

CHAPTER 5.0 POLICY-LEVEL MITIGATION MEASURES AND ALTERNATIVES DEVELOPMENT

This chapter presents a discussion of the policy-level mitigation measures developed by the LTMS agencies to address the potential adverse environmental impacts within the three disposal/reuse environments (see Chapter 4). These policy-level mitigation measures would be implemented on a programmatic level and would be common for the range of dredged material reuse/disposal alternatives presented in the alternatives development section of this chapter. This chapter also presents a programmatic analysis of air quality impacts, pursuant to the federal Clean Air Act.

5.1 POLICY/PROGRAM-LEVEL MITIGATION MEASURES

The resources that may be affected by dredged material disposal in each of the three environments (in-Bay, ocean, and upland/wetland reuse [UWR]) are protected by a number of existing agency policies and new policy-level mitigation measures developed for this EIS/EIR. This chapter summarizes those measures that the LTMS agencies are taking or will take to ensure that potentially significant environmental impacts will not occur as a result of dredged material disposal, regardless of which alternative is selected as the preferred approach.

Generally, mitigation measures are presented in a typical EIS/EIR to reduce the potential impact of a project from a level that may be significant to a level that is less than significant. The policy-level mitigation measures contained in this Policy EIS/Programmatic EIR serve a similar function. However, policy-level mitigation measures differ from project-specific mitigation measures in two important ways. First, they address potential adverse impacts on a broad, regional and cumulative level. In this regard, they help direct how and when site-specific measures are needed to avoid or mitigate potential impacts, but they do not replace the need for site-specific mitigation measures. Second, policy-level measures are included in this EIS/EIR as a basic aspect of each of the alternatives to help pro-actively avoid impacts. Therefore, the policy-level mitigation measures effectively reduce the number of resources and pathways that could theoretically be of concern so that the subsequent alternatives analysis focuses on those resources that are most likely to be affected by dredged material management activities.

The policy-level mitigation measures presented in this chapter fall into three main categories. The first category includes overall policies that are independent of the placement environment or type of disposal or reuse. For example, general policies related to sediment suitability

(quality) and site management and monitoring fall into this category. The second category includes policy-level mitigation measures that apply to specific placement environments (ocean, in-Bay, and upland/wetland reuse). The third category of policy-level mitigation measures are those that apply to individual types of disposal or reuse such as wetland restoration or landfill use. The following sections discuss the policy-level mitigation measures in each of these three categories.

5.1.1 Mitigation Measures that Generally Apply to Dredged Material Disposal and Reuse

The general policies described in this section apply to management of dredged material proposed for disposal or reuse in any of the three placement environments, at any type of site. Additional specific measures that apply to individual placement environments, or to specific kinds of disposal or reuse, are presented in subsequent sections.

5.1.1.1 Material Suitability and Sediment Quality Testing

Chapter 3 provides extensive background information about the behavior of sediment contaminants when the sediments are managed in different placement environments. In particular, each placement environment has a specific set of potential “contaminant exposure pathways” through which adverse effects to environmental quality or human health may occur. However, there are appropriate reliable control measures that address many of the potential contaminant exposure pathways in each placement environment. The most important measure is to ensure that dredged material is only placed in specific sites where the number of potential exposure pathways are minimized — for example, by avoiding areas above drinking water aquifers that could be affected by leachate from upland dredged material disposal sites, or avoiding placing new rehandling facilities adjacent to land uses or populations that would be impacted by dust or odors that might be generated by the operations. However, all potential impacts cannot be avoided entirely at all sites, and some dredged material is sufficiently contaminated to require special management. Therefore, appropriate design and operational control measures must be included at different kinds of disposal or reuse sites, and sediment quality testing must be appropriate to address the concerns (exposure pathways) inherent at the proposed placement site(s).

To ensure that dredged material placed or disposed at any site will not cause unacceptable contaminant-related effects, the LTMS agency will adopt the following general policies:

- *The LTMS agencies will evaluate proposals for new dredged material placement or disposal sites, consistent with alternatives analysis requirements of state and federal laws (e.g., CEQA, NEPA, and CWA).*
- *For any particular site, the LTMS agencies will address all of the relevant contaminant exposure pathways of concern (as described in Chapter 3 of this EIS/EIR and in other agency guidance documents as appropriate) as part of the environmental assessment.*
- *The LTMS agencies will include specific conditions in authorizations for dredged material disposal or reuse sites that stipulate appropriate design or operational features necessary to control all contaminant pathways identified as being of concern at a given site. Control measures will be adequate to manage the worst-case material that would be considered for placement at a specific site.*
- *Only dredged material determined by the LTMS agencies to be suitable for the proposed placement or disposal option will be authorized for such placement or disposal. The LTMS agencies will require that sediments are adequately characterized for the proposed placement environment or specific disposal site, using appropriate physical, chemical, and biological testing methods, as necessary. Sediment quality evaluations will include consideration of potential effects related to the specific pathways of concern identified for the proposed placement environment or disposal site.*

5.1.1.2 Site Management and Monitoring

Dredged material disposal or placement may cause adverse effect through physical, as well as chemical or toxicological, processes. In general, dredged material disposal sites must be actively managed and/or monitored to confirm that the site is performing as predicted, that its capacity is not being exceeded, and that unauthorized use of the site is not occurring. In addition, an important aspect of ongoing management at any site is the periodic review of monitoring information to determine whether specific site use parameters may need adjustment to ensure that unacceptable or unanticipated impacts do not occur. The LTMS agencies will adopt the following general policies to ensure that appropriate site

management and monitoring actions are conducted at any placement or disposal site, in any of the placement environments:

- *The LTMS agencies will develop and implement site management and monitoring plans for all multi-user placement or disposal sites.¹ These plans will specify the site use parameters necessary to ensure that impacts are minimized and/or benefits are realized. The plans will also specify the monitoring requirements and post-closure activities as appropriate for each site. Site management and monitoring plans will identify specific conditions that would constitute acceptable site performance, as well as adjustments to site use parameters (including termination of continued site use) that would be triggered by specific findings of non-performance.*
- *The LTMS agencies will provide opportunity for public input and comment on proposed site management and monitoring plans for new disposal or placement sites, and on proposed substantive revisions to existing plans. Information from site monitoring efforts will be made available to the public, and opportunity for comment will also be provided as part of the periodic review for existing sites.*

5.1.1.3 Reviewing the Need for Dredging

The impacts and benefits associated with any dredged material management strategy are related to the total amount of material that would be managed under that strategy. This, in turn, depends on the total volume, depth, and physical characteristics of each dredging project. The need for ship channels and other navigation features is determined by the COE in its initial evaluation of the costs and benefits of each new project. This assessment must also be periodically reviewed and updated to reflect changing conditions over time. Appropriate mechanisms to ensure that no unnecessary dredging will be conducted in the region include revisions of COE Dredged Material Management Plans, and the COE's Composite EIS for Maintenance Dredging.

¹ The development of individual Site Management and Monitoring Plans for single-user placement and disposal sites, such as the Suisun Bay and San Francisco Bar sites, is not necessary because the project environmental and management documents for single-user sites include such management and monitoring plan development requirements.

In addition, each of the major ports within the region engages in a periodic review of past, present, and future port operations as part of the Seaport planning process. During such reviews, the ports may consider the feasibility of structural and other measures that could reduce dredging requirements.

The LTMS agencies will ensure that only necessary dredging occurs by adopting the following policies:

- *The COE, in consultation with the other LTMS agencies, will confirm or revise the Dredged Material Management plans for existing federal maintenance dredging projects in San Francisco Bay, and perform NEPA reviews as needed including supplementing the Composite EIS for Maintenance Dredging. These reviews will include consideration of channel widths, depths, and configurations in terms of potential changes that could reduce the volume of dredging necessary to meet the navigational needs of each project.*
- *BCDC, in consultation with the other LTMS agencies, will continue to work with area ports within the framework of its joint Seaport planning process within the Metropolitan Transportation Commission to identify potential means to reduce the need for dredging while meeting the navigational needs of each port facility. In addition, the LTMS agencies will continue to work to reduce the need for dredging associated with other projects.*

Together, these measures will serve to ensure that environmental risks and expenditure of public funds are minimized. The LTMS agencies recognize that there are special concerns regarding dredging and dredged material disposal options for smaller marine facilities, such as recreational marinas. This issue is addressed in Chapter 6 of this document (see section 6.3.1).

5.1.1.4 Coordinated Dredged Material Management

To improve regulatory certainty for both dredgers and the public, and to ensure that dredged material is managed in a comprehensive manner that addresses relevant concerns and requirements under all of the applicable authorities, the LTMS agencies will adopt the following general policy:

- *The COE, EPA, SFBRWQCB, and BCDC, together with the State Lands Commission, are formally cooperating in an interagency Dredged Material Management Office (DMMO), to coordinate regulatory requirements and to provide better service to the dredging community and the public.*

The DMMO was established as a pilot program by the Memorandum of Agreement (MOA), signed by the participating agencies. The DMMO will likely continue to review and coordinate on proposed dredging projects in accordance with the comprehensive LTMS Management Plan developed to implement the preferred alternative management approach selected in the LTMS Policy EIS/ Programmatic EIR.

The general operating principles under which a pilot DMMO is operating, and upon which the MOA will be based, were signed by the LTMS agencies on September 12, 1995. These general operating principles are presented in Appendix M.

5.1.1.5 Small Dredger Set-Aside

Dredgers vary in their ability to implement UWR or ocean disposal. Small dredgers, defined as dredging projects not exceeding a depth of 12 feet or a volume of 50,000 cy per year on average, in particular, are hampered by the fact that the shallow and often confined areas to be dredged may not allow use of large ocean-going barges. Further, small dredgers may not have the economies of scale or plain economic ability to use the SF-DODS or some UWR sites. Therefore, the LTMS agencies will adopt the following policy:

- *250,000 cy of the in-Bay disposal capacity under the disposal cap will be reserved each year for small dredgers. This small dredger set-aside volume will not be decreased over time. Further, small dredgers will be allowed to exceed the 250,000 cy set-aside in any given year, on a case-by-case basis. Small dredgers will still be required, on a case-by-case basis, to evaluate and implement UWR or ocean disposal if feasible and practicable.*

5.1.2 Mitigation Measures that Apply in Specific Environments

The policies described in this section apply to management of dredged material proposed for disposal or reuse in specific placement environments. General measures that apply to all disposal environments are discussed above in section 5.1.1, and measures that apply to specific kinds of disposal or reuse projects are presented below in section 5.1.3.

5.1.2.1 Upland Habitat Conversion Associated with Restoration Projects

Some degree of habitat conversion may occur as a result of any type of habitat restoration project. The types of

restoration projects most likely to use dredged material are those that restore lands along the Bay margin that were once tidal wetlands but have been diked off, drained, and used for agriculture or other purposes in recent time. In these areas, dredged material can be used to raise the elevation of subsided diked historic baylands so that when dikes are breached, tidal wetland habitat is restored. Such restoration projects offer a unique opportunity, both to reduce the impacts associated with the historic practice of disposing of dredged material in the Bay, and to provide significant regional environmental benefits. The regional environmental benefits of wetland restoration are discussed further in the alternatives analysis presented in Chapter 6 of this EIS/EIR.

