

CHAPTER 4

DREDGING AND DISPOSAL OF DREDGED SEDIMENT

BACKGROUND

Dredging and dredged sediment disposal in the San Francisco Bay Area is an ongoing activity because of continual shoaling that impedes navigation and other water-dependent activities. Large volumes of sediment are transported in the waters of the Sacramento and San Joaquin rivers, which drain the Central Valley. The average annual sediment load to the San Francisco Bay system from these two rivers is estimated to be eight million cubic yards. Of this amount, some four million cubic yards are transported out of the Bay through the Golden Gate. The remaining four million cubic yards are circulated and/or deposited in the Bay. In addition, some two-and-one-half million cubic yards are deposited into the Bay from local watersheds. The largest volume of sediment that affects the Bay is the approximately 100 million cubic yards that are re-suspended in the water column by the actions of tide, wind and currents.

Dredging is generally necessary to maintain the beneficial use of navigation. The trend to increasingly large vessels also necessitates increased channel depths in the shipping channels.

Disposal of the majority of dredged material from San Francisco Bay has historically been at designated disposal sites in San Francisco Bay. This practice dates back to at least the beginning of the 20th century. Currently there are three such multi-user disposal sites designated by the U. S. Army Corps of Engineers (USACE, or Corps): the

Alcatraz (SF-11), San Pablo Bay (SF-10), and Carquinez (SF-9) Disposal Sites. A fourth site (Suisun Bay, SF-16) is maintained for Corps use exclusively for material from dredging of the Suisun Bay and New York Slough federal channels.

Annual maintenance dredging of shipping channels, harbors, and marinas in the San Francisco Bay results in disposal of between two and eight million cubic yards of dredged material at in-bay disposal sites. All designated aquatic dredged material disposal sites are operated as “dispersive” sites, that is, material disposed at the sites is intended to disperse and be carried by currents out to sea. Additionally, one of the management practices is to only allow material to be disposed of at disposal sites downstream of the dredging sites, with the objective of moving sediments away from dredging sites and out of the Bay. While the overall hydrodynamics of the Bay are not completely understood it is clear that the fate of material placed at in-bay disposal sites is dependent upon material type, disposal volume, and disposal frequency.

Since 1994, when the U. S. EPA designated the Deep Ocean Disposal Site approximately 50 miles offshore of San Francisco, approximately 6 million cubic yards of dredged material have been disposed of there.

Dredged material has also been used as fill for wetland restoration projects, for levee maintenance, and as daily cover for landfills. Volumes for these, and other beneficial reuse projects, have totaled approximately 2 million cubic yards over the past 9 years.

REGULATORY FRAMEWORK

The Corps of Engineers issues federal permits for dredging projects pursuant to Section 404 of the Clean Water Act. The U. S. EPA provides oversight of the Corps' regulatory program.

As a part of the Section 404 permitting process, the dredging permit applicant must seek water quality certification from the State of California, in accordance with Section 401 of the Clean Water Act. The Regional Board reviews the proposed project, then may grant or deny certification. Additionally, the Regional Board may choose to act under the authority of the state Porter Cologne Water Quality Control Act, by issuing waste discharge requirements for the project in conjunction with the water quality certification.

Water quality certifications and waste discharge requirements often contain conditions to protect water resources that the permittee must meet during the term of the permit.

The San Francisco Bay Conservation and Development Commission (BCDC) also regulates dredging and disposal under the provisions of the McAteer-Petris Act.

Projects involving the use of sovereign lands of the state may be subject to the lease or permitting requirements of the State Lands Commission.

LONG TERM MANAGEMENT STRATEGY

In the early 1980s, the problems associated with heavy reliance on in-Bay disposal sites became apparent, including navigational problems associated with the "mound" of dredged material at the Alcatraz disposal site, as well as potential environmental

problems associated with disposal and dredging activities in general. These conditions led to the creation of the Long Term management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS).

The LTMS program began in 1990, when the Regional Board joined with USACE, U. S. EPA, BCDC, the State Board, and representatives from the dredging and environmental communities to ensure adequate dredged material disposal and reuse capacity and protection of aquatic resources over a 50-year planning period. The adopted goals for the program (Table 4-13) reflect this purpose. The primary focus of the LTMS is on the various dredged material disposal options and their related impacts. The LTMS was also initiated to maximize beneficial reuse of dredged material, improve coordination of the agencies governing these activities, and ensure a more predictable regulatory framework.

