dredging project that is covered by these requirements is complete, so that the Notice of Applicability may be withdrawn and the Discharger will no longer be covered by this Order, although long-term maintenance of sediments in the DMD sites will continue to be covered.

12. The Discharger shall immediately notify the Board by telephone whenever a violation or an adverse condition occurs as a result of the dredging and disposal operation or the discharge of effluent. Written confirmation shall follow within two (2) weeks. 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 other conditions of this Order.

13. The Discharger shall report promptly to the Board any material change or proposed change in the character, location, or volume of the discharge.

14. The Board considers the Discharger to have continuing responsibility for correcting any problems which may arise in the future as a result of maintenance dredging activities and of the subsequent use of the dredge material disposal sites.

15. 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 the Notice of Applicability.

16. A copy of this Order and the Notice of Applicability shall be kept as a reference for dredging operation personnel. Key operating personnel shall be familiar with its contents.

17. The Applicability Table A.3 will not be implemented for the 2001 dredging season in order to provide time for the Discharger to gather information needed for the site-specific studies. Although all required testing will be performed for the 2001 dredging season, the Discharger must meet the Applicability numbers in the former WDR: 88-143. The Discharger shall submit a Technical Report with a hydrologic site assessment of each of the DMD sites by 1 February 2002.

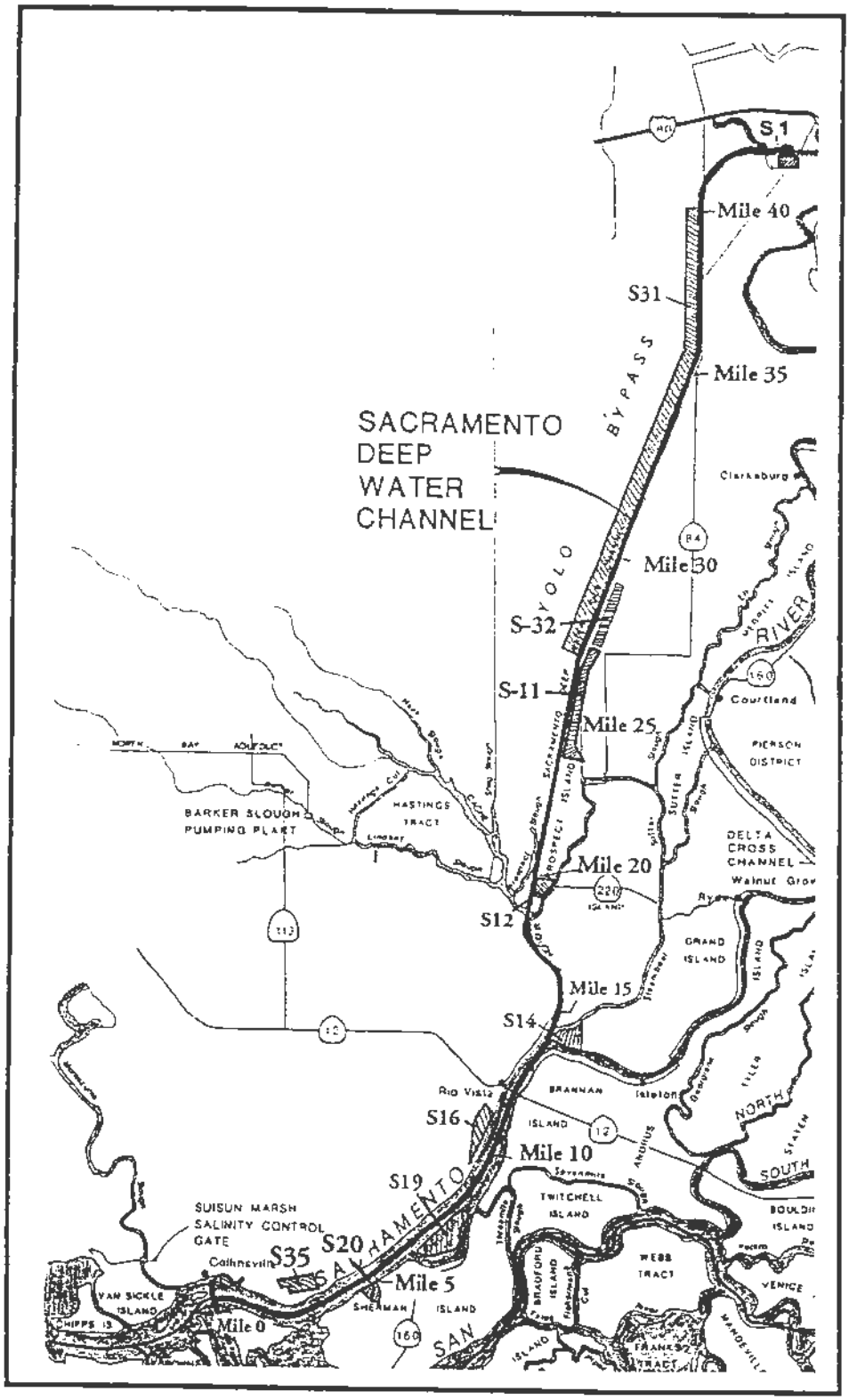
18. After pre-dredge sampling is completed, sampling results will be reviewed in conjunction with anticipated attenuation and dilution factors. If the review shows that discharge of solids to land or effluent to surface waters would be prohibited, then the Board will reopen this Order to evaluate any additional factors which may affect the terms of compliance, to determine if alternative or less stringent standards can be adopted which are protective of the environment without hampering dredging activities.

I, GARY M. CARLTON, 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 11 May 2001.