LTMS technical studies have identified and preliminarily evaluated numerous sites around the Bay margin where wetland restoration using dredged material would be feasible (LTMS 1995d). The main physical features commonly present at these sites are perimeter levees, internal levees, drainage ditches, and saline basins. The existing habitat value of these sites depends, in part, on whether the current users drain and pump water, the type of crops grown, and the types of agricultural equipment used. Even though these sites typically have been extensively altered by decades of human activity, they often still provide some important habitat values. For example, many diked historic bayland areas support seasonal wetlands that serve as habitat for migrating shorebirds and other waterfowl.

Restoration of tidal wetlands at these locations would permanently change the existing habitat type (e.g., from seasonal farmed wetland or upland grassland, to tidal wetland), and result in the establishment of different communities of plants, migratory and resident bird populations, fish, and wildlife using these sites. Public concern has been expressed over the regional implications of shifting the ecological values and functions of a site in this manner; in particular, there are differences of opinion about which habitat type(s) may be more important at a given location. To adequately address this issue, it is necessary to define long-term, regional goals for different habitat types, including the desired acreage and distribution within and among different areas of the region. Developing such goals is called for in the Comprehensive Conservation and Management Plan (CCMP) of the San Francisco Estuary Project. However, this task is extremely complex.

A coordinated effort to develop regional habitat goals is in progress through the coordination of numerous planning and regulatory efforts focused on the recovery of regional wetland and other natural resources. Planning

efforts such as the Endangered Species Recovery Plan, BCDC's North Bay Management Program, the Regional Wetlands Management Program of the SFBRWQCB, including the Regional Wetlands Monitoring Program, the interagency Regional Wetlands Goals effort coordinated through the San Francisco Estuary Institute, and the Save San Francisco Bay Association's Partnership for the San Pablo Baylands are expected to bring the shared vision of habitat restoration into focus to implement the CCMP.

The LTMS agencies support the continuation of these planning efforts, and will rely on their results when considering the use of dredged material in wetland restoration projects by adopting the following policies:

- *The LTMS agencies will encourage, and authorize as legally appropriate, habitat enhancement and restoration efforts using dredged material that are designed to be consistent, to the maximum extent practicable, with specific habitat goals established by regional planning efforts for managing the region's natural resources. Implementation of projects in this manner will ensure that such reuse efforts will reflect the regional goals for restoration, thereby maximizing the environmental benefits of such projects for the region.*
- *The LTMS agencies will also encourage, and authorize as legally appropriate, independent habitat restoration projects using dredged material (in areas not covered by established habitat goals) when they would clearly result in an overall net gain in habitat quality, and would minimize loss of existing habitat functions. Whenever feasible, such projects will provide, as part of the project design, for a no net loss in the habitat functions existing on the project site or, where necessary, provide compensatory mitigation for lost habitat functions in accordance with state and federal mitigation requirements.*

Together, these measures will assist in the implementation of established regional habitat restoration goals, ensure long-term enhancement of habitat, support beneficial uses associated with that habitat within the region, and improve regulatory certainty for sponsors of restoration projects.

5.1.2.2 Habitat Protection

As generally described in Section 3.1, dredging and dredged material disposal in the San Francisco Bay Estuary has the potential to affect a variety of species of concern. During the preparation of this EIS/EIR, federal

and state resource agencies were informally consulted about the degree of potential impacts to different aquatic resources in different locations. As a result of this consultation and public comments on the DEIS/EIR, the LTMS and resource agencies agreed to broaden the consultation to include dredging related impacts and parts of the Delta in order to streamline the permitting process. A complete description of the consultation requirements and concerns raised by the resource agencies are presented in the revised Appendix J. Some of the concerns raised in Appendix J are addressed in this EIS/EIR through the programmatic consideration of environmental impacts/risks associated with different dredged material placement distributions in the alternatives analysis (Chapter 6). Specifically, all of the action alternatives considered in Chapter 6 include a reduction of in-Bay disposal volumes. A reduction of in-Bay disposal volume and frequency would effectively mitigate some potential impacts. However, there are a number of concerns that relate to specific sensitive species, dredging, and in-Bay disposal that are not fully addressed by the more general assessment of material placement distributions. This section describes the species of concern and policy-level mitigation measures that will avoid these particular types of impacts.

The following discussions summarize the vulnerability of special-status and/or high-concern species to dredging and disposal activities within various parts of the LTMS study area. Section 3.1.1.3 provides an overview of the consequences of dredging in aquatic environments, and sections 3.2.4 through 3.2.6 describe issues related to sediment disposal and potential contaminant release in aquatic, upland, and nearshore environments. For background information on the species of concern, refer to section 4.3.1.5.

Delta Smelt

The Delta smelt is a federally listed threatened species, for which designated critical habitat includes the waters of the Delta and Suisun Bay west to the Carquinez Bridge. All dredging and disposal activities in these waters require consultation with the USFWS. The fish are short-lived planktivores that are vulnerable to dredging or disposal activities that may entrain fish, degrade water quality, and otherwise disrupt foraging. Shoreline and shallow-bottom “nursery” areas may also be adversely affected by dredging or disposal activities that impinge on these areas or affect them indirectly through increased turbidity. To avoid adversely impacting this species, dredging and disposal activities within tidal open water habitats in this critical habitat area should be restricted throughout the year, subject to

review on a case-by-case basis through consultation with the USFWS and CDFG.

Chinook Salmon

Winter-run chinook salmon are federally listed as an endangered species. Fall/Late-fall and Spring-run chinook salmon are proposed for federal listing. Migration of chinook salmon could be affected by dredging in the vicinity of Pinole Shoal, the Suisun Bay channel, and along migratory corridors in the Delta. Dredging may disrupt foraging, migration, or cause injury to migrating fishes. Dredging in these areas during fall through spring migration periods, which depend on the location under consideration, should generally be restricted and requires consultation with NMFS.

Migration is not expected to be adversely affected by disposal operations at the Alcatraz and San Pablo disposal sites (particularly if overall allowable disposal volumes are reduced), because these fish would be able to easily avoid any area of degraded habitat near the sites. However, the Carquinez disposal site is of more concern because it lies in a narrow channel that these migratory fish must pass through, and they would not be able to easily avoid degraded habitat near this disposal site. Disposal may be permitted outside of the restricted period without contacting the resource agencies, thereby precluding the need to conduct a formal consultation for this species.

Steelhead Trout

All races of steelhead trout that migrate through the Bay are now federally listed as threatened. Steelhead migrate through the Bay during fall and early winter and congregate at the mouth of the Napa River waiting for high flows before they continue upstream. Here and elsewhere, dredging may disrupt foraging or migration and cause injury to migrating fishes. Dredging activities during the fall through spring migration season should be restricted along known migration corridors, especially the Napa and Petaluma rivers and Sonoma Creek, and generally conducted only after consultation with NMFS.

As discussed in Chapter 4, material deposited at the Carquinez Strait site has been shown to move back up into the mouth of the Napa River. During periods of high frequency disposal at this site, plumes may not fully dissipate between dumps and tidal action can potentially transport disposed material back into the area where steelhead congregate. Avoiding, to the extent practicable, high-frequency disposal in the narrow Carquinez Strait area during the peak migration period for steelhead trout is a reasonable and prudent conservation measure. Disposal at this site and at the San Pablo Bay and Alcatraz sites should be minimized during the January through May migration period. Disposal should be restricted along Delta migration corridors during the October through May

Sacramento Splittail

The Sacramento splittail is a federally proposed threatened species that inhabits tidal sloughs and embayments from the Delta to Suisun Bay and westward through the Carquinez Strait to San Pablo Bay (Petaluma River). These fish are bottom feeders. Submerged vegetation provides important spawning and juvenile rearing habitat. This species is vulnerable to entrainment or burial, as well as indirect effects of dredging and disposal on water quality. To avoid adversely impacting this species, dredging and disposal activities in tidal open water areas in the Suisun Bay and Delta west to the Carquinez Bridge, and in proximity to tidal creek and river mouths in San Pablo Bay, should be restricted throughout the year, subject to review on a case-by-case basis through consultation with the USFWS, NMFS, and CDFG.

Longfin Smelt

The longfin smelt is a former candidate for federal listing, and is also commercially important. This species spawns in Suisun Bay and the Delta during late winter and early spring. The larvae float downstream and are

abundant in both the deep channels and shallower areas of Suisun Bay. The larvae and juveniles drift downstream during high flows and as a result are vulnerable to entrainment during dredging operations in spring and early summer in San Pablo Bay. Dredging should be minimized during this period. Dredging activities may entrain fish or degrade spawning grounds in the Suisun Bay region and western Delta and should be minimized, from December through August in the Suisun Bay region, and from December through February in the western Delta.

Disposal of sandy material (the only type of material currently approved for disposal at the Suisun Bay site) causes short-term degradation of water quality that is usually limited to the disposal site and immediately adjacent area. Disposal of this material is therefore not expected to significantly affect the longfin smelt population. However, avoiding the period when larvae are most abundant is a reasonable and prudent conservation measure.

Pacific Herring

Pacific herring is not specifically protected but is an abundant and commercially important species in Central San Francisco Bay. Artificial structures along developed shorelines provide the primary spawning habitat for Pacific herring. Spawning occurs in the spring, and the eggs undergo development for about two weeks while attached to hard surfaces. In these areas, the eggs are vulnerable to smothering caused by turbidity that results from dredging. Temporary restrictions on dredging and measures to limit turbidity where spawning has occurred are appropriate and should be refined for specific projects in consultation with CDFG.

Recreational Fishing

Recreational fishing may be affected by disposal activities in the vicinity of the Alcatraz disposal site. To minimize potential conflicts, disposal should be minimized during the period of highest recreational activity, nominally May 1 through October 31.

Dungeness Crab

As discussed in section 4.3.1.5, Central San Francisco Bay and San Pablo Bay constitute a vital nursery area for juvenile dungeness crab, a commercially important species. The juveniles live on the bottom and, as a result, are vulnerable to entrainment during dredging activities. In shallow berthing areas and channels subject to dredging, dredging should be restricted during the May-

June period when juveniles migrating into the estuary are most vulnerable.

California Least Tern

This state and federally listed endangered species depends on shallow water foraging habitats that support an abundance of small fishes that serve as this species' main food source. Least terns are present during spring and summer primarily in the Central Bay and South Bay and, to a lesser extent, eastward into San Pablo and Suisun Bays. Consultation with the USFWS and CDFG is required for activities that may affect this species, including direct and indirect impacts on eelgrass beds and, in South Bay, salt ponds and sloughs, that serve as important foraging habitat for this species. Impacts of dredging or disposal operations that eliminate or degrade these habitats are of concern regardless of time of year. Impacts of dredging and disposal activities on turbidity and, consequently, foraging success, are of high concern during the critical spring-summer nesting season.

California Clapper Rail

This state and federally listed endangered species inhabits tidal marsh habitats in the Central and South Bay, San Pablo Bay, and the western Suisun Marsh. It nests tidal marsh vegetation feeds on invertebrates and small fishes along adjacent tidal channels and mudflats. They also utilize adjacent non-tidal marsh and upland habitats when tidal marshes are inundated by extreme high tides. Within these habitats, rails are sensitive to noise and human activity. Consultation with USFWS and CDFG should be undertaken where these tidal marsh habitats and contiguous non-tidal habitats are exposed to the effects of dredging or disposal operations. Similar considerations would apply to the state-listed threatened black rail.

Western Snowy Plover

This federally listed threatened species nests on beaches in a few locations in the Bay/Delta and is potentially vulnerable to dredging or disposal operations that directly or indirectly affect these beaches and adjacent tidal flats where the species forages. Informal consultation with USFWS should be initiated to determine whether particular sites may support this species, and consultation continued for projects that may affect their nesting and foraging habitats.