The LTMS examined several possible long-term dredge material management strategies. The LTMS Policy Environmental Impact Statement/Programmatic Environmental Impact Report (LTMS EIS/EIR) for the program selected as the preferred alternative a reduction in the reliance on in-Bay disposal. The ultimate goal of this alternative is a "low" volume of disposal at in-Bay sites (20% of historical average dredging volumes), and an increased reliance on ocean disposal and beneficial reuse of dredged material (with the remaining material split evenly between these two options). The LTMS EIS/EIR was certified by the USACE and U. S. EPA in July 1999, and by the State Board in November 1999, thus

beginning the implementation of the preferred alternative.

During the preparation of the LTMS EIS/EIR, the LTMS agencies consulted with USFWS, NMFS, and CDFG regarding potential impacts of dredging and dredged material disposal to sensitive biological resources. These resource agencies, in conjunction with the LTMS agencies, developed a list of restrictions for such projects to protect critical habitat for special status and important commercial and recreational species.

The LTMS EIS/EIR identified the overall future disposal management strategy (i.e. reduced in-Bay disposal volumes at the designated dispersive sites). The LTMS Management Plan contains specific guidance that will be used to implement the preferred alternative by each of the LTMS agencies. The Management Plan will be reviewed and updated every three years to reflect changing statutory, regulatory, technical, or environmental conditions. The Basin Plan dredging policies will be updated, as necessary, in conjunction with Management Plan updates.

ENVIRONMENTAL IMPACTS OF DREDGING AND DISPOSAL IN THE AQUATIC ENVIRONMENT

Most dredging and dredge material disposal operations cause localized and ephemeral impacts with related biological consequences (Table 4-12).

In the 1980s, it was determined that the Alcatraz disposal site was accumulating significant amounts of material, with the depth of the site going from the original 110 feet to 30 feet. The mounding at the disposal site ultimately became a threat to navigation. The Corps eventually dredged the Alcatraz site to

increase the depth, redistributing the material within the disposal area several times between 1984 and 1986.

In September of 1988, Regional Board staff circulated and presented an issue paper entitled “A Review of Issues and Policies Related to Dredge Spoil Disposal in San Francisco Bay.” The issue paper discussed the major environmental concerns posed by dredged sediment disposal in San Francisco Bay, namely: 1) mounding at the Alcatraz disposal site, which posed a navigational hazard and has the potential to alter circulation patterns in the Bay; 2) the disposal of increasingly large amounts of material has the potential to alter benthic and shoreline habitats and to increase water column turbidity; and 3) the resuspension of dredged sediments may increase contaminant bioavailability. The issue paper presented a range of alternative strategies for the Regional Board to consider. Public and agency testimony was received by the Regional Board during hearings on September 15, 1988, and October 19, 1988. Agencies testifying included the Corps, U.S. EPA, and the California Department of Fish and Game. In the issue paper, Regional Board staff recommended that the Regional Board consider adopting quantity and quality limits for the disposal of dredged sediment at unconfined aquatic disposal sites within San Francisco Bay.

Additionally, the Regional Board and the Corps took steps to prevent further “mounding” at the region’s single largest disposal site, the Alcatraz site. In 1989, the Regional Board adopted volume targets, which served to prevent overfilling of the region’s three aquatic disposal sites. BCDC also revised its

policies to restrict in-bay disposal. These volumes were reduced further for the Alcatraz disposal site (SF-11) in 1993 when the USACE issued Public Notice 93-3.

WETLAND RESTORATION USING DREDGED MATERIAL

While the Regional Board remains concerned about the impacts of both polluted and clean sediments on the San Francisco Estuary, much of the sediment disposed of in the region is not polluted and could be used in beneficial ways (termed “reuse”). One of these uses involves the restoration of tidal marshes in areas that were once part of the Bay. These areas, known as diked historic baylands, were once open to the tides and were thriving salt marsh and mudflat ecosystems (discussed further under the “Wetlands Protection and Management” section). Decades of land “reclamation,” first initiated in the 1800s, resulted in diked agricultural lands, the land surface of which has subsided for a variety of reasons.

In order to foster growth of marsh vegetation and proper slough channel formation, the new marsh must be built near mean high tide. In many cases it will be beneficial to place a layer of sediment across the site to raise the elevation of the land surface to a point near the mean tide line. LTMS studies have examined the environmental, engineering, and economic considerations that are involved in restoring certain sites. The studies commissioned by LTMS have shown that, given current laws and policies, placement of dredged sediment at wetland restoration projects may cost more than traditional in-bay disposal, but less than ocean disposal.