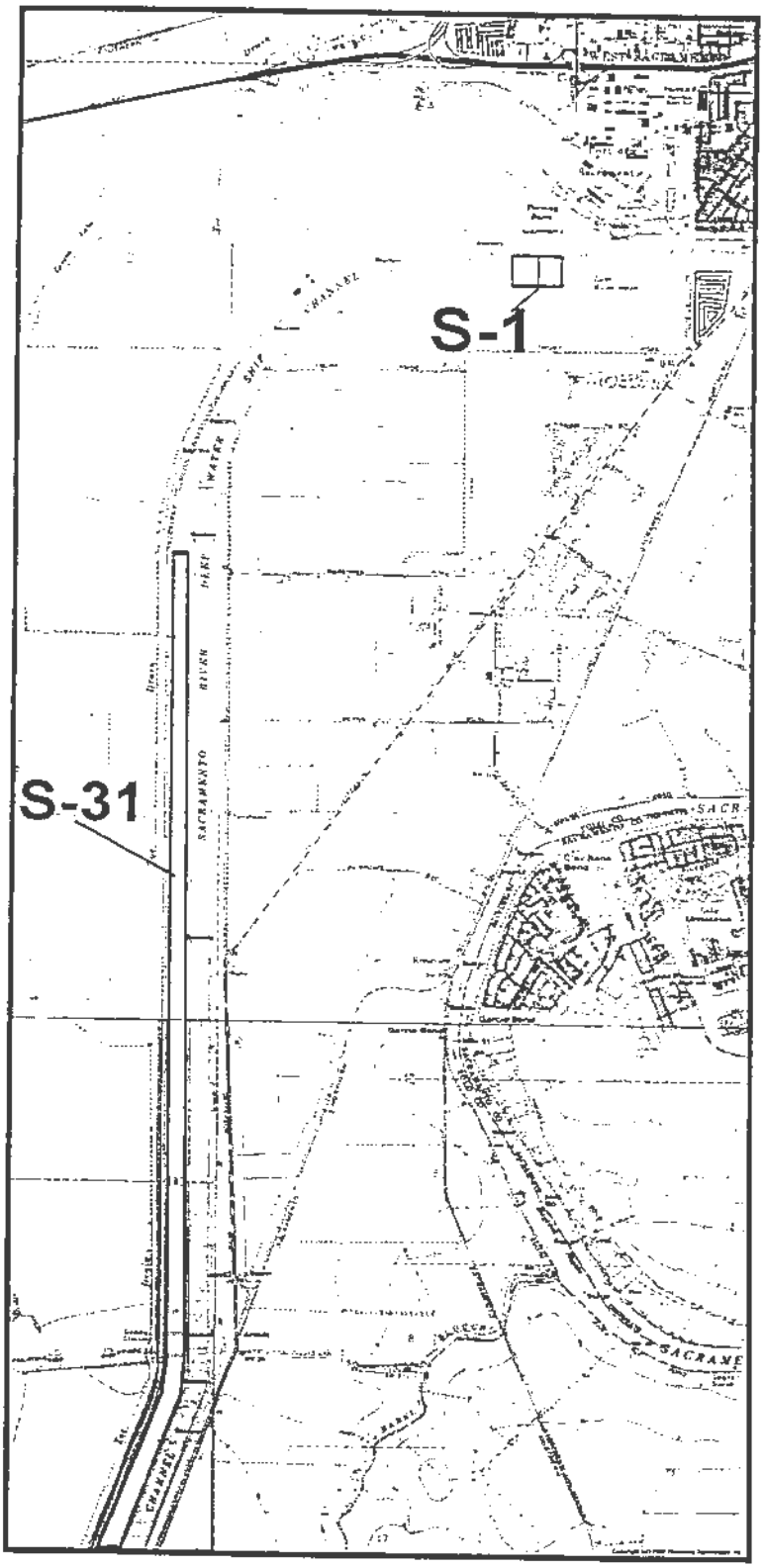
GARY M. CARLTON, Executive Officer

Sac_DWSC.wdr: dmp

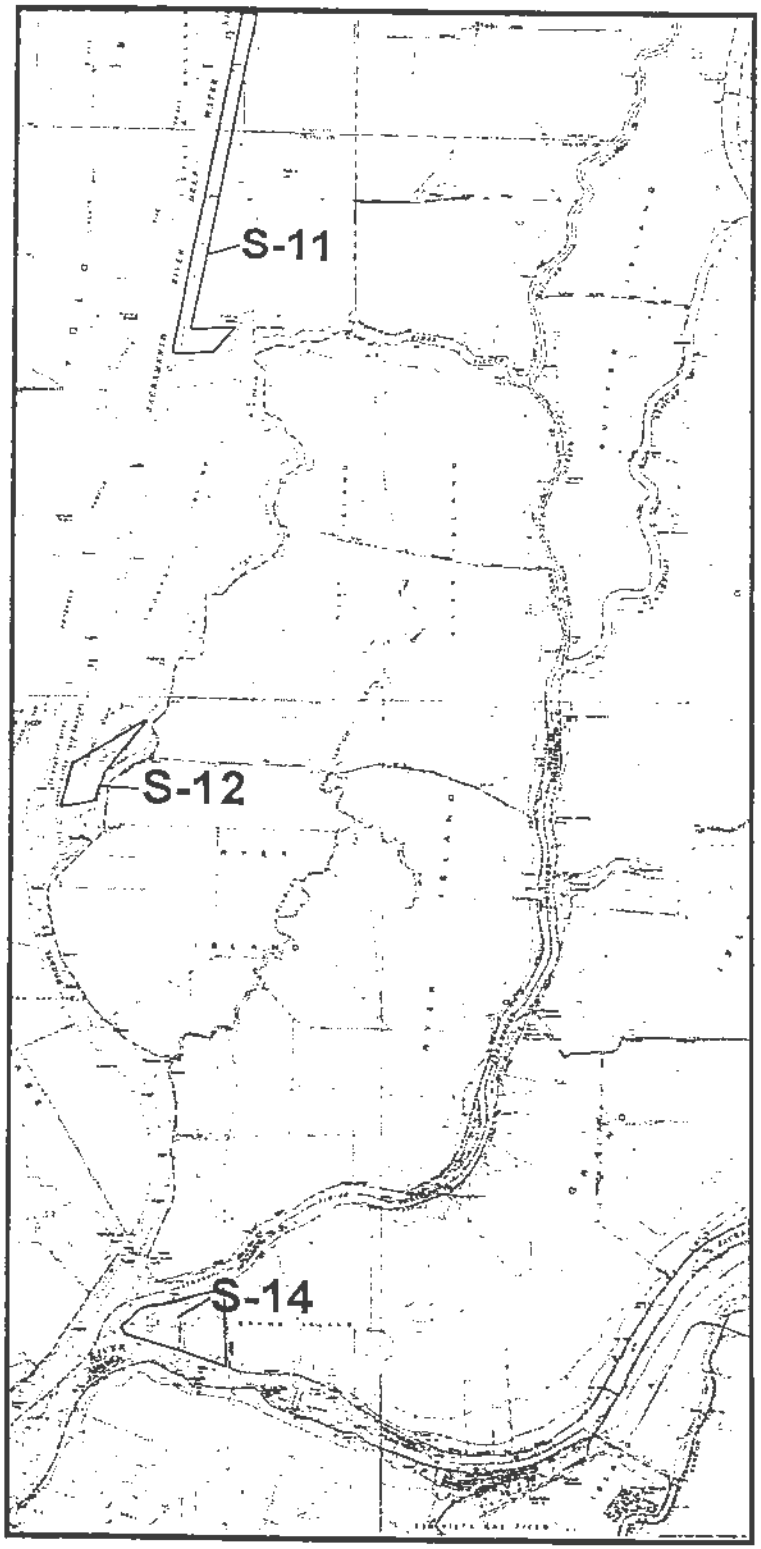
## ATTACHMENT "A"
## PROJECT LOCATION



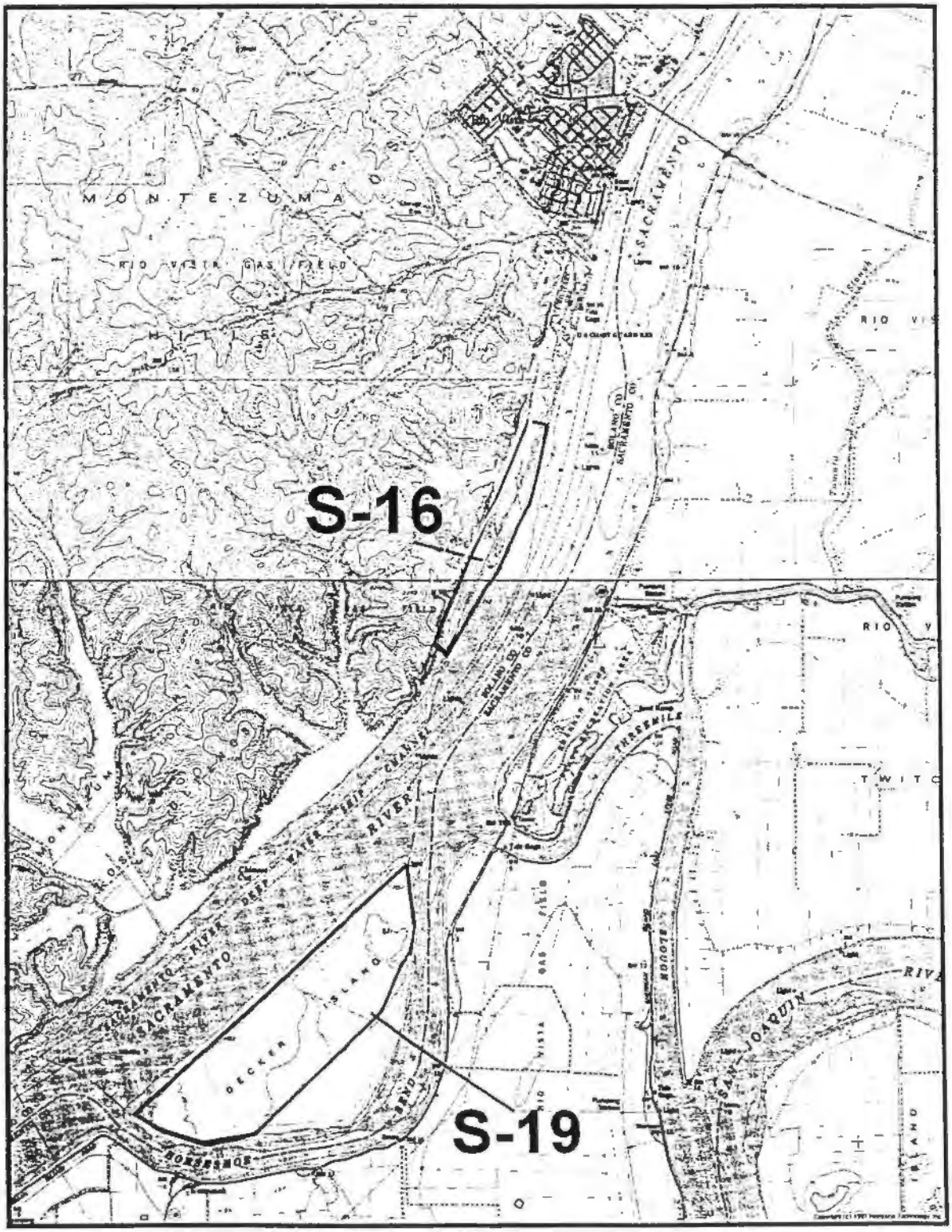
## ATTACHMENT "A": PROJECT LOCATION DETAIL SITES S-1 & S-31



