APPENDIX C
COSTS AND CONTRACTING MEETING MATERIALS PACKAGE

LONG-TERM MANAGEMENT STRATEGY FOR THE PLACEMENT OF DREDGED MATERIAL IN THE SAN FRANCISCO BAY REGION

12-YEAR REVIEW PROCESS

BACKGROUND INFORMATION FOR SEPTEMBER 11, 2012, MEETING

FOCUS: COSTS AND CONTRACTING

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

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1 INTRODUCTION

The Management Plan for the Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) program called for periodic review and/or modification to ensure that the program remains achievable and current in light of changing conditions over time (USACE et al. 2001). Specifically, the LTMS agencies were directed to complete basic reviews of the program every 3 years with input from interested parties. More comprehensive reviews occur every 6 years. A Six Year Review Report was issued in May 2006.

Because the beginning of 2013 will mark the end of the twelfth year and the end of the LTMS transition period, the LTMS agencies began the review process by initially reviewing existing data, developing the first background report, and organizing discussions held at a meeting on March 29, 2012. The process involves the LTMS agencies collecting, analyzing, and disseminating data about the program's performance to date and holding a series of meetings with stakeholders (each meeting focused on a different key topic suggested by stakeholders) culminating with a summary report. This process, the summary report, analysis, and recommendations will form a basis for discussing potential changes to program implementation.

During the March 29th meeting, the LTMS agencies and interested parties reviewed the policies and implementation of the LTMS program throughout the past 12 years. The program was reviewed in relation to evaluation criteria established in Chapter 8 of the Management Plan as well as in relation to the LTMS goals, which include:

- Maintain, in an economically and environmentally sound manner, those channels necessary for navigation in San Francisco Bay and Estuary and eliminate unnecessary dredging activities in the Bay and Estuary
- Conduct dredged material disposal in the most environmentally sound manner
- Maximize the use of dredged material as a resource
- Establish a cooperative permitting framework for dredging and dredged material disposal applications

At the March 29th meeting, stakeholders identified the following three topics for future meetings:

1. Beneficial reuse (meeting held on June 19, 2012)
2. Costs and contracting (September 11, 2012)
3. Policy and strategy development (date is to be determined)

This document presents information specific to the third LTMS stakeholder meeting and focuses on costs and contracting of dredging projects. Additional information requests from the March 29th meeting will be forthcoming in either topic-related, pre-meeting background documents; as presentation material; or as part of the summary report. The information provided herein is intended to address specific questions on cost and contracting, provide background information for the upcoming meeting, and stimulate thoughtful and productive discussions.

2 CONTRACTING ISSUES

At the March 29th meeting, LTMS stakeholders provided input on potential alternative contracting concepts, including:

- Consider contract acquisition strategies recommended in the U.S. Army Corps of Engineers' (USACE's) Value Engineering (VE) study (2011)
- Make better use of the dredging contracting community (e.g., Dredging Contractors of America and American Association of Port Authorities) to improve understanding of contracting techniques
- Foster coordination among groups of dredgers or dredging proponents regarding equipment and contracting
- Optimize federal funds across the year, not just by projects
- Strive to improve timing certainties; uncertainty leads to higher bids
- Reenergize the Confounding Factors Work Group

Contracting and costs associated with dredging and dredged material placement options have often been a topic of discussion at LTMS meetings. The LTMS agencies recognize that contracting dredging projects is a complicated process and dredging and dredged material placement is an expensive endeavor. The LTMS agencies also recognize that out-of-Bay disposal at either the San Francisco Deep Ocean Disposal Site (SF-DODS) or at beneficial reuse sites, including wetland and beach habitat restoration projects, construction sites, and levees, is more expensive than in-Bay disposal. In fact, the transition period was designed and included in the LTMS program to allow the community to plan and make appropriate budgetary decisions for voluntary compliance with the program.

The LTMS agencies do not have the ability to directly influence contracting practices or dredging costs for permittees; however, through discussions with the dredging and stakeholder community, the LTMS agencies have become aware of potential contracting efficiencies that may be broadly applicable. In 2011, the USACE held a VE study to examine opportunities for improving contracting efficiencies within its program. The executive summary of the VE Study is included as Appendix A to this document.

While the study was specifically conducted on the USACE San Francisco District's Navigation Program, the LTMS agencies found that many of the issues identified by the VE study reflected common issues faced by both public and private dredging proponents. Accordingly, these recommendations could be applied to any dredging project in San Francisco Bay to improve its efficiency and cost-effectiveness. The LTMS agencies encourage dredging proponents to review the VE study for ideas that may be appropriate to their project(s). Measures that may benefit the larger dredging community from the contracting perspective include:

- Use an array of disposal sites in contracts rather than a single-source disposal site (IC-4)
- Dredge more volume, less frequently (EE-1; i.e., dredge the whole project in one episode versus multiple small episodes)
- Develop multi-year contracts (ICP-14)
- Consolidate projects into one large contract (IC-13)
- Use a separate beneficial reuse contract (IC-12)
- Have permits in hand prior to contracting and include them in the solicitation package
- Begin dredging as soon as the environmental work window opens
- Use knockdowns or advanced maintenance dredging where appropriate

While some of these concepts may require modification to be applied to non-USACE dredging projects, the spirit of the VE study recommendations can still be useful. Proponents wishing to apply these recommendations should review their permits and dredging contracts, and direct any questions related to proposed changes in operations or implementation to the relevant permitting agencies.

3 COST ISSUES

This section presents additional dredging and beneficial reuse project cost information, much of which was requested at the March 29th meeting. Information provided includes dredging costs in the San Francisco Bay compared to other regions of the country, additional San Francisco Bay operations and maintenance (O&M) dredging cost information, and case studies for the Hamilton Wetland Restoration Project (HWRP), Middle Harbor Enhancement Area (MHEA), and several non-USACE dredging projects in the San Francisco Bay Area.

3.1 Variability in Regional USACE Dredging Project Costs

Regional dredging cost data were obtained from the USACE Dredging Information System (DIS) located on its Navigation Data Center website (http://www.ndc.iwr.usace.army.mil).

The website is accessible to the public; however, USACE staff have special permissions to run additional data queries enabling it to obtain more specific information.

Figure 1 provides a comparison of the overall annual cost of USACE-contracted dredging projects by region and fiscal year (all projects combined for each region, each year, independent of type of equipment used). Data for San Francisco Bay are for O&M dredging projects only; however, because of how data are presented in the DIS, new work and maintenance dredging data reported by other regions are indistinguishable. While this comparison shows overall San Francisco Bay Area costs per cubic yard (cy) as generally higher than other regions, a number of important variables may influence these costs differently from region to region, including:

- The relative proportion of mechanical versus hydraulic dredging projects conducted
- The relative proportion of dredged material suitable for aquatic disposal versus needing special handling
- The kind of placement or reuse sites used
- The distance to placement or reuse sites used
- The contracting environment (in terms of competition and equipment availability)

Figure 2 provides a similar annual cost comparison for government hopper dredges only. Again, data for the San Francisco Bay Area are for O&M dredging only, while data presented from the rest of the nation are presumed to include all types of dredging work. Nevertheless, costs for government hopper dredging in the San Francisco Bay Area seem to be well within the range for other regions of the country.

3.2 Additional San Francisco Bay Operations and Maintenance Dredging Cost Information

Figures 3 and 4 provide information on San Francisco Bay USACE O&M dredging costs from 2000 to 2011, including and excluding mobilization and demobilization costs, respectively. It should be noted that mobilization and demobilization costs were not readily available for all projects in all years.

Figures 5 and 6 provide the costs for USACE O&M dredging projects to use San Francisco Bay dredged material placement sites from 2000 to 2011, including and excluding mobilization and demobilization costs, respectively.

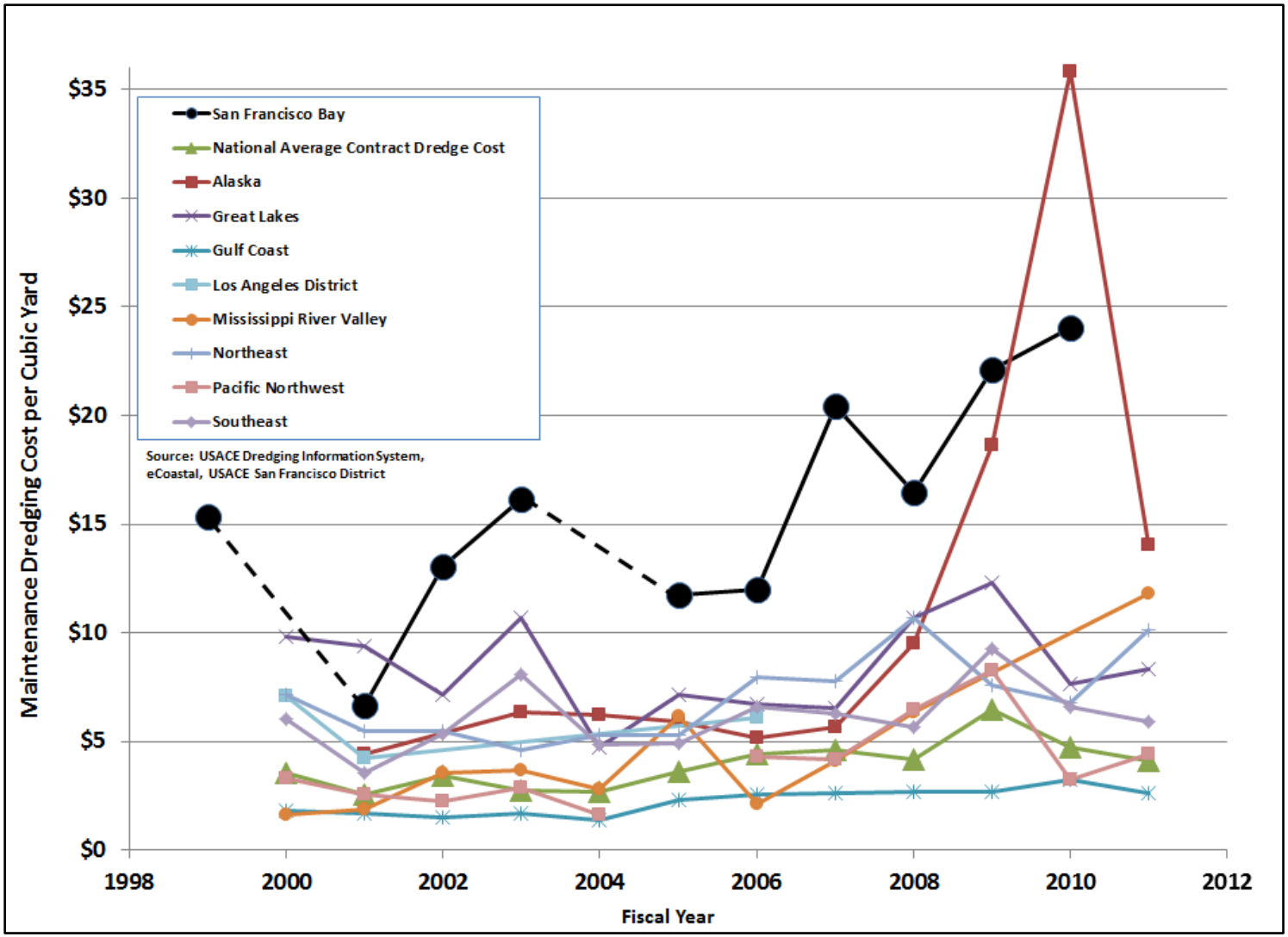

Figure 1. USACE-Contract Dredging Costs: San Francisco Bay* vs. Other Regions

* O&M dredging projects only.

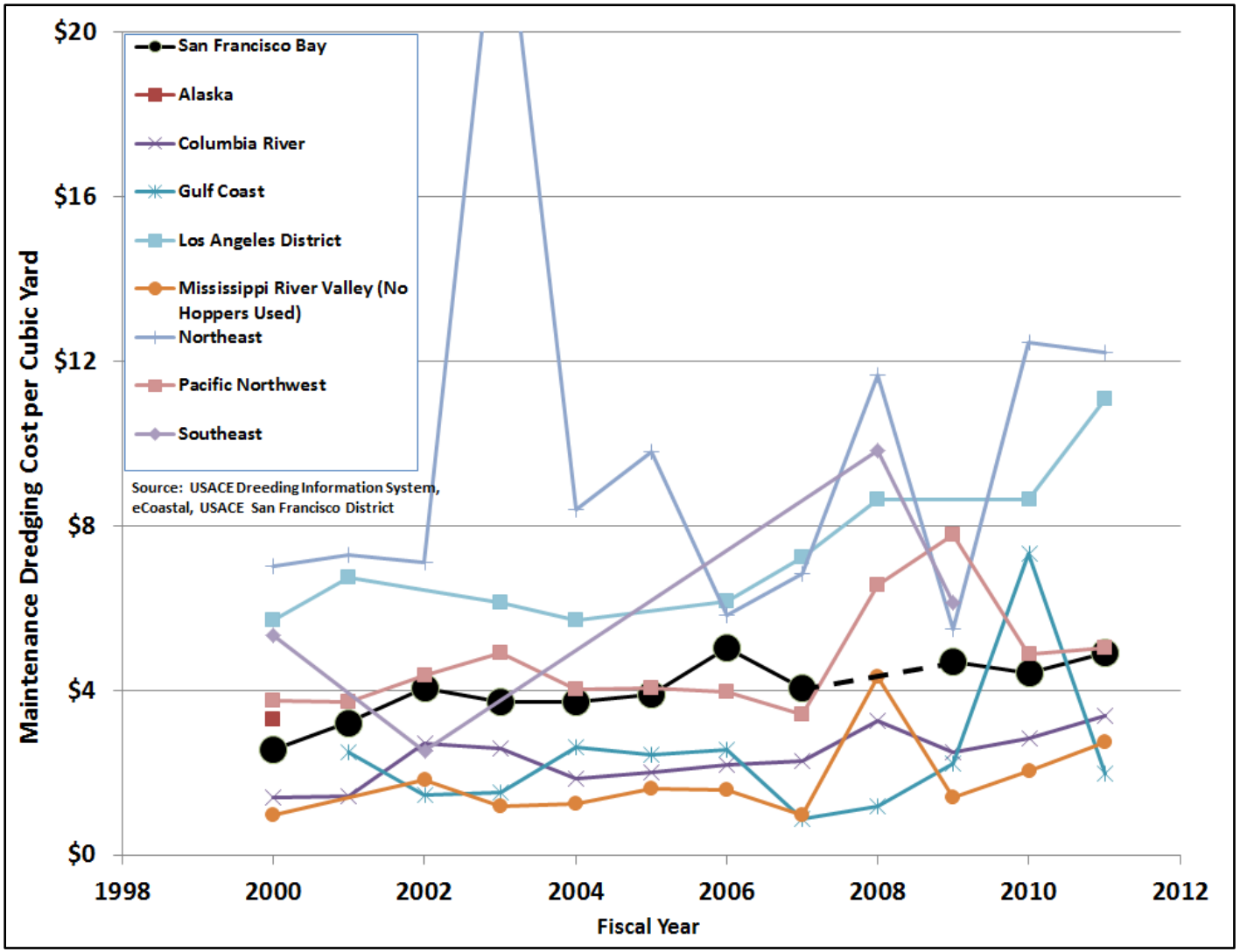

Figure 2. Government Hopper Dredging Costs: San Francisco Bay* vs. Other Regions

* O&M dredging projects only.

