

SAN FRANCISCO BAY LONG-TERM MANAGEMENT STRATEGY PROGRAM 12-YEAR REVIEW

BACKGROUND INFORMATION FOR MARCH 29, 2012, MEETING



Prepared by

San Francisco Bay Conservation and Development Commission

San Francisco Bay Regional Water Quality Control Board

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

TABLE OF CONTENTS

1	INTRODUCTION	1
2	PROGRAM REVIEW BASED ON THE MANAGEMENT PLAN EVALUATION MEASURES.....	3
3	PROGRAM REVIEW BASED ON THE LTMS GOALS	8
3.1	Establish a Cooperative Permitting Process	8
3.1.1	Permit Coordination/Dredged Material Management Office.....	8
3.1.2	Programmatic Environmental Work Windows	9
3.1.3	Essential Fish Habitat	12
3.2	Manage Dredged Material Disposal in an Environmentally Sound Manner.....	13
3.2.1	Testing/Suitability	13
3.3	Maximize the Beneficial Reuse of Dredged Material.....	14
3.4	Maintain Navigation Channels in an Economically and Environmentally Sound Manner.....	17
3.4.1	Volumes and Costs	17
3.4.2	Implementation of Policy Improvements.....	17
4	NEXT STEPS	18

List of Tables

Table 1	LTMS Program Performance Using Quantitative Evaluation Measures.....	4
Table 2	LTMS Program Performance Using Qualitative Evaluation Measures Criteria	6
Table 3	Bay Habitat Restored through Beneficial Reuse of Dredged Material	15

List of Figures

Figure 1	Management Plan-Projected Beneficial Reuse and Upland Disposal Capacity.....	19
Figure 2	2010 Draft DMMP-Projected Ocean, Beneficial Reuse, and In-Bay Disposal Capacities*	20
Figure 3	Actual Beneficial Reuse by Category – 2000 to 2010.....	21
Figure 4	Transition Glide Path.....	22
Figure 5	In-Bay Disposal: Capacity and Transition Glide Path.....	23
Figure 6	Annual Dredging Volumes Since 1956	24

Figure 7 Maintenance Dredging Volumes by Navigation Sector – 2000 to 2010 25

Figure 8 USACE Dredging Volumes by Activity Type – 2000 to 2010 26

Figure 9 Dredging Volumes for Select Sectors – 2000 to 2010..... 27

Figure 10 San Francisco Dredging Industry Cost Trends – 2000 to 2012..... 28

Figure 11 Cost Per Cubic Yard by USACE Maintenance Dredging Project – 2000 to 2011 ... 29

Figure 12 Placement Site Cost Per Cubic Yard for USACE Maintenance Dredging Projects –
2000 to 2011 30

Figure 13 Comparison of Cost Per Cubic Yard for USACE Dredge Plant vs. Contract
Dredging – 2000 to 2011..... 31

1 INTRODUCTION

Development of the San Francisco Bay Long-Term Management Strategy (LTMS) program for dredged material began in 1990 to address issues regarding the mounding of dredged material at the Alcatraz disposal site (SF-11) and potential impacts from dredging and dredged material disposal on water quality, wildlife, and uses of the San Francisco Bay. The agencies involved in the creation of the LTMS included the San Francisco Bay Conservation and Development Commission (BCDC), State Water Resources Control Board (SWRCB), San Francisco Bay Regional Water Quality Control Board (RWQCB), the U.S. Army Corps of Engineers (USACE) San Francisco District, U.S. Environmental Protection Agency (USEPA), and State Lands Commission (SLC). The goals adopted in the LTMS program include:

- Maintaining navigation channels in an economically and environmentally sound manner
- Managing dredged material disposal and placement in an environmentally sound manner
- Maximizing the beneficial reuse of dredged material
- Establishing a cooperative permitting process for dredging and dredged material disposal and placement applications

Following several years of studies and substantial public coordination, the LTMS agencies issued the Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region Policy Environmental Impact Statement/Programmatic Environmental Impact Report (EIS/EIR) in 1998. The EIS/EIR evaluated alternative long-term dredged material management strategies for dredged material placement in the Bay, the ocean, and at beneficial reuse sites. The environmentally preferred alternative, and the one selected for implementation, was designed to maximize beneficial reuse and minimize in-Bay disposal, with placement at the new San Francisco Deep Ocean Disposal Site (SF-DODS) as a “safety valve” so that in-Bay disposal could steadily be reduced even while additional reuse site capacity was being developed.

Specific guidance for implementing the strategy selected in the LTMS EIS/EIR was presented in the LTMS Management Plan (Management Plan), issued by the LTMS agencies in 2001. The Management Plan established a 12-year transition period for achieving reduced in-Bay disposal volumes. The transition period, with voluntary compliance as long as in-Bay goals were met and allocations triggered only if goals were missed, provided time for reuse site planning and provided public assurance that in-Bay disposal would in fact decrease. It also formalized the Dredged Material Management Office (DMMO); provided detailed guidance for permitting projects involving dredging and dredged material placement in the Bay;

completing suitability determinations; managing and monitoring placement sites (including in-Bay, ocean, and beneficial reuse sites); managing the in-Bay placement goals; implementing environmental work windows; aligning beneficial reuse with regional habitat goals; and conducting reviews of the Management Plan itself. Certain aspects of the Management Plan became state and federal policy and regulation, such as the transition targets and in-Bay disposal volumes.

The Management Plan called for periodic review and/or modification to ensure that the program remains achievable and current in light of changing conditions over time. Specifically, the LTMS agencies were directed to complete basic reviews of the program, every three years, with input from interested parties. More comprehensive reviews were to occur every six years. A “Six Year Review Report” was issued in May 2006.

Since the beginning of 2013 will mark the end of the 12-year Transition Period, the LTMS agencies are beginning the 12-year review process now. It is anticipated that this process will involve the agencies collecting and disseminating basic data about the Program’s performance to date, and holding a series of meetings with stakeholders (each focused on a different key topic or topics) culminating with a summary report. This process and report will form a basis for discussing whether changes to the program may be desirable in the future.

The first meeting will be held on March 29, 2012. During that meeting, the LTMS agencies and interested parties will review the policies and implementation of the LTMS program over the past 12 years in order to create a common understanding on which more detailed discussions will be built. In preparation for the meeting, this document provides information on the progress of the LTMS’ agencies implementation of the Management Plan through consideration of the quantitative and qualitative success criteria included in Chapter 8 of the Management Plan. This document also provides summaries of current key LTMS program components that were not specifically envisioned at the time that the Management Plan was prepared.

2 PROGRAM REVIEW BASED ON THE MANAGEMENT PLAN EVALUATION MEASURES

Tables 1 and 2 provide preliminary assessments of the LTMS program using the quantitative and qualitative evaluation measures established in the Management Plan, respectively.

Table 1
LTMS Program Performance Using Quantitative Evaluation Measures

Evaluation Measure		Performance
1	Ten percent increase in funding for upland disposal annually	Governmental funding for upland disposal projects has not increased by 10 percent annually.
2	No lawsuits	No lawsuits have been filed regarding the LTMS program.
3	Acreage of Bay habitat restored using dredged material	Approximately 2,090 acres of Bay and wetland habitat have been restored using dredged material.
4	Increased number of approved alternatives to in-Bay disposal	There is an increase in the number of approved alternatives to in-Bay disposal. Figure 1 shows the beneficial reuse sites that the Management Plan anticipated would be used in the future, Figure 2 shows the draft Dredged Material Management Plan's (DMMP's) predictions for beneficial reuse in the future, and Figure 3 shows the beneficial reuse sites that have actually been used over the past 12 years.
5	Available in-Bay disposal capacity	Because of beneficial reuse and SF-DODS, sufficient in-Bay disposal capacity has consistently been available to meet the Bay's dredging needs. The Management Plan established a 12-year Transition Period (see Figure 4) that reduces in-Bay disposal by 387,500 cy every three years, until the final limit of 1.25 million cubic yards (mcy) annually is reached. As is shown in Figure 5 and the response to Measure 7, surplus capacity has remained each year at in-Bay placement sites even as in-Bay disposal limits have decreased. On occasion, the DMMO has redirected dredging projects to other in-Bay sites to maintain capacity at individual sites.
6	Document long-term trends and variability in dredging volumes	Dredging volumes in the San Francisco Bay since 1956 are shown in Figure 6. The Dredged Material Management Office (DMMO) prepares annual reports that track the annual trends and variability of dredging volumes. These reports are available at: http://www.spn.usace.army.mil/conops/annualreports.html . Figures 7, 8, and 9 provide a summary of the annual dredging volumes in the San Francisco Bay between 2000 and 2010.
7	Meet or beat transition glide path	As shown in Figures 4 and 5, the Transition Period's "glide path" for reducing in-Bay disposal has consistently been met, with volume to spare.
8	Depth of Alcatraz disposal site	The depth of the Alcatraz site has been consistently maintained between -35 and -60 feet mean lower low water (MLLW). As such, it is not a navigation hazard.
9	Footprint of Alcatraz and other sites	The footprint of the Alcatraz site, and the other in-Bay sites, has not changed. The mound has been actively managed by the DMMO to ensure that it has not increased in size.
10	Acreage of habitat created for threatened and endangered species	Approximately 2,090 acres of habitat for threatened and endangered species have been created. See the response to Measure 3.