DELTA ISLAND LEVEE REPAIR AND MAINTENANCE

Winter Island, located in the western Delta, near Pittsburg, is operated as a duck club by the local Reclamation District. In 1998, the Reclamation District, in need of material to repair levees, partnered with the Corps of Engineers, and accepted over 200,000 cubic yards of sandy dredged material from the Corps' dredging of the federal Suisun Bay Channel. In 1999, an additional 225,000 cubic yards from the Suisun Bay Channel project was placed on the site, along with approximately 30,000 cubic yards of finer-grained material from the Port of San Francisco. The Reclamation District estimates that they will have a long-term need for fine-grained dredged material, of about 100,000 cubic yards per year.

Other Delta islands are also in need of material for levee repair. For example, the Corps is currently exploring the possibility of taking material from the Suisun Bay Channel to Sherman Island. Cooperation with the Department of Water Resources, the Central Valley Water Resource Control Board and the CalFed program may provide additional opportunities for reuse of dredge material in the future.

REGIONAL BOARD POLICIES ON DREDGING AND DREDGED SEDIMENT DISPOSAL

The overall policy for dredging and disposal of dredged sediment will include a reduction of in-bay disposal volumes and an increased emphasis on beneficial reuse of dredged material. The most likely beneficial reuses of dredged material are wetland restoration projects or for levee maintenance and repair. Additional capacity for dredged material is available at the deep ocean disposal

site designated by U. S. EPA in 1994. The goal of the policies below is to reduce in-bay disposal volumes to approximately 20% of recent historical dredging volumes, to about 1 million cubic yards per year.

Dredging and dredged material disposal should be conducted in an environmentally and economically sound manner. Dredgers should reduce disposal in the Bay over time to achieve the LTMS goal of one million cubic yards, or less, per year. The LTMS agencies will implement a system of disposal allocations for the designated disposal sites to individual dredgers to achieve the LTMS goal only if voluntary efforts are not effective in reaching this goal.

1. NEED FOR REGIONAL AND LOCAL MONITORING

Specific monitoring requirements will be fulfilled through two programs: (1) the Regional Monitoring Program (RMP), which monitors the general health of the Bay and provides specific technical studies that inform policy decisions on required sediment testing (see Policy 5, below) and (2) specific monitoring programs at the designated disposal sites.

2. MATERIAL DISPOSAL RESTRICTION

Materials disposed of at approved aquatic dredged material disposal sites shall be restricted to dredged sediment. Disposal of rock, timber, general refuse, and other materials shall be prohibited. Additional specific requirements regarding material type and dredging and disposal mechanisms may be implemented as required, based on ongoing site monitoring and adaptive management.

3. VOLUME TARGETS

INDIVIDUAL DISPOSAL SITES

Volume targets for each disposal site were developed based on understandings of sediment dynamics and historical information regarding disposal volumes (Table 4-15).

In addition, the Regional Board established a volume target of 0.2 million cubic yards per year for the Suisun Bay Channel disposal site and restricts its use to Corps maintenance dredging. The San Francisco Bar site is used for disposal of material from the bar channel. The use of the San Francisco Bar disposal site is regulated under the Marine Protection, Research, and Sanctuaries Act (MPRSA).

OVERALL IN-BAY DISPOSAL

Total in-Bay dispersive disposal volumes shall decrease according to the schedule identified in Table 4-16, until the long-term LTMS target of 1.25 million cubic yards per year is attained.

In addition to the total volume specified in Table 4-16:

- a. Material from small dredging projects (see below) will, in general, be exempt from restrictions on in-Bay disposal if it is demonstrated through an alternatives analysis that there are no practical alternatives to in-Bay disposal, and
- b. A contingency volume of 250,000 cubic yards per year will be established for “emergencies”¹ or for years

¹ A dredging emergency is a situation that poses an immediate danger to life, health, property, or essential public service and that

when sedimentation or other factors result in unanticipated material volumes.