California Brown Pelican

This widely ranging state and federally listed endangered species forages in open water habitats and roosts on

breakwaters and other structures along the shoreline. Disturbance at roosting sites may affect foraging success or the birds' energetics by forcing them to use other roosts that are farther from foraging areas. Dredging or disposal within 300 feet of major roosting areas should be avoided when the birds are present.

Salt Marsh Harvest Mouse

This state and federally listed endangered species inhabits the upper zone of tidal marshes, as well as diked, non-tidal salt marshes around the Bay margins. Like the clapper rail, this species requires a refuge above extreme high tides or flooding in diked marshes, and will utilize adjacent uplands to that end. Consultation with USFWS and CDFG should be initiated where tidal and non-tidal salt marshes and adjacent uplands would be affected by dredging or disposal operations.

Table 5.1-1 summarizes the restrictions developed with the resource agencies for dredging projects. It lists the locations and time periods that represent critical habitat for special status and/or important commercial and recreational species. During periods when these organisms are present at or near certain dredging projects, they may be subject to adverse impacts unless the indicated restrictions are applied. Any dredging projects proposing deviations from these tables will not be approved by the LTMS agencies unless, through the Section 7 consultation process, project sponsors obtain project-specific concurrence from the appropriate resource agencies. This table is a summary of the dredging table included in Appendix J. The table in Appendix J includes more detailed information on the impacts to specific species and should be consulted for complete details. In order to ensure that dredging projects do not pose unacceptable risks to species of special concern, the LTMS agencies adopt the following policy level mitigation measure:

- *Dredging activities will be restricted as indicated on Table 5.1-1. Any dredging projects proposing deviations from these tables will not be approved by the LTMS agencies unless, through the Section 7 consultation process, project sponsors obtain project-specific concurrence from the appropriate resource agencies.*

Table 5.1-1 Summary by Area: Timing
Restrictions on Dredging Activity in the San Francisco
Bay/Delta Estuary

Table 5.1-1. Summary by Area: Timing Restrictions on Dredging Activity in the San Francisco Bay/Delta Estuary
(page 1 of 2)

<i>Dredging Site</i>	<i>Period When Dredging Generally Allowed (a)</i>	<i>Period of Restricted Dredging (b)</i>	<i>Restriction(s), or Applicable Consultation and Permit Requirements (c)</i>	<i>Species Causing Restriction(s) (Rank) (d)</i>
Southern Delta critical habitat (see Figure J-1 [Appendix J])	July 1 to January 31	February 1 to June 30	Consultation & Permit Requirements A, B, and E apply.	Delta smelt (1)
Central Delta critical habitat (see Figure J-1 [Appendix J])	July 1 to November 30	December 1 to June 30	Do not permit dredging in these locations during period of restriction. Otherwise, applicants REQUIRED to conduct individual formal Consultation with USFWS and CDFG.	Delta smelt (1)
Northern Delta critical habitat (see Figure J-1 [Appendix J])	August 1 to September 14	September 15 to July 31	(same as above)	Delta smelt (1)
Western Delta (= Northern Delta) critical habitat (see Figure J-1 [Appendix J])	March 1 to November 30	December 1 to February 28	(same as above)	Longfin smelt (3)
Delta	December 1 to July 31	August 1 to November 30	(same as above)	Sacramento splittail (2)
Fish migratory corridors east of Sherman Island	June 1 to September 30	October 1 to May 31	(same as above)	Chinook salmon adults and juveniles, and steelhead trout (1)
Carquinez Strait/ Suisun Bay including marshes, Martinez Bridge east to Collinsville	N/A	January 1 to December 31 (all year)	Formal consultation REQUIRED for aquatic OR upland disposal at any location where species of concern may be present	Delta smelt, California least tern, California clapper rail, salt marsh harvest mouse (1); Sacramento splittail (2); longfin smelt (3)
Carquinez Strait/ Suisun Bay including sloughs	June 1 to December 31	January 1 to May 31	Consultation & Permit Requirements A, B, C, D and E apply.	Chinook salmon adults & juveniles, steelhead trout (1)
Napa River, Petaluma River, Sonoma Creek	August 1 to October 14	October 15 to July 31	Do not permit dredging in these locations during period of restriction. Otherwise, individual ESA Consultation with the USFWS, NMFS, and CDFG is required.	Steelhead trout (1); Sacramento splittail (2)

Table 5.1-1. Summary by Area: Timing Restrictions on Dredging Activity in the San Francisco Bay/Delta Estuary

(page 2 of 2)

<i>Dredging Site</i>	<i>Period When Dredging Generally Allowed (a)</i>	<i>Period of Restricted Dredging (b)</i>	<i>Restriction(s), or Applicable Consultation and Permit Requirements (c)</i>	<i>Species Causing Restriction(s) (Rank) (d)</i>
San Pablo Bay	August 1 to December 31	January 1 to July 31	Consultation & Permit Requirements A, B, C, D and E apply.	Chinook salmon adults & juveniles, steelhead trout (1); longfin smelt (3)
San Pablo Bay mudflats, and in/adjacent to tidal salt marshes)	N/A	January 1 to December 31 (all year)	Consultation & Permit Requirements D and F apply (re clapper rail — February 1 to August 31). Formal consultation REQUIRED for any project that may result in a direct loss of mudflat (re plover) or salt marsh habitat (re SMHM).	California clapper rail, snowy plover, salt marsh harvest mouse (1)
San Pablo Bay (eelgrass beds)	N/A	January 1 to December 31 (all year)	Formal consultation REQUIRED for any project that may result in a direct loss of eelgrass.	California least tern (1)
San Pablo Bay (shallow berthing areas & channels)	July 1 to April 30	May 1 to June 30	Consultation & Permit Requirements A and B apply.	Dungeness crab (4)
Central SF Bay	June 1 to November 30	December 1 to May 31	Herring: Consultation & Permit Requirement H applies December 1 to February 28. Salmon & Steelhead, Consultation & Permit Requirements A, B, C, D and E apply.	Chinook salmon and steelhead trout (1); Pacific herring (3)
Central SF Bay (shallow berthing areas & channels)	July 1 to April 30	May 1 to June 30	Consultation & Permit Requirements A and B apply.	Dungeness crab (4)
Central SF Bay (within 3 miles of NAS Alameda)	September 1 to March 31	April 1 to August 31	Do not permit dredging in these locations during period of restriction. Otherwise, applicant is REQUIRED to conduct individual formal Consultation with USFWS and CDFG.	California least tern (1)
Central SF Bay (eelgrass beds)	N/A	January 1 to December 31 (all year)	Formal consultation REQUIRED for any project that may result in a direct loss of eelgrass.	California least tern (1)
South SF Bay (including sloughs and salt ponds)	September 1 to May 31	June 1 to August 31	(same as above)	California least tern (1)
<p><i>Notes:</i></p> <ul style="list-style-type: none"> a. Time period during which dredging may generally be permitted, without additional restrictions for species of special concern. b. Time period during which dredging generally will NOT be permitted, or when additional restrictions apply to protect species of special concern. c. See Legend for consultation and permit requirements. d. See Legend for species rankings (1 through 4). 				

Legend for Tables 5.1-1 and 5.1-2

<i>Species Ranking</i>	<i>Consultation and Permit Requirements (Dredging and Disposal Restrictions)</i>	
<p>1. Federal or state-listed endangered or threatened species. Consultation is required with USFWS, and possibly CDFG, if dredging or disposal is proposed during the period of restricted activity in critical locations.</p>	<p>A. Clamshell dredging shall be required whenever practicable in areas within 250 feet of a shoreline OR in depths less than 20 feet.</p>	<p>E. Best Management Practices to reduce turbidity (including silt curtains or other physical or operational measures) shall be required for these projects.</p>
<p>2. Species proposed for listing under the federal ESA, candidate for listing under the California ESA, or CDFG Species of Special Concern for which impacts from dredging or disposal could pose significant problems to existing or future population levels.</p>	<p>B. If hydraulic dredging in depths less than 20 feet, dredge head must be maintained at or below substrate surface. Head may not be raised more than 3 feet off bottom for flushing; shut off pump when raising head more than 3 feet off bottom (e.g., at end of dredging).</p>	<p>F. Restriction applies within the identified critical period, and within 250 feet of emergent vegetation. USFWS and CDFG must be contacted in these circumstances.</p>
<p>3. Status reviews are being conducted. Species with established recreational or commercial value or ecological function for which impacts from dredging or disposal may pose significant problems to existing or future population levels.</p>	<p>C. For new-work projects where eelgrass will be unavoidably affected, a compensatory mitigation plan must be submitted and approved by USFWS, NMFS, CDFG, USACE, and EPA prior to permitting.</p>	<p>G. If dredging must be conducted during this period, CDFG must be contacted and the permittee must provide an observer to identify herring spawning activity. Dredging must stop immediately if herring are within 200 m of the work site, and may not until hatch-out is complete (approximately 10-14 days).</p>
<p>4. Species of species groups with established recreational or commercial value or ecological function for which impacts from dredging or disposal should pose only minor problems to existing or future population levels.</p>	<p>D. If project will cause unavoidable direct or indirect effects to submerged or emergent aquatic vegetation, compensatory mitigation at 3:1 ratio is required for lost functions and values. Other proposed ratios require consultation with USFWS and CDFG.</p>	<p>H. Other historically used nesting areas include Bair Island, Oakland Airport, Alvarado salt ponds, PG&E Pittsburg, and Port Chicago. Contact USFWS to determine whether species may be present; if present, dredging restriction in Table applies.</p>

Table 5.1-2 summarizes the restrictions developed with the resource agencies for dredged material disposal. It lists the locations and time periods that represent critical habitat for special status and/or important commercial and recreational species. During periods when these organisms are present at or near certain dredged material disposal sites, they may be subject to adverse impacts unless the indicated restrictions are applied. Any dredged material disposal projects proposing deviations from these tables will not be approved by the LTMS agencies unless, through the Section 7 consultation process, project sponsors obtain project-specific concurrence from the appropriate resource agencies. In regard to minimizing disposal at the designated in-Bay disposal sites, the LTMS agencies will closely review proposed projects to ensure that overall disposal is minimized during the indicated time frames. Disposal project proponents are advised that the agencies will require that the need for disposal at these sites during the specified time frames must be clearly established. This table is a summary of the dredged material disposal table included in Appendix J. The table in appendix J includes more detailed information on the impacts to specific species and should be consulted for complete details. In order to ensure that dredged material disposal projects do not pose unacceptable risks to species of special concern, the LTMS agencies adopt the following policy level mitigation measure:

- *Dredged material disposal activities will be minimized or restricted as indicated on Table 5.1-2. The LTMS agencies will closely review disposal projects proposed for the designated in-Bay disposal sites to ensure that disposal during the indicated time frames is minimized or avoided as indicated. Disposal project proponents are advised that the agencies will require that the need for disposal at these sites during the specified time frames must be clearly established. Any disposal projects or new disposal sites proposing deviations from these tables will not be approved by the LTMS agencies unless, through the Section 7 consultation process, project sponsors obtain project-specific concurrence from the appropriate resource agencies.*

The measures listed above, in combination with reduced in-Bay disposal under any of the action alternatives described later in this chapter, would constitute appropriate, programmatic mitigation for the potential impacts of dredging and dredged material disposal on species of special concern.