Program Review Based on the Management Plan Evaluation Measures

Evaluation Measure		Performance
11	Number of sites for reuse of material that is not suitable for unconfined aquatic disposal to be reused	While four sites (Montezuma, Port of Oakland's Berth 10, Port of San Francisco Pier 92/94, and Richmond Levin Terminal) have accepted material that is not suitable for unconfined aquatic disposal, only one (Montezuma) is specifically for reuse.
12	Adequate funding for LTMS	From 2007 through 2010, the LTMS program has received sufficient funding to support the operations of the LTMS program and the DMMO, and to fund several studies on potential impacts from dredging on listed species. However, since 2010, there has been a marked and severe cut in LTMS funding from the federal government.
13	Increased number of rehandling facilities	The number of rehandling facilities has not increased. However, the Port of Oakland's Berth 10 and the Port of San Francisco's Pier 94 have accepted unsuitable material from other projects on occasion.
14	Reduced cost for upland disposal	This measure has been variable year to year and project-by-project and more detailed information is provided in Figures 10 through 13.
15	Maintain navigability and project depths	In almost all cases, the federal navigation channels have been maintained to full project depth. In some cases, certain areas have not been maintained to full project depth at each episode. These situations are primarily driven by federal funding shortfalls, not by restrictions imposed by the LTMS program.
16	Reduced impact of dredged material on native species	By completing dredging and dredged material placement within specified environmental work windows, the impacts of these activities on native aquatic and terrestrial species has been reduced.
17	Reduced navigational incidents or accidents (i.e., groundings)	Navigational incidents associated with groundings have been few. See the response to Measure 15.

Table 2
LTMS Program Performance Using Qualitative Evaluation Measures Criteria

Evaluation Measure		Performance
1	Do we have upland sites?	Yes, see Figure 3.
2	Is regional planning under way?	The LTMS agencies have been involved with the Subtidal Goals Project, the Programmatic Essential Fish Habitat (EFH) consultation with National Marine Fisheries Service (NMFS), programmatic Endangered Species Act (ESA) consultation with NMFS and U.S. Fish and Wildlife Service (USFWS), Regional Sediment Management (RSM), and the USACE DMMP planning, among other efforts.
3	Healthier Bay	The LTMS program has contributed to a healthier Bay by confirming the suitability of dredged material disposed in the Bay, reducing in-Bay disposal volumes (and thereby turbidity), facilitating beneficial reuse of dredged material for restoring Bay habitat, and reducing impacts to native aquatic and terrestrial species by adopting environmental work windows.
4	Predictability of testing (Regional Implementation Manual approved/adopted)	The DMMO has established clear and predictable testing requirements and procedures. When new information or new policies develop that affect these requirements and procedures (i.e., through the LTMS Programmatic EFH Consultation), the LTMS agencies have worked closely with the interested parties to ensure that the new information is conveyed timely and effectively. See Section 3.2.1
5	Documented participation of all stakeholders	Through ongoing work group and Management Committee meetings, interested parties are able to regularly participate in the LTMS program. However, representation from the resource agencies, fishers, and environmental groups has been relatively limited since adoption of the Management Plan.
6	Local governments aware of LTMS process and taking action in reviewing dredging and disposal projects in support of LTMS (CEQA)	Local governments do not commonly take action in reviewing dredging and dredged material placements in support of the LTMS. However, the LTMS agencies are reaching out to local governments through the RSM process.
7	Sustained regional economic contribution from maritime community	The LTMS program has not received sustained economic contributions directly from the maritime community; however, regional maritime-focused business groups have historically collaborated to ensure that federal funding for the LTMS program has been provided on an annual basis. In addition, most dredgers contribute to the Regional Monitoring Program (RMP), data from which is used directly by the LTMS program. See the response to Measure 11.
8	Process for dredging is “predictable”	As with the testing requirements and procedures, the DMMO has improved the permitting process for projects involving dredging and dredged material placement. Section 3.1.1 provides more information on the DMMO permitting process. The DMMO uses tools such as a consolidated permit application and regular bi-weekly meetings to ensure that the multi-agency permitting process is consistent and that any questions are communicated to all agencies involved.

Evaluation Measure		Performance
9	Reduce uncertainty as to adverse effects of disposal or reuse of dredged material	The LTMS has conducted studies to determine the potential effects of dredged material placement, both in water (i.e., turbidity studies) and in wetlands (i.e., methylmercury studies). These studies, as well as additional studies conducted by other entities, have reduced uncertainty associated with the potential effects of dredged material placement; however, ongoing research will continue to provide a better understanding of both direct and indirect effects of these activities on water quality and aquatic and terrestrial species.
10	Consensus on nomenclature for suitability of dredged material	There is now interagency consensus on the nomenclature used regarding the suitability of dredged material.
11	In-Bay monitoring efforts of LTMS and RMP linked	The RMP and the LTMS coordinate efforts in several ways including special studies, data availability, Total Maximum Daily Load (TMDL) limits, and bioaccumulation trigger calculations for EFH.

3 PROGRAM REVIEW BASED ON THE LTMS GOALS

While the goals of the program remain consistent with those in the Management Plan, evaluation of the program as it operates today using only the established measures does not allow for a thorough evaluation of certain key program aspects. As such, this section provides a brief assessment of key aspects of the LTMS program undertaken to accomplish the program's goals but not specifically envisioned in the development of the Management Plan's evaluation measures.

3.1 Establish a Cooperative Permitting Process

3.1.1 Permit Coordination/Dredged Material Management Office

Origin

Prior to the LTMS program, applicants had to separately submit and coordinate permit applications to between 3 and 5 authorizing agencies. When applicants made changes to the project or conditions were added by an individual agency, the result was separate authorizations for slightly different projects. These inconsistencies often required permit modifications to bring the permits in line with one another, causing additional delays and expense. Agencies also issued permits for different durations and with different expiration dates, and in some cases, permits expired before all other permits were granted.

Impacts Addressed

Impacts addressed include: complicated coordination between agencies and applicants; inconsistent project descriptions and permit conditions; and delays in permit issuance and thereby dredging.

Benefits

The creation of the DMMO included a consolidated application for dredging projects to be submitted to LTMS agencies; regular public meetings offer applicants the opportunity to discuss their project with all LTMS agencies; improved permit processing time and consistency; and improved certainty in the permitting process.

Detriments

No joint permit is issued by responsible agencies.

Additional LTMS Efforts

Ten-year permits are available from BCDC, USACE and the State Lands Commission. The Regional Water Quality Control Board can issue a 5-year water quality certification. In addition, the LTMS agencies developed a programmatic alternative disposal site analysis for

small projects, and allow larger projects or those with multiple facilities to prepare an integrated alternative disposal site analysis that increases flexibility in meeting the LTMS goals.

3.1.2 Programmatic Environmental Work Windows

Origin

After completion of the LTMS EIS/EIR, USACE and USEPA with the support of the RWQCB and BCDC requested programmatic consultations for all maintenance dredging projects covered by the LTMS program (including the federal channels, Bay Area ports, refineries and other berthing facilities, marinas, and homeowners with individual docks). The consultations resulted in biological opinions (BO) from NMFS and USFWS, with concurrence from California Department of Fish and Game (DFG). Together, the BOs resulted in environmental work windows that avoided dredging and dredged sediment disposal at locations and times where listed species and species of special concern could be present.

Threatened or Endangered Species: Chinook and Coho salmon, steelhead trout, delta smelt, least tern, clapper rail, salt marsh harvest mouse (not addressed: longfin smelt and green sturgeon)

Species of Special Concern: Pacific herring and Dungeness crab

Impacts Addressed

Environmental work windows minimize impacts to listed species and species of special concern by reducing dredging and disposal activities when species are present. The potential impacts from dredging and disposal on listed and species of special concern include: increased turbidity, burial, entrainment, habitat destruction, loss of forage area, and avoidance. While the same potential impacts may occur for green sturgeon and longfin smelt, work windows are not practical as these species are present in the Bay all year.

Status

The USFWS BO was updated in 2004 to ease restrictions in the South Bay due to loss of the least tern colony at Redwood City and include a work window for the deep water berths located between the Carquinez Strait and Suisun Bay. The LTMS agencies requested an amendment to the NMFS BO in 2006 to include the recently listed green sturgeon and consider the new information provided through tracking listed salmonids. NMFS has not yet completed the amendment.

DFG listed longfin smelt in 2009. No work windows exist for longfin smelt as they are present in the Bay year round. DFG requires an incidental take permit for take of listed species; however, mechanical dredging is generally considered to not take longfin smelt. As NMFS and USFWS complete new or amended BOs, DFG can review the amendments and determine whether concurrence is appropriate or a separate take authorization, including mitigation, is necessary.

Benefits

Benefits include: planning advantage in knowing when dredging can occur; reduced paper work for the applicant and agencies through programmatic BOs; time savings in permitting process; and improved protection for endangered and threatened species.

Detriments

Detriments include: limited time for dredging to occur; difficulty for construction companies to have full-time year-round work; competition for equipment; time extensions are often needed to complete projects; and additional costs are likely due to compressed timeframes to complete work.

Additional LTMS Efforts

LTMS agencies and stakeholders met several times per year between 2002 and 2010 to help projects more successfully dredge within the work windows. This education and planning effort continues. Additional efforts were made to examine technological advances or operational changes that might reduce impacts sufficiently to programmatically extend the work windows in some areas. This effort produced a set of best management practices (BMPs) for medium to large dredging contractors, but largely did not identify improvements that would ease dredging and disposal restrictions.

The most extensive effort in both time and funding was spent on increasing scientific knowledge regarding either species' presence and behavior or impacts from dredging. An LTMS Environmental Work Window Science Framework was developed that identified agency concerns and potential studies that may be able to address those concerns. The LTMS program went on to undertake a number of studies (listed below), including both literature reviews and laboratory and field studies. For example, a study of the effects of increased turbidity on herring eggs and larvae confirmed that impacts do occur, primarily to egg adhesion and development. The salmon tracking studies identified residence times and migration pathways out of the Bay. The science work group also hosted a number of symposia to facilitate collaborative communication among stakeholders and scientists.