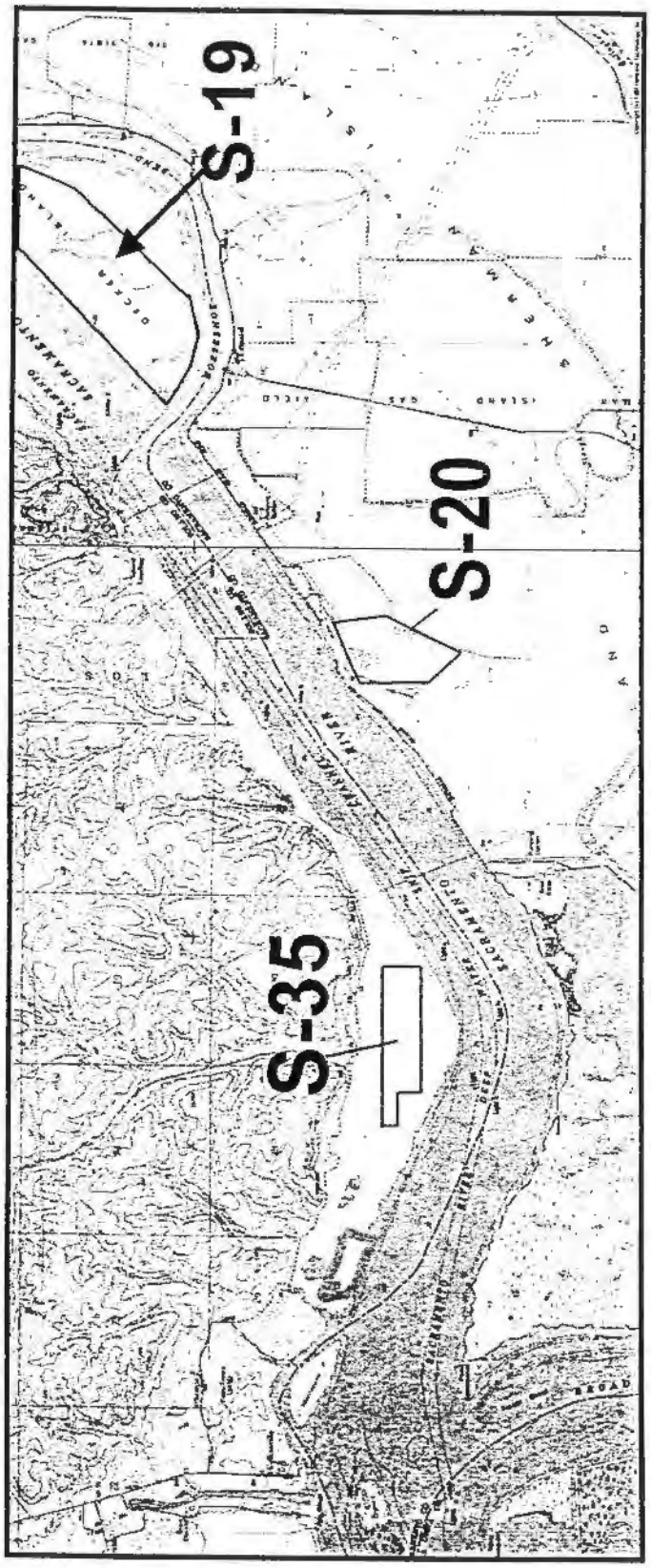
## ATTACHMENT "A": PROJECT LOCATION DETAIL
## SITES S-11, S-12, & S-14



## ATTACHMENT "A": PROJECT LOCATION DETAIL SITES S-16 & S-19



**ATTACHMENT "A": PROJECT LOCATION DETAIL**
**SITES S-19, S-20, & S-35**



## ATTACHMENT "B"
## APPLICATION REQUIREMENTS

A Notice of Intent and filing fee must be submitted for each proposed maintenance dredging project. The Notice of Intent shall be prepared under the supervision of either a California Registered Civil Engineer, Registered Geologist, or Certified Engineering Geologist and shall provide the following information:

**A. Dredging Project Area Description**

1. Map of proposed maintenance dredging area.
2. Maximum depth of dredging.
3. Estimated total cubic yards to be removed.
4. Any additional physical or structural aspects of the project that would make the maintenance dredging unique, i.e., pipelines, cables, bridges, piers, docks, marinas, sewer outfalls, etc.

**B. Predredge Sampling and Analyses**

1. Sufficient predredge sediment samples must be collected for analyses to demonstrate that the General Order is applicable to the proposed maintenance dredging project.
2. The Discharger shall submit a "Sampling and Analysis Plan" for approval by Regional Board Staff. The plan should include:
   a. Location and rationale for sampling.
   b. Quantity of samples.
   c. Test method and procedure used for each measurement/analysis.
   d. Detection and reporting limits for each analysis method.
   e. Sample collection technique.
   f. Quality Assurance/Quality Control to be performed for both field and lab.
3. The general categories of analyses required to demonstrate applicability as listed in Section A.3 are as follows:
   a. Analysis of metals (total concentrations)
   b. Soluble metals using Waste Extraction Test with citrate buffer performed in accordance with the procedures of Title 22 CCR, Division 4.5, Chapter 11, Appendix II (if the ratio of neutralizing potential to acid-generating potential is less than 3).
   c. Soluble metals using Waste Extraction Test method with de-ionized water as the extractant, if the ratio of neutralizing potential to acid-generating potential is greater than 3.
   d. Solid-phase Organic compounds (as specified by Regional Board staff).
   e. Analyses for organic compounds, metals, pH, TDS, and chloride should be performed on supernatant from Modified Elutriate Test, which mixes sediment from the dredge site with the receiving water. A toxicity test shall be performed on elutriate from the Modified Elutriate Test. The toxicity test (acute or chronic) shall be chosen dependent on the duration of dredging in

that reach. Tributyltin must also be analyzed on the filtered supernatant if dredging will occur near the Port or near a marina

f. Neutralizing Potential and Acid Generating Potential analysis of solids.
g. Regional Board staff may modify the required analyses as new information becomes available.

**C. Description and Operation Plan of Dredging Method**

1. Type of dredging equipment (ex: hydraulic cutter-head suction dredge).
2. Dredging rate in cubic yards per day.
3. Hours of operation and estimated days to complete project.
4. Best management practices to be implemented during dredging operations to prevent impacts to water quality.
5. Method of transporting dredged materials to Dredge Material Disposal site.

**D. Dredge Material Disposal Site** Dredge Material Disposal

1. Name and Location of Dredged Material Disposal Site.
2. Site Operation Plan which must include the following:
   a. Description of dredge material handling equipment.
   b. Scaled site plan showing the following:
      - North arrow and scale.
      - Location of DMD site.
      - DMD site overflow structure locations.
      - Location and diameter of river outfall pipe for effluent from disposal site.
      - Sampling points for effluent and receiving water monitoring.
      - Locations where Best Management Practices will be applied to prevent erosion.
      - Design specifications (including prevention of erosion, washout or inundation by storms).
3. Volume available for dredge material in the DMD site.
4. Calculations and analyses for determining minimum holding times required for dredge materials before decanting effluent to the receiving water.
5. Estimated duration of effluent discharge from each DMD site.

**E. Additional Receiving Water Requirements**

If the concentration of the predredge sediment or elutriate samples exceed those specified in Applicability Section A.3, then a technical report may be submitted to the Executive Officer for review and approval. The technical report must be prepared in accordance with the provisions in Section F.

## ATTACHMENT "C"
## List of approved Dredge Material Disposal Sites

| Site | Location (River Mile) | Discharge Point | Volume capacity (cy) | Acre-age | Location (Latitude, Longitude) | Owner (Addresses to follow) |
|---|---|---|---|---|---|---|
| S1 | RM 43.4 | Sacramento Channel RM 43.4 | 500,000 | 124 | 38°33'32" 121°33'26" | Port of Sacramento |
| S-11 | RM 23 to 26 | Sacramento Channel RM 26 | 3,040,000 | 640 | Prospect Island, RM 23 to 26 38°18'06" 121°39'01" | Port of Sacramento & Leo Fahn, trustee for Sylvia et al |
| S-12 | RM 20 | Sacramento Channel RM 19-20 | 1,000,000* | 320 | Prospect Is. RM 20 38°14'50" 121°39'47" | Port of Sacramento |
| S-14 | RM 14 | Steamboat Slough | 1,000,000* | 196 | Grand Is., 38°10'45" 121°39'09" | U.S. Army Corps of Engineers |
| S-16 | RM 9 to 11 | Sacramento River RM 11 | 1,000,000* | 149 | Rio Vista, 38°07'48" 121°42'00" | U.S. Army Corps of Engineers |
| S-19 | RM 6 to 8 | Sacramento River at Horseshoe Bend RM 7 | 1,410,000* | 590 | Decker Is., 38°05'30" 121°43'14" | Port of Sacramento & Robt. Oppenheimer BBI |
| S-20 | RM 5 | Sacramento River RM 5 | 640,000* | 98 | Sherman Is. Augusto Pit 38°05'30" 121°42'00" | Department of Water Resources |
| S-31 | RM 27 to 40 | Sacramento Channel between RM 27 to 40 | 11,150,000* | 663 | 38°26'42" 121°35'54" | Port of Sacramento |
| S-32 | RM 26.0 to 26.5 | Sacramento Channel between RM 26 & 26.5 | 670,000 | 265 | 38°20'22" 121°38'33" | Port of Sacramento |
| S-35 | RM 1 | Sacramento River RM 1 | 890,000 | 196 | 38°04'09" 121°48'23" | Dow Chemical Co. |