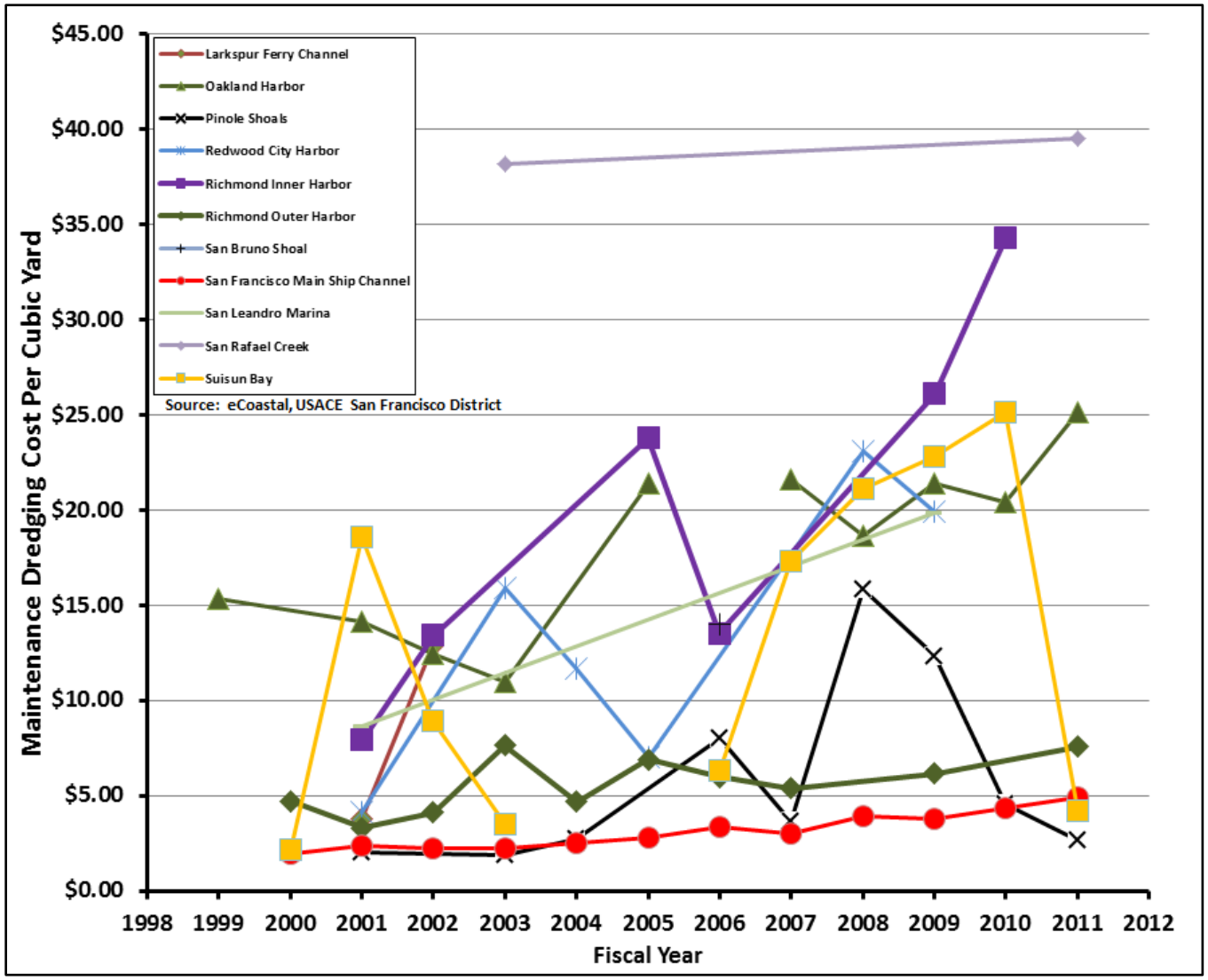

Figure 3. San Francisco Bay USACE Maintenance Dredging Costs from 2000 to 2011 (Including Mobilization and Demobilization)

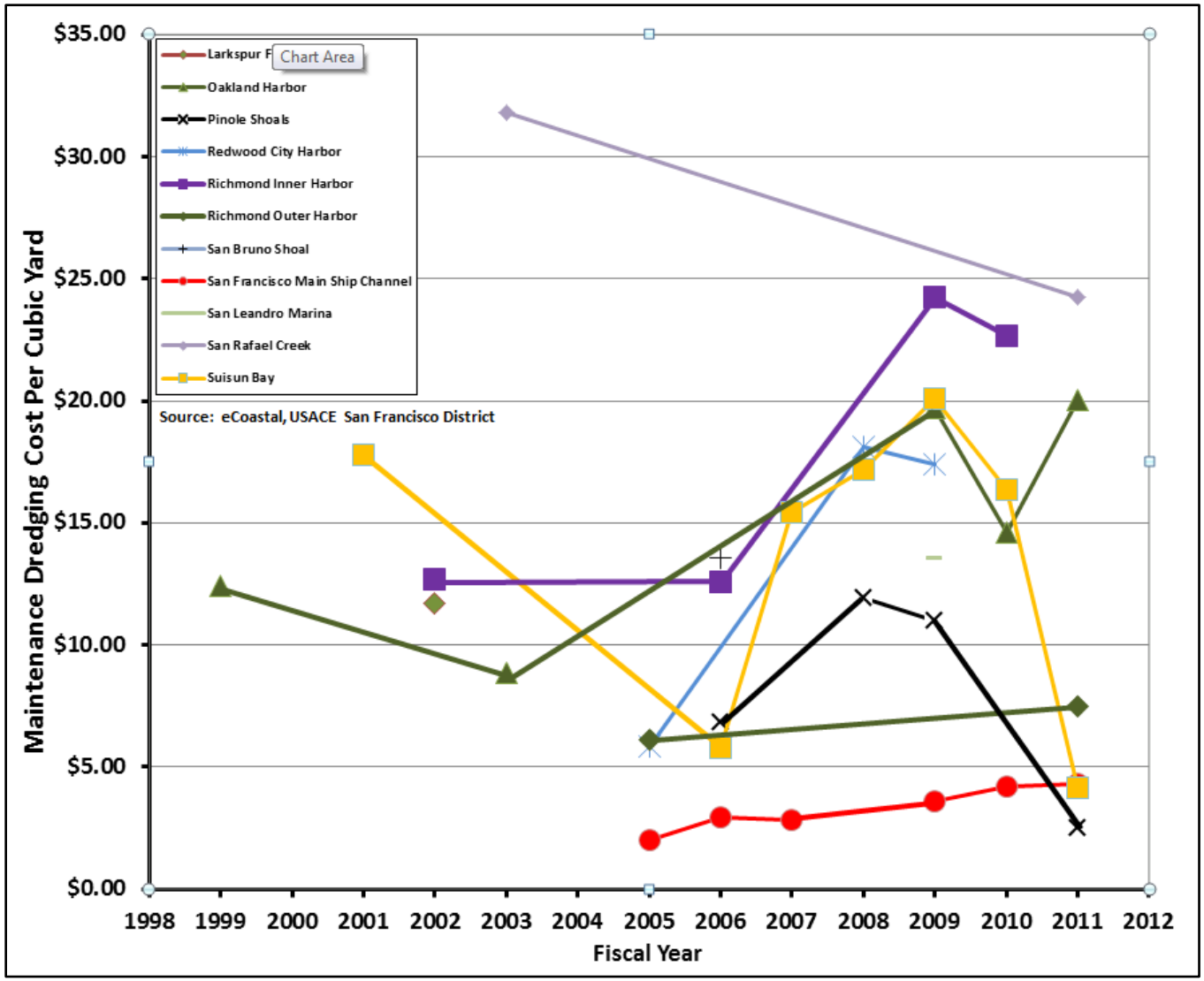

Figure 4. San Francisco Bay USACE Maintenance Dredging Costs from 2000 to 2011 (Excluding Mobilization and Demobilization)

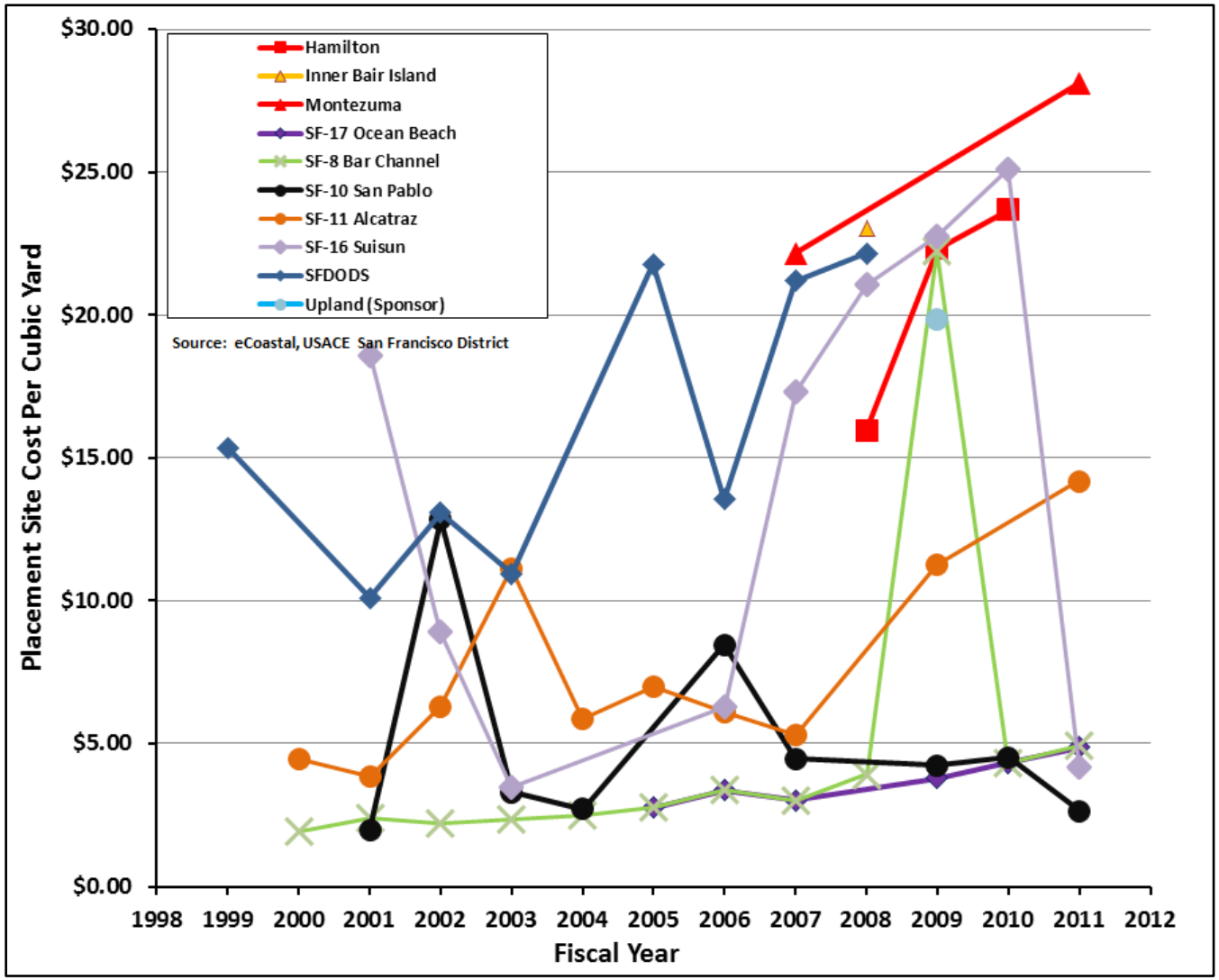

Figure 5. San Francisco Bay Dredged Material Placement Site Costs from 2000 to 2011 (Including Mobilization and Demobilization)