The LTMS program was well funded by Congress for approximately four years, largely due to stakeholders' efforts to secure funding. However, in 2011 and 2012, funding has been nearly eliminated; therefore, the study program has been put on hold.

Completed Studies and Literature Reviews

1. Framework for Assessing Dredging Effects
2. Spatial Characterization of Suspended Sediment Plumes at Oakland Outer Harbor
3. Assessment of Resuspension by Vessel Traffic at Redwood City Harbor
4. Characterization of Plumes Associated with Knockdowns at Richmond Long Wharf
5. Bibliography of Herring Literature
6. Herring Literature Review
7. State of Knowledge of Dredging Impacts on Herring
8. Herring Study I - Impacts on Larvae
9. Herring Study II - Impacts on Juveniles
10. Least Tern Literature Review
11. Tools for Assessing Fish Behavior Literature Review
12. Effects of Water Quality Impacts Literature Review

Draft Studies and Literature Reviews

13. Juvenile Salmonid Outmigration: Interim Draft Report 2008 – 2009
14. Juvenile Salmonid Outmigration & Green Sturgeon: Distribution Draft Annual Report 2009
15. Juvenile Salmonid Outmigration & Green Sturgeon: Distribution Draft Annual Report 2010
16. Juvenile Salmonid Outmigration & Green Sturgeon: Distribution Draft Annual Report 2011
17. Framework Update
18. Effects of Resuspended Sediments Literature Review
19. Fish Behavior During Dredging - Literature Review
20. Longfin Smelt Literature Review
21. Fish Behavior During Dredging

Completed literature reviews and studies and some drafts can be found on the LTMS website at: http://www.spn.usace.army.mil/ltms/ltms_studies_symposia.html.

3.1.3 Essential Fish Habitat

Origin

The 1996 Magnuson Stevens Fishery Conservation and Management Act was signed into law to protect the habitat on which NMFS' managed species depend. EFH includes those waters and substrates necessary for spawning, breeding, feeding, or growth. All of San Francisco Bay is essential fish habitat for the three NMFS managed fisheries: pelagic; groundfish; and salmonids. The LTMS EIS/EIR was completed prior to EFH issues being addressed by NMFS and therefore, each project required individual consultation upon permitting. NMFS and the LTMS agencies began a programmatic consultation process to address EFH in 2009.

Status

In June 2011, programmatic EFH conservation measures for projects managed under the LTMS program were agreed to by USACE, USEPA and NMFS. The agreement provided further protection for eelgrass; additional testing requirements for specific chemical analytes; and required further study of impacts of dredging on benthic invertebrates and subaquatic vegetation. Since implementing the EFH agreement, a technical modification has been made that limits the need for additional mercury testing.

Impacts Addressed

Impacts addressed include: indirect effects from turbidity and direct removal on eelgrass, disposal of contaminants – specifically mercury, polycyclic aromatic hydrocarbons, PCBs, DDTs, chlordane, dieldrin, dioxins/furans; residual (post-dredging) contamination; subtidal habitat disturbance; loss of forage; invasive species; and submerged aquatic vegetation.

Benefits

The programmatic EFH recommendations cover all maintenance dredging projects managed under the LTMS program, resulting in: less permit processing time for the USACE, NMFS and permittees; establishment of BMPs which reduce frequency of disturbance; certainty in minimization and mitigation measures for projects with proximity to eelgrass; and better reporting.

Detriments

Additional testing requirements (including residuals and bioaccumulation testing) may increase cost and time for some projects, and inclusion of silt curtains and/or light monitoring for projects adjacent to eelgrass beds increases costs.

3.2 Manage Dredged Material Disposal in an Environmentally Sound Manner

3.2.1 Testing/Suitability

Origin

Prior to the LTMS program, there was considerable public distrust that the Bay was being appropriately protected from the aquatic disposal of contaminated sediments. During the development of the Management Plan, the USEPA and USACE issued national sediment testing guidance in the form of the 1998 National Inland Testing Manual (ITM) for inland waters, including coastal estuaries. The LTMS agencies used this national guidance to replace the antiquated sediment testing program by increasing chemical and biological testing, including development of a disposal reference site and creation of the Alcatraz disposal site reference database.

Under the Management Plan

Once the Management Plan was adopted, the DMMO developed and provided public notices and guidance (Implementation of the ITM for the Bay Region, Tier One Exclusions from Testing and Sampling and Analysis Plan preparation, and beneficial reuse guidance). This new program was in compliance with the ITM, improved testing quality and predictability, and created environmental protection credibility. Further, an Ocean Testing Manual for SF-DODS and Bay Area database was established. Overall, the program reduced sampling and testing requirements and increased environmental protectiveness.

Post-Management Plan Testing Advances

Work through the DMMO has further improved environmental protection and helped to reduce testing costs. Greater environmental protection has been achieved by reviewing test results for in-Bay, ocean disposal, and beneficial reuse of sediment in a systematic way; establishing that the program is a net “remover” of contaminated sediments through upland disposal; integrating the TMDL in the testing program; requiring bioaccumulation testing where appropriate; and developing a post-oil spill rapid assessment method. The program has reduced costs overall by increasing the use of Tier I waivers where appropriate over multi-year testing schedules; increasing predictability in the testing program; and utilizing the RMP expertise in developing appropriate comparators and reducing delays to dredging projects overall by having a succinct and efficient program. Further, the DMMO agencies have participated in other efforts regarding dredged sediment and have clarified that new TMDLs impose no “allocation” for dredging, since the LTMS is a net remover of contaminants (exemption would likely not exist in absence of LTMS program) and that California sediment quality objectives do not directly apply to dredged material discharges.

Emerging Testing Issues

Ongoing research, new TMDLs, or new national sediment testing guidelines could lead to:

- More routine evaluation for additional contaminant classes such as pyrethroids, PBDEs, or dioxins/furans
- Different testing thresholds for contaminants routinely monitored today, such as PAHs and other bioaccumulative compounds
- Different bioassays (such as chronic toxicity) or different test species
- New sediment reference sites for the Bay

3.3 Maximize the Beneficial Reuse of Dredged Material

Dredged material has been beneficially reused in a number of ways around the Bay, including wetland creation and restoration, levee maintenance, construction fill, sand, and landfill daily cover. Figure 3 shows how approximately 19 million cy of dredged material from the Bay has been beneficially reused under the LTMS program. Table 3 shows the acreage of habitat restoration projects in the Bay that have been completed through beneficially reusing dredged material.

Table 3
Bay Habitat Restored through Beneficial Reuse of Dredged Material

Project	Acres of Habitat Restored	Acreage of Habitat Restored for Threatened and Endangered Species	Project Status
Port of Oakland, Middle Harbor Enhancement Area	180 acres of subtidal habitat including eelgrass beds	180 acres of restored habitat including 161 acres shallow water and eelgrass beds, 5 acres of salt marsh, and 0.5 acres of avian high tide refugia (green sturgeon, longfin smelt, salmonids, least tern)	Dredging/placement complete; regrading and eelgrass planting incomplete
Inner Bair Island, Area D	33 acres of tidal wetlands	33 acres of tidal wetlands (habitat for salt marsh harvest mouse and California clapper rail)	Incomplete; currently inactive
Hamilton Wetland Restoration Site	962.4 acres of tidal and seasonal wetlands, and transitional uplands	360 acres of tidal wetlands (habitat for California clapper rail and salt marsh harvest mouse, longfin smelt, salmonids)	Dredging/placement complete; levee breach scheduled for 2013
Montezuma Wetland Restoration Site Phase I	561 acres – Phase 1	A total of 1,820 acres planned for Phases 1-4: 332 acres low tidal marsh; 198 acres high tidal marsh; 32 acres intertidal channels; 28 acres seasonal wetlands; 6.6 acres intertidal ponds; 29 acres Clank Hollow; and 19 acres refugial and nesting island for birds for a total of 644.6 acres, plus 220 acres of upland transition and buffer zone habitat for least tern, snowy plover, longfin smelt, Delta smelt, green sturgeon and salmonids	Incomplete; accepted 3 mcy 2003 to 2006 and 600,000 cy in 2012
Sonoma Baylands	322 acres of tidal wetlands	322 acres tidal wetlands (habitat for California clapper rail, salt marsh harvest mouse, longfin smelt, salmonids)	Complete
Chevron Remediation Site at Castro Cove	18.5 acres of subtidal wetlands and 1.5 acres of salt marsh	18.5 acres of restored subtidal habitat (green sturgeon and steelhead); 1.5 acres of restored salt marsh (habitat for salt marsh harvest mouse, California black rail, California clapper rail)	Incomplete
Yosemite Slough	7 acres of tidal wetlands	California clapper rail, salt marsh harvest mouse, and longfin smelt	Dredging and placement in Phase I complete, Phase II will include an additional 5 acres of tidal wetland
Port of Richmond Shipyard 3	1 acre intertidal and shallow bayland	Least tern foraging; salmon, steelhead and longfin smelt habitat	Complete

Project	Acres of Habitat Restored	Acreage of Habitat Restored for Threatened and Endangered Species	Project Status
Stege Marsh	3 acres of salt marsh		Complete
Peyton Slough	14.6 acres of tidal wetland		Complete

3.4 Maintain Navigation Channels in an Economically and Environmentally Sound Manner

3.4.1 Volumes and Costs

Overview

This category of analysis is perhaps the most challenging to characterize and the LTMS agencies recognize that additional information would be helpful to fully understand the actual costs to the dredging and reuse community. Figures 10 through 13 provide information on the cost of dredging/placement of federal operations and maintenance (O&M) projects. Information in the figures was derived from USACE official contract documents, which identify volume dredged, unit prices, and total payments made to contractor. USACE dredge plant costs (hopper dredges Essayons and Yaquina) are derived from reports provided by the dredge plant and actual cost transfer records. All deepening costs have been removed from the data.