5.1.2.3 Ocean Site Monitoring

Extensive site management and monitoring requirements have been established for the San Francisco Deep Ocean Disposal Site (SF-DODS). These requirements are set out in the EPA final rule formally designating the site, and thus are already codified in law. Additional rulemaking would be required to substantively change these existing site management and monitoring requirements. EPA will prepare an additional rule following completion of this EIS/EIR to designate a permanent capacity for the SF-DODS (see Chapter 7). However, the basic site management and monitoring requirements already established for this site are not expected to be significantly changed. The existing site management and monitoring plan for the SF-DODS is fully in accord with the general LTMS Site Management and Monitoring policies listed above under section 5.1.1.3.

5.1.3 Mitigation Measures Applicable to Specific Types of Projects or Facilities

Increased upland or wetland reuse and disposal of material that is not suitable for unconfined aquatic disposal (NUAD-class material) may require a number of new projects and facilities within the region over the 50-year planning period. The most likely types of new facilities that may be constructed in the future include rehandling facilities, dedicated confined disposal facilities, wetland restoration projects, and confined aquatic disposal sites. In addition, the LTMS agencies expect that a substantial amount of dredged material will be used in place of other sources of fill material to repair or stabilize existing levees.

Construction and operation of any of these projects or facilities has the potential to affect on-site and nearby environmental quality including, but not limited to, the following: plant communities, migratory and resident bird populations, fish and wildlife, water quality, air quality, traffic, and noise. A complete environmental review of proposed projects and facilities is necessary to evaluate these potential impacts at specific sites. However, numerous existing policies and regulations currently being implemented by the LTMS agencies serve to programmatically avoid and minimize environmental impacts associated with these types of projects and facilities (e.g., NEPA and CEQA requirements; the Clean Water Act 404(b)(1) Guidelines, etc.). The LTMS agencies will fully and appropriately apply the existing regulations and policies to ensure that any adverse impacts associated with the construction and operation of specific new projects or

Table 5.1-2 Summary by Area: Timing
Restrictions on Disposal Activity in the San Francisco
Bay/Delta Estuary

Table 5.1-2. Summary by Area: Timing Restrictions on Disposal Activity in the San Francisco Bay/Delta Estuary

(page 1 of 2)

<i>Location, or Disposal Site</i>	<i>Period When Disposal Generally Allowed (a)</i>	<i>Period of Restricted Disposal (b)</i>	<i>Restriction(s), or Applicable Consultation and Permit Requirements (c)</i>	<i>Species Causing Restriction(s) (Rank) (d)</i>
SF-8 (Suisun Bay Disposal Site)	January 1 to December 31 (all year)	N/A	Minimize disposal to the extent possible when species is present (January 1 to May 31)	Chinook salmon (adults, juveniles) (1)
SF-9 (Carquinez Strait Disposal Site)	January 1 to December 31 (all year)	N/A	Minimize disposal to the extent possible when species of concern may be present (January 1 to May 31)	Chinook salmon (adults, juveniles), steelhead trout (1)
SF-10 (San Pablo Bay Disposal Site)	January 1 to December 31 (all year)	N/A	Minimize disposal to the extent possible when species of concern may be present (January 1 to October 31)	Chinook salmon (adults, juveniles), steelhead trout: January 1 to May 31 (1); recreational marine fishes: May 1 to October 31 (3)
SF-11 (Alcatraz Disposal Site)	January 1 to December 31 (all year)	N/A	Minimize disposal to the extent possible when species of concern may be present (January 1 to October 31)	Steelhead trout: January 1 to May 31 (1); recreational marine fishes May 1 to October 31 (3)
SF-12 (San Francisco Bar Channel Disposal Site)	January 1 to December 31 (all year)	N/A	None	N/A
SF-DODS	January 1 to December 31 (all year)	N/A	None	N/A
Sacramento/ San Joaquin Delta critical habitat	N/A	January 1 to December 31 (all year)	Formal consultation with USFWS and CDFG for any disposal outboard of levees in this area, at any time. (No restrictions on upland disposal relative to Delta smelt.)	Delta smelt (1)
Fish migratory corridors east of Sherman Island	June 1 to September 30	October 1 to May 31	Restrict disposal to the extent feasible in these areas during period of restriction. See Consultation and Permit Requirement E.	Chinook salmon (adults, juveniles), steelhead trout (1)

Table 5.1-2. Summary by Area: Timing Restrictions on Disposal Activity in the San Francisco Bay/Delta Estuary

(page 2 of 2)

Location, or Disposal Site	Period When Disposal Generally Allowed (a)	Period of Restricted Disposal (b)	Restriction(s), or Applicable Consultation and Permit Requirements (c)	Species Causing Restriction(s) (Rank) (d)
Carquinez Strait/Suisun Bay (other than SF-8, SF-9) including marshes, Martinez Bridge east to Collinsville	N/A	January 1 to December 31 (all year)	Formal consultation with USFWS and CDFG is REQUIRED for aquatic OR upland disposal at any location where species of concern may be present (other than SF-8 or SF-9)	Delta smelt, California least tern, California clapper rail, salt marsh harvest mouse (1); Sacramento splittail (2); longfin smelt (3)
San Pablo Bay (other than SF-10) including marshes and salt ponds	N/A	January 1 to December 31 (all year)	Formal consultation with USFWS and CDFG is REQUIRED for aquatic OR upland disposal at any location where species of concern may be present (other than SF-10)	California least tern, California clapper rail, snowy plover, salt marsh harvest mouse, California brown pelican (1); Sacramento splittail (2)
Central SF Bay (other than SF-11) in/adjacent to tidal marshes, and within 3 miles of NAS Alameda	N/A	January 1 to December 31 (all year)	Formal consultation with USFWS and CDFG is REQUIRED for aquatic OR upland disposal at any location where species of concern may be present (other than SF-11)	California least tern, California clapper rail, salt marsh harvest mouse, California brown pelican (1)
South SF Bay (including sloughs and salt ponds)	N/A	January 1 to December 31 (all year)	Formal consultation with USFWS and CDFG is REQUIRED for aquatic OR upland disposal at any location where species of concern may be present	California least tern, snowy plover (1)
<p><i>Notes:</i></p> <ul style="list-style-type: none"> a. Time period during which disposal may generally be permitted, without additional restrictions for species of special concern. b. Time period during which disposal generally will NOT be permitted, or when additional restrictions apply to protect species of special concern. c. See Legend for consultation and permit requirements. d. See Legend for species ranking (1 through 4). 				

facilities will be minimized and, as necessary, mitigated.

The following sections briefly list issues that should be addressed in site-specific environmental analyses for specific types of dredged material disposal or reuse facilities.

5.1.3.1 Rehandling Facilities and Dedicated Confined Disposal Facilities

Rehandling facilities provide a key link between dredging projects and the ultimate use of material in upland projects. Material is typically offloaded from barges, dewatered, dried, then shipped off-site to a final use. These facilities can also sort and potentially treat contaminated material. Material that requires confinement may be transported to a dedicated confined disposal facility (CDF) constructed specifically for the permanent storage of such dredged material, or to other appropriate, existing sites (such as landfills) that provide adequate containment. A number of existing rehandling facilities and CDFs have been used to process or manage relatively small volumes of material from specific dredging projects within the planning area. However, the existing capacity of these facilities is not sufficient to handle the volume of material that would go to upland or wetland reuse or disposal under the action alternatives described in Chapter 6. The existing capacity is also insufficient for the overall volume of material that is projected to be not suitable for unconfined aquatic disposal (10 to 20 percent of all material dredged is expected to be NUAD-class material). Thus any of the alternatives (other than No-Action) would require the construction of new facilities or expansion of existing facilities.

The potential impacts of construction and operation of specific new rehandling facilities or CDFs must be identified and evaluated in project-specific environmental assessments. As overall guidance, the construction/expansion and operation of rehandling facilities and CDFs must carefully consider, but not be limited to the evaluation of, the following issues: (1) site selection; (2) facility construction practices; (3) facility operations; (4) facility administration and maintenance; and (5) regulatory, mitigation, and monitoring requirements. Specific engineering guidance can be

obtained from the LTMS Reuse/Upland Site Ranking, Analysis, and Documentation report (LTMS 1995d) and other LTMS upland/reuse technical studies reports. To ensure that these environmental assessments appropriately address all the issues of concern, the LTMS agencies will adopt the following general policy:

- *The LTMS agencies will address, as appropriate, the issues identified in Table 5.1-3 in site-specific assessments of the development, expansion, or operation of dredged material rehandling facilities or dedicated confined disposal sites.*

5.1.3.2 Wetland Restoration

As described in more detail in section 5.1.2.1, one of the most important beneficial uses of dredged material in the region is in the restoration of historic habitats, including tidal wetland areas around the margins of the Bay. There are several potential environmental impacts that should be addressed in the design and site-specific environmental assessments of wetland restoration projects. As overall guidance, the reuse of dredged material for wetland restoration must carefully consider, but not be limited to the evaluation of, the following issues: (1) site selection; (2) site construction; (3) site development (i.e., dredged material placement); (4) facility administration and maintenance; and (5) regulatory, mitigation, and monitoring requirements. Also, a Section 7 consultation pursuant to the ESA needs to be conducted for projects that may adversely affect or jeopardize any federally listed species. The state Department of Fish and Game may also need to be consulted for such projects. Specific engineering guidance can be obtained from the LTMS Reuse/Upland Site Ranking, Analysis, and Documentation report (LTMS 1995d) and other LTMS upland/reuse technical studies reports. The following policy ensures that the necessary issues will be evaluated:

- *The LTMS agencies will address, as appropriate, all of the issues identified in Table 5.1-4 in site-specific assessments of proposed wetland restoration projects using dredged material.*

Table 5.1-3. Overall Guidance for Rehandling Facilities and Dedicated Confined Disposal Facilities

<i>Type of Issue</i>	<i>Issues to be Addressed During Project-Specific Review</i>
<i>Maximization of Wetland Restoration and Enhancement</i> Wetland restoration and enhancement using dredged material will be emphasized to enhance and restore the natural resources of the Estuary.	
Site Selection	Water access to the site for dredged material off-loading —deep-water access (-15 to -17 feet MLLW) is optimal
	Evaluate existing habitat functions and document other existing baseline conditions
	Evaluation of proposed site conditions in terms of their suitability for the restoration effort, including: <ul style="list-style-type: none"> • Average elevation of areas to be filled • Tidal range and flood elevation • Alignment and elevation of existing levees • Area available for dredged material use (fill depth) • Total restoration area possible • Typical foundation conditions • Location and size of existing culverts and pumps • Characteristics of the dredged material to be used (e.g., grain size, material density, dredging method, etc.) • Consideration of regional and/or interagency habitat plans (e.g., the Wetlands Ecosystem Goals Project)
	Assessment of utility crossings, easements, and adjacent land uses
Site Construction	Assessment of adequately engineered and constructed perimeter and interior levees
	Analyses of the suitability of proposed spillways and water controls
	Assessment of the feasibility of proposed dredged material off-loading facilities and the adequacy and location of proposed pipelines for transporting dredged material
	Assessment and development of appropriate engineering guidelines for seismic events.
<i>Projects Designed for Ecological Restoration</i> — Projects using dredged material for wetland restoration and enhancement will be designed in a manner that provides for ecological restoration of the site and provides for a diversity of habitat values, particularly for threatened and endangered species.	
Site Development	Proximity to a channel with sufficient water depth to allow access by off-loading scows, with little or no hindrance to local navigation
	The ability to moor full scows waiting to be unloaded and empty scows waiting to be towed back to the dredging site
	Evaluation of a suitable off-loading site in terms of proximity to the restoration site and its ability to handle the proposed types of off-loading equipment
	Evaluation of the proposed means for dredged material placement at the restoration site
	Evaluation of the ability to prevent overfilling of the restoration site
Facility	Evaluation of the proposed management of all construction operations and post-construction maintenance
Administration & Maintenance	Evaluation of the proposed inspection and supervision of contractors working on site
Regulatory, Mitigation, & Monitoring Requirement	Determination of the need for federal permits or reviews
	Determination of the need for state permits or reviews
	Determination of the need for local approvals
	Evaluation of proposed mitigation and monitoring plans to ensure compliance with all applicable federal and state regulations and policies
	Consultation per Section 7 of the Endangered Species Act
Evaluate proposed projects in terms of their likelihood of success, as shown in monitoring of smaller scale demonstration studies conducted in the Bay Area.	