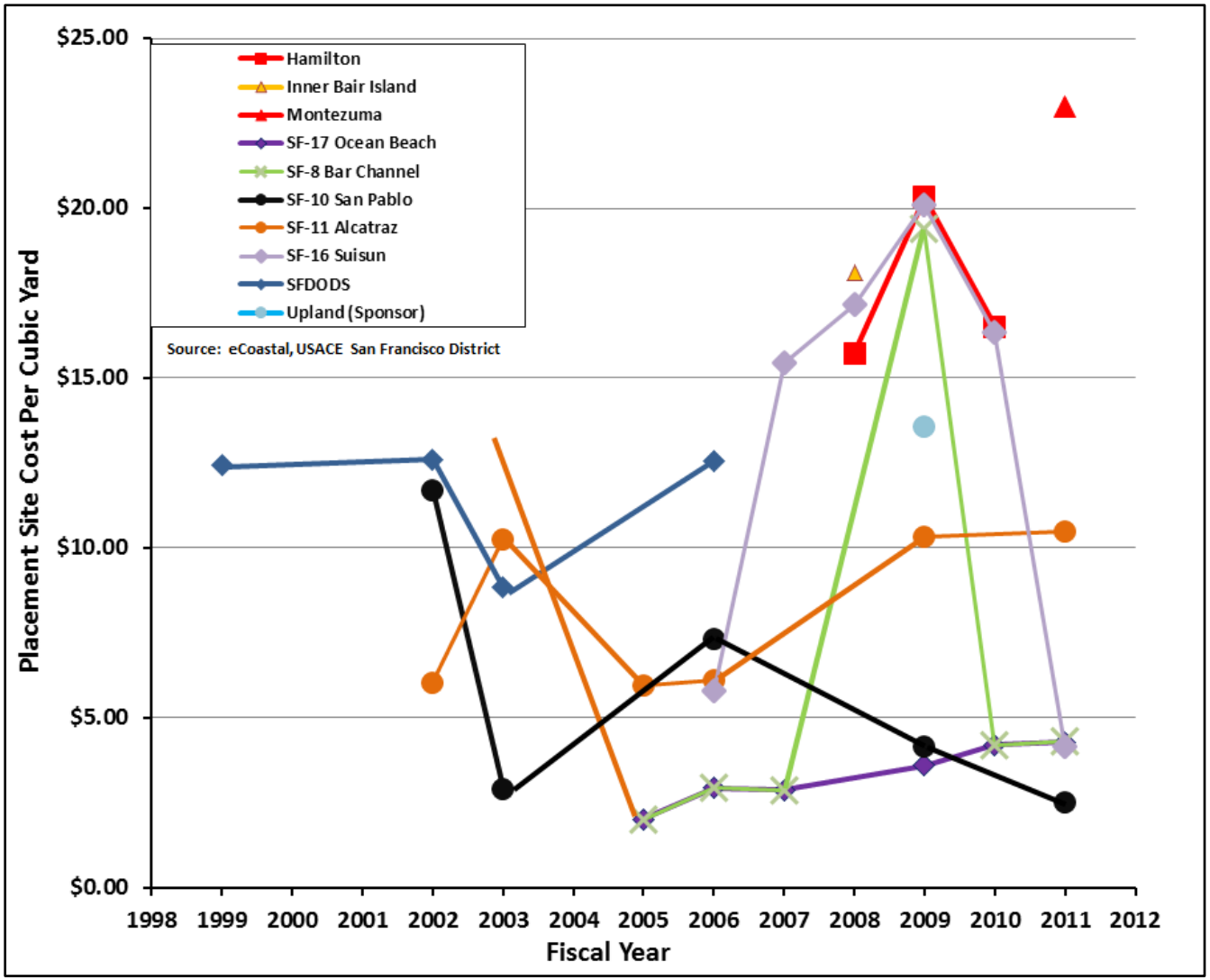

Figure 6. San Francisco Bay Dredged Material Placement Site Costs from 2000 to 2011 (Excluding Mobilization and Demobilization)

3.3 Case Studies

At the March 29th meeting, it was requested that an analysis be provided of the cost to construct the beneficial reuse sites used by the Oakland Harbor 50-Foot Deepening Project (50-Ft Project) for comparison purposes. The 50-Ft Project was authorized by Congress to dredge the Oakland Inner and Outer Harbors and the entrance channel to -50 feet mean lower low water (MLLW). The project delivered approximately 15.9 million cy of dredged material to the MHEA, Montezuma Wetlands Restoration Site (MWRP), and the HWRP to be beneficial reused. The MWRP received material that was both suitable for unconfined aquatic disposal (SUAD) and material that was not suitable for unconfined aquatic disposal (NUAD). Material was also disposed at SF-DODS and the Port of Oakland's Berth 10 (for landfill-bound NUAD material). The case studies provided herein focus mainly on the costs to construct the HWRP and MHEA. The full cost of constructing the MWRP site is not included in this analysis because it is not known to the LTMS agencies; however, the cost to dredge and place material from the 50-Ft Project at the MWRP is reported. Jim McGrath provided additional analysis on the placement of material from the 50-Ft Project, which is included as Appendix B to this document.

The current total project cost (TPC) estimate for the 50-Ft Project now stands at $413,758,000 (dredging and placement costs are $254.1 million; additional project costs are $159.7 million). The final cost of the project has yet to be determined because the MHEA has not been fully constructed.

Table 1 presents the costs of dredging and placement/disposal activities for the 50-Ft Project to date at the sites previously mentioned, as well as the costs of other items of work required in order to achieve a complete project, including Preliminary Engineering & Design (PED) costs; Engineering & Design (E&D); construction Supervision & Administration (S&A); demolition and construction work at the Inner Harbor Turning Basin; provision of electrical power for the dredge plants; port infrastructure improvements; and Lands, Easements, Rights of Way, Relocations (LERRs) costs.

Table 1

Total 50-Ft Project Costs

Site/Item	Cost
Dredging and Placement/Disposal Costs	
HWRP	$99.3 million
MHEA	$66.8 million
MWRP	$66.3 million
SF-DODS	$15.4 million

Site/Item	Cost
Berth 10	$6.3 million
Subtotal	*$254.1 million*
Additional Costs	
PED	$4.4 million
S&A and E&D	$27.5 million
Other Construction Costs	$41.5 million
Project Coordination Team	$6.3 million
Local Service Facilities	$53.9 million
Berth Facilities	$6.7 million
LERRs	$19.1 million
USCG Navigation Aids	$0.3 million
Subtotal	*$159.7 million*
Total 50-Ft Project Cost	**$413.8 million**

Note: The costs in Table 1 are only those paid by the 50-Ft Project to dredge and deliver material to the specified sites and do not include the cost to construct the placement/disposal sites with the exception of the MHEA. For this site, the figure represents the total cost for construction, because the 50-Ft Project was the sole source of the sediment placed at that site.

3.3.1 Hamilton Wetland Restoration Project

The HWRP, located in Novato, California, on San Pablo Bay, allows for the beneficial reuse of up to 24 million cy of dredged material, including 3.5 million cy from the 50-Ft Project. The 2,600 acre restoration project includes a 1,000-acre former military airfield and adjacent California State Lands Commission parcel, and the 1,600-acre Bel Marin Keys Unit V (BMKV) parcel. The HWRP will provide valuable habitat for various waterfowl, fish and other wetland dependent species of plants and animals, including the California clapper rail and the salt marsh harvest mouse.

To date, 5.8 million cy of dredged material have been placed primarily at the airfield portion of the HWRP from the 50-Ft Project, other USACE O&M dredging projects, and some non-USACE dredging projects around the Bay. Final seasonal wetland contouring and shaping, construction of a portion of the Bay Trail, and site preparation and outboard levee breach is expected to be completed in 2013.

The HWRP was initially authorized under the Water Resources Development Act (WRDA) 1999 for $55.2 million and was modified for increased costs and to add the BMKV parcel for $228.1 million under WRDA 2007. The estimated TPC for the original Hamilton Airfield section only, including adaptive management and monitoring, is approximately $117.2

million. A majority of the costs reflected below were funded by HWRP federal appropriations and non-federal sponsor (California State Coastal Conservancy [SCC]) funds. Dredging and transport costs were paid for by the 50-Ft Project and other O&M dredging projects—primarily Oakland Harbor and Richmond Harbor. The majority of sediment placed at the HWRP was from the 50-Ft Project. Once contracting mechanisms and cost sharing were established other O&M dredging projects and non-USACE dredging projects also placed material at the site. Total expenditures allocable to the HWRP project through July 2012 are shown in Table 2. Dividing the total cost to construct the airfield portion of the HWRP by the total volume of dredged material placed at the site to date reveals that the cost per cy was $39.76.

Table 2

Total HWRP Costs

Component	Cost
Site Construction	
Design and PED	$34.9 million
Construction Management	$3.3 million
LERRDs and Relocation	$2.6 million
Site Shaping, Culverts, and Nursery	$26.7 million
Planting, Surveys, and Monitoring	$2.0 million
Other	$1.3 million
Subtotal	*$70.8 million*
Offloading and Placement	
Offloading and Placement	$24.9 million
Subtotal	*$24.9 million*
Dredging/Offloading (Paid by 50-Ft Project and O&M Projects)	
50-Ft Project	$99.3 million
Oakland Harbor O&M	$23.2 million
Richmond Harbor O&M	$12.4 million
Subtotal	*$134.9 million*
Total Cost to Construct HWRP	**$230.6 million**

3.3.2 Middle Harbor Enhancement Area

The MHEA is an integral part of the 50-Ft Project and was designed to provide a combination of habitats including deep-water channels, shallow-water channels and flats, covered water (e.g., pile-supported structures), eelgrass beds (42 acres), hard substrate, sandy

beach, salt marsh, high tide island refugia for birds, non-beach shoreline, and piles. The total MHEA habitat enhancement is approximately 181 acres.

Between 2002 and 2007, approximately 5.8 million cy of deepening material was placed in the MHEA from the 50-Ft Project. Since 2007, sediment has been consolidating, which is required to provide a stable substrate for restoration activities. In March 2011, the USACE completed a geotechnical report that concluded approximately 600,000 cy of sediment should be relocated to provide proper substrate for the targeted planting of eelgrass beds. The USACE contracted with a dredging company to relocate dredged material in appropriate locations and elevations as part of the initial shaping of the site. It is anticipated that over the next 6 years, with appropriate funding from Congress, final shaping, habitat construction, and planting of eelgrass will provide the habitat benefits described in the project authorization.

Cost data presented in this section are based on consultant and construction contracts that were specifically awarded for the MHEA. Planning costs, also known as feasibility phase costs, are not included in this analysis. Because the MHEA was designed and is being constructed as part of the 50-Ft Project, certain costs (i.e., USACE S&A and E&D costs specific to the MHEA) cannot be easily separated from other deepening activities. These costs are included as a percentage of the total S&A and E&D costs for the 50-Ft Project. The presented MHEA costs can be broken down into the following broad categories: design costs, site preparation costs, dredging and placement costs, final site work, and monitoring costs. The design, site preparation, dredging and placement, and initial grading are sunk costs, in other words, already expended. An estimated $9.525 million of grading, eelgrass planting, and environmental monitoring work has yet to be accomplished. The total cost to construct the MHEA is estimated to be $66.8 million as is shown in Table 3. Dividing the total cost by the total volume of dredged material placed at the site reveals that the cost per cy was $11.52. Table 4 provides a detailed breakdown of the MHEA costs.

Table 3

Summary of Total MHEA Construction Costs

Component	Cost	Cost/CY	Percentage
Design	$3.2 million	$0.55	4.8
S&A and E&D	$6.6 million	$1.14	9.9
Site Preparation	$9.6 million	$1.66	14.4
Dredging and Placement	$33.1 million	$5.70	49.5
Initial Grading	$4.8 million	$0.82	7.1
Final Site Work	$9.5 million	$1.64	14.3
Total Cost	**$66.8 million**	**$11.52**	**100**

Table 4

Detailed MHEA Cost Information

Category	Description of Work	Final Quantity	Unit of Measure	Unit Price	Total Cost
Design					
MHEA Design	Design	1	LS	LS	$3,202,524
	Total	1	LS	LS	$3,202,524
Site Preparation					
MHEA Phase 2A	Containment Structure	1	LS	LS	$7,699,316
MHEA Phase 2B	Storm Water Treatment Units	1	LS	LS	$1,939,794
				Total	$9,639,110
Dredging and Placement					
IHTB Phase 1A2	Young Bay Mud	67,020	CY	$5.00	$335,100
	San Antonio Formation, Old Bay Mud	81,590	CY	$7.60	$620,084
	San Antonio Formation, Old Bay Mud	16,906	CY	$2.00	$33,812
	Total	*165,516*	*CY*	*$5.98*	*$988,996*
IHTB Phase 1B	Wet Basin/Inner Bulkhead SAF	63,175	CY	$13.30	$840,228
	Total	*63,175*	*CY*	*$13.30*	*$840,228*
Phase 3B/3C	Reaches 1 to 9	2,270,509	CY	$6.43	$14,599,373
	Reaches 10, 11, & 12	648,124	CY	$6.76	$4,381,318
	Inner Harbor Cells 5961N & 6164N	386,890	CY	$8.19	$3,168,629
	Total	*3,305,523*	*CY*	*$5.64*	*$22,149,320*

Category	Description of Work	Final Quantity	Unit of Measure	Unit Price	Total Cost
Phase 3D	Dredging	206,739	CY	$7.00	$1,447,173
	Dredging	8,000	CY	$17.61	$140,880
	Total	*214,739*	*CY*	*$7.40*	*$1,588,053*
Phase 3E	Dredging	474,872	CY	$9.00	$4,273,848
	Dredging	151,794	CY	$8.00	$1,214,352
	Total	*626,666*	*CY*	*$8.76*	*$5,488,200*
Port of Oakland	Berth Dredging	338,048	CY	$6.00	*$2,028,288*
Unpaid Overdepth	All Areas	1,086,352	CY	-	-
	Total	5,800,019	CY	$5.70	$33,083,085
Final Site Work					
Initial Grading	Sand Placement	1	LS	LS	$4,775,171
Remaining Work	Final Grading/Eelgrass Planting	1	LS	LS	$9,525,000
				Total	$14,300,171
S&A and E&D					
S&A	All Contracts	1	LS	LS	$3,849,585
E&D	All Contracts	1	LS	LS	$2,749,704
				Total	$6,599,289
	Total Cost to Construct and Fill MHEA	**5,800, 019**	**CY**	**$11.42**	**$66,824,178**

Note: LS = lump sum

3.3.3 Non-USACE Dredging Projects

To better understand costs included in non-USACE dredging projects, several project proponents were contacted to collect details regarding their dredging expenses. In general, dredging project proponents stated that the overall costs of dredging have increased incrementally each year by approximately 5 percent. Because their dredging bids were all written as lump sums, the origins of these increases are not readily apparent. For example, price of fuel, labor rates, and insurance costs are not separated out in bids. It is worth noting that the price of fuel has increased by more than 50 percent since 2000.