Figure Information

- Figure 10 shows costs for fuel, Davis-Bacon wage rates, and navigation construction index, on an annualized basis with year 2000 as the baseline.
- Figure 11 provides a graphical representation of yearly maintenance dredging costs per cy specific to each federal channel beginning in 2000; large drops do not indicate a sharp decrease in cost but are rather a function of the availability of funding for the particular project; and a key point to remember is that USACE has not had adequate funding to fully execute its program, particularly in the past three years.
- Figure 12 provides a graphical representation of yearly costs per cy by placement location for USACE maintenance dredging projects, beginning in 2000; if more than one project placed at the same site in a given year, all were combined to produce a single data point for that year; and actual costs represent available funding, not necessarily a decrease in the cost of doing the work.
- Figure 13 provides a comparison of costs for USACE maintenance dredging projects, between contract dredging and the USACE dredge plant, and all contract dredging placed at a specific site in the same year is combined into a single data point.

3.4.2 Implementation of Policy Improvements

Pre-Management Plan

- Without the LTMS and DMMO, there were uncoordinated regulatory requirements, longer timeframes, and higher expenses.

- The sediment testing program was antiquated and there was public distrust that the Bay was being protected.
- There were both public objections and few alternatives to in-Bay disposal of dredged sediment.
- The project approval process was unpredictable. For example, it took 20 years to approve the Port of Oakland -42 feet MLLW deepening project, as compared to 3 years to approve the Port of Oakland -50 feet MLLW deepening project.

Policy Advances

As the LTMS agencies have gained experience working with the dredging community and beneficial reuse sites, additional policy advancements have been made, including (others are mentioned in the text above):

- Multi-year permitting with environmental review intact
- Multi-year sediment testing schedules
- Authorization of in-place knock-downs in permits (monitoring required for projects above 5,000 cy)
- Permitting of advance maintenance dredging where need is demonstrated

Emerging Policy Issues

- Equipment: entrainment of longfin and delta smelt by hydraulic dredges
- Water quality: dredging scow water overflow
- Recent ESA listings: green sturgeon and longfin smelt
- Contracting improvements for beneficial reuse: 2011 Value Engineering Study (some are already in implementation)
- Long-term planning: sea level rise; reduced Bay sediment supply; Subtidal Habitat Goals integration/coordination; and identification of new beneficial reuse approaches

4 NEXT STEPS

This document was prepared as background information for the March 29, 2012, meeting with the LTMS agencies and interested parties that focuses solely on the LTMS Management Plan 12-year review process. As stated in Section 1, it is anticipated that the 12-year review process will involve a series of meetings with LTMS agencies and interested parties, and a summary report that documents the LTMS' performance and information gathered throughout the year-long process. Depending on the input received at this meeting, modifications to the currently-envisioned process for carrying out the review may be made. When the 12-year review process is complete, the LTMS agencies will consider whether there may be a need to revise elements of the Management Plan.

Figure 1
Management Plan-Projected Beneficial Reuse and Upland Disposal Capacity

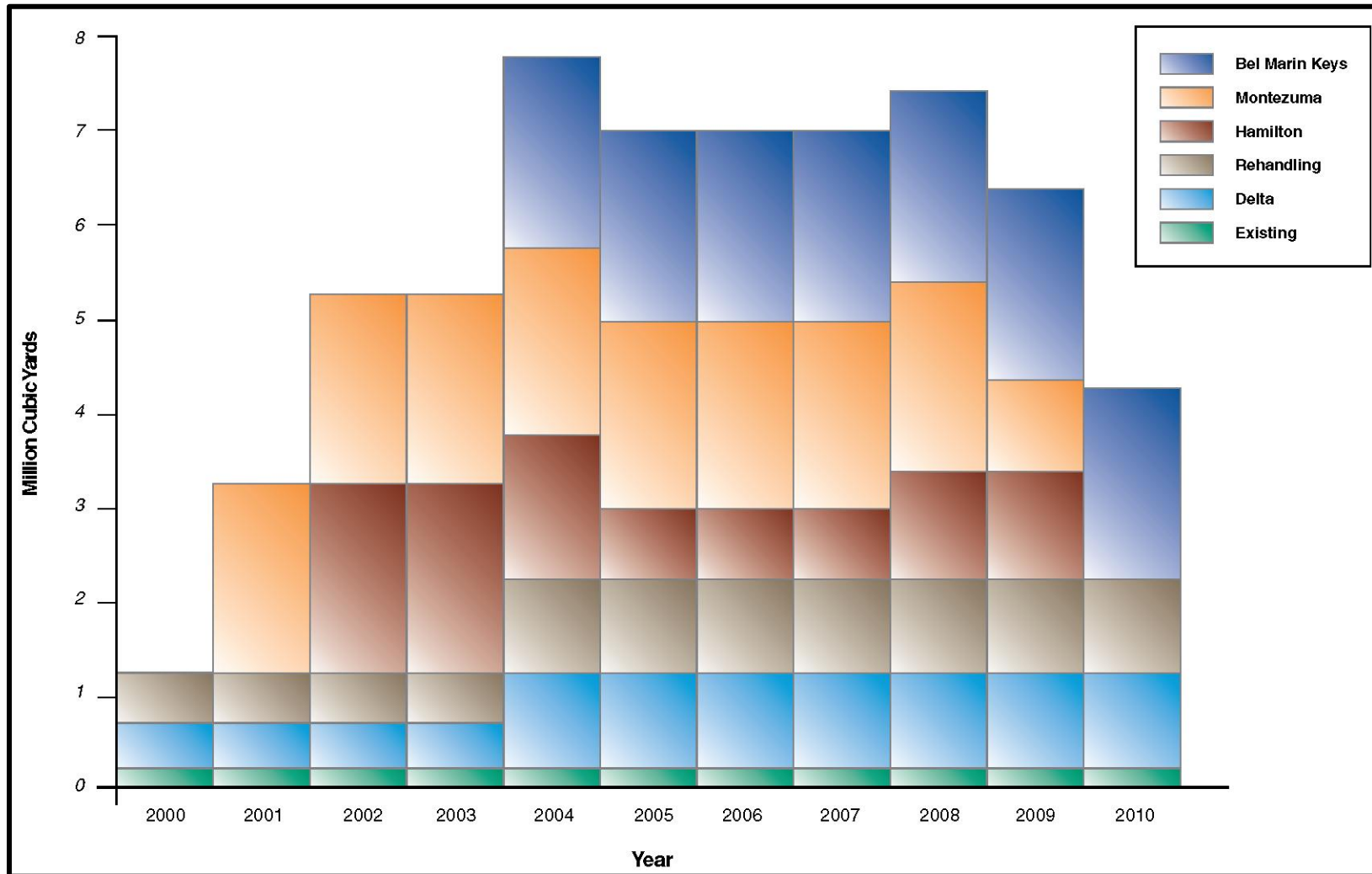
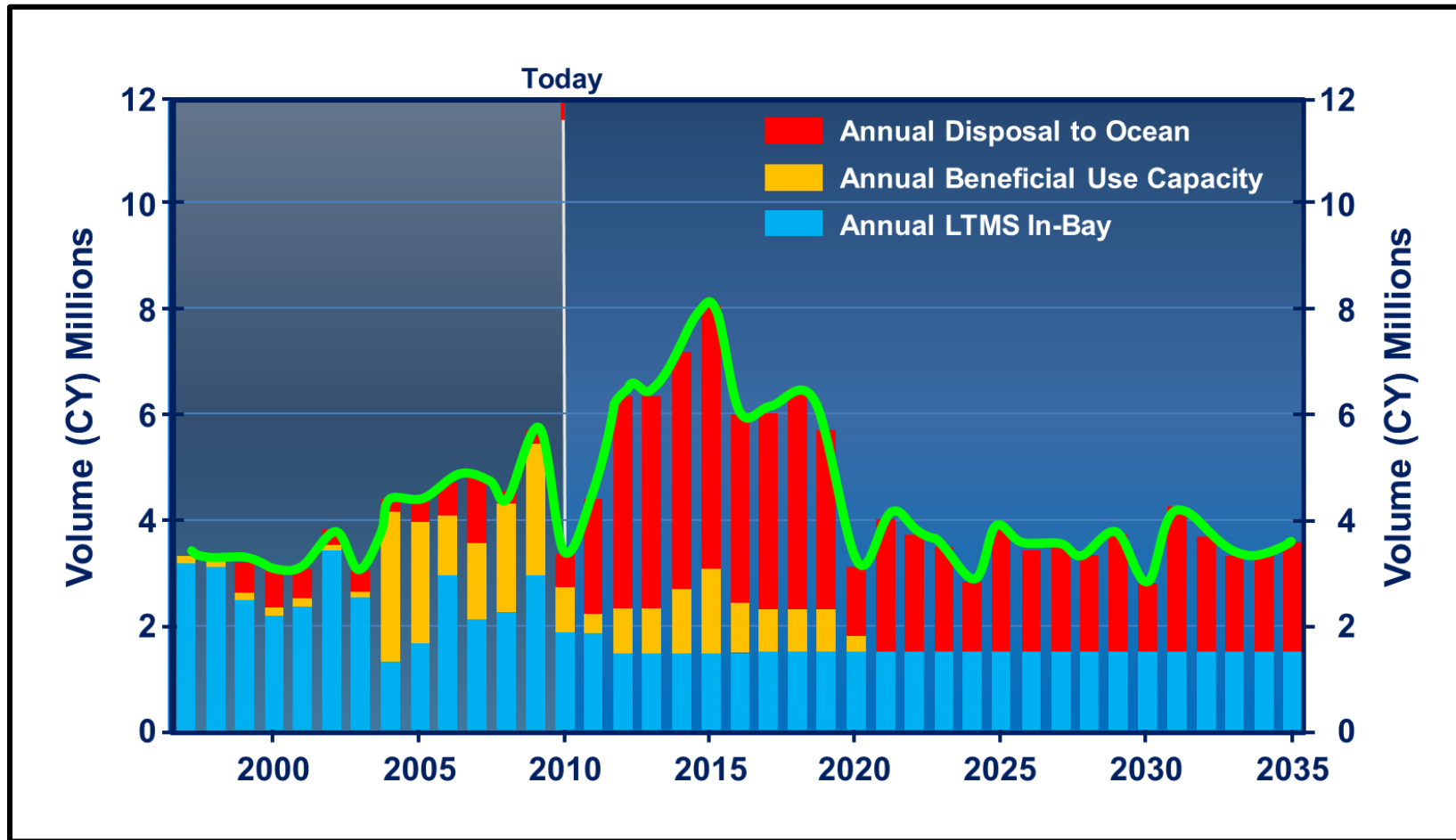


Figure 2
2010 Draft DMMP-Projected Ocean, Beneficial Reuse, and In-Bay Disposal Capacities*



* Including different assumptions about new-work projects, reuse sites, etc.