Table 5.1-4. Overall Guidance for Wetland Restoration

<i>Type of Issue</i>	<i>Issues to be Addressed During Project-Specific Review</i>
<i>Maximization of Wetland Restoration and Enhancement</i> —Wetland restoration and enhancement using dredged material will be emphasized to enhance and restore the natural resources of the Estuary.	
Site Selection	Water access to the site for dredged material off-loading —deep-water access (-15 to -17 feet MLLW) is optimal
	Evaluate existing habitat functions and document other existing baseline conditions
	Evaluation of proposed site conditions in terms of their suitability for the restoration effort, including: <ul style="list-style-type: none"> • Average elevation of areas to be filled • Tidal range and flood elevation • Alignment and elevation of existing levees • Area available for dredged material use (fill depth) • Total restoration area possible • Typical foundation conditions • Location and size of existing culverts and pumps • Characteristics of the dredged material to be used (e.g., grain size, material density, dredging method, etc.) • Consideration of regional and/or interagency habitat plans (e.g., the Wetlands Ecosystem Goals Project)
	Assessment of utility crossings, easements, and adjacent land uses
Site Construction	Assessment of adequately engineered and constructed perimeter and interior levees
	Analyses of the suitability of proposed spillways and water controls
	Assessment of the feasibility of proposed dredged material off-loading facilities and the adequacy and location of proposed pipelines for transporting dredged material
	Assessment and development of appropriate engineering guidelines for seismic events.
<i>Projects Designed for Ecological Restoration</i> —Projects using dredged material for wetland restoration and enhancement will be designed in a manner that provides for ecological restoration of the site and provides for a diversity of habitat values, particularly for threatened and endangered species. Wetland characteristics specific to special status species must be addressed for the purposes of establishing performance criteria for created systems.	
Site Development	Proximity to a channel with sufficient water depth to allow access by off-loading scows, with little or no hindrance to local navigation
	The ability to moor full scows waiting to be unloaded and empty scows waiting to be towed back to the dredging site
	Evaluation of a suitable off-loading site in terms of proximity to the restoration site and its ability to handle the proposed types of off-loading equipment
	Evaluation of the proposed means for dredged material placement at the restoration site
	Evaluation of the ability to prevent overfilling of the restoration site
Facility Administration & Maintenance	Evaluation of the proposed management of all construction operations and post-construction maintenance
	Evaluation of the proposed inspection and supervision of contractors working on site
Regulatory, Mitigation, & Monitoring Requirement	Determination of the need for federal permits or reviews
	Determination of the need for state permits or reviews
	Determination of the need for local approvals
	Evaluation of proposed mitigation and monitoring plans to ensure compliance with all applicable federal and state regulations and policies
	Consultation per Section 7 of the Endangered Species Act
Evaluate proposed projects in terms of their likelihood of success, as shown in monitoring of smaller scale demonstration studies conducted in the Bay Area.	

5.1.3.3 Confined Aquatic Disposal (CAD)

The LTMS agencies may consider a number of options for the disposal of NUAD material in the future, including confined aquatic disposal (CAD). CAD can include nearshore fill or wetland creation projects where NUAD-class dredged material is used as “non-cover” material, as well as the more traditional concept of capping in open water environments. Issues associated with CAD in nearshore or wetland creation situations are

addressed by policy-level mitigation measures related to material suitability and habitat conversion. As overall guidance, the LTMS agencies will evaluate any CAD site proposed in the Estuary following the general guidance provided in Appendix G (Palermo et al. 1995), and in the COE/EPA national capping guidance document *Guidance for Subaqueous Dredged Material Capping* (Palermo et al. 1995) and its future revisions.

CAD projects must include careful consideration of siting, design, construction, and monitoring. Contaminated sediments must be placed at the CAD site with acceptable levels of dispersion, and the cap must be successfully placed and maintained. The evaluation process for a CAD project includes selection of an appropriate site, characterization of both contaminated and capping sediments, selection of compatible equipment and placement techniques, prediction of material dispersion during placement, determination of the required cap thickness, evaluation of cap stability against erosion or bioturbation, and development of a monitoring program. In the San Francisco Bay Area, CAD projects may be considered in association with habitat enhancement or restoration, or other beneficial reuses.

ensure that these issues are appropriately addressed in project-specific evaluations of the use of dredged

The LTMS agencies are adopting the following policy to ensure that the appropriate issues are adequately addressed in any consideration of CAD in the future:

- *The LTMS agencies will address, as appropriate, the issues identified in Table 5.1-5 during site-specific assessments of proposed CAD sites for NUAD-class dredged material.*

5.1.3.4 Levee Reuse

The potential environmental impacts evaluated in this EIS/EIR that are associated with use of dredged material on levees generally include only those impacts that are unique to the use of dredged material for this purpose. Impacts that could occur as a result of levee maintenance or stabilization, independent of the source of fill used (such as temporary loss of vegetation on the levees), would have to be addressed in project-specific evaluations and are not directly covered here. The material suitability/sediment quality policies (section 5.1.1.2) will ensure that pollutant levels do not pose environmental impacts. The other potential environmental concern is that the salinity of dredged materials may be higher than that normally found in waters or habitats adjacent to levees. As overall guidance, the reuse of dredged material for levee maintenance and rehabilitation must carefully consider, but not be limited, to the evaluation of the following issues: (1) site selection; (2) construction; (3) facility administration and maintenance; and (4) regulatory, mitigation, and monitoring requirements. Specific engineering guidance addressing the reuse of dredged material for levee maintenance and rehabilitation can be obtained from the LTMS Reuse/Upland Site Ranking, Analysis, and Documentation report (LTMS 1995d) and other LTMS upland/reuse technical studies reports. To

material on levees, the LTMS agencies will adopt the following general policy:

- *The LTMS agencies will address, as appropriate, all of the issues identified in Table 5.1-6 in site-specific assessments of proposed levee maintenance, stabilization, or construction projects using dredged material.*
- *To address water quality concerns associated with the reuse of dredged material for levee repair and stabilization in the Delta region, only material determined to be suitable in regard to pollutant and salinity concentrations, as well as material which has been processed to reduce pollutants and salinity to suitable concentrations, will be used for this purpose. This may involve such control measures as directing only material dredged from the eastern portion of San Francisco Bay, where sediment salinity concentrations are lowest, for reuse purposes in the Delta region.*

5.2 CLEAN AIR ACT CONFORMITY ANALYSIS

5.2.1 Introduction

As required by the CAA, states establish State Implementation Plans (SIPs) to ensure that areas in attainment of the National Ambient Air Quality Standards (NAAQS) remain in compliance with these standards and that they have a viable plan for nonattainment areas to reach attainment. Section 176(c) of the CAA requires that federal actions conform with the most recent federally approved SIP. Conformity to an implementation plan means that:

1. A project will conform to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards, and
2. A project will not (a) cause or contribute to any new violations of any standard in any area, (b) increase the frequency or severity of any existing standard violation in any area, or (c) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area. The determination of conformity shall be based on the most recent estimates of emissions, as determined by the metropolitan planning organization or other agency authorized to make such estimates.

Table 5.1-5. Overall Guidance for Open-Water Confined Aquatic Disposal (CAD) Sites

Table 5.1-5. Overall Guidance for Open-Water Confined Aquatic Disposal (CAD) Sites

(page 1 of 2)

<i>Type of Issue</i>	<i>Issues to be Addressed During Project-Specific Review</i>
Site Selection	<p>Depositional/erosional characteristics</p> <ul style="list-style-type: none"> • Relatively depositional locations reduce dispersion during placement, the potential for later cap erosion, and the need for armoring or long-term cap maintenance • Relatively erosional locations increase concerns about dispersion during placement, the potential for cap erosion, and the need for armoring or long-term cap maintenance <p>Current velocities</p> <ul style="list-style-type: none"> • Water column currents (affect dispersion during placement) • Bottom currents (affect resuspension; erosion of mound and cap) • Storm-induced waves (affect maximum bottom current velocities) <p>Bathymetry that may confine the material and reduce dispersion and erosion</p> <ul style="list-style-type: none"> • Natural or man-made depressions • Other geometric features including constructed subaqueous berms <p>Other siting issues</p> <ul style="list-style-type: none"> • Location relative to sensitive resources • Capacity to meet the disposal need (including multiple projects) • Depth and width needed to contain the spread of material during placement • Depth needed for barge access • Potential for interference with navigation traffic or other activities • Consideration of regional and/or interagency habitat plans (e.g., the Wetlands Ecosystem Goals Project)
Design	<p>Potential water column impacts during placement</p> <ul style="list-style-type: none"> • Release of contaminants • Water column toxicity • Mass loss of contaminants • Initial mixing <p>Efficacy of cap placement</p> <ul style="list-style-type: none"> • Type of capping material • Dredging/placement method for contaminated sediment • Dredging/placement method for capping material • Compatibility of site conditions, material types, and dredging/placement methods <p>Long-term cap integrity</p> <ul style="list-style-type: none"> • Physical isolation of contaminants • Bioturbation of the cap by benthos • Consolidation of the sediments (confined and cap material) • Long-term contaminant loss (due to advection/diffusion) • Potential for physical disturbance of the cap (e.g., by currents, waves, anchors, ship traffic) • Assessment and development of appropriate engineering guidelines for seismic events

Table 5.1-5. Overall Guidance for Open-Water Confined Aquatic Disposal (CAD) Sites

(page 2 of 2)

<i>Type of Issue</i>	<i>Issues to be Addressed During Project-Specific Review</i>
Design (continued)	<p>Cap composition and thickness (the determination of cap thickness should include all of the factors listed; interim versus final cap designs may differ)</p> <ul style="list-style-type: none"> • Thickness needed for physical isolation (~ 20 cm typically needed for chemical seal) • Thickness needed for bioturbation (~ 40 to 50 cm typically needed in San Francisco Bay) • Consolidation of both confined and cap material • Potential need for cap armoring against worst-case erosive events
Regulatory, Mitigation, & Monitoring Requirement	Determination of the need for federal permits or reviews
	Determination of the need for state permits or reviews
	Determination of the need for local approvals
	Evaluation of proposed mitigation and monitoring plans to ensure compliance with all applicable federal and state regulations and policies
	Consultation per Section 7 of the Endangered Species Act
Monitoring	<p>Evaluate proposed projects in terms of their likelihood of success, as shown in monitoring of smaller scale demonstration studies conducted in the Bay Area.</p> <p>Ensure contaminated sediments are placed as intended, with acceptable levels of dispersion/release</p> <ul style="list-style-type: none"> • Pre-disposal bathymetry/baseline surveys using a SVPC¹ system, as appropriate • Plume monitoring during placement
	<p>Ensure cap material is placed as intended, and that required thickness is attained and maintained</p> <ul style="list-style-type: none"> • Intermediate post-capping bathymetry/SVPC¹ surveys • Core samples through cap immediately after capping
	<p>Ensure cap remains effective in isolating the contaminated material</p> <ul style="list-style-type: none"> • Periodic post-capping bathymetry/SVPC¹ surveys • Periodic core samples through cap
<p><i>Note:</i> 1. SVPC = Sediment Vertical Profiling Camera system</p>	

In accordance with Section 176(c) of the CAA, the EPA promulgated the final conformity rule for general federal actions on November 30, 1993, which is codified as 40 CFR 51 Subpart W, and 40 CFR 93 Subpart B. The 40 CFR 93 Subpart B applies to federal agencies until states revise their SIPs to adopt a conformity rule at least as stringent as EPA's rule (40 CFR 51 Subpart W).