Disposal rates in bids, however, have stayed fairly consistent at $9-$11/cy for in-Bay disposal and $22-$25/cy for upland or disposal at SF-DODS. Few dredging contractors are located in the area and there is a sense among project proponents that volume-based dredging costs do

not reflect the true cost of dredging, but, instead, that this is the amount the dredging companies feel the market will bear.

Project proponents also agreed that out-of-Bay and upland disposal requirements have greatly increased dredging costs and noted the following specific concerns:

- SF-DODS is their last choice among out-of-Bay disposal sites. The distance to the site (approximately 50 miles west of the Golden Gate Bridge) as well as limiting factors, such as weather and equipment availability, can add a lot of time to a project, increasing costs and delaying normal use of the dredge area.
- Availability of upland sites
- Availability of off-loading equipment at upland sites
- Double handling costs when using upland sites
- Excessive study and testing requirements
- Excessive time for review and approval of permit applications and plans

To further understand project costs, staff interviewed several small to medium dredging projects to develop case studies based on regularity and frequency of dredging, size of projects, disposal locations, and sediment characteristics. Information specific to each project is presented in Tables 5 to 9.

Table 5

Golden Gate Ferry Larkspur Terminal Berths and Channel Maintenance Dredging Costs

General Information	
Permittee	Golden Gate Bridge Highway & Transportation District
Typical Dredging Frequency	Every 3 to 4 years
Typical Dredging Method	Clamshell
Typical Volume Dredged	500,000 cy per episode; 50,000 cy for berths-only dredging
Disposal/Placement Site(s)	• SF-11 • SF-10 • MWRP • HWRP • SF-DODS
Project Costs for 2010 Episode	
Pre-Construction/Internal Costs	$1,363,327
Mobilization/ Demobilization	$ 834,995 (included in dredging price figure)
Dredging	$5,231,020
Placement	• SF-10/SF-11: $12/cy (2010 actual cost) • HWRP: $15-$20/cy • SF-DODS: $23.90/cy (2010 actual cost) • MWRP: $24/cy (All placement costs are included in dredging price figure)
Overall Costs	$6,594,347
Lessons Learned/Recommendations	
Reported Cost "Driver(s)"	Distance to SF-DODS and double-handling costs for upland disposal sites
What would you change?	• Need wider work window to accommodate associated work including repairs of piers, navigational markers, dolphins, and camels that may be damaged during construction. • Need quicker response to in-project supplemental permit applications for associated work within the dredging window. Or, the Dredged Material Management Office (DMMO) could allow permittees to incorporate potential associated repair works as a rider into the various agency dredging permits. • Need more clarity from the DMMO regarding the timing and availability of upland placement sites and expected off-loader tipping fees, and any foreseeable changes to their availability.
Other comments?	Few dredging contractors with equipment that can handle our yardage results in less competition and potentially higher costs. There is pressure from smaller contractors to break up projects into smaller bits to allow for increased competition.

Table 6

Valero Refining Company Dredging Costs

General Information	
Permittee	Valero Refining Company
Typical Dredging Frequency	4 to 5 times per year
Typical Dredging Method	Clamshell and knock-down
Typical Volume Dredged	10,000-20,000 cy per event
Disposal/Placement Site(s)	• MWRP • HWRP • Winter Island • SF-9 • SF-11 • SF-DODS
Project Costs	
Pre-Construction	Approximately $80,000 for Tier III sediment testing every three years
Mobilization/Demobilization	Included in dredging price
Dredging (Includes dredging, transport, tipping fees, and mobilization/demobilization)	$13/cy - $27/cy plus stand-by/demurrage ($0-$100,000 per event)
Placement	Included in dredging price
Internal costs	Report preparation (including surveys, volume calculations, pre- and post-dredge event reports to DMMO, dredge operation plan): $10,000 per event
Overall Costs	• One 15,000 cy event: $200,000-$500,000 • Annually (4 events/60,000 cy): $820,000-$1,600,000
Lessons Learned/Recommendations	
Reported Cost "Driver(s)"	• Distance to SF-DODS and double-handling costs for upland sites • Out-of-Bay disposal increases duration of dredge event
What would you change?	• No turbidity study requirement for knockdowns • Need more out-of-Bay options • Consider in-Bay placement of clean sediment at dispersive locations as "beneficial reuse" relative to sediment deficit issues
Other comments?	• DMMO permit process has improved significantly • High cost of out-of-Bay placement is not justified in situations where in-Bay placement indicates no measurable negative environmental effects

Table 7

City of Martinez Marina Maintenance Dredging Costs

General Information	
Permittee	City of Martinez
Typical Dredging Frequency	3 to 4 years
Typical Dredging Method	Hydraulic suction dredge
Typical Volume Dredged	22,000-25,000 cy
Disposal/Placement Site(s)	City-owned upland disposal pond
Project Costs	
Pre-Construction	Permitting and design: $235,000; pre- and post-dredge surveys: $15,000
Mobilization/ Demobilization	$75,000
Dredging and Placement	$175,000 (contract cost: $8/cy; total project cost: $22/cy)
Overall Costs	Total project budget: $500,000
Lessons Learned/Recommendations	
Reported Cost "Driver(s)"	Permitting, testing and mitigation fees have become prohibitively expensive and permits take a long time to process
What would you change?	Since the work falls under a Nationwide permit from USACE and it seems the agencies want to promote upland disposal, the City would like to see the permits issued "over-the counter" without extensive studies each episode.
Other comments?	• The City has performed regular maintenance dredging utilizing our upland disposal ponds since the marina was constructed in the early 1960s. • Permit conditions have been very similar, with frequently only the date and dredge amounts changing. • A very limited number of dredging contractors bid our projects. • Maintenance of the disposal ponds between dredging episodes has become an issue because of the possibility habitat developing. • Finding a home (disposal site) for the dredged sediment from the settling ponds continues to be an issue.

Table 8

Richmond Long Wharf Maintenance Dredging Costs

General Information	
Permittee	Chevron U.S.A., Inc., in Richmond, CA
Typical Dredging Frequency	Annually
Typical Dredging Method	Clamshell
Typical Volume Dredged	150,000 cy
Disposal/Placement Site(s)	• SF-11 • SF-DODS • HWRP
Project Costs for 2011 Episode	
Pre-Construction	Pre-dredge survey included in overall costs
Mobilization	Included in overall costs
Dredging	$13/cy overall costs
Placement	SF-11 disposal included in overall costs
Demobilization	Included in overall costs
Overall Costs	$1,900,000
Lessons Learned/Recommendations	
Reported Cost "Driver(s)"	Limits to in-Bay disposal
Addressable by the LTMS?	Cost issues can be addressed through policy changes
What would you change?	Even a small increase in the in-Bay disposal limits would be helpful to dredgers.
Other comments?	• Few contractors in the Bay Area; would like to have more options and increased competition • Would like to combine projects to share costs and increase efficiency

Table 9

Pier 39 Marina Maintenance Dredging Costs (East and West Basins)

General Information	
Permittee	Pier 39 Marina
Typical Dredging Frequency	10 years
Typical Dredging Method	Excavator
Typical Volume Dredged	28,000 cy
Disposal/Placement Site(s)	• Port of Oakland Berth 10 • SF-11 • SF-DODS
Project Costs for 2012 Episode	
Pre-Construction	$50,000
Mobilization/ Demobilization	Included in dredging price
Dredging	• West Basin (Berth 10): $73,000 • East Basin (SF-DODS): $542,000 • East Basin (SF-11): $232,000
Placement	Included in dredging price
Overall Costs	$897,000
Lessons Learned/Recommendations	
Reported Cost "Driver(s)"	PAH levels required SF-DODS and Berth 10 disposal
What would you change?	Access to information on other local dredging projects and test results; ability to combine projects and share costs if dredging at same time as neighboring facility
Other comments?	Changes in requirements during permitting process adds costs to project budget (Essential Fish Habitat-associated)

4 REFERENCES

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APPENDIX A
VALUE ENGINEERING STUDY EXECUTIVE SUMMARY

EXECUTIVE SUMMARY **FINAL**

Value Management Strategies, Inc., in association with Noble Consultants, Inc., conducted a Value Engineering (VE) study, sponsored by the U.S. Army Corps of Engineers (USACE) San Francisco District (SPN) for SPN's Navigation Program. The study was conducted in Sacramento, California, in May 2011. This *Executive Summary* provides an overview of the project, key findings, and the alternatives developed by the VE team.

PROJECT SUMMARY

The VE team was able to identify numerous opportunities to increase competition among the dredging community by restructuring contracts, reevaluating contracting methodologies, exploring advance maintenance possibilities, while simultaneously exploring use of upland and other sites to meet current Long-Term Management Strategy (LTMS) goals for the placement of dredged material; all while assuring the program's goal of timely and continuous maintenance of the federally authorized navigation channels.

PROJECT PURPOSE AND NEED

The focus of the VE study was the evaluation of:

- Current contracting strategies and practices to determine whether they could be revisited and restructured to invite ***greater competition among the dredging contractor community***;
- Evaluate contracts to look for opportunities for advance maintenance in order to extend the utility of the project(s) for a longer maintenance cycle and possibly reduce the projects' budget; and
- Look at maximizing the use of upland sites where appropriate and cost effective, in order to meet current LTMS goals for the placement of dredged material, as well as structuring contracts to incorporate the latest environmental considerations.

VE STUDY OBJECTIVES

The objectives of the VE study as defined in the Scope of Work and further identified by the VE team were to:

- **Increase qualified dredging competition**
- **Reduce cost** and increase efficiency of dredging
- Maximize amount of dredging for available cost/budget
- **Optimize LTMS goals for available cost/budget**
- Increase use of advance maintenance dredging
- Incorporate latest environmental regulation
- Increase communication between parties/stakeholders/internal to agencies

- Streamline contracting methodology
- Meet customer expectations
- Increase PDT membership and assure participation
- Determine and develop process to implement these goals and objectives
- Reduce uncertainties
- Reduce frequency of dredging

KEY PROJECT ISSUES

The items listed below are the key drivers, constraints, or issues being addressed by the project and considered during this VE study to identify possible improvements.

Environmental Parameters:

- Environmental Work Windows
- Endangered Species Act (ESA) / Essential Fish Habitat (EFH)
- In-Bay Placement / Sediment Quality / Characterization Time

Environmental Goals:

- In-Bay <40% of total – 2012 / In-Bay <20% of total –2013
- Maximize Beneficial Use (Upland or In-water)

Budget:

- $30M/year – all O&M projects in SPN's jurisdiction

Other:

- **Reduced Competition**
- Contracting Restrictions
- Dredging Equipment Availability
- Budget Uncertainties (Specific to fiscal years (past 2010), 2011 and possibly 2012)

Constraints:

- Permitting
- Budget Timing
- Contract Award Timing
- USACE "Process"
- Timing of Sediment Testing

VE ALTERNATIVES

The VE team developed a total of 26 alternatives for improvements to the O&M dredging program. Eleven alternatives have been identified by the VE team to be the most critical for deliberation. The remaining 15 alternatives are by no means unimportant, nor to be neglected, and are included for review and disposition. It is noted that most, if not all of the developed alternatives, are intertwined

and although some are truly standalone recommendations, most are not and should be evaluated in that context.

The following Alternatives designations were used throughout the study report: IC – Increase Competition; ICP – Improve Contract/Project; and EE – Enhance Environmental. **Furthermore, please refer to the *Glossary* section at the end of this report for definitions of all of the acronyms used throughout.**

DISCUSSION OF KEY FINDINGS

A. Competition and Communication between Dredging Contractors

Since one of the objectives of the VE study was to "*Increase Competition"* between dredging contractors, ***Alternative No. IC-1*** explored the possibilities of consolidating similar projects under a smaller number of contracts. This consolidation creates the opportunity to potentially:

- Increase the size of the contracts;
- Issuing 2 or 3 (minimal) contracts for all O&M undertakings;
- Using multi-year contracts;
- Using a prime-contractor-type contract vehicle; and
- Consolidating non-federal projects by balancing the work across numerous projects.

The combining of similar projects reduces the number of required contracts, thereby benefitting the overall program costs by reducing SPN's up-front (i.e.; administration) time and generally contract costs due to scale of economy and allowing the contractor more efficient use of their equipment (large or small). This consolidation would allow for added competition among the existing dredging contractors in SPN's area of responsibility, but would also increase the pool of contractors by opening up the opportunity to bid on specific areas of expertise, size, and ability. As an example, the pre-2006 contracting effort for the Oakland and Richmond Harbors' O&M contract attracted four bidders (Weeks Marine, Dutra Dredging, Manson Construction, and Great Lakes Dredge and Dock). Not only did these contracts attract non-local dredging contractors, the lowest bidders were the non-local entries.

This alternative further explored the potential of using multi-year contracts. These types of contracts would increase competition by allowing the competitors the ability to spread the cost of mobilization/demobilization and equipment over the life of the contract or place all of these costs into the first year and not into subsequent years. Additionally, these contracts could reduce the amount of environmental testing (see Alternative ICP-14). This type of contract could be extended up to five years by having the government exercise yearly options if the work is being satisfactorily accomplished and Congress appropriates the funds. This contracting methodology is ideally suited for a prime contractor. In addition to the "regular" dredging process, other examples of the type work to by undertaken by multi-year contracts could be: (a) knockdown shoals (like an on-call contract as noted on Alternative IC-13) for Pinole Shoal and Suisun Bay, (b) pilot/test programs for anti-shoaling systems to prevent the creation of shoals, eliminating the need for disposal by maintaining a fluidized suspension, or (c) for advance maintenance dredging.