Figure 3
Actual Beneficial Reuse by Category – 2000 to 2010

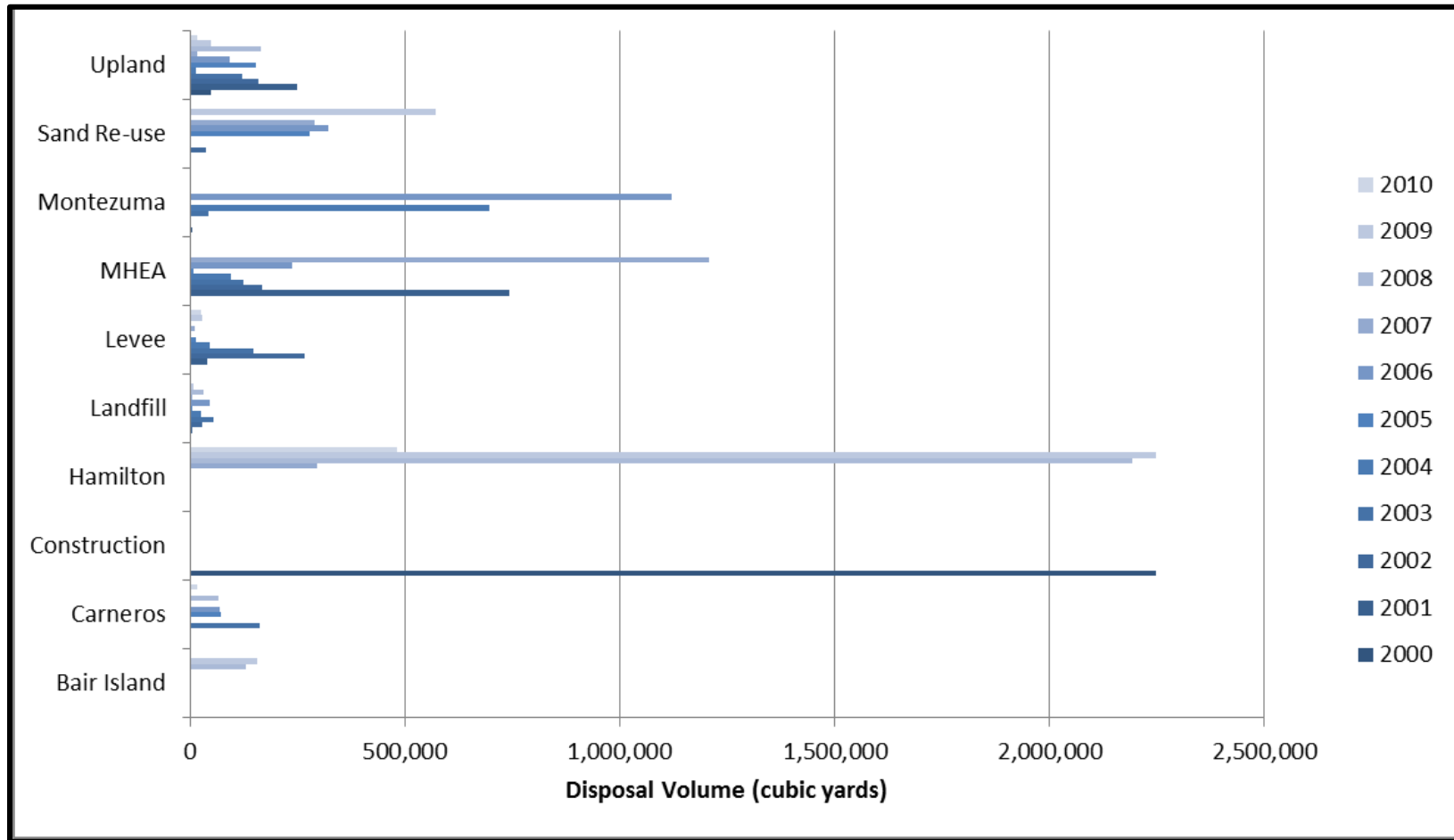


Figure 4
Transition Glide Path

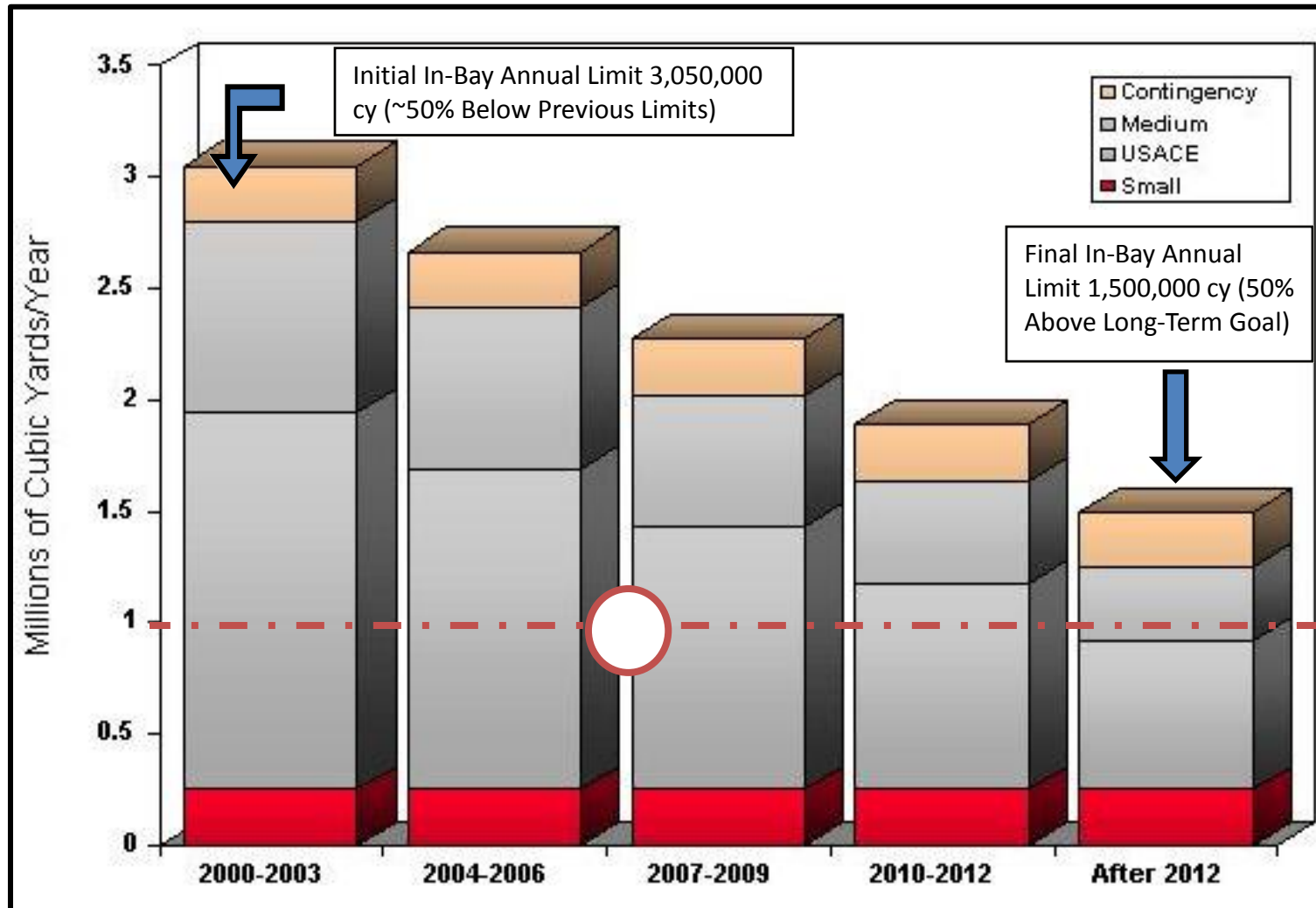


Figure 5
In-Bay Disposal: Capacity and Transition Glide Path

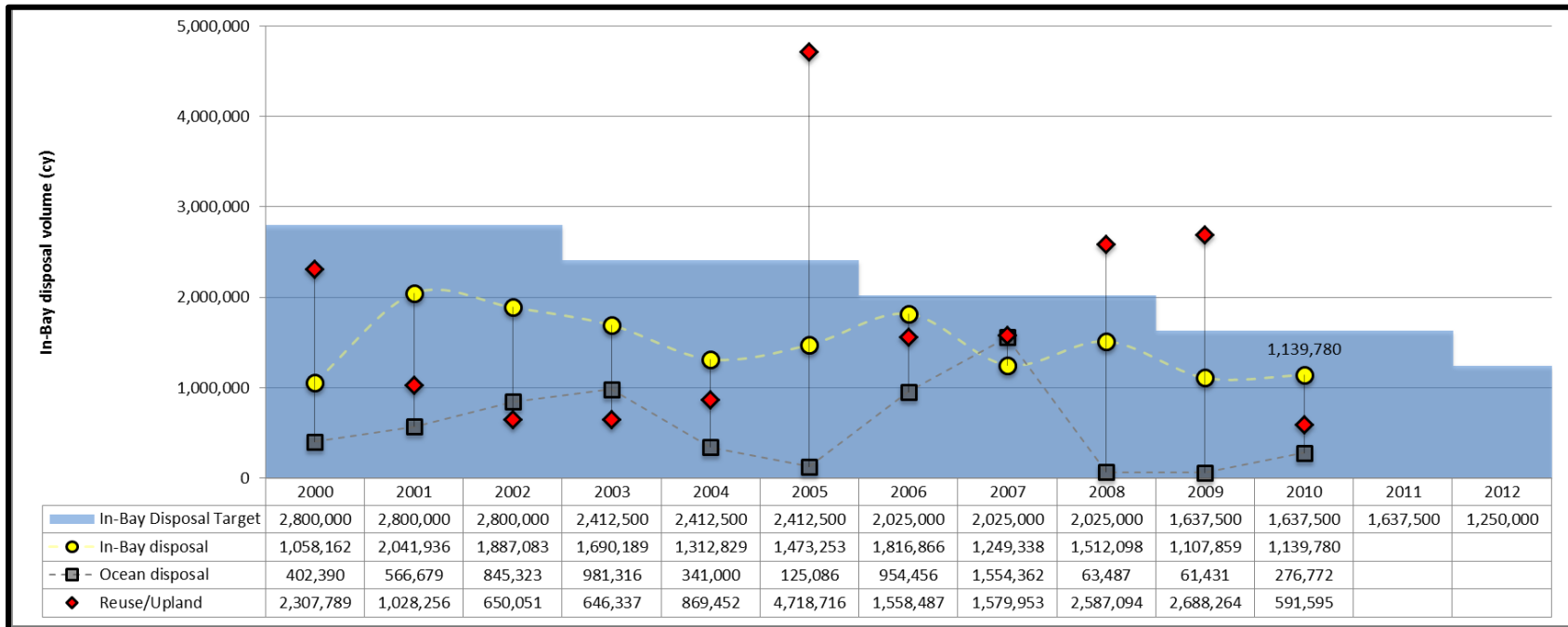


Figure 6