*** Denotes sites where useful capacity of site may be extended indefinitely due to removal of dredge material for beneficial reuse.**

**Addresses of DMD site owners:**

Sacramento Yolo Port District
Port of Sacramento
P.O. Box 980070
West Sacramento, CA 95691

Frank Ramos et al.
1450 Harbor Boulevard
West Sacramento, CA 95691

Fahn Bros. Farms
Attn: Linda Peters
P.O. Box 1563
Sacramento, CA 95812-1563

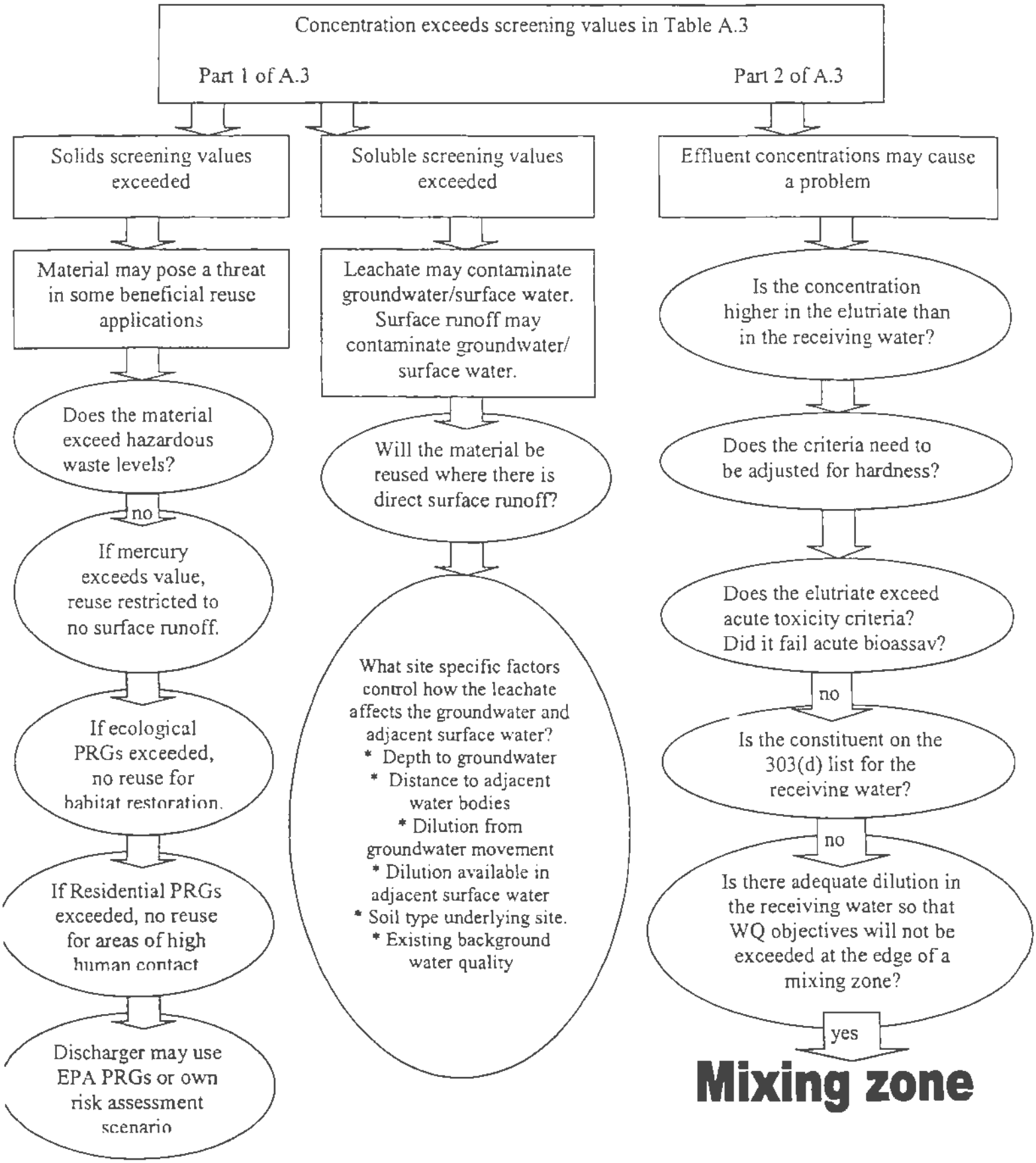
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

The Reclamation Board
State of California
1416 Ninth Street
Sacramento, CA 95814

Dow Chemical Company
Tax Department
AFB Building
Freeport, TX 77541

Robert Oppenheimer
15890 Norton Road
Healdsburg, CA 95448

## ATTACHMENT "D"
## TECHNICAL REPORT FLOW DIAGRAM



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 5-01-116

FOR
UNITED STATES ARMY CORPS OF ENGINEERS AND
THE PORT OF SACRAMENTO
SACRAMENTO DEEP WATER SHIP CHANNEL MAINTENANCE DREDGING
ACTIVITIES CHANNEL MILE 0.0 TO 43.4
CONTRA COSTA, SACRAMENTO, SOLANO AND YOLO COUNTIES

This monitoring program includes pre-dredge sediment and elutriate analysis, dredge site monitoring, effluent (return-water) monitoring and receiving water monitoring.

## PRE-DREDGE SEDIMENT AND ELUTRIATE MONITORING

Pre-dredge sediment sampling and analyses shall be performed to determine sediment constituent concentrations for those items listed in Applicability Section A.3, Discharge Applicability Table. Soluble metal constituents shall be measured after performing a Title 22 Waste Extraction Test (WET) procedure. The WET procedure may be modified to use deionized water in place of the citrate buffer when the ratio of neutralizing potential (NP) to Acid Generating Potential (AGP) is greater than 3. Another extraction procedure may be used with approval by the Executive Officer. In some cases, the Waste Extraction Test with citrate buffer may be required to show that the dredge material is not classified as hazardous waste. A modified elutriate test (MET)(USACOE Tech Note EEDP 04-2) shall be performed on representative sediment samples and receiving water from the site. The supernatant from the MET shall be analyzed for the constituents listed in Part 2 of Table A.3. Approved analytical methods are listed in Table 3 below.

The frequency of samples required depends on a number of factors including: previous analysis results, location, distribution of the sediments and type of analysis. Historically, some reaches of the channels have smaller amounts of sediment deposited and other sections have had massive sediment deposits. It is assumed that the sediments within a reach have been recently deposited, and have similar characteristics and source of materials. Therefore, the sampling frequency will be adjusted for the amount of material to be dredged from a reach, so that reaches with large amounts of material will have a lower sampling frequency. In addition, sampling frequency may be decreased in the future if there are sufficient number of results to indicate that the constituent has a low probability of being found in levels that would cause concern. If ten samples taken in a given sampling frequency category have results well below the levels of concern, the sampling frequency can be decreased by one category (for example from A to B) for that constituent, with category D as a maximum. If results from a sample are above levels of concern, the sampling frequency may be increased by one category (for example from B to A). Table 2 shows the sampling frequency categories for different constituents depending on the amount of material in each discrete reach to be dredged.

A "reach" is defined as a segment of channel where the material to be removed has the following similarities: similar grain size, similar sources of contaminants, and a similar depositional environment.

**Table 1: Sampling frequency categories**

| Category | Sampling Frequency Minimum |
|---|---|
| A | One sample per 12,500 cubic yards, or part thereof |
| B | One sample per 25,000 cubic yards, or part thereof |
| C | One composite sample per 50,000 cubic yards, or part thereof (composite of 2 different sample locations) |
| D | One composite sample per 75,000 cubic yards, or part thereof (composite of at least 3 different sample locations) |

**Table 2: Sampling frequency assignments based on constituent and amount of material to be dredged in a reach.**

| Constituent | Sampling category based on volume of dredge material to be removed from reach | | | |
|---|---|---|---|---|
| | Under 25,000 | 25,000-50,000 | 50,000-100,000 | Over 100,000 |
| Acid Generating Potential/ Neutralizing Potential | A | B | C | D |
| WET metals | A | B | C | D |
| MET metals | A | B | C | D |
| MET Ammonia & Ammonium | A | B | C | D |
| MET COD | A | B | C | D |
| MET BOD | A | B | C | D |
| Metal solids | A | B | C | D |
| PAH solids | A | B | C | D |
| PCB solids | A | B | C | D |
| OC Pesticide solids | A | B | C | D |
| MET PAH | A | B | C | D |
| MET PCB | A | B | C | D |
| MET OC Pesticides | A | B | C | D |
| MET OP Pesticides | A | B | C | D |
| MET Toxicity Bioassay | A | B | C | D |
| MET pH | A | B | C | D |
| MET Specific conductivity (EC) | A | B | C | D |
| MET Total Dissolved Solids(TDS) | A | B | C | D |
| MET Chloride | A | B | C | D |
| Receiving Water Hardness, pH | A | B | C | D |
| MET Tributyltin (filtered) | If within 500 yards of the Port or a marina | | | |
| MET Oil and Grease | If within 500 yards of the Port or a marina | | | |

The sampling and analysis plan for pre-dredge sampling shall be approved by Regional Board staff before samples are taken.