In another effort to focus on increasing dredging contractor competition, ***Alternative IC-4*** recommends including an array of approved disposal sites in the contracts rather than a single-source disposal site or allowing contractors to propose reuse sites, with some restrictions. This would permit the bidders to evaluate the choices available for disposal and bid according to their expertise and equipment availability, thereby resulting in lower costs. If tied to a multi-year or with similar project consolidations as noted in Alternative IC-1 above or with separate on-call contracts as indicated on Alternative IC-13, separate beneficial reuse contracts would benefit greatly by potentially maximizing the use of upland sites where appropriate to meet current LTMS goals for the placement of dredged material, as well as structuring the contracts to incorporate the latest environmental considerations.

Another area deemed necessary to explore by the VE team for increased dredging contractor participation is to "*Increase Communication*" with contractors. This effort is basically outlined in ***Alternative IC-15***, which would commence with conducting periodic workshops with the contractor community to evaluate concerns, constraints, etc., as noted in Alternative ICP-37. These workshops could dovetail into pre-solicitation conferences with the dredging community to foment better understanding of the projects/program and relationship with SPN, EPA, BCDC, CMANC, and other stakeholders/sponsors. As an example of known concerns noted by the dredging community is the failure of SPN to maintain a contracting schedule with minimal delays, stoppages, setbacks, and postponements, which has led to lower contractor participation for fear of "losing other contracting opportunities" or having to commit equipment when it could have been better used elsewhere. ***Alternative IC-25*** expands the market research being undertaken to appropriately improving dredging contractor competition. This is a good example of how the recommendations presented in this report are shared for the desired result. When combined with Alternative IC-15, IC-1 and IC-4 to name a few, the desired outcome can only improve.

B. Contracting Program

Another aspect of the VE study was to explore other available avenues to further the rationale of increasing dredging contractor competition was to *Improve Contracting Program*. This is clearly demonstrated in ***Alternative ICP-1***, which researched the possibility of awarding the contracts as scheduled. This is an extension of the concerns noted by contactors in the past as noted above in Alternative IC-15 and creates undue uncertainty within the dredging community as to the "sincerity" of awarding the contracts. This can be overcome by having SPN complete the contracts and advertise earlier pending authorization of funds.

Furthermore, the contracting language should be concentrated on completing work by the end date of the work window rather than focusing on the start date. Additional contracting efforts could concentrate on: (a) providing the NTP 30 days prior to the work window opening, (b) awarding the contracts earlier, and (c) aligning the projects in order of when environmental work windows open. Past experience indicates these improvements to the contracting effort can increase competition by optimizing each contractor's ability to schedule the work within the available work window thereby reducing costs. This is as opposed to late awards that lead to more work shifts, additional equipment rental, and reduced time available to complete the project during the work window. Past experience on marina dredging work, when awarded on time or even early, led to a reduction of about $2/CY on work that costs in the range of $12/CY to $15/CY. On larger dredging operations, savings could

approach ~25% (see attached bid schedule for Oakland Entrance Channel that indicated a reduction from $8.459M to $6.557M in the write-up for Alternative ICP-1).

Another source of concern among the dredging community is the consistent lack of project team continuity. This is noted on ***Alternative ICP-6***, wherein a dedicated effort should be undertaken by SPN to ensure a cradle-to-grave project delivery team, thereby avoiding miscommunications, misinterpretation, repeated mistakes, uninformed follow-on by team members, etc. This effort should concentrate on the PMs' assignments to ensure theses individuals are always the consistent POC for each project. It is acknowledged this may not always be possible as advancements or required reassignments cannot be withheld from personnel; however, the PMs should be the key POC person for each project regardless of the project delivery teams' composition.

A tie-in with Alternative IC-10 to use multi-year contracts could be ***Alternative ICP-14*** that promotes the use of multi-year EA for each dredging project. By using this approach to EAs, it is possible to save nearly 4 weeks of effort per each EA. This reduction optimizes the costs associated with the work for which the EA was performed and may permit plans and specifications to be issued earlier in the year, allowing for greater contractor flexibility in scheduling work.

The current SPN contracting process concept of the design-bid-build effort includes time to assure the BCOE compliance of the project/program being undertaken from design through construction. If the "E" (Environmental) were to be decoupled from the BCOE series process, i.e.; each task following the other, and conducted as a parallel, simultaneous effort as noted on ***Alternative ICP-18***, a four- to six-week time savings may be possible for each contract in a manner similar to Alternative ICP-4 above. This effort may entail redistribution of risk wherein SPN assumes more of the risk as some design work may need to be redone based on the environmental process; especially if the decoupling is separated from the design process in and of itself. This undertaking could be accomplished by maximizing the use of Tier I approval of dredge material testing protocol (including Tier III pre-dredge of prior year[s]).

As noted on ***Alternative ICP-30***, the overall time to accomplish BCOE, and to the same extent the ITR, should be analyzed to reduce the current effort consisting of redundant reviews, sign-offs, and the like. They also should be reviewed to determine if value is added to the process by completing these internal processes. This reduced effort can translate into more available time to advertise, conduct contractor workshops, undertake pre-solicitation conferences, and allow the contractors additional time for better equipment scheduling and pricing. As noted above, generalized consensus was that an approximately four-week reduction could be expected.

C. Environmental Concerns

The final area delved into by the VE team addressed some of the *Environmental Concerns* and ways to optimize the intended LTMS goals regarding placement of dredged material. ***Alternative EE-1*** basically explores how to dredge deeper and less frequently. Recommendations within this alternative include: (a) redefine and consider more use of advanced maintenance dredging, (b) expand the use of knockdowns and other non-extractive dredging methods, (c) reduce the use of or eliminate annual dredging, (d) reduce the disturbance created by dredging, (e) consider the use of anti-shoaling technologies to reduce dredging, (f) realignment of projects to take advantage of deep waters, and (g) consider dredging bi-annually as a minimum. All of these aspects have merit for

consideration and as noted in previous paragraphs, some are intertwined with means of improving contractor participation and optimizing costs.

Taking advantage of some of the items listed above, ***Alternative EE-6*** would work to identify new in-Bay beneficial reuse opportunities. This can be accomplished by redefining and reevaluating environmental impacts, redefining LTMS goals, and developing and conducting beneficial reuse pilot projects.

A listing of the proposed VE alternatives is provided below. As noted above with short narratives, the first 11 are those alternatives deemed critical for deliberation; the last 15 alternatives are also proposed for review and disposition.

SUMMARY OF ALTERNATIVES

Summary of Priority Alternatives

Alternative No. and Description	Cost / Quality Impact
IC-1 Consolidate contracts - Increase competition by increasing the size of the advertised dredging contract in order to entice more contractors to pursue the project.	Savings between 2 and 16 percent is possible for two to four bids, respectively.
IC-4 Include an array of disposal sites in contracts rather than single-source disposal site - Implement dredging contracts that either identify multiple sites for disposal or allow the contractor to identify disposal site(s) with options for disposal within the contract bid.	Improved scheduling, equipment usage, potential lower bid results, and potentially increasing beneficial reuse.
IC-15 Increase communication with contractors - Invite contractors early on in the acquisition process by holding pre-solicitation conferences and workshops.	Quality improvement for better specifications/contract documents, lower potential for bid protests. Contracting community would have a clearer understanding of the work to be undertaken, resulting in more favorable bids as better planning and scheduling can be undertaken.
IC-25 Focus market research appropriately to improve competition - Identifying more specialized and more capable SBA/8(a) contractors and/or identifying contractors who might be customers or users of the products generated by the initial contractors that were surveyed – such as customers of landfill cap material, construction fill, or levee rehabilitation material.	Increases pool of qualified dredging contractors. Could lead to savings between 2 and 16 percent, as noted in IC-1.
ICP-1 Get individual contracts out on time - Increase effort to ensure the published schedule at the beginning of each fiscal year is maintained.	Improves work schedule resulting in lower costs and potentially shortened work durations.

Alternative No. and Description	Cost / Quality Impact
ICP-6 Maintain PDT continuity - Provide for the continuity of PDT membership during the life cycle of the project to the maximum extent possible.	Consistency within PDT provides for better management, reduced bidding time, and decreased potential for change orders.
ICP-14 Use multi-year EAs - Consider greater use of "categorical exclusion" clause within 33 CFR 230 referring to the information provided to the District Commander for proposed action, or alternatively, use a three-year EA tied to the IAA and CD, and only update more frequently for changes at the dredge or disposal site.	The removal of a critical path task will result in a higher likelihood of maintaining the work schedule, reducing end-of-work scrambling, reducing the time to award, and producing more favorable bids.
ICP-18 Decouple "Environmental Review" from engineering/contract process - Decouple the environmental review process from other engineering tasks, allowing these tracks to proceed in parallel and reduce project delays.	As much as two weeks could be reduced in specification preparation and final engineering, resulting in overall earlier contract awards.
ICP-30 Reduce internal design/specification review period - Reduce the time period for each review and thus have a better chance to be ready to dredge when the work windows open.	In a manner similar to Alternative ICP-18, as much as two weeks could be reduced in specification preparation and final engineering, resulting in overall earlier contract awards.
EE-1 Dredge deeper less frequently - The concept is the hydrodynamic consideration of channel shoaling at specific locations in the waterway. This concept is very similar to advance maintenance dredging to create a sediment sump or catch basin.	A "sweet spot" of around 2 feet over advanced maintenance dredging achieves 75% of the cost savings; i.e., from approximately $20.60/CY to about $15.00/CY.
EE-6 Identify new In-Bay beneficial reuse opportunities - Identify approaches and situations in which discrete placement of O&M dredged material into San Francisco Bay and Estuary produces net environmental or societal benefits that help meet the LTMS goals in a more affordable manner.	By using in-Bay reuse approach, energy savings associated with ocean disposal alone would warrant further investigation; e.g., an ocean-going scow would have to travel approximately 120 miles roundtrip from the shoreline plus the distance from the dredge site to the Golden Gate Bridge, and consume nearly 3,000 gal of diesel fuel at $4.80/gal or $14,400 per scow. If the average in-Bay distance were 10 miles, the scow would only burn $2,400 of fuel (500 gal at $4.80/gal). In addition, the staff time of the contractor would be greatly reduced, perhaps by as much as 50%.

Summary Remaining Alternatives

Alternative **No.** and **Description**	**Cost / Quality Impact**
IC-3 Alternative contracting methods - Select the best contracting methodology to maximize the overall O&M dredging program and improve the O&M of individual projects.	Improves the quality of the end product and how it is to be contracted.
IC-7 Reduce size of dredging contracts - Use more smaller dredging contracts (in terms of size, dollars, and length/depth) to encourage participation of additional dredging contractors.	The quality of smaller contracts can be better achieved due to their tendency to be simpler and readily adaptable to different contracting vehicle.
IC-12 Use separate beneficial reuse contracts – Decouple meeting LTMS reuse goals from individual O&M contracts by having separate contracts to take specified material to reuse; perhaps from multiple locations.	The quality of the contracts can be improved when they are focused on a given task, such as beneficial reuse, rather than a broader dredging contract. Single task contracts can be adjusted to the specifics, resulting in better quality control, improved scheduling, and potentially lower overall costs.
IC-13 Use separate on-call contracts – Examples would be for "clean-up" dredging, knockdowns, discrete shoals that impact an entire channel, or "emergency" dredging.	The quality of the contracts can be improved when they are focused on a given task such as in an on-call contract as the specifics can be focused, resulting in better quality control, improved scheduling, quicker response time including unanticipated needs, and lower overall costs.
ICP-8 Review of contract language - Establish a procedure for the SPN staff to periodically review contract language and provisions for assessment as to relevancy.	Improved quality of the product: the dredging, on-call, beneficial reuse, maintenance, etc., contract itself.
ICP-9 Have all permitting as part of solicitation package - Attach permit requirements to the specification as an appendix to eliminate any duplication throughout the specification, and make sure all permits are part of the bidding process.	Improves quality of the contract(s) by elimination of ambiguous and unclear language, resulting in better bid values. This should lead to reduced concerns by contractors regarding compliance risks.

Alternative **No.** and **Description**	**Cost / Quality Impact**
ICP-11 First quarter Project Team meeting - Have each PM conduct a first-quarter PDT meeting to review project, budget, schedule, AAR results from the previous year, IAA, and the latest environmental restrictions and changes for the program in order to begin all up-front work and baseline/template work as soon as possible.	Improves the quality of the work product – design, management, and execution of the dredging program – which could result in lower bids and increased contactor participation.
ICP-15 Expand Consistency Determinations to 10 Years - Produce multi-year CDs.	Improves quality by preparing CDs less frequently, which could reduce or eliminate some project delays and timing complications.
ICP-22 Periodic audit workshop related to regulatory (permit) requirements - LTMS/DMMO agencies should review the full range of permit conditions they jointly apply to O&M dredging projects. This process should include input from both USACE SPN and permit applicants, as well as dredging contractors.	From a quality view point, the LTMS/DMMO agencies should also review the full range of permit conditions jointly applied to O&M dredging projects.
ICP-24 Move O&M dredging to one branch - Consider moving the maintenance dredging function to the Operation and Readiness Division, which has responsibility for navigation debris removal and O&M of USACE SPN lakes.	By placing the appropriate "team" in-house to manage and control the O&M dredging program, the end result will be a better product and an efficiently operated, well executed program. This alternative precludes the "borrowing" of expertise from one division/branch to another and places the burden of proper execution within a single division. Clear lines of communications and responsibility with authority are established.
ICP-29 Minimum dig face - Use advance maintenance dredging and/or sediment redistribution methods, i.e., knockdown, etc., to remove minor localized shoaling in between cost-effective, thicker dig cut, maintenance dredging events.	Although the VE team only analyzed one set of dredging contract bid results, it demonstrated with a fair share of certainty that by restricting dredging to areas with a specified minimum dig face, greater equipment utilization will occur leading to cost savings. For a depiction of savings, see the graph in the Alternative's write-up.