Annual Dredging Volumes Since 1956

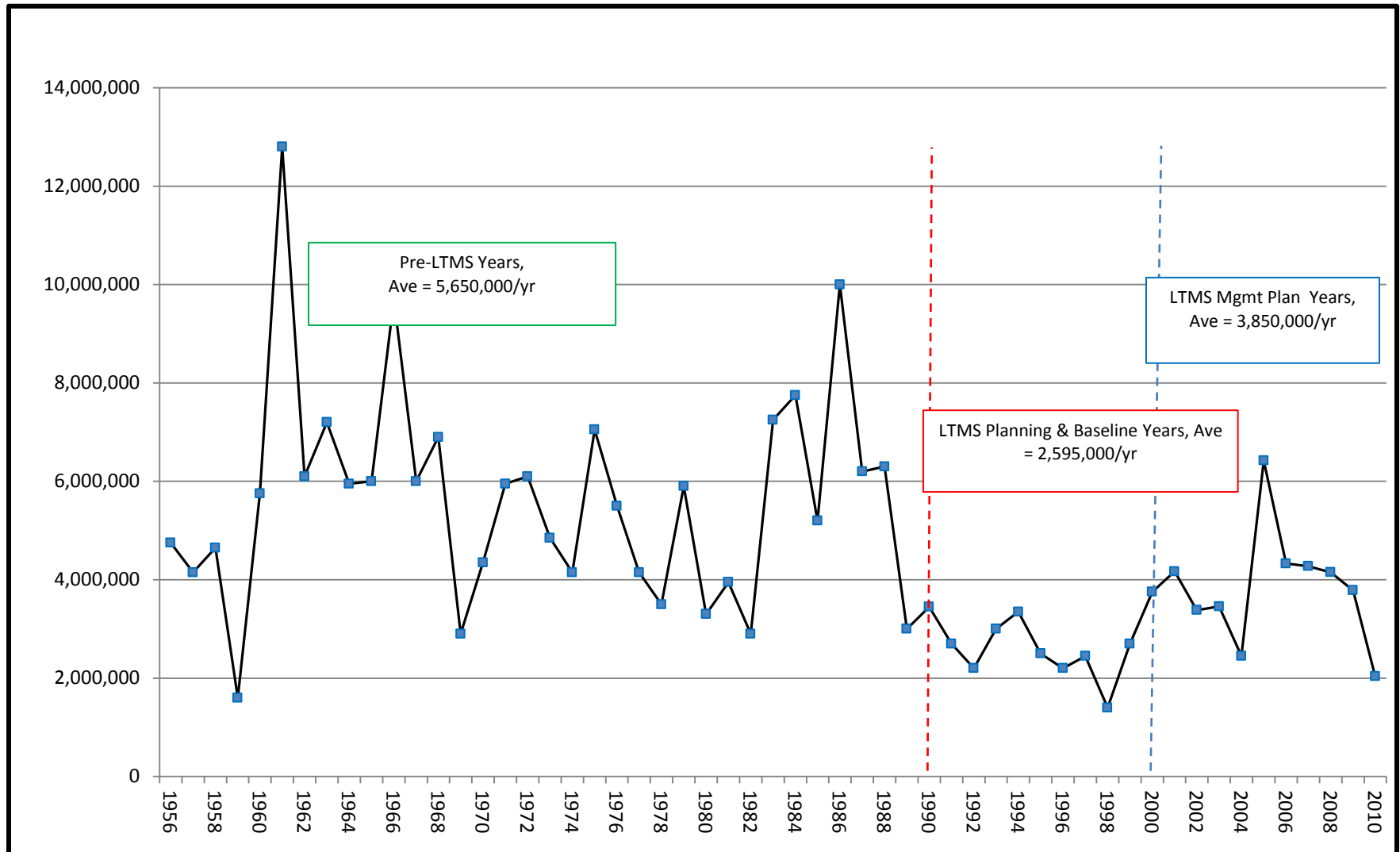


Figure 7
Maintenance Dredging Volumes by Navigation Sector – 2000 to 2010

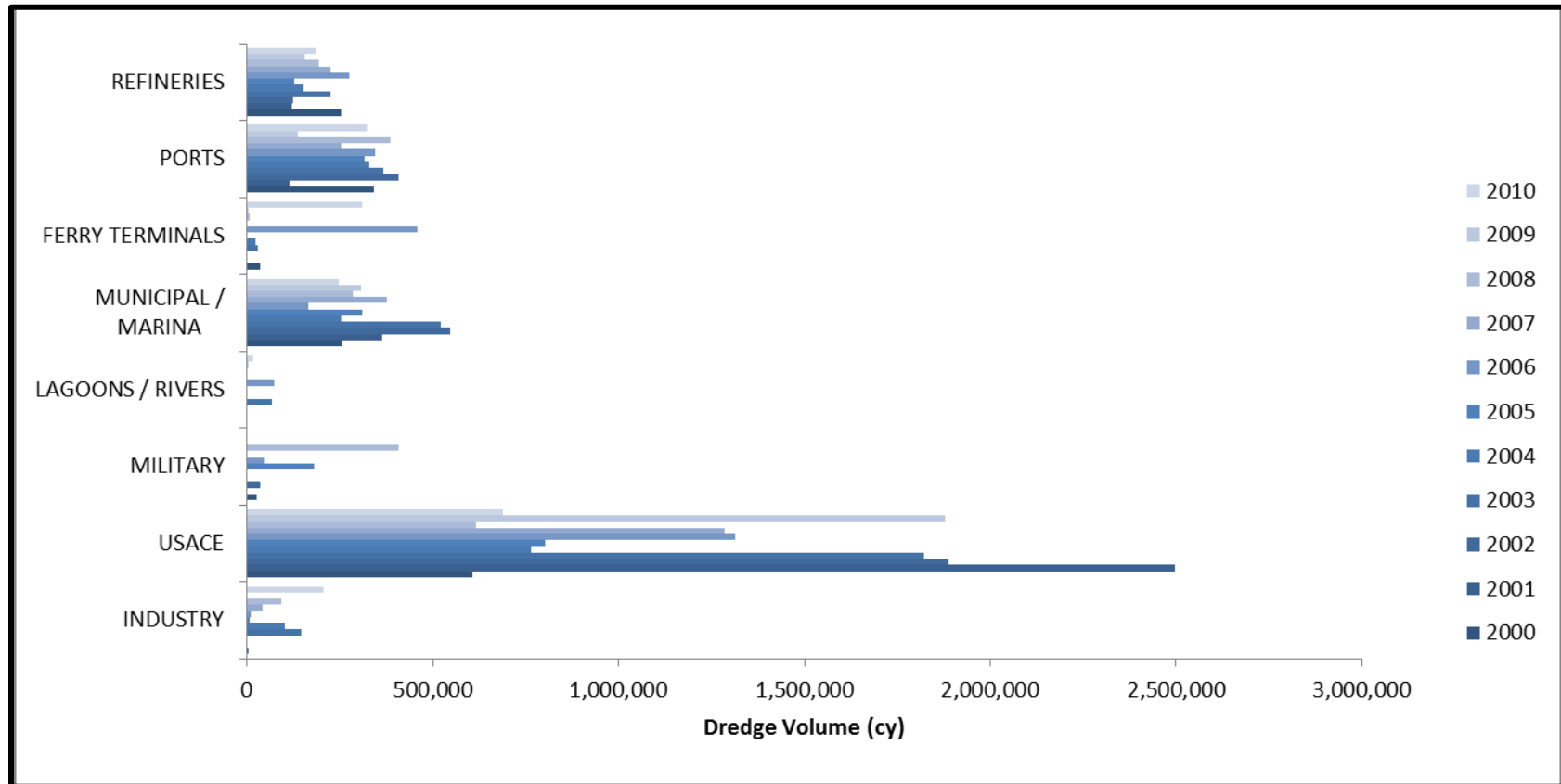


Figure 8
USACE Dredging Volumes by Activity Type – 2000 to 2010

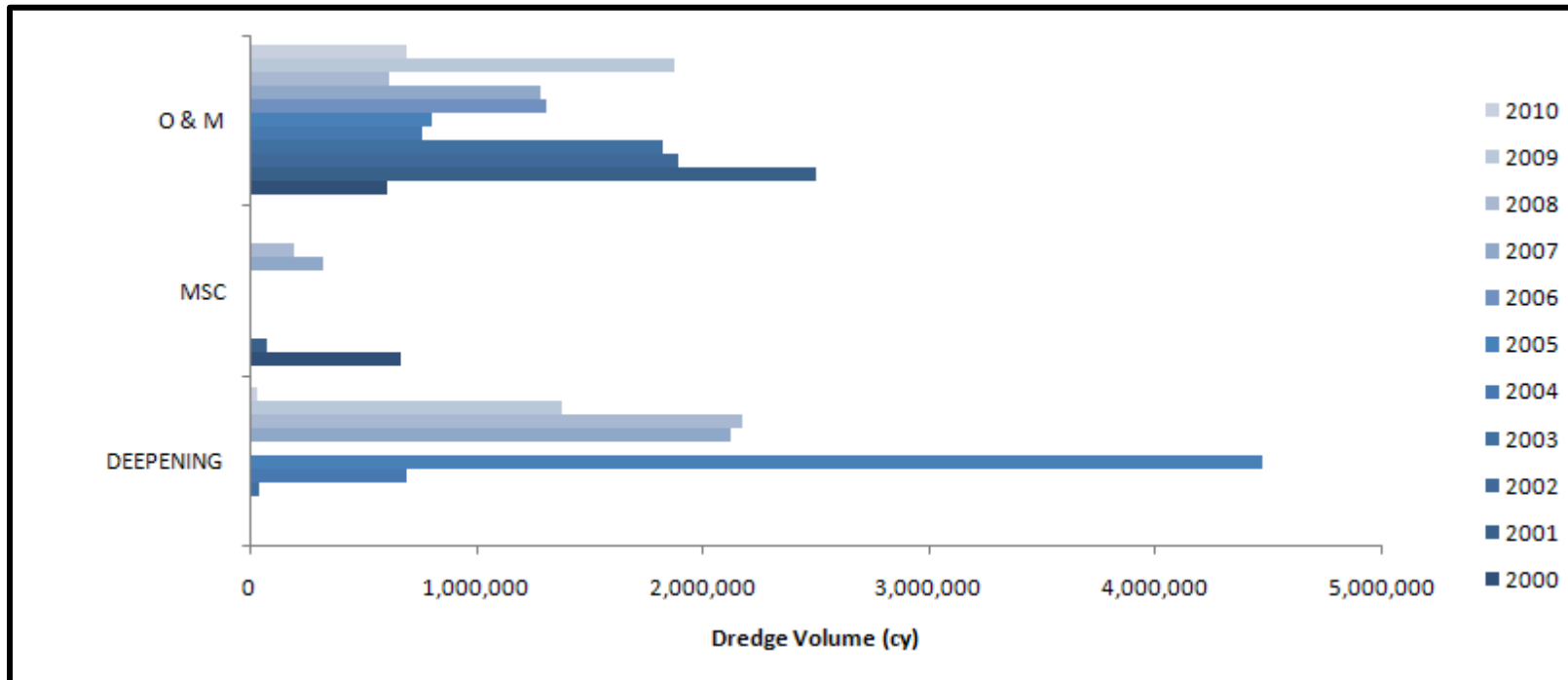