**Table 3: Analytical Methods**

| | Sample preparation | Analysis method |
|---|---|---|
| Acid Generating Potential/ Neutralizing Potential | | |
| WET metals | Waste Extraction Test (citrate buffer or deionized water) | Arsenic 7062<br>Barium 6010B<br>Cadmium 7131A<br>Total Chromium 6010B<br>Chromium VI 7195, 7196, or 7191<br>Copper 6010B<br>Lead 7421<br>Mercury 7471A (RL<25 ng/l)<br>Nickel 7521<br>Selenium 7740 or 7741<br>Zinc 6010B |
| MET metals | Modified Elutriate Test (USACOE Tech Note EEDP 04-2) | |
| MET Ammonia & Ammonium | Modified Elutriate Test | Standard Method 4500-$NH_3$ |
| MET COD | Modified Elutriate Test | 5220B |
| MET BOD | Modified Elutriate Test | 5210B |
| Metal solids | | 6010B except Mercury |
| PAH solids | | 8310 |
| PCB solids | | 8082 |
| OC Pesticide solids | | 8081A |
| MET PAH | Modified Elutriate Test | 8310 or 8270C |
| MET PCB | Modified Elutriate Test | 8082 |
| MET OC Pesticides | Modified Elutriate Test | 8081A |
| MET OP Pesticides | Modified Elutriate Test | 8141A |
| MET Toxicity Bioassay | Modified Elutriate Test | EPA 600/4-90/027F |
| MET pH | Modified Elutriate Test | 150.1 |
| MET Specific conductivity (EC) | Modified Elutriate Test | 2510 |
| MET Total Dissolved Solids(TDS) | Modified Elutriate Test | 2540C |
| MET Chloride | Modified Elutriate Test | 300.0 |
| Receiving Water Hardness | | 2340B |
| MET Tributyltin (filtered) | Modified Elutriate Test | Gas chrom. w/ FPD detect. |
| MET Oil and Grease | Modified Elutriate Test | 5520C/8440 |

**BOD:** Biological Oxygen Demand
**COD:** Chemical Oxygen Demand
**MET:** Modified Elutriate Test U.S. Army Corps of Engineers Tech Note EEDP-04-1,-2,-3,-4
**OP:** Organophosphorous

**OC:** Organochlorine
**PAH:** Polyaromatic Hydrocarbons
**PCB:** Polychlorinated Biphenyls
**WET:** Waste Extraction Test

Equivalent analytical methods may be substituted with approval of Regional Board staff.

## DREDGE SITE RECEIVING WATER MONITORING

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

| Station | Description |
|---|---|
| R-1 | Upcurrent of the dredging location undisturbed by the dredging operation, and not to exceed 3000 feet from the dredge. |
| R-2 | within 300 feet downcurrent of the dredge suction head or clamshell. |

In environments without significant current, R-1 should be located at a distance that is unaffected by dredging and R-2 shall be taken within 300 feet of the dredge. Other monitoring points may be required at the dredge site if the predredge analysis shows contaminants of concern that have the potential to cause toxicity at the dredge site.

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

| Constituent/ analysis | Units | Sampling Frequency |
|---|---|---|
| Turbidity | NTUs | Daily |
| Dissolved Oxygen | mg/l | Daily |
| Temperature | °F | Daily |
| Suspended Solids | mg/l | Twice a week |
| Constituents of concern[1] | µg/l | To be determined by staff |

[1] Constituents of concern will be identified by Regional Board staff after reviewing the pre-dredge sediment and elutriate analysis. The Notice of Applicability will include a list of constituents of concern for monitoring.

## DMD SITE EFFLUENT MONITORING

The effluent from the sedimentation basin or Dredged Material Disposal (DMD) site shall be monitored at the overflow weir or discharge pipe during discharge. The initial set of samples shall be collected within 24 hours of the initiation of discharge. Subsequent samples shall be collected from the effluent discharge and analyzed according to the following schedule:

## DMD SITE EFFLUENT MONITORING (Continued)

| Constituent/ analysis | Units | Sampling Frequency |
|---|---|---|
| Flow | MGD | Daily |
| pH | | Daily |
| Suspended solids | mg/l | Daily |
| Turbidity | NTU | Daily |
| Dissolved Oxygen | mg/l | Daily |
| Temperature | °F | Daily |
| Constituents of concern[2] | µg/l | To be determined by staff [3] |

[2] Constituents of concern will be identified by Regional Board staff after reviewing the pre-dredge sediment and elutriate analysis. The Notice of Applicability will include a list of constituents of concern for monitoring.

[3] The following are the "normal" expected turnaround times for laboratory analysis:

| | |
|---|---|
| Total Suspended Solids | 3 days after sample collection |
| Chronic bioassays | 21 days after sample collection |
| Acute bioassays | 7 days after sample collection |
| BOD | 10 days after sample collection |
| Ammonia | Field measurement verified with laboratory analysis |
| Other analyses | 14 days after sample collection |

Sample holding times must be observed according to U.S. EPA recommendations. Regional Board staff may ask for shorter turnaround times in cases where there is potential for the effluent to exceed water quality objectives in the receiving water and to impair beneficial uses.

## RECEIVING WATER MONITORING FOR THE DMD SITE DISCHARGE

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

| Station | Description |
|---|---|
| **R-3** | Upcurrent of the discharge location and undisturbed by the effluent discharge from the DMD site, not to exceed 300 feet from the point of discharge. |
| **R-4** | within 300 feet down current of the discharge point and on the same side of the river as the discharge point. |

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

| Constituent/ analysis | Units | Sampling Frequency |
|---|---|---|
| pH | | Daily |
| Turbidity | NTU | Daily |
| Dissolved Oxygen | mg/l | Daily |
| Temperature | °F | Daily |

| Constituent/ analysis | Units | Sampling Frequency |
|---|---|---|
| Suspended solids | mg/l | Twice weekly |
| Constituents of concern[4] | µg/l | To be determined by staff[5] |

[4] Constituents of concern will be determined by Regional Board staff after reviewing the analytical results from the pre-dredge analysis. The Notice of Applicability will include a list of constituents of concern for monitoring.

[5] The following are the "normal" expected turnaround times for laboratory analysis:

| | |
|---|---|
| Total Suspended Solids | 3 days after sample collection |
| Chronic bioassays | 21 days after sample collection |
| Acute bioassays | 7 days after sample collection |
| BOD | 10 days after sample collection |
| Ammonia | Field measurement verified with laboratory analysis |
| Other analyses | 14 days after sample collection |

Sample holding times must be observed according to U.S. EPA recommendations. Regional Board staff may ask for shorter turnaround times in cases where there is potential for the effluent to exceed water quality objectives in the receiving water and to impair beneficial uses.

## REPORTING

The following constituents shall have monitoring performed with field equipment at the dredge site, in the effluent and in the receiving water with violations reported to Regional Board staff immediately:

| | |
|---|---|
| Flow | pH |
| Dissolved Oxygen | Temperature |
| Turbidity | Ammonia (with lab analysis for validation) |

The following are the "normal" expected turnaround times for laboratory analysis:

| | |
|---|---|
| Total Suspended Solids | 3 days after sample collection |
| Chronic bioassays | 21 days after sample collection |
| Acute bioassays | 7 days after sample collection |
| BOD | 10 days after sample collection |
| Ammonia | Field measurement verified with laboratory analysis |
| Other analyses | 14 days after sample collection |

Sample holding times must be observed according to U.S. EPA recommendations. Regional Board staff may ask for shorter turnaround times in cases where there is potential for the effluent to exceed water quality objectives in the receiving water and to impair beneficial uses.

The Discharger shall immediately notify the Board by telephone whenever a violation or adverse condition occurs as a result of the dredging and disposal operation or the discharge of effluent. Written confirmation shall follow within 2 weeks.

If the project is in operation for more than one month, monthly Self Monitoring Reports shall be submitted to Regional Board Staff no more than 15 days after the end of the month. The Self Monitoring Reports shall include:

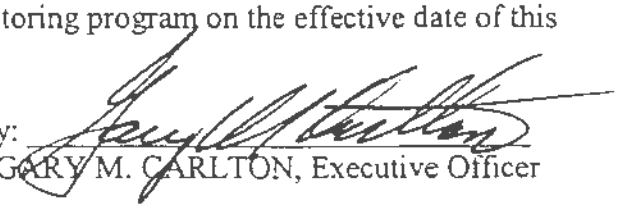
1. The date, exact place, time of sampling and the name of the person taking the sample.
2. The dates analyses were performed and the name of the person who performed the analyses.