4. VOLUME TARGET IMPLEMENTATION

INDIVIDUAL DISPOSAL SITES

The Regional Board will consider denial of water quality certification for any project proposing to place material at a disposal site for which the monthly or annual volume target, as defined in Table 4-15, has been exceeded. Small project proponents may apply for an exemption to monthly or annual volume targets. A small project is defined as a facility or project whose design depth does not exceed -12 feet Mean Lower Low Water (MLLW) with an annual average disposal volume of less than 50,000 cubic yards. The project proponent must demonstrate:

- a. That the additional burden of using an alternative to in-Bay disposal placed upon the applicant would be inordinate relative to the beneficial uses protected; and
- b. The alternatives analysis indicates that there are no practical alternatives to in-Bay disposal.

OVERALL IN-BAY DISPOSAL

A voluntary program will be instituted to attain the overall in-Bay disposal targets adopted by the LTMS EIS/EIR, with the majority of maintenance material from Corps of Engineers projects being used in wetland restoration projects or taken to the ocean disposal site. As part of the voluntary

program, other dredgers will make efforts to use alternatives to in-Bay disposal.

Progress towards the goal will be evaluated both on an annual basis and every three years, based on the three-year average volume of in-Bay disposal. Should this voluntary program fail to provide progress toward the goal in the reviews outlined above, a mandatory allocation program will be considered. The institution of the mandatory allocation process will occur as outlined below and the determination to rescind mandatory allocation, if imposed, will be a symmetric process.

The Board will consider the imposition of mandatory allocation in a Board hearing. In making its decision regarding disposal allocations, the Board will confer with the LTMS agencies and consider the factors affecting the need for allocations in light of progress towards the long-term goal adopted by the LTMS EIS/EIR, including (1) the status of alternatives to in-Bay disposal and cooperative efforts to implement them, (2) exigencies that hamper the use of alternative sites, and (3) other relevant factors. If the Board votes to impose mandatory allocations then the mandatory allocation program will be regulated through the issuance of general Waste Discharge Requirements for small- and medium-category dredging projects and through separate Waste Discharge Requirements for all USACE dredging projects. If in place, rescission of the mandatory allocation program would be considered if the three-year average disposal volume was lower than the target volumes as identified in Table 14-16, unless, after review by the Board in a Board hearing, the Board votes to not rescind mandatory allocations. Both

demands action by the Board more quickly than the Board's normal permit procedures would allow

the institution and rescission of the mandatory allocation program would be discretionary actions of the Board, and thus subject to review pursuant to CEQA under the Board's functionally-equivalent process.

5. USE OF TESTING GUIDELINES

In February of 1998, the Corps and U.S. EPA published *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual, Inland Testing Manual* (ITM). The ITM provides comprehensive guidance to dredging permit applicants on sampling and testing of sediment proposed for disposal in waters of the United States, pursuant to Section 404 of the Clean Water Act. Disposal at the in-Bay disposal sites is subject to this guidance. The ITM outlines a tiered approach to sediment testing, similar to the existing Ocean Disposal Testing Manual, or "Green Book," the federal guidance document for testing for ocean disposal (pursuant to MPRSA). The Dredged Material Management Office, through USACE Public Notice 99-3, "Proposed Guidelines for Implementing the Inland Testing Manual within the USACE San Francisco District," has issued further guidance, detailing how the ITM is implemented locally. The Regional Board's Executive Officer will require evaluation of sediments proposed for in-Bay disposal according to Public Notice 99-3, or subsequent guidance, which is incorporated by reference into this plan, before issuing authorizations for such disposal.

The ITM was intended to only address testing of material for aquatic disposal and does not provide a protocol for upland disposal. Regional Board staff have developed a guidance document,

"Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines," to assist project planners with developing testing procedures for beneficial reuse projects, including wetland restoration, levee maintenance, and construction fill. The guidance document also provides general sediment screening guidelines for these uses. However, disposal of dredged material for beneficial reuse will be subject to site-specific testing requirements and "acceptance criteria" provided by the Regional Board.

The Regional Board is working in cooperation with other LTMS agencies to develop a regional implementation manual that will detail testing requirements for all three disposal environments.

The Executive Officer, following consultation with other agencies, will periodically review and update all testing procedures. The Executive Officer may require additional data collection beyond the tiered-testing procedures on a case-by-case basis.

6. ENVIRONMENTAL WINDOWS

The Regional Board will restrict dredging or dredge disposal activities during certain periods ("windows") in order to protect the beneficial uses of San Francisco Bay. These beneficial uses include water contact recreation; ocean, commercial, and sport fishing; marine habitat; fish migration; fish spawning; shellfish harvesting; and estuarine habitat. These restrictions may include, but are not limited to those specified by the United States Fish and Wildlife Service and the National Marine Fisheries Service in their review of the LTMS programmatic EIS/EIR pursuant to Section 7 of the Endangered

Species Act, and will incorporate any requirements from project specific consultations.