Alternative **No.** and **Description**	**Cost / Quality Impact**
ICP-32 Expand participants of annual program AAR - Prepare an AAR for the entire program, in addition to selected projects and invite all interested stakeholders to include non-federal sponsors, harbor pilots, resource/regulatory agency staff, and members of the Harbor Safety Committee to participate in the AAR process.	This is a quality issue. Since AARs are currently prepared on selected projects, the value is not readily apparent to non-federal sponsors and stakeholders who experience frustrations with respect to federal channel maintenance year after year . The AAR process could be the vehicle to help reduce these frustrations through process improvement and total quality management. Moreover, non-federal sponsors may be in a position to favorably influence funding and legislative "fixes" in support of the O&M program.
ICP-33 Have Construction assume responsibility of AARs - The responsibility of the AARs should be transferred to the Construction Branch and prepared for each and every project upon completion of the construction.	This alternative again addresses quality issues associated with using the AAR process for betterment. Participation in the AAR meeting should be mandatory for the PMs, PDT members, and all chiefs and should include invitations to the local sponsors and appropriate resource agencies (LTMS PMs), Ports, bar pilots, etc., as appropriate.
ICP-35 Improve coordination between contract package creation and Construction - Provide a construction representative as a full-time member of the PDT.	As with other alternatives suggesting quality improvements, this too addresses the issue of involving construction as a permanent member of the PDT as in other District sections.
ICP-39 Fund O&M program rather than individual projects - Project sponsors should lobby Congress to fund USACE SPN's O&M program and create a regional dredging program, or allow greater flexibility to manage the overall budget to move the most mud.	This alternative proposes a change in the funding process to reduce the number of, if not eliminate, all current annual dredging projects as line items. More funds would be available for each project in the year the project was scheduled to be dredged. In addition, the suggestion to maximize the use of advance maintenance will make for a more efficient dredging project for the contractor, which could lead to lower unit costs to dredge, including reducing mobilization/ demobilization expenses from a yearly expense to a two- or three-year expense.

VE TEAM

VE Study Team

Name	Organization	Title
Luis M. Venegas	VMS	VE Study Team Leader
April Hiller	VMS	VE Study Assistant
James E. Garror	USACE SPN, Subject Matter Expert (SME)	Contracting
David V. Doak	USACE SPN, SME	Engineering, Dredging, Management
Brian D. Ross	U.S. EPA, Region 9, SME	Dredging and Sediment Management Team (WTR-8)
Brenda Göeden	BCDC, SME	Dredging and Sediment Management Team Manager
Charles F. Fano	USACE Walla Walla District, SME	Cost Engineer
Richard M. Rhoads	Moffatt & Nichol, SME	Dredging
James M. Haussener	CMANC, SME	Executive Director
Greg Hartman	Hartman Associates, SME	Dredging
Scott M. Noble	Noble Consultants, Inc., SME	Civil Engineering
Leonard E. Cardoza	Weston Solutions, Inc., SME	Senior Technical Advisor
Syed I. Burney	USACE SPN	Value Engineering Officer

Key Project Contacts

Name	Organization	Title
Syed I. Burney	USACE SPN	Value Engineering Officer

APPENDIX B
ADDITIONAL ANALYSIS ON THE 50-FT PROJECT

MEMO

To: Brenda Goeden

From: Jim McGrath

Date: June 2012

Subject: Analysis of Port of Oakland Fifty Foot Deepening Project Placement Volumes

Brenda,

I was interested in seeing if patterns emerged from the data--how much was Port of Oakland/Corps work on the 50 foot project, what other material went into Hamilton, what reuse sites were one-off and which might be sustainable for a longer period. So I took the spread sheet data for 2000-2011 and made annual totals for all projects as Port of Oakland/50 foot, Hamilton, and miscellaneous. I then went back over the miscellaneous data to see what emerged. I essentially ignored the small projects except to round the numbers and place them in the miscellaneous category. Here's the results:

1. The Port of Oakland 50 foot project, which includes I believe the maintenance work during the construction period, was the primary driver. Total re-use was 17,446,000 cubic yards. (this does not include the other re-use projects I worked on, Sonoma Baylands and Galbraith, which was about 700,000 cy. I think Sonoma Baylands was about 2.5 million cy.)

2. The total for Miscellaneous was 1,894,000 cy. Of the larger reuse projects that made up that total, San Leandro (180,000 cy in 2001) is no longer available, and the subtotals were:

Winter Island at 520,000 cy

Port Sonoma at 430,000 cy

Bair Island at 286,000 cy

3. Port of Oakland 50 foot material went to Montezuma, at 3,000,000 cy, Hamilton at 6,000,000, and 5,000,000 to Middle Harbor. I know that doesn't add up to the full

17,446,000 and I don't remember the source, or if I knew it, of the discrepancy.

4. The totals I got for material destined to Hamilton were 6 mcy from Oakland and 1.1 mcy from all others, mostly Richmond Federal channel.

For the information needed to discuss cost the next time, it would be useful to divide the reuse volumes into three categories, by volume: a) New work with authorization in either the Oakland or Hamilton WRDA's; b) maintenance during construction at Oakland; and c) maintenance, both of Federal channels and non-Federal channels. The reason for category b is that a lot of material gets dropped in a construction project as large as the 50 foot project, and the maintenance material is not just normal maintenance, but maintenance plus dropped new work. It was, I believe, cost-shared on much the same basis, and used the same contractor, so it is a special category that might not be seen again.

San Francisco Bay
Long Term Management Strategy

12-Year Review Process

Costs and Contracting Meeting

September 11, 2012

12-Year Review Process Overview

Includes four stakeholder meetings:

- ☑ First meeting: LTMS to date
- ☑ Second meeting: Beneficial reuse
- ☐ Third meeting: Costs and contracting
- ☐ Fourth meeting: Policy and strategy

Meeting Purpose

- Share relevant information on costs and contracting
- Identify opportunities for the dredging community to reduce costs and improve contracting processes

USACE's VE Study Purpose and Need

- Evaluate current USACE contracting strategies and practices to invite greater competition
- Identify opportunities for advanced maintenance, knockdowns, etc.
- Maximize the use of upland sites where appropriate and cost effective to meet LTMS goals and environmental considerations

Constraints and Drivers Considered

- Environmental constraints & regulations
  - Environmental work windows, essential fish habitat, and sediment testing
- Environmental goals
  - Maximize beneficial reuse, reduce in-Bay placement to <40% through 2012 and 20% after 2012
- Federal budget and other uncertainties
- Contracting restrictions and award timing

VE Study Recommendations Relevant to All Projects

- Have permits in-hand prior to contracting, and include them in the solicitation package
- Include an array of placement sites in permits and contracts
- Develop multi-year permits
- Consolidate similar projects for contracts

VE Study Recommendations Relevant to All Projects

- Develop a separate beneficial reuse contract
- Begin dredging as soon as the environmental work window opens
- Dredge more volume, less frequently (i.e., dredge the whole project in one episode vs. multiple small episodes)
- Use knockdowns or advanced maintenance dredging where appropriate

Questions?

Booster pumps for hydraulic off-loading of dredged material at the Hamilton Wetland Restoration Project

Implementing Contracting Efficiencies

- More dredge for your dollar!
- Determine dredging needs early
- Pre-solicitation coordination with the dredging industry
- Dredged material management planning
  - Site availability
  - Site capacities
  - Access issues
  - Distance

Implementing Contracting Efficiencies (Continued)

- Availability, feasibility, and practicability of alternatives
- Access and distance
- Match site capacity with dredge volumes
- Other issues (handling/re-handling, monitoring, disposition, etc.)

Desired Outcomes of Contracting Efficiencies

- Reduce mobilization/demobilization costs
- Economies of scale
- Dredged material delivery consistency (quality and quantity)
- Understand equipment limitations
- More dredge for your dollar!

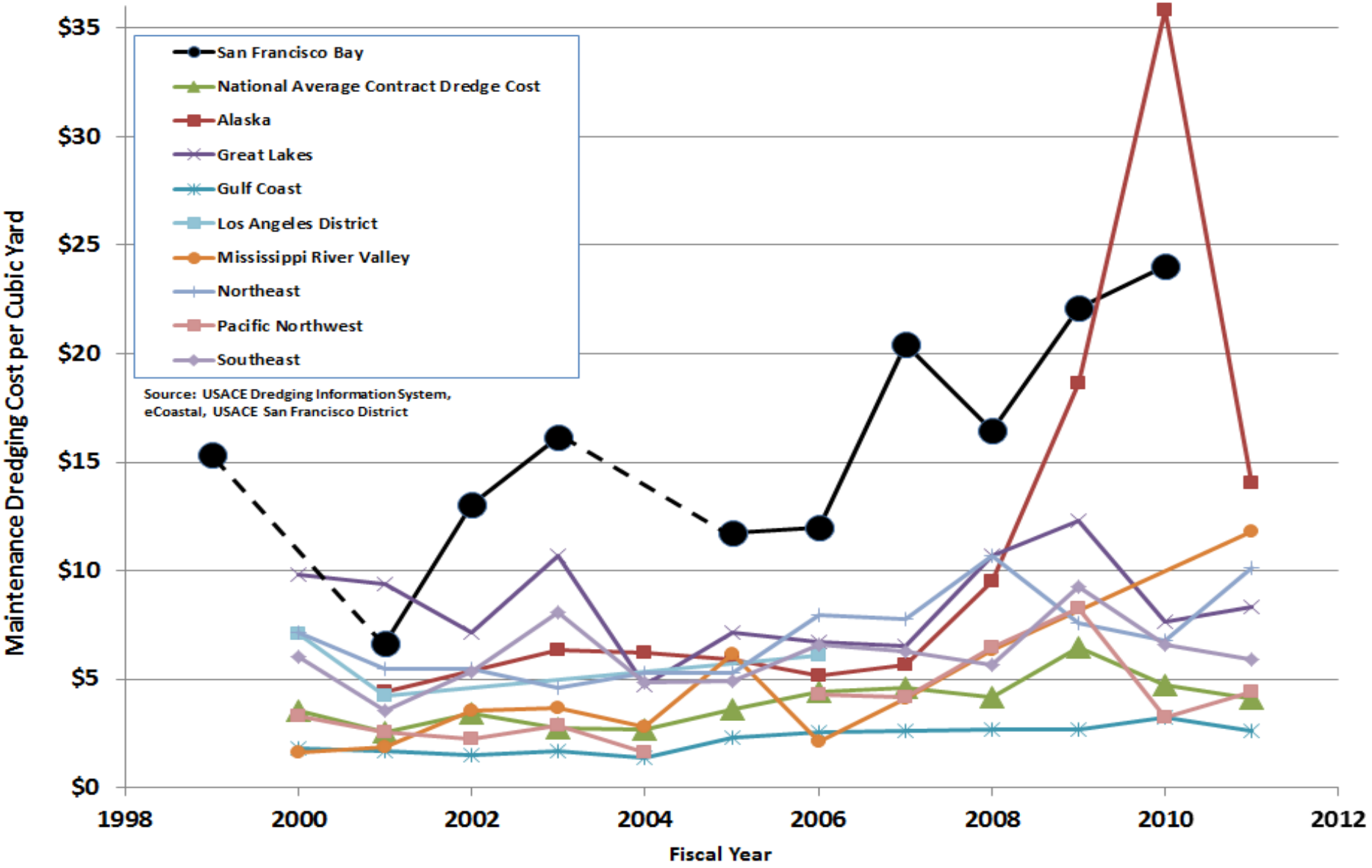
Discussion

Liberty Off-loader at Montezuma Wetlands Restoration Project

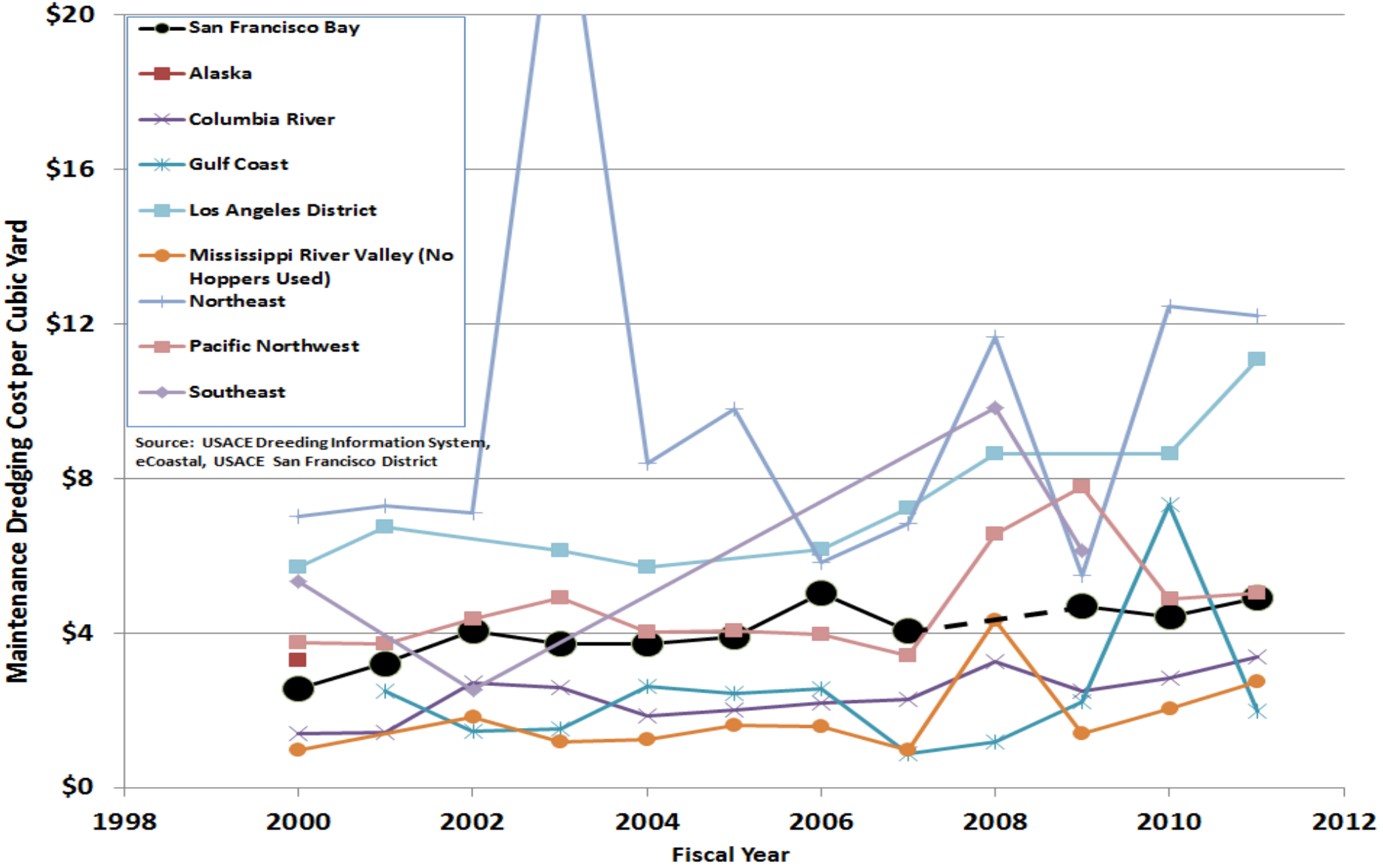
Regional Dredging Cost Comparison

View from USACE's Essayons, a trailing suction hopper dredge in the San Francisco Bay