For the programmatic level of analysis considered in this document, air quality emissions are not yet reasonably foreseeable and therefore no conformity determination will be made at this time. However, on a project-specific basis, projects implemented under any of the alternatives considered as part of the LTMS program may (depending

on dredge material quantity, dredging locations, disposal locations, and transport routes) result in air emissions sufficient to trigger the need for a conformity determination. The conformity process is discussed in the following sections, but final conformity determinations would have to be made on a case-by-case basis as individual projects are defined. Maintenance dredging and debris disposal projects where "no new depths are required, applicable permits are secured, and disposal will be at an approved disposal site" are exempt from the conformity rule requirements [Subpart 93.153(c)(2)(ix)].

5.2.2 Regulatory Background

Table 5.1-6. Overall Guidance for Levee Reuse

<i>Type of Issue</i>	<i>Issues to be Addressed During Project-Specific Review</i>
<i>Beneficial Reuse of Dredged Material for Levee Repair and Stabilization</i> — Use dredged material for levee repair and rehabilitation to the maximum extent possible, taking full consideration of engineering and environmental constraints.	
Site Selection	Evaluation of the suitability of the proposed dredging technique in terms of site limitations (e.g., ability to construct containment facilities for hydraulically dredged material, material stockpile capabilities, etc.)
	Evaluation of the ability to transport material to a site (e.g., deep-water access [-15 to -17 feet MLLW], suitable roadways for land transport of material, etc.)
	Evaluation of proposed site conditions, including: <ul style="list-style-type: none"> • Condition of existing levees • Existing habitat and special status species • Geological engineering evaluations of the ability of levees to handle the weight of the new dredged material for repair/stabilization • Extent of levee repair and stabilization material needed • Characteristics of the dredged material to be used (e.g., grain size, concentrations of chemical constituents) • Cumulative impacts associated with reuse of dredged material for levee repair and stabilization
	Suitability of the location in terms of avoiding impacts to agricultural, industrial, and municipal water supply intakes
Construction	Evaluation of the suitability of proposed material off-loading and on-site placement
	Compliance with identified geo-engineering constraints at the placement site
	Evaluation of the ability to avoid potential adverse environmental impacts (e.g., surface and groundwater, plant communities, sensitive wildlife species, and riparian or other wetland habitat areas)
	Evaluation of proposed site monitoring activities during the construction phase
	Evaluation of the suitability of a levee repair/stabilization site to reduce pollutant concentrations (salinity, metals, etc.) in the dredged material
	Preferential use of sandier dredged material for Delta levee repair and rehabilitation work
	Compliance with applicable design standards for levee repair/stabilization, as specified by state and federal regulations and policies
	Assessment and development of appropriate engineering guidelines for seismic events
<i>Coordinated Approach for Dredged Material Reuse</i> — LTMS agencies will aid, to the extent possible in the development of an organization and a mean of communication between dredgers, the California Department of Water Resources, the COE, and local flood control reclamation districts to identify levee repair/rehabilitation sites that can best use dredged material.	
Facility	Evaluation of the proposed management of all construction operations and post-construction maintenance
Administration & Maintenance	Evaluation of the proposed inspection and supervision of contractors working on site
Regulatory, Mitigation, & Monitoring Requirements	Determination of the need for federal permits or reviews
	Determination of the need for state permits or reviews
	Determination of the need for local approvals
	Evaluation of proposed mitigation and monitoring plans to ensure compliance with all applicable federal and state regulations and policies
Consultation per Section 7 of the Endangered Species Act	

According to 40 CFR 93 Subpart B, determining conformity is essentially a two-step process: (1) applicability analysis and (2) conformity analysis. The applicability analysis is performed according to Subpart 93.153, wherein de minimis thresholds based on the region's nonattainment status and regional emission levels are established for total project direct and indirect pollutant emissions. The conformity analysis is not required for projects where the total direct and indirect emissions caused by the federal action are less than the respective thresholds. The definitions of total direct and indirect emissions for conformity purposes distinguish emissions according to timing and location rather than the type of emission source. Direct emissions occur at

the same time and place as the federal action. Indirect emissions include those that may occur later in time or at a distance from the federal action. In addition, the conformity rule limits the scope of indirect emissions to those that can be quantified and are reasonably foreseeable by the federal agency at the time of analysis, and those for which the federal agency can practicably control and maintain control through its continuing program responsibility.

If required by the applicability analysis, the conformity analysis should consider whether the project conforms to the guidelines of the most recent federally approved SIP, as stated in section 176(c) of the CAA. Until recently,

the San Francisco Bay Area Air Basin (SFBAAB) portion of the SIP approved by the EPA was the 1982 *Bay Area Air Quality Plan* (Air Quality Plan) (Bay Area Air Quality Management District [BAAQMD], Association of Bay Area Governments [ABAG], and the Metropolitan Transportation Commission [MTC] 1982). This plan was required to demonstrate attainment of the ozone (O₃) and carbon monoxide (CO) NAAQS by 1987 in the SFBAAB, but ultimately failed to reach its goals. Since no O₃ violations occurred in the SFBAAB from 1990 through 1992, the BAAQMD requested the EPA in 1993 to redesignate the region as attainment for O₃ in the submittal of the *Redesignation Request and Maintenance Plan for the National O₃ Standard* (BAAQMD, ABAG, and MTC 1993) (O₃ Maintenance Plan). The Maintenance Plan adopts most of the emission control measures identified in the 1982 SIP and includes new transportation emission control measures. Upon final approval of the O₃ Maintenance Plan by the EPA, this redesignation became effective on June 21, 1995. As part of the approval process for the Maintenance Plan, the EPA determined that reliance on volatile organic compound (VOC) control measures would be sufficient to maintain the O₃ standard and the nitrogen oxides (NO_x) class of compounds was given the status of an exempt pollutant (60 FR 27028-27041). However, the O₃ Maintenance Plan contains contingency measures that would implement NO_x Reasonably Available Control Technologies (RACT) in the event of an O₃ standard violation.

Since violations of the O₃ standard occurred in 1995 and 1996, the EPA is in the process of redesignating the SFBAAB from attainment/maintenance to nonattainment of the O₃ standard. This redesignation is expected in July 1998 and will require the BAAQMD to prepare a new plan that demonstrates attainment of the O₃ standard within a mandated time frame.

In addition to the O₃ redesignation, the BAAQMD requested the EPA to redesignate the SFBAAB as attainment of CO, since the region did not record any violations of the 8-hour CO NAAQS for the 2-year period of 1992-1993 (the 1-hour standard for CO has not been exceeded in the region since 1985). Credit for this air quality improvement can be traced to improvements in the vehicle inspection and maintenance (I&M) program, additional contingency measures adopted in 1990, and the introduction of a winter-time oxygenated fuels program, as required by the 1990 CAA. The request for redesignation is presented in the *Redesignation Request and Maintenance Plan for the National CO Standard* (BAAQMD, ABAG, and MTC 1994). This CO Maintenance Plan contains a contingency measure that would improve the

effectiveness of the existing I&M program in the event of a CO standard violation. On June 1, 1998, the EPA redesignated the SFBAAB to attainment of the national CO standard.

5.2.3 Applicability Analysis

All activities associated with the LTMS, except activity occurring in the Delta area and disposal at sites outside of the 3-mile limit of BAAQMD regulatory jurisdiction, are located within the SFBAAB. The SFBAAB is currently designated as a maintenance area for ozone and CO, attainment for nitrogen dioxide and sulfur dioxide, and unclassified for particulate matter less than 10 microns in diameter (PM₁₀). Therefore, the applicable de minimis thresholds for the SFBAAB are 100 tons per year of VOC and CO [Subpart 93.153(b)(2)], as the region is presently exempt from the NO_x de minimis threshold. Additionally, emissions of VOC and CO must not exceed 10 percent of the total SFBAAB inventories of these pollutants [Subpart 93.153(i)]. If total project direct and indirect VOC and CO emissions are less than the de minimis thresholds and less than 10 percent of the area inventory for VOC and CO, the project is assumed to conform, and further conformity analysis would not be required. Since the EPA will redesignate the SFBAAB to nonattainment of the O₃ standard by as early as July 1998, the O₃ de minimis thresholds for the purpose of conformity applicability analyses in the region could become more stringent as a result of this action.

Emissions from LTMS-related activity occurring in the Delta area could potentially affect the Sacramento County portion of the Sacramento Valley Air Basin (SVAB) and/or the San Joaquin County portion of the San Joaquin Valley Air Basin (SJVAB). Sacramento County is designated as in “severe” nonattainment of the federal ozone standard, “moderate” nonattainment of the federal CO standards, and “moderate” nonattainment of the federal PM₁₀ standards (see section 4.7.2 for an explanation of the nonattainment classification scheme). The applicable de minimis thresholds for emissions occurring within Sacramento County are therefore 25 tons per year for ozone precursors, 100 tons per year for CO, and 100 tons per year for PM₁₀ [Subpart 93.153(b)(1)]. San Joaquin County is in “serious” nonattainment for ozone and PM₁₀, and the Stockton urbanized area is in “moderate” nonattainment for CO. The de minimis thresholds for emissions in these areas are therefore 50 tons per year of ozone precursors, 100 tons per year of CO, and 70 tons per year of PM₁₀ [Subpart 93.153(b)(1)].

The applicability analysis would focus on the direct short-term emissions associated with dredging, transport,

and disposal activities. Long-term emissions from the change in shipping activities that would occur upon completion of project dredging, transport, and disposal activities are assumed to decrease and provide beneficial air quality impacts.

Due to the deepening of the navigational channels and harbors provided by the LTMS projects, ships would be able to call more fully loaded, and future cargo throughput per ship visit would increase. As a result, fewer ships would be required to transport the same amount of cargo compared to the existing fleet, and fewer emissions would be produced over the long term for a given amount of cargo throughput. The main reason for this decrease in emissions is that a decreased number of ship visits would eliminate a substantial amount of emissions from cruising, maneuvering, and queuing activities, and tugboat assistance.

5.2.4 Conformity Determination

If total project short-term emissions from a proposed LTMS action would exceed the de minimis thresholds, conformity would have to be demonstrated in one of the following ways:

1. Show that total project emissions are accounted for in the applicable SIP;
2. For O₃ and NO₂, provide offsets of total project emissions so there is no net increase in emissions;
3. For criteria pollutants other than O₃ and NO₂, perform dispersion modeling of project emissions to show no violations of the NAAQS;
4. For O₃ and NO₂, where EPA has approved a revision to an area's attainment/maintenance plan after 1990,
 - a. Demonstrate that the federal activity emissions plus baseline emissions would not exceed the emissions budget in the applicable SIP, or
 - b. When the federal activity emissions plus baseline emissions exceed the emissions budget in the applicable SIP, obtain a written commitment from the state governor to revise the SIP to include the emissions; or
5. For O₃ or NO₂, where EPA has not approved a revision to an area's attainment/maintenance plan after 1990, demonstrate that the federal activity emissions will not increase emissions with respect to the baseline emissions.