Figure 9
Dredging Volumes for Select Sectors – 2000 to 2010

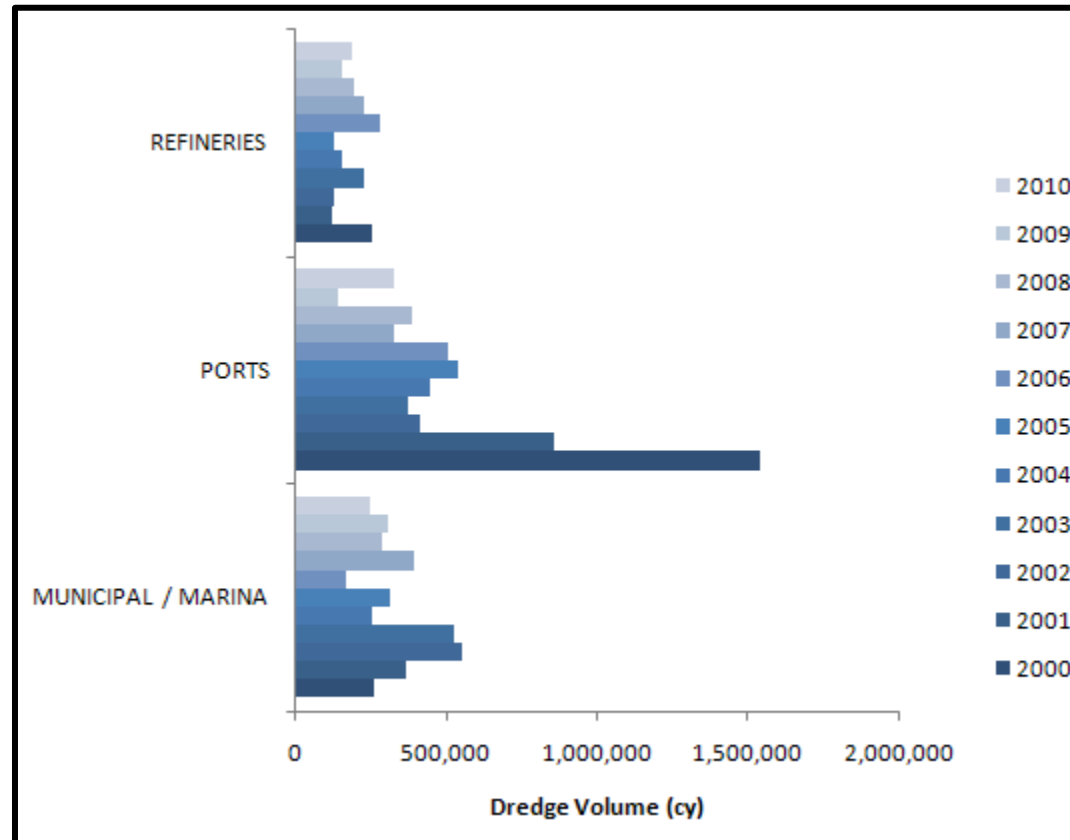


Figure 10
San Francisco Dredging Industry Cost Trends – 2000 to 2012

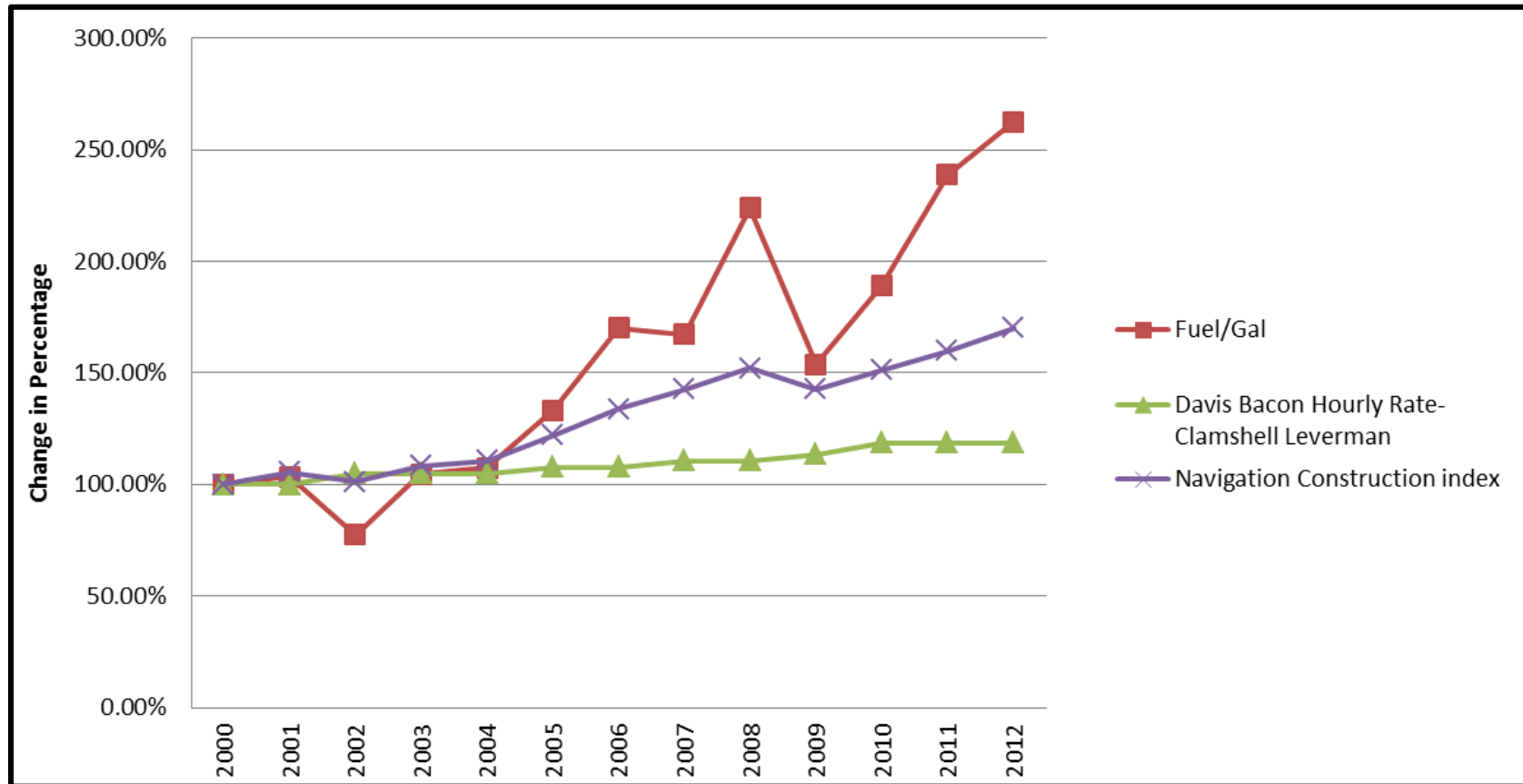


Figure 11
Cost Per Cubic Yard by USACE Maintenance Dredging Project – 2000 to 2011