3. Analytical techniques/methods used.
4. Results of the analyses.

The Discharger shall compile and summarize the data from the Self Monitoring Reports and submit an Annual Report to Board staff within 90 days of project completion.

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

The Discharger shall implement the above monitoring program on the effective date of this Program.

Ordered by: 
GARY M. CARLTON, Executive Officer

11 May 2001

DMP:dmp/18 April 2001 Sac_DWSC.mrp

INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. 5-01-116
UNITED STATES ARMY CORPS OF ENGINEERS AND PORT OF SACRAMENTO
SACRAMENTO DEEP WATER SHIP CHANNEL MAINTENANCE DREDGING
CONTRA COSTA, SACRAMENTO, SOLANO & YOLO COUNTIES

The Waste Discharge Requirements for maintenance dredging of the Sacramento Deep Water Ship Channel are being updated to reflect current conditions, policies and plans. The previous Waste Discharge Requirements Order Number 88-143 will be rescinded at the time this Order is approved by the Board.

This General Order applies to maintenance dredging of 43.4 miles of the Sacramento Deep Water Ship Channel from the boundary of the Central Valley Region near Collinsville to the Port of Sacramento. The dredge material will be removed with a hydraulic suction dredge, and then piped or barged to one of the ten approved Dredge Material Disposal (DMD) sites. The DMD sites are used for settling solids from the dredge material slurry. After settling, excess water (effluent) will be discharged into the adjacent receiving water. Three of the ten DMD sites discharge into the man-made section of the Sacramento Ship Channel. Six of the ten DMD sites discharge into the Sacramento River. One DMD site discharges into Steamboat Slough. The average rate of effluent discharge will be 9 million gallons per day. The duration of the effluent discharge ranges from several days to several weeks per year. Due to concerns for threatened and endangered fish species, dredging occurs between 1 September and 30 November.

Each year that the Discharger wishes to dredge under this General Order, the Discharger will submit a Notice of Intent that will include a project description and analytical results from representative sediment samples. If the sediment samples are below the maximum concentrations listed in Applicability Table A.3, the Executive Officer will grant a Notice of Applicability for the project. The maximum concentration values in Applicability Table A.3 are conservative screening values for assessing potential impacts from the dredging operations, from effluent discharges to surface waters, leaching and runoff to groundwater and adjacent surface water, and reuse of dredge material in an upland environment. Since the values in Table A.3 do not allow for site-specific attenuation factors, there are provisions allowing the Discharger to submit a technical report explaining how dredged material could exceed values in the Applicability Table and still not cause or contribute to exceedances of water quality objectives. The technical report would undergo public review and comment. The Order allows the Executive Officer to review site-specific information provided in the Discharger's technical report and find that values higher than those in the Applicability Table comply with the conditions of the Order. To provide the Discharger with additional time to collect site-specific information for the technical reports, the Discharger will be allowed to use the Applicability values from the 88-143 WDR for the 2001 dredging season only.

The Monitoring and Reporting Program includes pre-dredge analysis of the sediment and effluent, as well as monitoring during dredging at three locations: the dredge site, the effluent from the disposal site, and the receiving water. During dredging and disposal, the following constituents will be monitored: turbidity, dissolved oxygen, suspended solids, pH, flow,

temperature, and other constituents of concern that may be identified from the pre-dredge analysis.

The values in Table A.3 Discharge Applicability Table will be used to evaluate both potential impacts from effluent discharged from the disposal site and potential long-term impacts from dredge material placement in an upland environment. Part 1 of Table A.3 is used to assess the dredge material remaining in the DMD site or at a beneficial reuse site. The exposure pathways include: direct exposure to the solid phase dredge material, leachate and runoff to groundwater and surface water. Part 2 of Table A.3 is used to assess the effluent from the DMD site with the only exposure pathway being effluent discharge to surface water. The values for leachate, runoff and effluent pathways are based on applicable water quality objectives and criteria. The values for solid phase dredge material are based on U.S. EPA's published values for human health protection (Preliminary Remediation Goals) and ecological protection (Ecological Preliminary Remediation Goals). Each value listed in Table A.3 is explained in the table below. Figures 1 and 2 follow the table and contain an exposure pathway diagram and an explanation of pathways considered in the USEPA Residential PRGs.

**LIST OF ACRONYMS:**

**CA DFG:** California Department of Fish and Game
**CTR:** California Toxics Rule
**DHS:** California Department of Health Services
**EC:** Electrical Conductivity
**FW:** Fresh Water
**MCL:** Maximum Contaminant Level (for drinking water purveyors)
**NAWQC:** National Ambient Water Quality Criteria (developed by USEPA)
**ND:** Non-detect
**OEHHA:** Office of Environmental Health Hazard Assessment
**OP:** Organophosphorous
**PAH:** Polynuclear aromatic hydrocarbons
**PCB:** Polychlorinated biphenyls
**PRG:** Preliminary Remediation Goal (USEPA)
**RWL:** Receiving Water Limit
**SSL:** Soil Screening Level (USEPA)
**TBD:** To be determined
**USEPA:** United States Environmental Protection Agency

**Table 1: EXPLANATION OF CRITERIA:**
**Discharge Applicability Table Part 1**: Applicability of sediments for upland disposal

| Constituent | Max. Concentration of solids analysis[1] (dry weight) | Reference: |
|---|---|---|
| Arsenic | See footnote [2] | Average Delta soil conc. |
| Cadmium | 21 mg/kg | EPA Ecological PRG (Soil Invertebrates) |
| Total Chromium | See footnote [2] | Average Delta soil conc. |
| Copper | 61 mg/kg | EPA Ecological PRG (Soil Invertebrates) |
| Lead | 400 mg/kg | EPA PRG Residential |
| Mercury | 0.2 mg/kg | Screening value |
| Nickel | See footnote [2] | Average Delta soil conc. |
| Selenium | 390 mg/kg | EPA PRG Residential |
| Zinc | 120 mg/kg | EPA Ecological PRG (Soil Invertebrates) |
| **Polyaromatic hydrocarbons (PAH):** | | |
| Acenaphthene | 3,700 mg/kg | EPA PRG Residential |
| Anthracene | 22,000 mg/kg | EPA PRG Residential |
| Benzo(a)anthracene | 0.62 mg/kg | EPA PRG Residential |
| Benzo(b)fluoranthene | 0.62 mg/kg | EPA PRG Residential |
| Benzo(k)fluoranthene | 0.61 mg/kg | EPA PRG Residential |
| Benzo(a)pyrene | 0.062 mg/kg | EPA PRG Residential |
| Chrysene | 6.1 mg/kg | EPA PRG Residential |
| Dibenzo(a,h)anthracene | 0.062 mg/kg | EPA PRG Residential |
| Fluoranthene | 2,300 mg/kg | EPA PRG Residential |
| Fluorene | 2,600 mg/kg | EPA PRG Residential |
| Indeno(1,2,3-cd)pyrene | 0.62 mg/kg | EPA PRG Residential |
| Naphthalene | 56 mg/kg | EPA PRG Residential |
| Pyrene | 2,300 mg/kg | EPA PRG Residential |
| **Polychlorinated Biphenyls (PCB):** | | |
| Aroclor 1016 | 3.9 mg/kg | EPA PRG Residential |
| Aroclor 1221 | 0.22 mg/kg | EPA PRG Residential |
| Aroclor 1232 | 0.22 mg/kg | EPA PRG Residential |

[1] Maximum concentrations in Table A.3 for solids are based on USEPA Preliminary Remediation Goals (PRG) for residential use, USEPA Preliminary Remediation Goals (PRG) for upland ecological exposure, or local background soil concentrations. The PRG screening values are based on risk assessment of common exposure pathways in a residential environment or common exposure pathways for wildlife exposure to constituents in the soil. If the solids concentrations are exceeded, beneficial reuse options may be restricted or the Discharger may submit a technical report that demonstrates a risk assessment based on expected exposure routes due to dredged material placement.