7. IMPACTS AT DREDGE SITE

The Regional Board may require additional documentation and inspections during dredging activities in order to ensure that dredgers minimize impacts at the dredging location. Water quality certifications or waste discharge requirements may contain additional conditions to address barge overflow and other impacts at the dredging site. Permit conditions may include:

- a. Special reporting procedures for the hydraulic pumping of dredged material into transport scows prior to disposal (marina slip applications);
- b. Evidence of compliance with the conditions described in 6, above;
- c. Time limit on the overflow from hopper-type hydraulic dredges in order to obtain an economical load; or
- d. Precautions to minimize overflow and spillage from the dredging vessel when en-route to the authorized disposal site. (Appreciable loss during transit shall be considered unauthorized disposal, or “short dumping,” and such occurrences are subject to enforcement by the Regional Board or other applicable state or federal agencies.)

8. POLICY ON LAND AND OCEAN DISPOSAL

The Regional Board shall continue to encourage land and ocean disposal

alternatives whenever practical. Regional Board staff have determined that there should be a high priority placed on disposing of dredged sandy material upland. At a minimum, incentives should be developed to limit disposal of any such material with a market value to upland uses. Staff may condition certifications so as to encourage upland reuse of high value sediments. Staff will also continue to work with staff from the Central Valley Regional Water Quality Control Board to provide appropriate options for material use in levee maintenance in the delta or for use on delta islands, as appropriate.

9. POLICY ON DREDGED MATERIAL DISPOSAL PERMIT COORDINATION

The Regional Board will implement these measures through its issuance of waste discharge requirements, water quality certification under Section 401 of the Clean Water Act, or other orders. In addition, the Regional Board may require pre- and post-dredge surveys to determine disposal volumes and compliance with permit conditions. In order to better manage data and reduce paper files, Regional Board staff may request, but not require, that applicants submit testing and other project data in a specific electronic format. Regional Board staff have been participating in a coordinated permitting process, the Dredged Material Management Office (DMMO), since 1995. The DMMO consists of staff representatives of the Regional Board, BCDC, U. S. EPA, USACE, and the California State Lands Commission, with active participation by the California Department of Fish and Game and the National Marine Fisheries Service as commenting resource agencies. The DMMO meets regularly to review permit applications and sediment

testing plans and results and to make recommendations on proposed dredging projects. While each agency retains its separate authority the agency representatives strive to provide clear and coordinated guidance to applicants and to reach a consensus-based recommendations.

Lands Commission through the multi-agency Dredged Material Management Office (DMMO); and (2) recognized the success of the DMMO in providing a coordinated permitting process for dredging and disposal projects in the Bay area and as an important component in implementing the Long Term Management Strategy for Disposal of Dredged Material in the San Francisco Bay Region (LTMS), and directed staff to continue to participate in the DMMO.

CHAPTER 5

REGIONAL BOARD PLANS AND POLICIES

DREDGING

SCREENING CRITERIA AND TESTING REQUIREMENTS FOR USE OF SEDIMENT FOR WETLAND CREATION AND OTHER UPLAND USES – RESOLUTION NO. 92-145

In this resolution, the Regional Board established screening criteria to be used to evaluate the appropriateness of using dredged material for beneficial purposes.

EVALUATION FRAMEWORK FOR DREDGED MATERIAL PROPOSED FOR IN-BAY DISPOSAL AND DREDGED MATERIAL MANAGEMENT OFFICE – RESOLUTION NO. 01-XXX

This resolution, (1) adopted the federal guidance issued by the USACE and the U. S. EPA in 1998 for evaluating the suitability of dredged material for disposal at aquatic disposal sites like the in-Bay disposal sites: *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual, Inland Testing Manual* (ITM), as well as the guidance for implementing the framework locally, which was developed jointly by Regional Board staff, USACE San Francisco District, U. S. EPA Region IX, San Francisco Bay Conservation and Development Commission, and State