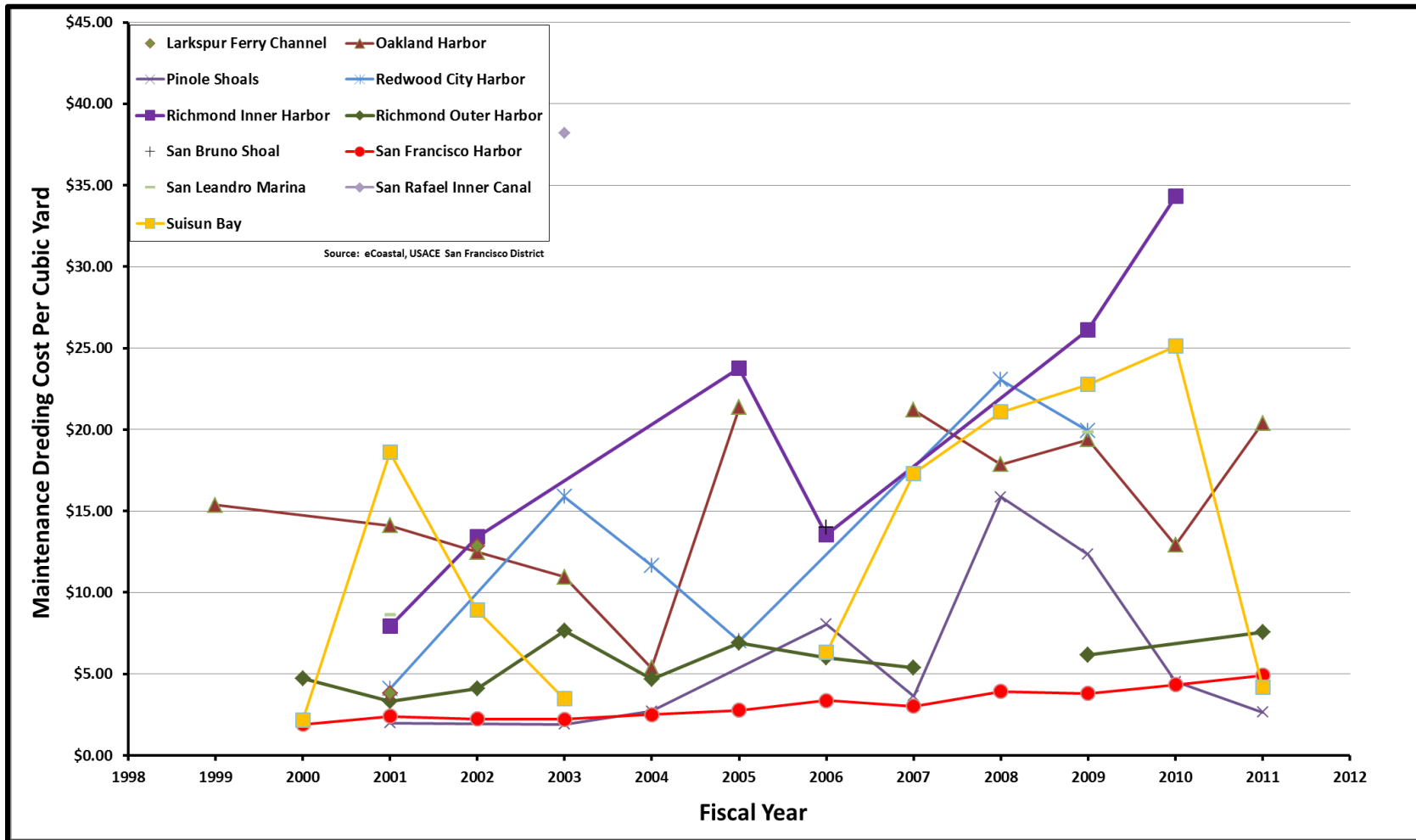


Figure 12
Placement Site Cost Per Cubic Yard for USACE Maintenance Dredging Projects – 2000 to 2011

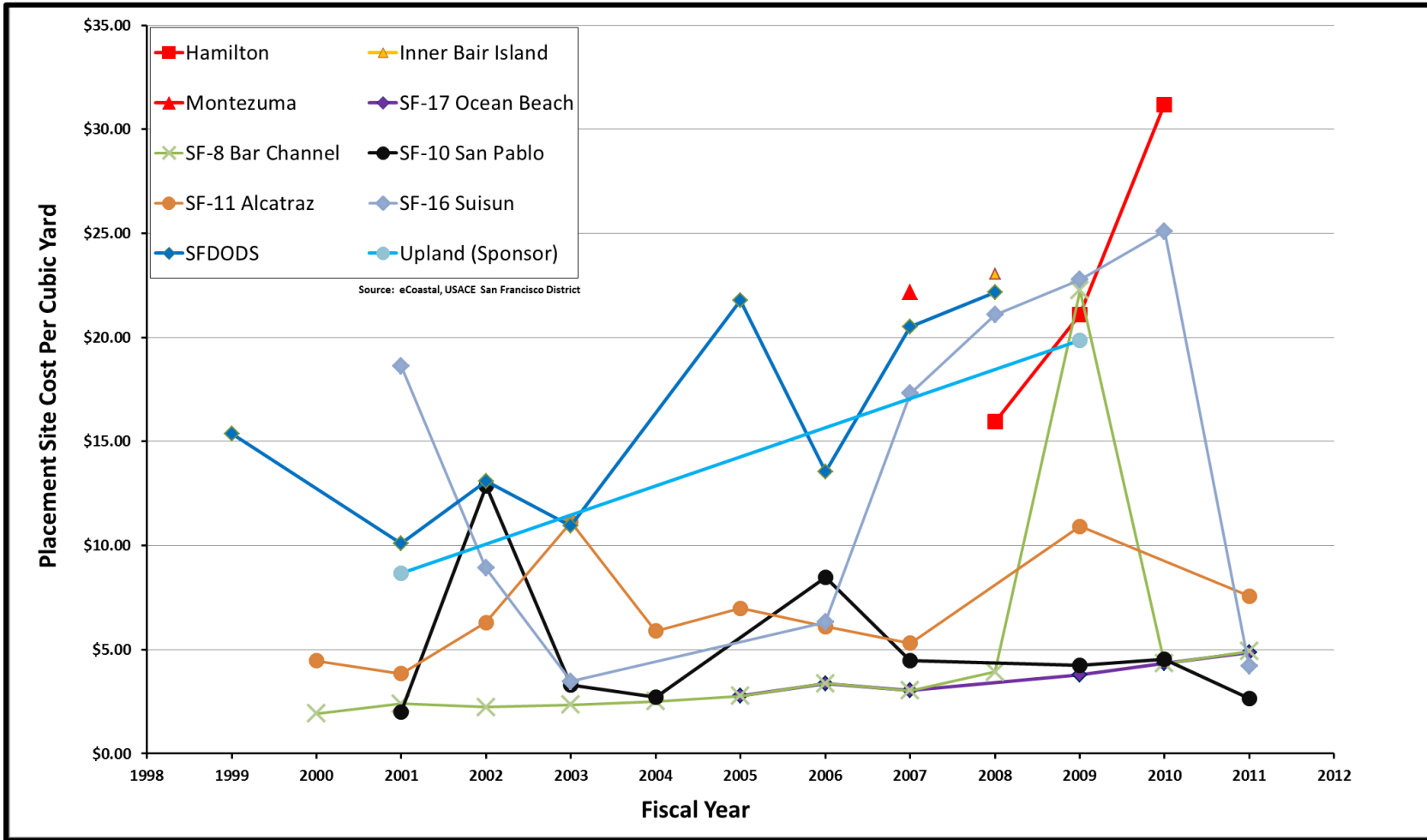


Figure 13
Comparison of Cost Per Cubic Yard for USACE Dredge Plant vs. Contract Dredging – 2000 to 2011