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

**Discharge Applicability Table Part 1 (Continued)**: Applicability of sediments for upland disposal

| Constituent | Max. Concentration of solids analysis[1] (dry weight) | Reference: |
|---|---|---|
| Aroclor 1242 | 0.22 mg/kg | EPA PRG Residential |
| Aroclor 1248 | 0.22 mg/kg | EPA PRG Residential |
| Aroclor 1254 | 0.22 mg/kg | EPA PRG Residential |
| Aroclor 1260 | 0.22 mg/kg | EPA PRG Residential |
| **Organochlorine Pesticides:** | | |
| Aldrin | 0.029 mg/kg | EPA PRG Residential |
| Alpha BHC | 0.090 mg/kg | EPA PRG Residential |
| Beta BHC | 0.032 mg/kg | EPA PRG Residential |
| Gamma BHC (Lindane) | 0.44 mg/kg | EPA PRG Residential |
| Chlordane | 1.6 mg/kg | EPA PRG Residential |
| 4,4-DDD | 2.4 mg/kg | EPA PRG Residential |
| 4,4-DDE | 1.7 mg/kg | EPA PRG Residential |
| 4,4-DDT | 1.7 mg/kg | EPA PRG Residential |
| Dieldrin | 0.011 mg/kg | EPA PRG Ecological (Avian) |
| Endosulfan | 370 mg/kg | EPA PRG Residential |
| Endrin | 18 mg/kg | EPA PRG Residential |
| Heptachlor | 0.11 mg/kg | EPA PRG Residential |
| Heptachlor epoxide | 0.052 mg/kg | EPA PRG Residential |
| Hexachlorocylopentadienne | 420 mg/kg | EPA PRG Residential |
| Methoxychlor | 8 mg/kg | EPA PRG Residential |
| Toxaphene | 0.44 mg/kg | EPA PRG Residential |

**Discharge Applicability Table Part 1**: Applicability of sediments for upland disposal

| Constituent | Max. Concentration of soluble constituents[2] | Reference |
|---|---|---|
| Arsenic (filtered) | 10 µg/l | Basin Plan Objective |
| Cadmium (filtered) | 5 µg/l [3] | CA & USEPA Primary MCL |

[1] Maximum concentrations in Table A.3 for solids are based on USEPA Preliminary Remediation Goals (PRG) for residential use, USEPA Preliminary Remediation Goals (PRG) for upland ecological exposure, or local background soil concentrations. The PRG screening values are based on risk assessment of common exposure pathways in a residential environment or common exposure pathways for wildlife exposure to constituents in the soil. If the solids concentrations are exceeded, beneficial reuse option may be restricted or the Discharger may submit a technical report that demonstrates a risk assessment based on expected exposure routes due to dredged material placement.

[2] Soluble constituents shall be extracted using the Waste Extraction Test with either deionized water or citrate buffer, depending on the ratio of neutralizing potential to acid generating potential in the dredge material.

[3] Background levels of cadmium routinely exceed the 0.07 µg/l California Public Health Goal. It is not economically feasible to require dredge material to meet the lower Public Health Goal standard, so the drinking water MCL is used for the water quality objective in this permit.

**Discharge Applicability Table Part 1** (Continued): Applicability of sediments for upland disposal

| Constituent | Max. Concentration of soluble constituents[2] | Reference |
|---|---|---|
| Total Chromium (filtered) | 50 µg/l | CA MCL |
| Chromium VI (filtered) | 11 µg/l | Chronic aq. toxicity (CTR) |
| Copper (filtered) | 10 µg/l | Basin Plan Objective |
| Lead (filtered) | 2.5 µg/l[4] | Chronic aq. toxicity (CTR) |
| Mercury | 0.05 µg/l | CTR Human Health |
| Nickel (filtered) | 52 µg/l[4] | Chronic aq. toxicity (CTR) |
| Selenium | 5 µg/l | Chronic aq. toxicity (CTR) |
| Zinc (filtered) | 100 µg/l | Basin Plan Objective |
| pH | 6.5 – 8.5 | Basin Plan Objective |

**Discharge Applicability Table Part 2**: Applicability of sediment elutriate and solids analysis for effluent discharges from the disposal site and dredge site impacts.

| Constituent | Max. Concentration of soluble constituents[5] | Reference |
|---|---|---|
| Arsenic (filtered) | 10 µg/l | Basin Plan Objective |
| Cadmium (filtered) | 5 µg/l [3] | CA & USEPA Primary MCL |
| Total Chromium (filtered) | 50 µg/l | CA MCL |
| Chromium VI (filtered) | 11 µg/l | Chronic aq. toxicity (CTR) |
| Copper (filtered) | 10 µg/l | Basin Plan Objective |
| Lead (filtered) | 2.5 µg/l[4] | Chronic aq. toxicity (CTR) |
| Mercury | 0.05 µg/l | CTR Human Health |
| Nickel (filtered) | 52 µg/l[4] | Chronic aq. toxicity (CTR) |
| Selenium | 5 µg/l | Chronic aq. toxicity (CTR) |
| Zinc (filtered) | 100 µg/l | Basin Plan Objective |
| pH | 6.5 – 8.5 | Basin Plan Objective |

[2] Soluble constituents shall be extracted using the Waste Extraction Test with either deionized water or citrate buffer, depending on the ratio of neutralizing potential to acid generating potential in the dredge material.

[3] Background levels of cadmium routinely exceed the 0.07 µg/l California Public Health Goal. It is not economically feasible to require dredge material to meet the lower Public Health Goal standard, so the drinking water MCL is used for the water quality objective in this permit.

[4] Concentration based on chronic aquatic toxicity for an average background receiving water hardness of 100 mg/l $CaCO_3$. Values may be recalculated using equations from the California Toxics Rule with justification of different receiving water hardness.

[5] Soluble concentrations shall be determined by analysis of supernatant from the modified elutriate test or standard elutriate test for Ammonia, BOD and COD.

**Discharge Applicability Table Part 2** (Continued): Applicability of sediment elutriate and solids analysis for effluent discharges from the disposal site and dredge site impacts.

| Constituent | Max. Concentration of soluble constituents[5] | Reference |
|---|---|---|
| EC (Specific conductivity) | 700 µmhos/cm | Ag. Water Quality Goal |
| TDS (Total Dissolved Solids) | 450 mg/l | Ag. Water Quality Goal |
| Chloride | 106 mg/l | Ag. Water Quality Goal |
| Ammonia + Ammonium | See footnote [6] | Chronic aq. tox. (EPA NAWQC) |
| Tributyltin | 0.063 µg/l | Chronic aq. tox. (EPA NAWQC) |

For the effluent: the following water criteria are based on applicable water quality objectives including the California Toxics Rule. The solids criteria are based on two assumptions: 1) these compounds will stay sorbed to the sediments and will not partition into the water column, and 2) a maximum of 100 mg/l suspended solids will be present in the effluent. For other TSS concentrations, the solid concentration of the constituent in Table A.3 can be recalculated as: (WQ criteria/ TSS ) * unit conversion.

| Constituent | Max. Concentration of solids analysis (dry weight) | | Max. Concentration of soluble constituents[5] | Reference |
|---|---|---|---|---|
| **Polynuclear aromatic hydrocarbons (PAH):** | | | | |
| Acenaphthene | 12,000 mg/kg | *or* | 1,200 µg/l | CTR Human Health |
| Anthracene | 96,000 mg/kg | *or* | 9,600 µg/l | CTR Human Health |
| Benzo(b)fluoranthene | 44 µg/kg | *or* | 0.0044 µg/l | CTR Human Health |
| Benzo(k)fluoranthene | 44 µg/kg | *or* | 0.0044 µg/l | CTR Human Health |
| Benzo(a)pyrene | 44 µg/kg | *or* | 0.0044 µg/l | CTR Human Health |
| Chrysene | 44 µg/kg | *or* | 0.0044 µg/l | CTR Human Health |
| Dibenzo(a,h)anthracene | 44 µg/kg | *or* | 0.0044 µg/l | CTR Human Health |
| Fluoranthene | 3,000 mg/kg | *or* | 300 µg/l | CTR Human Health |
| Fluorene | 13,000 mg/kg | *or* | 1,300 µg/l | CTR Human Health |
| Indeno(1,2,3-cd)pyrene | 44 µg/kg | *or* | 0.0044 µg/l | CTR Human Health |
| Naphthalene | 6,200 mg/kg | *or* | 620µg/l | Chronic aq. toxicity U.S. EPA NAWQC |
| Pyrene | 9,600 mg/kg | *or* | 960 µg/l | CTR Human Health |
| **Polychlorinated Biphenyls (PCB):** | 1.7 µg/kg (Total sum) | *or* | 0.00017 µg/l (Sum of PCBs in elutriate) | CTR Human Health |
| **Organophosphorous Pesticides:** | | | | |
| Chlorpyrifos | | | 0.014 µg/l | CA DFG Chronic FW Aquatic Life protection |
| Diazinon | | | 0.05 µg/l | CA DFG Chronic FW Aquatic Life protection |

[5] Soluble concentrations shall be determined by analysis of supernatant from the modified elutriate test or standard elutriate test for Ammonia, BOD and COD.