5.3 ALTERNATIVES DEVELOPMENT

This section of the EIS/EIR describes development of a range of alternative long-term management approaches for San Francisco Bay Area dredged material that meet the overall goals and objectives of the LTMS. Public comments (see Chapter 2) and initial agency evaluation have identified that any alternative should be based on disposal in a *combination* of the three placement environments. Public comment also indicated the need to address cumulative environmental and economic impacts and benefits over the entire 50-year LTMS planning period. In this section, an initial range of alternatives is developed based on the LTMS planning estimates for long-term dredging and disposal volumes, and this dredged material is distributed among the three placement environments in a variety of ways. Section 5.3.3 describes the alternative management approaches retained for preliminary consideration. Each alternative consists of a dredged material distribution scenario, coupled with the policy-level mitigation measures presented earlier in this chapter (section 5.1). Final screening of the preliminary alternatives, and evaluation of the final alternative management approaches, is presented in Chapter 6.

5.3.1 Options Eliminated from Consideration Based on Scoping

The formal and informal scoping process for this EIS/EIR is described in Chapter 2. One of the key issues identified during the scoping period was a need to balance disposal among the three types of environments. In response to these and other comments, several potential approaches for long-term dredged material management were eliminated from consideration during the process of developing dredged material distribution scenarios. These included eliminating dredging, returning to pre-LTMS conditions, placing all dredged material in a single environment, and placing all material suitable for unconfined aquatic disposal in a single environment. These options are discussed below.

Eliminating Dredging is not considered a viable option for the San Francisco Bay Area. Failing to maintain and construct necessary navigational channels would eventually lead to shoaling in all of the shipping lanes and, in the worst case, effectively limit vessel traffic in the Estuary to recreational boats. This approach would not meet the overall goals of the LTMS, and would result in dire economic consequences for the region. It would also preclude realization of the environmental benefits that could be gained through reuse of dredged material.

A Return to Pre-LTMS Conditions is a second option that was eliminated from detailed consideration. In the late 1980s, a situation commonly referred to as “mudlock” created substantial economic hardship, uncertainty over regulatory policies and procedures, a lack of predictability for dredging project planning, and environmental concerns. The No-Action alternative considered in this EIS/EIR reflects important management changes that have come about *after* the establishment of the LTMS, such as improved interim sediment testing requirements, improved management of mounding at the Alcatraz disposal site, and designation of a deep ocean disposal site, which represents the first, major alternative to in-Bay disposal of most of the area’s dredged material. A return to the situation in effect prior to the LTMS would be a significant step backward for all aspects of dredged material management in the Bay Area, would be inconsistent with the San Francisco Estuary Project’s (SFEP) Comprehensive Conservation Management Program (CCMP), and would not achieve the objectives of the LTMS.

Placing All Dredged Material in a Single Environment was eliminated from consideration because this action also does not meet LTMS goals. Not all dredged material is suitable for disposal in all environments. For example, NUAD material may not be disposed at unconfined aquatic disposal sites in the Estuary or in the ocean under existing law. All classes of dredged material could theoretically be placed in hazardous waste landfills, but a large fraction of that material would be appropriate to reuse for beneficial purposes, and the volumes of material would quickly overwhelm disposal capacity for actual hazardous wastes that could then not be disposed of properly. In addition, reliance on any one disposal environment would leave the region once again vulnerable to “mudlock” if the chosen disposal environment were suddenly to become unavailable for any reason.

Placing All SUAD Material in a Single Environment was also eliminated from consideration for many of the reasons outlined above. The public scoping notice for this EIS/EIR included options that heavily emphasized disposal in individual environments. Further agency evaluation indicated a strong need to broaden the proposed material distributions. A mix of different disposal environments is also necessary to account for variation in disposal volumes over time; to address changing circumstances, project sizes, and economies of foreseeable dredging projects; and to avoid potentially significant impacts associated with disposal in one environment.

5.3.2 Development of Material Distribution Scenarios

A range of distribution scenarios was developed to reflect reasonable volume projections that could be managed in each type of environment. These scenarios were constructed in a step-wise fashion, as outlined below.

First, projections of the volume of material that will need to be dredged from existing navigation and berthing areas were made. These projections are outlined in section 3.1.2 and more fully described in Appendix E. For the purpose of developing long-term management approaches, the high range estimate of 5.93 mcy per year (a total of 296.5 mcy over a 50-year period) is used.

Second, a range of feasible disposal options for upland/wetland reuse was developed. The capacity of potentially feasible UWR sites, and the timeframe within which these capacities could be developed, was evaluated (LTMS 1995d; BCDC 1995a). These upland/wetland site reuse capacities, together with the allowable disposal volume limits at existing aquatic disposal sites, were used to define the maximum levels of disposal that would be considered for each of the three disposal environments.

Third, historic data on the physical, chemical, and toxicity properties of dredged material was reviewed to estimate the volume of material that would be suitable for unconfined aquatic disposal (a framework for determining suitability is presented in Chapter 3). Based on this review, 80 to 90 percent of the material to be dredged over the next 50 years is expected to be suitable for unconfined aquatic disposal (SUAD-class material). Current regulations and policies would require the remaining 10 to 20 percent (NUAD-class material) to be confined in some manner. A portion of the NUAD material, depending on its characteristics, would be suitable for use in wetland restoration, landfill cover, construction fill, and other reuse options. (Confinement at any CAD sites that may be designated in the future is also possible.) A very small fraction of this material — expected to be less than 1 percent of the total dredged volume — would require handling and disposal as hazardous waste (see Chapter 3). For the purpose of this analysis, the high range estimate of 20 percent of all dredged material being NUAD (an average of 1.18 mcy per year, or 59 mcy over 50 years) is used. This volume of material would require appropriate management under any of the alternative management approaches, and would not be generally available for distribution among the placement environments. In contrast, the other 80 percent of all material (~4.7 mcy per year, or 237 mcy over 50 years) would be SUAD-class material that would

Table 5.3-1. Scenarios for Distribution of Dredged Material in In-Bay, Ocean, and Upland/Wetland Reuse Environments

<i>Preliminary Alternative</i>	AVERAGE ANNUAL TARGET VOLUME (MCY) PER PLACEMENT ENVIRONMENT		
	<i>In-Bay</i>	<i>Ocean</i>	<i>UWR</i>
A (No Action)	Very High (3.8+)	Very Low (0.48)	Very Low (0.48)
B	Medium (to 2.4)	Medium (to 2.4)	Low (to 0.9)
C	Low (to 0.9)	High (to 3.8)	Low (to 0.9)
D	Medium (to 2.4)	Low (to 0.9)	Medium (to 2.4)
E	Low (to 0.9)	Medium (to 2.4)	Medium (to 2.4)
F	Low (to 0.9)	Low (to 0.9)	High (to 3.8)

theoretically be available for distribution among all of the placement environments.

The fourth step was to define an upper bound on the amount of SUAD material that would be considered for placement in any one environment. In response to public comments regarding a need for a balance among the three disposal environments, the LTMS agencies determined that no alternative long-term management approach would include more than 80 percent or less than 5 percent of the total volume of dredged SUAD material in any of the three environments.

The fifth step was to develop scenarios for material distribution using these upper (80 percent) and lower (5 percent) bounds. Three volume categories were defined:

- *High:* 65 to 80 percent of the material suitable for aquatic disposal; this corresponds to 3.1 to 3.8 mcy per year and 154.1 to 189.6 mcy over the 50-year planning period;
- *Medium:* 35 to 50 percent of the material suitable for aquatic disposal; this corresponds to 1.7 to 2.4 mcy per year and 83.0 to 118.5 mcy over the 50-year planning period; and
- *Low:* 5 to 20 percent of the material suitable for aquatic disposal; this corresponds to 0.2 to

0.9 mcy per year and 11.9 to 47.5 mcy over the 50-year planning period.

Discontinuous ranges were used to highlight the differences between use levels as much as possible.

Refer to Figure 2.9-1, which illustrates this evaluation process.

Based on the above considerations, six distribution scenarios were constructed that, overall, include the range of potential disposal volume categories (high, medium, and low) in each placement environment. The six scenarios are presented in Table 5.3-1. Three of the six scenarios involve placing a high percentage of dredged material in one environment with the remainder split between the other two environments. The other three scenarios achieve a more even balance of dredged material disposal by placing no more than a medium amount in any one environment.

5.3.3 Preliminary Alternatives Carried Forward for Consideration

Each of the alternative long-term approaches for management of Bay Area dredged material evaluated in this EIS/EIR consist of one of the distribution scenarios for SUAD-class material (presented in section 5.3)

combined with the policy-level mitigation measures (described in section 5.1). The policy-level mitigation measures effectively mitigate and minimize many of the environmental risks that would otherwise be associated with dredged material disposal. The six preliminary alternatives are summarized in the following paragraphs. Taken together, this set of preliminary alternatives presents a range of policy options for achieving a dredged material management system that attempts to maximize environmental benefits and minimize environmental impacts, in an economically sound manner. The environmental consequences of these alternatives are presented in Chapter 6. The evaluation there is presented in two stages. First, a “generic analysis” of the environmental impacts, risks, and benefits associated with different volumes of dredged material placed in each of the three environments is presented. This analysis serves as the final screening of the preliminary alternatives. The second stage is a detailed evaluation of the remaining alternatives, using the evaluation criteria developed in Chapter 2 based on public issues of concern.

5.3.3.1 Preliminary Alternative A: No-Action (Current Conditions)

The No-Action alternative is based on continuation of current management practices that emphasize the maximum use of in-Bay unconfined aquatic disposal sites. Conditions under the No-Action alternative are presented in Table 5.3-2.

This alternative is not based on conditions in San

Francisco Bay that occurred prior to the formation of the LTMS in 1990. Rather, No-Action includes continued disposal of about 4.0 mcy per year at Alcatraz (SF-11) consistent with COE Public Notice 93-3. It also includes continuation of existing levels of disposal at the Carquinez Strait site (SF-9), which has an allowable disposal volume limit of 2.0 or 3.0 mcy (depending on the year), and at the San Pablo Bay site (SF-10), which has a target disposal volume limit of 0.5 mcy per year.

Accordingly, the No-Action distribution scenario would involve the continued use of in-Bay sites up to a maximum level of 5.5 to 6.5 mcy per year, with low use of the SF-DODS, and upland or wetland reuse only as opportunities arise. All of the other distribution scenarios would involve less in-Bay disposal, and more upland or wetland reuse, than the No-Action scenario.

Four major characteristics distinguish No-Action from the other five alternatives:

- The vast majority of dredged material disposal would continue to occur within the already-stressed Estuary.
- This alternative relies primarily on the ocean disposal site for situations when in-Bay capacity is reached, but otherwise does not require specific levels of ocean disposal.
- It does not establish, provide for, or facilitate the beneficial reuse of dredged material in a coordinated fashion.