TABLE 4-12 POTENTIAL CONSEQUENCES AND IMPACTS OF DREDGING AND DREDGED MATERIAL DISPOSAL

Consequences	Impacts
Bottom disturbance	Mastication of sediment-inhabiting organisms; smothering of organisms living in or on the bottom; habitat disruption
Suspended solids loading	Abrasion and clogging of gills (fish and clams); impaired respiration, feeding, and excretory functions; reduced water pumping rates (clams); retarded egg development and reduced growth and survival of larvae
Dissolved oxygen reduction	Reduced efficiency of oxygen uptake by aquatic organisms; increased stress on organisms resulting in reduced ability to meet environmental and biological demands
Mobilization of toxicants adsorbed to sediments	Uptake and accumulation by aquatic organisms
Release of biostimulatory substances (nitrogen, phosphorus, ammonia)	Stimulation of algal growth; ammonia toxicity

TABLE 4-13 GOALS OF LTMS

- 1) Maintain those channels in the SF Bay Estuary which are necessary for navigation, in an environmentally and economically sound manner and eliminate unnecessary dredging activities in the region
- 2) Conduct dredged material disposal activities in the most environmentally sound manner
- 3) Maximize the use of dredged material as a resource
- 4) Establish a cooperative permitting framework for dredging permit applications

TABLE 4-14 LTMS PARTICIPANTS

EXECUTIVE COMMITTEE

- Corps of Engineers, South Pacific Division, Commander
- U.S. EPA, Region IX, Regional Administrator
- State Dredging Coordinator
- San Francisco Bay Conservation and Development Commission, Chairperson
- San Francisco Bay Regional Water Quality Control Board, Chairperson

MANAGEMENT COMMITTEE

- Corps of Engineers, San Francisco District, District Engineer
 - U.S. EPA, Region IX, Regional Administrator
 - San Francisco Bay Conservation and Development Commission, Executive Director
 - San Francisco Bay Regional Water Quality Control Board, Executive Officer
- As needed, depending on issues:
- Executive level staff member of California Department of Fish and Game, National Marine Fisheries Service, U.S. Fish and Wildlife Service, State Lands Commission, Coastal Conservancy

PROGRAM MANAGEMENT TEAM

- LTMS Agencies' program management staff

WORK GROUPS

- Varying levels of participation by the organizations listed above, plus other interested parties
 - Disposal site management and monitoring
 - Sediment quality guidelines
 - Funding

STAKEHOLDERS

- Meets quarterly with Program Management Team
- Meets annually with Executive Committee

DMMO

Staff members of:

- Corps of Engineers, San Francisco District
- U.S. EPA, Region IX
- State Lands Commission
- San Francisco Bay Conservation and Development Commission
- San Francisco Bay Regional Water Quality Control Board

Plus:

- Staff members of California Department of Fish and Game, National Marine Fisheries Service, and U.S. Fish and Wildlife Service as available in an advisory capacity

OTHER EFFORTS

- Data Management Team
- Coordination with related efforts such as CALFED, RMP, National Dredging Policy information Exchange

TABLE 4-15 DREDGED MATERIAL VOLUME TARGETS

INDIVIDUAL DISPOSAL SITES

The following volume targets shall be utilized at each aquatic disposal site.

Alcatraz Island (SF-11)	October-April	0.4 million cubic yards per month
	May-September	0.3 million cubic yards per month
San Pablo Bay (SF-10)	Any Month	0.5 million cubic yards per month
Carquinez Straits (SF-9)	Any Month	1.0 million cubic yards per month
Suisun Bay (SF-16)	Any Year	0.2 million cubic yards per year

OVERALL IN-BAY DISPOSAL

The following volume target shall be utilized each calendar year (i.e., January to December) for the total amount of disposal at the aquatic disposal sites.

Alcatraz Island (SF-11), San Pablo Bay (SF-10), Carquinez Straits (SF-9), and Suisun Bay (SF-16)	2.8 million cubic yards ^{a, b}
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NOTES:

- a. The average of the most recent three years of in-Bay disposal volumes shall not exceed this value.
- b. This value is equal to the target value of 2.8 million cubic yards plus a 0.25 mcy contingency volume

TABLE 4-16 TRANSITION VOLUME TARGETS FOR IN-BAY DISPOSAL OF DREDGED MATERIAL

Year	Target Volume
2001-2003	2.8 million cubic yards
2004-2006	2.41 million cubic yards
2007-2010	2.03 million cubic yards
2010-2013	1.64 million cubic yards
After 2013	1.25 million cubic yards

NOTES:

- a. These volumes do not include the allowable contingency volume of 250,000 cy per year.