[6] Ammonia and ammonium concentrations will be calculated based on the pH and temperature of the receiving water according to the following formula:

$$CCC=\{[0.0577/(1+10^{7.688-pH})] + [2.487/(1+10^{pH-7.688})]\} \times \{MIN[2.85, 1.45\times10^{0.028\times(25-T)}]\}$$

**Discharge Applicability Table Part 2** (Continued): Applicability of sediment elutriate and solids analysis for effluent discharges from the disposal site and dredge site impacts.

| Constituent | Maximum concentration of soluble constituents [5] | Reference |
|---|---|---|
| Dimethioate | 1.0 µg/l | DHS California State Action Level (toxicity) |
| Malathion | 0.43 µg/l | CA DFG Max 1-hr conc. FW Aq. Life protection |
| Parathion | 0.013 µg/l | USEPA NAWQC Chronic FW aquatic life |
| Phorate | 0.7 µg/l | National Academy of Sciences Drinking Water Health Advisory |

**Organochlorine Pesticides:**

The Basin Plan for the Sacramento River Basin and San Joaquin River Basin (Fourth Edition) 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 the Environmental Protection Agency or the Executive Officer." (pg III-6.00 of 1998 Water Quality Control Plan, Fourth Edition) The method detection limits listed below are from Table 2d of Appendix 4 of the State Implementation Plan (*Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California,* 2000).

| Constituent | Max. Concentration of soluble constituents[5] |
|---|---|
| Aldrin | ND (<0.005 µg/l) |
| Alpha BHC | ND (<0.01 µg/l) |
| Beta BHC | ND (<0.005 µg/l) |
| Gamma BHC (Lindane) | ND (<0.02 µg/l) |
| Chlordane | ND (<0.1 µg/l) |
| 4,4-DDD | ND (<0.05 µg/l) |
| 4,4-DDE | ND (<0.05 µg/l) |
| 4,4-DDT | ND (<0.01 µg/l) |
| Dieldrin | ND (<0.01 µg/l) |
| Endosulfan I | ND (<0.02 µg/l) |
| Endosulfan II | ND (<0.01 µg/l) |
| Endosulfan sulfate | ND (<0.05 µg/l) |
| Endrin | ND (<0.01 µg/l) |
| Endrin aldehyde | ND (<0.01 µg/l) |
| Heptachlor | ND (<0.01 µg/l) |
| Heptachlor epoxide | ND (<0.01 µg/l) |
| Hexachlorocyclopentadiene | ND (<0.01 µg/l) |
| Methoxychlor | ND (<0.1 µg/l) |
| Toxaphene | ND (<0.5 µg/l) |

[5] Soluble constituents determined by analysis of supernatant from modified elutriate test.

**Figure 1: HUMAN EXPOSURE TO DREDGED MATERIAL**
Values developed by USEPA as tools for evaluating and cleaning up contaminated sites. Calculates exposure levels to humans based on a common set of exposure pathways and behavior patterns.

**PRG**
**Preliminary Remediation Goals**

DOES NOT consider exposure pathways from groundwater

**Exposure pathways included**

Ingestion of soil

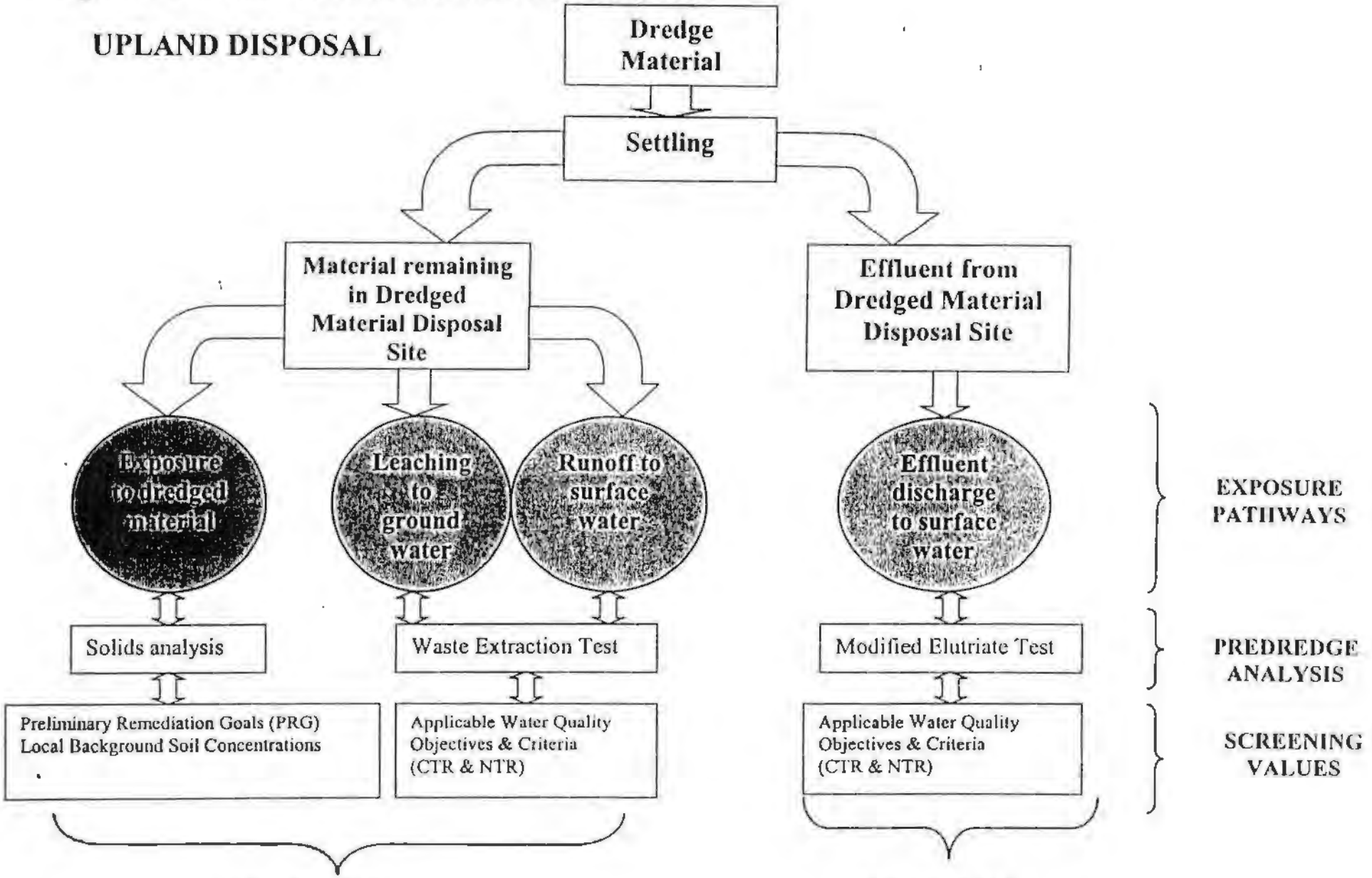
Inhalation of particulates
Inhalation of volatiles
Dermal adsorption

**Risk Evaluation**

$10^{-6}$ cancer risk for carcinogens
Hazard quotient=1 for non-carcinogens

*** NOTE: The EPA Residential Preliminary Remediation Goal (PRG) was used as a screening value. The average California soil concentrations of Arsenic, Nickel and Chromium are above PRG values, so average local background soil concentrations will be used as a screening value for those constituents.

**Figure 2: EXPOSURE PATHWAYS EXPLANATION:**



# California Regional Water Quality Control Board
## Central Valley Region
Robert Schneider, Chair

Winston H. Hickox
*Secretary for Environmental Protection*

Gray Davis
*Governor*

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18 May 2001

#1-2-3

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***NOTICE OF ADOPTION***
***GENERAL ORDER WASTE DISCHARGE REQUIREMENTS 5-01-116***
***FOR***
***UNITED STATES ARMY CORPS OF ENGINEERS AND***
***PORT OF SACRAMENTO***
***SACRAMENTO DEEP WATER SHIP CHANNEL MAINTENANCE DREDGING***
***ACTIVITIES CHANNEL MILE 0.0 TO 43.4***
***CONTRA COSTA, SACRAMENTO, SOLANO, AND YOLO COUNTIES***

General Order Waste Discharge Requirements Order No. 5-01-116 for the above named discharger were adopted by the California Regional Water Quality Control Board, Central Valley Region, on 11 May 2001.

If you have any questions, please contact Donna Podger at (916) 255-1872.

William J Marshall

WILLIAM J. MARSHALL
Chief, Stormwater/Dredging Section

Enclosure Adopted Order
Adopted Monitoring and Reporting Program
Standard Provisions (Discharger only)

cc: List attached

cc with Enclosures:
US Environmental Protection Agency, Permits Branch, (Mail Code M-5), San Francisco
Mohsen Tavanna, U.S. Army Corps of Engineers
John Headlee, U.S. Army Corps of Engineers
Bill Jennings, Delta Keeper, Stockton

cc without Enclosures:
Dan Stralka, US Environmental Protection Agency, Region 9, San Francisco
US Fish and Wildlife Service
National Marine Fisheries Service
Mike Finan, U.S. Army Corps of Engineers, Regulatory Branch,
Victor Chan, U.S. Army Corps of Engineers
Julie Minton, U.S. Army Corps of Engineers
Gwen Knitweiss, CALFED
John Youngerman, Division of Water Quality, State Water Resources Board, Sacramento
Frances McChesney, Office of Chief Counsel, State Water Resources Control Board, Sacramento
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Contra Costa County Planning Department, Martinez
Sacramento County Health Department, Sacramento
Sacramento County Planning Department, Sacramento
Solano County Health Department, Fairfield
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Yolo County Health Department, Woodland
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Scott Andersen, Ross Island Sand & Gravel, Portland, OR
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