USACE-Contract Dredging Costs: San Francisco Bay vs. Other Regions



Government Hopper Dredging Costs: San Francisco Bay vs. Other Regions



Hamilton Wetlands Restoration Project

Component	Cost	Cost/CY	Percentage
Site Construction			
Design and PED	$34.9 m	$6.20	14.7
Construction Management	$3.3 m	$0.59	1.4
LERRDs and Relocation	$2.6 m	$0.46	1.1
Site Shaping, Culverts, and Nursery	$26.7 m	$4.74	11.2
Planting, Surveys, and Monitoring	$2.0 m	$0.36	0.8
Other	$1.3 m	$0.23	0.5
Off-loading/Placement Increment (HWRP Share)	$24.9 m	$4.42	10.5
Dredging/Off-loading (Paid by 50-Foot Project and USACE O&M Projects)			
50-Ft Project (3.46 mcy)	$99.3 m	$28.70	41.7
Oakland Harbor O&M (1.02 mcy)	$23.2 m	$22.75	9.7
Richmond Harbor O&M (0.75 mcy)	$12.4 m	$16.53	5.2
Pinole + RWC O&M (0.40 mcy)	$7.6 m	$19.00	3.2
Total Cost to Construct HWRP	**$238.2 m**	**$42.31**	**100**

* Table does not include 0.34 mcy of non-USACE project material placed at HWRP

- Overall dredging and placement cost: $29.73/cy
- Overall project cost: $42.31/cy

Middle Harbor Enhancement Area

Component	Cost	Cost/CY	Percentage
Design	$3.2 m	$0.55	4.8
S&A and E&D	$6.6 m	$1.14	9.9
Site Prep	$9.6 m	$1.66	14.4
Dredging and Placement	$33.1 m	$5.70	49.5
Initial Grading	$4.8 m	$0.82	7.1
Final Site Work	$9.5 m	$1.64	14.3
Total Cost to Construct MHEA	**$66.8 m**	**$11.52**	**100**

- Overall dredging and placement cost: $5.70/cy
- Overall project cost: $11.52/cy

10-Minute Break

Off-loader and scow at the Hamilton Wetlands Restoration Project

Stakeholder Perspectives on Costs and Contracting

Dredged material placement at the Hamilton Wetlands Restoration Project

Discussion

Dredging at the Port of Oakland for placement at the Hamilton Wetlands Restoration Project

Next Steps

- Next stakeholder meeting: November 20
  - Topic: Policy and strategy
  - Read-ahead materials provided in advance
- Finalize 12-Year Review Report — early 2013

Booster pumps on the off-loader at the Hamilton Wetland Restoration Project

12-Year Review Process Summary Report

Will include:

- Read-ahead materials
- Issues raised by stakeholders
- Additional analysis
- Recommendations for the future

Thank You!

Montezuma Wetlands Restoration Project

Valero Refining Company Dredging Costs

Permittee	Valero Refining Company
Typical Dredging Frequency	4 to 5 times per year
Typical Dredging Method	Clamshell and knock-down
Typical Volume Dredged	10,000-20,000 cy per event
Disposal/Placement Site(s)	MWRP, HWRP, Winter Island, SF-9, SF-11, SF-DODS
Pre-Construction	Approximately $80,000 for Tier III sediment testing every three years
Mobilization/ Demobilization	Included in dredging price
Dredging (Includes dredging, transport, tipping fees, and mobilization/demobilization)	$13/cy - $27/cy plus stand-by/demurrage ($0-$100,000 per event)
Placement	Included in dredging price
Internal costs	Report preparation (including surveys, volume calculations, pre- and post- dredge event reports to DMMO, dredge operation plan): $10,000 per event
Overall Costs	• One 15,000 cy event: $200,000-$500,000 • Annually (4 events/60,000 cy): $820,000-$1,600,000
Reported Cost “Driver(s)”	• Distance to SF-DODS and double-handling costs for upland sites • Out-of-Bay disposal increases duration of dredge event
What would you change?	• No turbidity study requirement for knockdowns • Need more out-of-Bay options • Consider in-Bay placement of clean sediment at dispersive locations as “beneficial reuse” relative to sediment deficit issues
Other comments?	• DMMO permit process has improved significantly • High cost of out-of-Bay placement is not justified in situations where in-Bay placement indicates no measurable negative environmental effects

City of Martinez Dredging Costs

Permittee	City of Martinez
Typical Dredging Frequency	3 to 4 years
Typical Dredging Method	Hydraulic suction dredge
Typical Volume Dredged	22,000-25,000 cy
Disposal/Placement Site(s)	City-owned upland disposal pond
Pre-Construction	Permitting and design: $235,000; pre- and post-dredge surveys: $15,000
Mobilization/ Demobilization	$75,000
Dredging and Placement	$175,000 (contract cost: $8/cy; total project cost: $22/cy)
Overall Costs	Total project budget: $500,000
Reported Cost "Driver(s)"	Permitting, testing and mitigation fees have become prohibitively expensive and permits take a long time to process
What would you change?	Since the work falls under a Nationwide permit from USACE and it seems the agencies want to promote upland disposal, the City would like to see the permits issued "over-the counter" without extensive studies each episode.
Other comments?	• The City has performed regular maintenance dredging utilizing our upland disposal ponds since the marina was constructed in the early 1960s. • Permit conditions have been very similar, with frequently only the date and dredge amounts changing. • A very limited number of dredging contractors bid our projects. • Maintenance of the disposal ponds between dredging episodes has become an issue because of the possibility habitat developing. • Finding a home (disposal site) for the dredged sediment from the settling ponds continues to be an issue.

LONG TERM MANAGEMENT STRATEGY

LTMS 12-Year Review
Costs and Contracting Meeting

MEETING HIGHLIGHTS
San Francisco Bay Conservation and Development Commission
McAteer Petris Conference Room, 50 California Street, 26th Floor, San Francisco
Tuesday, September 11, 2012, 9:00 AM to 12:30 PM

INTRODUCTION

MEETING ATTENDEES
Please email Katie Chamberlin for a scanned copy of the meeting sign-in sheet.

MEETING MATERIALS
The Background Information Document, meeting agenda, and meeting minutes are available at http://www.spn.usace.army.mil/ltms/ltms_program_review.html.

MEETING PURPOSE
Share relevant information on costs and contracting and identify opportunities for the dredging community to reduce costs and improve contracting processes.

Welcome, Introductions, and Purpose – Presented by Larry Goldzband and Brenda Goeden (San Francisco Bay Conservation and Development Commission [BCDC])

Larry Goldzband welcomed meeting participants, and Brenda Goeden presented an overview of the Long Term Management Strategy Program for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) program 12-year review process that began on March 29, 2012. The 12-year review process involves LTMS agencies analyzing 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 suggested by stakeholders) culminating with a summary report. This process, the summary report, and any recommendations resulting from stakeholder meetings will form the basis for discussing whether changes to the program may be needed in the future. At the March 29 meeting, stakeholders identified beneficial reuse, costs and contracting, and policy and strategy development as the three most important topics for future 12-year review process meetings. The policy and strategy development meeting is scheduled for November 20, 2012.

Contracting Issues

This portion of the meeting consisted of the two presentations described below. The discussion period addressed questions on both presentations. The presentations are available at http://www.spn.usace.army.mil/ltms/LTMS_docs/Costs_and_Contacting_Meeting/Presentation.pdf.

Value Engineering Study and Concepts Relevant to Any Dredger – Presented by Jessie Burton Evans (U.S. Army Corps of Engineers [USACE])

Jessie Burton Evans presented the recommendations for improving contracting efficiency identified during the USACE's 2011 Value Engineering (VE) study that also have relevance to all dredgers (not just the USACE). The executive summary of the VE study is available in the Background Information Document at: http://www.spn.usace.army.mil/ltms/LTMS_docs/Costs_and_Contacting_Meeting/Background%20Info.pdf. A total of 26 concepts for improving contracting efficiency were identified during the VE study. Jessie Burton Evans focused her presentation on those that have relevance to non-USACE dredgers, including:

- Have permits in-hand prior to contracting and include them in the solicitation package.
- Include an array of placement sites in permits and contracts.
- Develop multi-year permits.
- Consolidate similar projects for contracts.
- Develop a separate beneficial reuse contract.
- Begin dredging as soon as the environmental work window opens.
- Dredge more volume, less frequently (i.e., dredge the whole project in one episode versus multiple small episodes).
- Use knockdowns or advanced maintenance dredging where appropriate.

Implementing Contracting Efficiencies – Presented by Len Cardoza (Weston Solutions, Inc.)

Len Cardoza further discussed the applicability of the methods for achieving contracting efficiencies as identified in the VE study to non-USACE dredgers. Dredged material management planning cannot be completed on an annual basis and must take into consideration site availability, capacities, access issues, and distance. Len stressed the importance of determining dredging needs early and recommended pre-solicitation coordination with the dredging industry. Matching a site's capacity with anticipated dredge volumes is a critical element in dredged material placement planning; handling/rehandling, monitoring, and disposition are also important to plan for in advance. The contractor's mobilization and demobilization costs can be reduced if dredging project timing is certain; dredgers can potentially reduce costs if they have the confidence that their equipment will be used. The more that a project dredges, the lower the cost is per cubic yard.

Public comments pertaining to the two contracting presentations included:

- Ellen Johnck (Independent) asked if the USACE is planning to identify which recommendations they are moving forward with as part of the 12-year review process. Jessie Burton Evans noted that the USACE will pursue a group effort in order to identify the recommendations from the VE study.
- Lieutenant Colonel John Baker (USACE) noted that he visited the Portland District, which provides the government dredges for other districts' use. The Portland District announces the federal dredging schedule to all nearby ports to allow non-USACE dredging projects to capitalize from the presence of the dredge. He asked whether this process has been done in the Bay Area. Oriana Duranczyk (The Dutra Group [Dutra]) added that she has seen similar instances in Coos Bay, Oregon. Jessie Burton Evans responded that it has been done for shallower draft projects in the Bay Area, but reductions in the federal budget have decreased the frequency of this coordination during recent projects.
- Jim McGrath (BCDC Commissioner and San Francisco Bay Regional Water Quality Control Board [Water Board] member) noted that while it is an interesting concept, the two systems are very different. The Columbia River is sandy and therefore does not have the same sediment quality issues in terms of potential contaminants. The Bay Area also has limits at certain in-Bay disposal

sites. There may not be as many opportunities to work side-by-side as there is in the Portland District. Jessie Burton Evans noted that the Project Coordination Work Group tracks the timing of Bay Area dredging projects and the LTMS tries to develop the connections that could potentially lead to a relationship like that between the Portland District and nearby ports. Al Paniccia (USACE) added that the USACE tries to plan projects a year or more in advance, but federal budget uncertainties have complicated the ability to carry out early coordination efforts.

- Jay Ach (Port of San Francisco) noted that listening to the VE study outcomes is interesting, because the Port of San Francisco has been planning and strategizing similarly. Most of the Port of San Francisco's permits are issued for a 10-year period, but the Port is still required to obtain episodic approvals for sediment characterization. The Port of San Francisco's dredging contracts include unit prices for placement at in-Bay and upland sites, which works well because both the Port of San Francisco and the contractor have certainty on costs. Between 200,000 and 300,000 cubic yards (cy) of material are dredged from the Port of San Francisco annually; Jay Ach noted that he strives to balance the volumes annually so that annual budget are relatively consistent. He noted that costs have increased and, based on his 5- and 10-year cost projections, will continue to increase over time. The Port of San Francisco spends more than $3 million annually on dredging and is expected to spend more than $5 million annually in another 5 years. The biggest driver of the cost increase is the requirement to place dredged material in upland placement sites. He added that disposal costs at SF-11 are generally $11/cy, compared to $22/cy at the San Francisco Deep Ocean Disposal Site (SFDODS), and $44/cy at upland beneficial reuse sites. These high costs mean that the Port of San Francisco may need to stop maintaining berths, which needs to be a part of this dialogue.
- Jim Haussener (California Marine Affairs and Navigation Conference) noted that the Golden Gate Bridge Highway and Transportation District encountered resistance because they went to SFDODS instead of waiting for certainty that the offloader would be available to use the Hamilton Wetlands Restoration Site.
- Ellen Johnck endorsed Lieutenant Colonel Baker's idea and noted that it will require a lot of coordination as well as the dredging community's ability to overcome uncertainties.
- Doug Lipton (Lipton Environmental) clarified that Montezuma's costs are not more than $40/cy unless the material is contaminated. Costs range from $22 to $28/cy, including dredging and transport, which is just a few dollars more than SFDODS and with more competition, it could be even less.
- Hugh Davis (Marin County Flood Control District) asked about the length of time required to obtain permit approvals. Brenda Goeden responded that permits are generally required from the USACE, San Francisco Bay Water Board, BCDC, and California State Lands Commission. All dredging projects go through the DMMO, which can still take some time. Timing depends on the completeness of applications. The USACE generally advises that permit approval could take up to a year but that is not always necessary. If permits are in place, only an episodic approval is required (in which case, approval can happen relatively quickly).
- Amy Hutzel (California Coastal Conservancy [CCC]) asked about a past instance where a USACE contract allowed for both an in-Bay and upland option. She added that the alternative transfer facility for Bel Marin Keys could be a cost savings mechanism. Al Paniccia responded that maintenance dredging of the Oakland Harbor is being advertised with alternative disposal and placement option schedules to give contractors an opportunity to balance costs.