Table 5.3-2. Preliminary Alternative A: No-Action (Current Conditions)

Conditions	In-Bay Disposal	Ocean Disposal	Upland/Wetland Reuse
<p>Material Distributions</p> <p>Disposal Volume Limit</p> <p>Annual Average Use</p> <p>Annual Average Use</p> <p>Total 50-yr Volume (SUAD)</p> <p>Total 50-yr Volume (SUAD)</p> <p>Total 50-yr Volume (SUAD)</p>	<p>see note 1</p> <p>5.5 - 6.5 mcy/yr</p> <p>1.7 - 2.4 mcy/yr</p> <p>83.0 ± 118.5 mcy</p> <p>190 mcy</p> <p>NA</p>	<p>6 mcy/yr²</p> <p>1.7 - 2.4 mcy/yr</p> <p>0.48 mcy/yr</p> <p>83.0 ± 118.5 mcy</p> <p>24 mcy</p> <p>NA</p>	<p>NA</p> <p>0.2 - 0.9 mcy/yr</p> <p>0.48 mcy/yr</p> <p>11.9 ± 47.9 mcy</p> <p>59 mcy (avg 1.18 mcy/yr)</p> <p>59 mcy (avg 1.18 mcy/yr)</p>
<p>Policy-Level Mitigation Measures</p>	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Protection • Fish Habitat Conservation • Site-Specific Review of CAD 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Conversion • Site-Specific Review of Rehandling and Confined Facilities, CAD, Wetland Rehandling and Confined Facilities, Upland Wetland Restoration, and Level
<p>Notes: 1. Administrative volume limits on in-Bay disposal are one option for implementing any dredged material placement scenario. This and other options are discussed more fully in Chapter 7.</p> <p>2. The volume limit for the ocean site will be finalized by EPA after completion of this EIS/EIR and will be based on the preferred alternative and the need to provide for flexibility (see Chapter 7 discussion on agency actions following the final EIS/EIR).</p>			

- It is associated with the lowest quantifiable economic costs when calculated on a project-by-project basis (but not necessarily on a regional basis).

Based on current 50-year projections, it appears that existing allowable disposal volume limits at in-Bay sites would be sufficient to manage all SUAD-class dredged material most of the time under No-Action. However, the No-Action Alternative represents an approach that leaves the region potentially vulnerable to situations where dredging needs periodically exceed in-Bay capacity. In this regard, the No-Action alternative does not meet the LTMS goals. Nevertheless, as required by NEPA and CEQA, it must be fully evaluated in this EIS/EIR to compare the relative benefits and consequences of the other action alternatives.

5.3.3.2 Preliminary Alternative B: Emphasize Aquatic Disposal (Minimal Upland/Wetland Reuse)

Preliminary Alternative B — Emphasize Aquatic Disposal — would include medium levels of disposal at both the existing in-Bay unconfined aquatic disposal sites and the SF-DODS. This represents a substantial reduction of long-term in-Bay disposal volumes (a long-term average of up to 2.4 mcy per year, as opposed to 4.8 mcy per year under No-Action). It also represents a substantial increase in ocean disposal (from less than 1 mcy per year under No-Action, to an average of as much as 2.4 mcy per year). Only low volumes of dredged material would go toward beneficial reuse in the UWR environment; however, substantially more material would be beneficially reused compared to No-Action. Conditions under Preliminary Alternative B are presented in Table 5.3-3.

5.3.3.3 Preliminary Alternative C: Emphasize Ocean Disposal

Preliminary Alternative C — Emphasize Ocean Disposal — would include high levels of disposal at the SF-DODS, and only low levels at existing in-Bay sites. This alternative represents the largest reduction of long-term in-Bay disposal volumes (an average of less than 1 mcy per year, as opposed to 4.8 mcy per year under No-Action) and therefore avoids or minimizes, to the greatest extent, the impacts and risks associated with disposal of large volumes of dredged material within the already-stressed Estuary. Similar to Preliminary Alternative B, only low volumes of dredged material would go toward beneficial reuse in the UWR environment; however, substantially more material would be beneficially reused compared to No-Action. Conditions under Preliminary Alternative C are presented in Table 5.3-4.

5.3.3.4 Preliminary Alternative D: Balance UWR and In-Bay Disposal (Minimal Ocean Disposal)

Preliminary Alternative D — Balance UWR and in-Bay Disposal — would include medium volumes of material going both to in-Bay disposal sites and to upland or wetland reuse. Only low volumes of material would be directed to the SF-DODS. Similar to Preliminary

Alternative B, this alternative represents a substantial reduction of long-term in-Bay disposal volumes (an

average of up to 2.4 mcy per year, as opposed to 4.8 mcy per year under No-Action). At the same time, it represents a substantial increase in the volume of dredged material that would go toward beneficial reuse in the UWR environment. Conditions under Preliminary Alternative D are presented in Table 5.3-5.

5.3.3.5 Preliminary Alternative E: Balance UWR and Ocean Disposal (Minimal In-Bay Disposal)

Preliminary Alternative E — Balance UWR and Ocean Disposal — would include medium levels of disposal at the SF-DODS, similar to Preliminary Alternative B. It would also include medium levels of material going toward beneficial reuse in the UWR environment, similar to Preliminary Alternative D. This alternative, like Preliminary Alternative C, also represents the largest reduction of long-term in-Bay disposal volumes (an average of less than 1 mcy per year, as opposed to 4.8 mcy per year under No-Action) and therefore avoids or minimizes, to the greatest extent, the impacts and risks associated with disposal of large volumes of dredged material within the already-stressed Estuary. Conditions under Preliminary Alternative E are presented in Table 5.3-6.

Table 5.3-4. Preliminary Alternative C: Emphasize Ocean Disposal (Low In-Bay, High Ocean, Low UWR)

<i>Conditions</i>	<i>In-Bay Disposal</i>	<i>Ocean Disposal</i>	<i>Upland/Wetland Reuse</i>
Material Distributions Disposal Volume Limit Annual Average Use Total 50-yr Volume (SUAD) Total 50-yr Volume (NUAD)	see note 1 0.2 - 0.9 mcy/yr 11.9 - 47.5 mcy NA	6 mcy/yr ² 3.1 - 3.8 mcy 154.1 - 189.6 mcy NA	NA 0.2 - 0.9 mcy/yr 11.9 - 47.5 mcy 59 mcy (avg 1.18 mcy/yr)
Policy-Level Mitigation Measures	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Protection • Site-Specific Review of CAD 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Conversion • Site-Specific Review of Rehandling and Confined Facilities, CAD, Wetland Restoration, and Levee Use
<p><i>Notes:</i> 1. Administrative volume limits on in-Bay disposal are one option for implementing any dredged material placement scenario. This and other options are discussed more fully in Chapter 7. 2. The volume limit for the ocean site will be finalized by EPA after completion of this EIS/EIR and will be based on the preferred alternative and the need to provide for flexibility (see Chapter 7 discussion on agency actions following the final EIS/EIR).</p>			

Table 5.3-5. Preliminary Alternative D: Balance UWR and In-Bay Disposal (Medium In-Bay, Low Ocean, Medium UWR)

<i>Conditions</i>	<i>In-Bay Disposal</i>	<i>Ocean Disposal</i>	<i>Upland/Wetland Reuse</i>
Material Distributions Disposal Volume Limit Annual Average Use Total 50-yr Volume (SUAD) Total 50-yr Volume (NUAD)	see note 1 1.7 - 2.4 mcy/yr 83.0 - 118.5 mcy NA	6 mcy/yr ² 0.2 - 0.9 mcy/yr 11.9 - 47.5 mcy NA	NA 1.7 - 2.4 mcy/yr 83.0 - 118.5 mcy 59 mcy (avg 1.18 mcy/yr)
Policy-Level Mitigation Measures	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Protection • Site-Specific Review of CAD 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Conversion • Site-Specific Review of Rehandling and Confined Facilities, CAD, Wetland Restoration, Levee Repair Use
<p><i>Notes:</i> 1. Administrative volume limits on in-Bay disposal are one option for implementing any dredged material placement scenario. This and other options are discussed more fully in Chapter 7.</p> <p>2. The volume limit for the ocean site will be finalized by EPA after completion of this EIS/EIR and will be based on the preferred alternative and the need to provide for flexibility (see Chapter 7 discussion on agency actions following the final EIS/EIR).</p>			

5.3.3.6 Preliminary Alternative F: Emphasize Upland/Wetland Reuse

include high levels of material going toward beneficial reuse in the UWR environment, the greatest amount of beneficial reuse of any of the alternatives. At the same

Preliminary Alternative F — Emphasize UWR — would

Table 5.3-6. Preliminary Alternative E: Balance UWR and Ocean Disposal (Low In-Bay, Medium Ocean, Medium UWR)

<i>Conditions</i>	<i>In-Bay Disposal</i>	<i>Ocean Disposal</i>	<i>Upland/Wetland Reuse</i>
Material Distributions Disposal Volume Limit Annual Average Use Total 50-yr Volume (SUAD) Total 50-yr Volume (NUAD)	see note 1 0.2 - 0.9 mcy/yr 11.9 - 47.5 mcy NA	6 mcy/yr ² 1.7 - 2.4 mcy 83.0 - 118.5 mcy NA	NA 1.7 - 2.4 mcy/yr 83.1 - 118.5 mcy 59 mcy
Policy-Level Mitigation Measures	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Protection • Site-Specific Review of CAD 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Conversion • Site-Specific Review of Rehandling and Confined Facilities, CAD, Wetland Restoration, and Levee Use
<p><i>Notes:</i> 1. Administrative volume limits on in-Bay disposal are one option for implementing any dredged material placement scenario. This and other options are discussed more fully in Chapter 7.</p> <p>2. The volume limit for the ocean site will be finalized by EPA after completion of this EIS/EIR and will be based on the preferred alternative and the need to provide for flexibility (see Chapter 7 discussion on agency actions following the final EIS/EIR).</p>			

time, like preliminary alternatives C and E, this alternative represents the largest reduction of long-term in-Bay disposal (an average of less than 1 mcy per year, as opposed to 4.8 mcy per year under No-Action) and therefore avoids or minimizes, to the greatest extent, the

volumes of dredged material within the already-stressed Estuary. Only low levels of disposal activity would occur at the SF-DODS, similar to Preliminary

Table 5.3-7. Preliminary Alternative F: Emphasize UWR (Low In-Bay, Low Ocean, High UWR)

<i>Conditions</i>	<i>In-Bay Disposal</i>	<i>Ocean Disposal</i>	<i>Upland/Wetland Reuse</i>
Material Distributions Disposal Volume Limit Annual Average Use Total 50-yr Volume (SUAD) Total 50-yr Volume (NUAD)	see note 1 0.2 - 0.9 mcy/yr 11.9 - 47.5 mcy NA	6 mcy/yr ² 0.2 - 0.9 mcy 11.9 - 47.5 mcy NA	NA 3.1 - 3.8 mcy/yr 154.1 - 189.6 mcy 59 mcy
Policy-Level Mitigation Measures	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Protection • Site-Specific Review of CAD 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs 	<ul style="list-style-type: none"> • Material Suitability and Sediment Quality Testing • Site Management and Monitoring • Review of Dredging Needs • Habitat Conversion • Site-Specific Review of Rehandling and Confined Facilities, CAD, Wetland Restoration, and Levee Use
<i>Notes:</i> 1. Administrative volume limits on in-Bay disposal are one option for implementing any dredged material placement scenario. This and other options are discussed more fully in Chapter 7. 2. The volume limit for the ocean site will be finalized by EPA after completion of this EIS/EIR and will be based on the preferred alternative and the need to provide for flexibility (see Chapter 7 discussion on agency actions following the final EIS/EIR).			

impacts and risks associated with disposal of large

Alternative D. Conditions under Preliminary Alternative F are presented in Table 5.3-7.