Cost Issues

Regional Dredging Cost Comparison – Presented by Al Paniccia

Al Paniccia first presented information on the USACE-contract dredging costs throughout the country, including mobilization and demobilization and excluding the cost of construction of upland placement sites. In order to better understand the reasons for the regional differences, the USACE must delve deeper into the specific details of projects each year. Al Paniccia noted that the charts have been updated since the Background Information Document was distributed. The revised figures are now included in the Background Information Document available at: http://www.spn.usace.army.mil/ltms/LTMS_docs/Costs_and_Contacting_Meeting/Background%20Info.pdf. Because the practices and requirements in the Bay Area are more stringent, dredging here is more costly.

Al Paniccia then presented information on the government hopper dredging costs throughout the country. The USACE pays the Portland District a daily rate inclusive of operating and fuel costs as well as a capital recovery factor.

Public comments pertaining to this presentation included:

- Ellen Johnck asked if there is still a restriction on how many days the USACE can use their hopper dredge. Jessie Burton Evans noted that there is a restriction in place for the dredges located on the East and Gulf coasts, but the *Essayons* and *Yaquina*, located on the West Coast, have no restrictions. They are maintained annually and, therefore, do not operate 365 days a year. In most cases, a project incurs costs associated with mobilizing the dredge from its previous project and not the demobilization, but in some cases, both could be incurred if an unnecessary or ineffective transit pattern is used.
- Lieutenant Colonel Baker explained that the two dredges on the West Coast are used for maintaining U.S. Navy access; however, they are used for other purposes when available to maximize their utility.

Case Studies: Hamilton and Middle Harbor – Presented by Al Paniccia

Al Paniccia presented the Hamilton Wetlands Restoration Project (HWRP) and Middle Harbor Enhancement Area (MHEA) cost tables. Specific to the HWRP, the project totaled $238.2 million, with overall dredging and placement costing $29.73/cy and the overall project cost costing $42.31/cy. The MHEA project was entirely paid for by the Port of Oakland's 50-Foot Deepening Project (50-Ft Project), and had a total cost of $66.8 million, with overall dredging and placement costing $5.70/cy and the overall project costing $11.52/cy. The placement phases of these projects are over, however neither project is complete.

Public comments pertaining to this presentation included:

- Jim McGrath noted that he appreciates the detail on the costs for both the HWRP and MHEA.
- Brian Ross (U.S. Environmental Protection Agency) clarified that the costs associated with the offloader and pipeline were shared between the 50-Ft Project and the HWRP.
- Jim McGrath suggested comparing the habitat enhancement value of MHEA to the HWRP on a cy/acre basis. Were the costs associated with the HWRP comparable to other habitat restoration projects or higher? Doug Lipton added that we need to know how many acres of habitat were restored and the habitat types and species recovered at the HWRP to understand the net benefit of the project. Al Paniccia responded that $238.2 million is the final cost for the HWRP, and the total habitat restored was 998 acres.

- Amy Hutzel noted that comparing costs is helpful, but it is important to understand that costs will vary based on a given site. Subsided sites will be more costly due to the need to construct berms.
- Beth Huning (San Francisco Bay Joint Venture) agreed and noted that the cost of carrying out habitat restoration will also vary depending on project sponsors.
- Bruce Wolfe (San Francisco Bay Water Board) noted that mitigation banks in the Bay Area are charging as much as $500,000/acre. The costs per acre for the MHEA and HWRP were $300,000 and $330,000, respectively.
- Tom Kendall (USACE) noted that assessments of habitat restoration costs have shown that costs are nearly always higher on the west coast.

Stakeholder Perspectives on Costs and Contracting Panel – Including Patrick Royce (Ahnta Construction), Jay Ach, Anne Whittington (Port of Oakland), Oriana Duranczyk (Dutra), and John Lazorik (Valero Benicia Refinery)

Jessie Burton Evans introduced the panel members and noted that they were provided a list of questions in advance of the meeting to provide feedback on. Due to the interactive nature of the panel, the following paragraphs summarize both panel members' responses to questions and audience commentary.

Patrick Royce introduced his firm, Ahtna Construction, as the beneficial reuse contractor for the MHEA. Ahtna Construction is following the USACE-designed topography that will result in a series of submerged islands in the MHEA eventually envisioned to be home to eelgrass. Ahtna Construction is dredging material from a borrow area and placing it in layers to shape the topography and form submerged islands. To minimize turbidity and increase the accuracy of appropriately placing the material, Ahnta Construction created a system that allows for the material to be placed as fast as it is dredged without creating mud waves by placing the sediment in 6- to 12-inch lifts. The equipment can disperse sediment while moving both forwards and backwards. Patrick noted that the cost for constructing this piece of equipment could potentially have been lower for the USACE if his company knew that it would be used on other projects in the Bay Area. The dredge drafts about 18 inches of water and must be coordinated with the tides; depending on the placement specifics of a project, the dredge could potentially be used for feeder beaches or mudflat projects. Patrick noted that it can be cost prohibitive to bring a piece of equipment to a region for a single project; if there is certainly that other specific projects would be constructed, dredging and beneficial reuse contractors could ensure that equipment is available in the area, thereby reducing costs.

Anne Whittington introduced herself an environmental manager at the Port of Oakland and noted that the Port of Oakland has similar issues as the Port of San Francisco (previously described by Jay Ach). The Port of Oakland dredges about 100,000 cy annually and is already implementing a number of the recommendations from the VE study. The majority of the Port of Oakland's recent budget has been designated for installation of shore power for cargo vessels, which is just about complete. Anne Whittington noted that coordinating with other dredgers is a great idea in theory, but she is not sure whether it would work in practice due to the varying requirements of specific dredgers. Nonetheless, the Port of Oakland will continue to evaluate opportunities to coordinate with others, including the USACE.

Brian Ross noted that Ports of Oakland or San Francisco have multiple facilities that require dredging, which could allow for more flexibility in implementing contracting efficiency recommendations from the VE study. He asked whether dredgers with a single dredging location would have the same benefits and whether sharing a dredging contractor would be worth trying. Anne Whittington responded that smaller projects may not have long-term permits in place. She added that the Port of Oakland rarely has material that is unsuitable for in-Bay disposal. The Port of Oakland would be glad to share mobilization and demobilization costs with another dredger, but they would generally want their dredging to be conducted first to ensure that dredging is completed within the construction window. Jay Ach added that he feels the

opportunities for small dredgers to partner with ports are limited due to the different size of equipment generally used. He noted that there could be opportunities for smaller dredgers to group together to complete several projects.

Oriana Duranczyk introduced herself as a project manager with Dutra. She currently manages project start-up and equipment utilization production and cost tracking for Bay Area projects. She noted that the main cost drivers for dredging and dredged material placement projects in the Bay Area are distance to sites and the need to rehandle material. Bay Area dredging projects are hampered by the fact that so many of the upland beneficial reuse sites are far away, though dredging contractors would rather take material to upland beneficial reuse sites than to SFDODS due to weather and other logistical constraints. The Port of San Francisco has some of Dutra's most competitive pricing because of the contracting efficiencies in place with their existing contracts. For example, Dutra is able to predict project timing in advance and the Port of San Francisco requests pricing in the spring rather than in the fall. The Port of Oakland has a similar situation but having more ship traffic to deal with complicates matters more. Having a project backlog firmly committed to in advance is a huge benefit to Dutra, so combined (and early planned) projects could receive more competitive pricing than last minute jobs. Oriana noted that Dutra rarely dredges in June, so another opportunity to reduce costs would be if projects were ready to dredge earlier in the season. Lieutenant Colonel Baker added that the Portland District sent out draft plans and specifications and a rough estimate of the work that is needed in advance of the official bidding process to allow dredging contractors to have an understanding of what to expect.

John Lazorik introduced himself as an engineer with the Valero Benicia Refinery. Because the refinery is open 24 hours per day, 365 days a year, and 80 percent of its crude arrives by vessel, maintenance of its dock is critical. Typically, a vessel is docked at the refinery about every 2 days. The refinery's location makes it prone to sedimentation, particulary in the spring outside the work windows; therefore, dredging is conducted between 4 and 5 times a year. In 2010, in an attempt to reduce the need to dredge so frequently the area around the dock was advanced maintenance dredged to -42 feet mean lower low water (MLLW). Although it had been previously maintained at -40 feet MLLW, it appeared that the deeper depths filled at a faster rate that the shallower depths. Oriana Duranczyk noted that the ability for advanced maintenance dredging to result in reduced dredging volumes depends on the specifics of a given site. The Valero Benicia Refinery is permitted to dredge 80,000 cy/year and currently dredges 65,000 cy/year. When dredging is conducted within the work window, dredged material is disposed of at SF-9, and when dredging is conducted outside the work window, dredged material is disposed of at SF-11. Vessels bound for the refinery face several challenges after passing under the Golden Gate Bridge; they must cross over the Pinole Shoal and under the Carquinez Bridge. The dock's minimum operating depth is -35 feet MLLW, and the Valero Benicia Refinery conducts monthly surveys to monitor the need for a dredge event. If the survey indicates the need for a dredge event, dredging must occur within 5 to 10 days, otherwise vessels must "lighter" at another facility or anchor until dredging is complete. John noted that a vessel waiting to dock costs Valero $20,000 to $50,000 per day. The Valero Benicia Refinery works closely with the DMMO to approve numerous events. The primary constraints to using beneficial reuse sites instead of disposing of material in-Bay are logistics and cost. A 15,000-cy dredge event can be completed in 2 days if an in-Bay disposal site is used, whereas a 2012 dredge event that placed material at Montezuma required 4 days due to the increased distance from the site. With the dock utilization at 50 percent, creating a 2-day window in which dredging can be completed is not difficult, but creating a 4-day window is very difficult and costly. Placing material out-of-Bay essentially doubles the costs of dredging for the Valero Benicia Refinery. In addition, there is no alternative placement option that would more similarly represent natural conditions than SF-9. The Valero Benicia Refinery has tried to coordinate

dredging events with Amports and was successful once, but due to the short lead time, coordinating with other dredgers is difficult.

Brian Ross asked the panelists about the viability of a contracting mechanism that would require the use of additional scows to make barging material to Montezuma a faster process and more comparable to in-Bay disposal. John Lazorik responded that if the Valero Benicia Refinery used two clamshells dredges, barging material to Montezuma would still be a 4-day dredge event. Oriana confirmed that the offloading is the constraint at Montezuma as compared to disposing in-Bay.

Dave Doak (USACE) asked whether the Valero Benicia Refinery has to sample its material annually and, if so, how long it takes to get a suitability determination. John Lazorik responded that the Valero Benicia Refinery completes full Tier III testing every 3 years. The results are not tied directly to any one event but constitute representative samples of the material likely to be dredged over a 3-year period. Jay Ach responded that the Port of San Francisco generally samples all the dredging units at various berths. While there are patterns in the test results, they do not normally negate the need for testing. As such, the Port of San Francisco does not see a lot of benefit from a Tier III exemption. Anne Whittington responded that the Port of Oakland completes Tier III testing every 2 or 3 years.

Doug Lipton suggested that it is time to begin discussing the concept of issuing mitigation credits for projects that place material at beneficial reuse sites in lieu of in-Bay disposal. The costs for beneficial reuse projects can change depending upon when a dredging contractor is bidding the job. It is possible that smaller projects could obtain lower costs if beneficial reuse site operators can be assured that other projects would be placing material at the site at around the same time.

Tom Kendall asked whether the Port of Oakland has multi-year contracts with dredging contractors. Anne Whittington responded that the Port of Oakland has an on-call contract that sets up the contracting structure in advance but allows for the volumes and costs to be specified each year. The on-call contract does not guarantee work, but the dredging contractors know what the Port of Oakland's leases require and are familiar with the sedimentation patterns at various berths. The Port of Oakland has tried having on-call contracts with a single and multiple dredging contractors, and the preferable scenario is to have the contract with a single dredger so that the contractor can expect work and provide lower prices. Jay Ach noted that the Port of San Francisco's on-call contract is for 5 years and includes actual costs for the first year of the contract and an estimate (but not commitment) of future work. Oriana added that if the on-call contract is with multiple contractors, it removes the certainty for contractors and thereby mutes the benefit of the contracting arrangement. Lieutenant Colonel Baker noted that there is also a concern that if on-call contracts are with a single dredging contractor, competition could leave the region.

Dave Doak asked the port staff panel members whether the ports would consider partnering with each other or the refineries to invest in helping establish upland beneficial reuse sites. Anne Whittington and Jay Ach responded that they do not feel that the ports would invest in establishing upland beneficial reuse sites since Montezuma is already operating. It makes more sense for the ports to let others do that, like the USACE or beneficial reuse site proponents. Jim Haussener noted that one of the reasons that Montezuma was established was because there was a large dredging project at the Port of Oakland. The Port of Oakland advanced the funding for the project and later received reduced pricing for using the site. Lieutenant Colonel Baker noted that incentivizing facilitating beneficial reuse should be a topic of discussion at the upcoming policy and strategy development meeting.

Next Steps

Brenda Goeden noted that the next meeting is scheduled for November 20, 2012, after which the LTMS agencies plan to step back, review the information collected, and finalize the 12-year review process summary report in early 2013. There will be an opportunity for public comment on the draft report once it is released. The long-awaited DMMO database, which contains USACE and non-USACE dredging projects' sediment data, is up and available for beta-testing; the USACE is currently working to get the password protection issues resolved. Brenda encouraged members of the public to provide feedback on the database. Thus far, the DMMO has been able to get about 10 years' worth of data entered, and they are expected that users of the site will soon be able to upload project-specific information on their own.