Final Value Engineering Study Report

USACE San Francisco District Navigation Program

July 2011

Prepared by

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In association with

Noble Consultants, Inc.

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Date: July 8, 2011

To: Scott Noble, Noble Consultants

Subject: Final VE Study Report
USACE San Francisco District Navigation Program

Dear Scott:

Value Management Strategies, Inc. is pleased to transmit this Final VE Study Report for the referenced project. This report summarizes the events of the study conducted May 16 through 20, 2011.

It was a pleasure working with Noble Consultants and the USACE San Francisco District, and we look forward to the next VE study. If you have any questions or comments concerning this report, please contact me at (678) 488-4287 or to the email address above.

Sincerely,

VALUE MANAGEMENT STRATEGIES, INC.

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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

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Syed I. Burney	USACE SPN	Value Engineering Officer

Key Project Contacts

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

VE ALTERNATIVES

The results of this study are presented as individual alternatives to the baseline concept. Each alternative consists of a summary of the baseline concept, a description of the suggested change, a listing of its advantages and disadvantages, discussion of project management considerations and assumptions (if applicable), and a brief narrative comparing the baseline design with the alternative. Sketches and calculations are also presented where applicable. A complete listing of all of the ideas generated by the VE team and their ratings are found in the *Idea Evaluation* section of this report.

It is noted the alternatives preceded by an asterisk (*) are deemed by the VE team as the most critical for deliberation.

Summary of VE Alternatives

Developed Alternative Nos. and Descriptions
*IC-1 Consolidate contracts
IC-3 Alternative contracting methods
*IC-4 Use an array of disposal sites rather than single-source disposal site
IC-7 Reduce size of dredging contracts
IC-12 Use separate beneficial reuse contracts
IC-13 Use separate on-call contracts
*IC-15 Increase communication with contractors
*IC-25 Focus market research appropriately to improve competition
*ICP-1 Get individual contracts out on time
*ICP-6 Maintain PDT continuity
ICP-8 Review of contract language
ICP-9 Have all permitting as part of solicitation package
ICP-11 First quarter project team meeting
*ICP-14 Use multi-year EAs
ICP-15 Expand Consistency Determinations (CDs) to 10 years
*ICP-18 Decouple environmental review from engineering/contracting process
ICP-22: Periodic audit workshop related to regulatory (permit) requirements
ICP-24 Move O&M dredging to one branch
ICP-29 Minimum dig face
*ICP-30 Reduce internal design/specification review period
ICP-32 Expand participants of annual program AAR
ICP-33 Have construction assume responsibility of AARs
ICP-35 Improve coordination between contract package creation and construction

Developed Alternative Nos. and Descriptions
ICP-39 Fund O&M program rather than individual projects
*EE-1 Dredge deeper less frequently
*EE-6 Identify new in-Bay beneficial reuse opportunities

VE ALTERNATIVE IC-1

Contract consolidation

Description of Baseline Concept: Currently, most dredging projects within the District's O&M program are pursued as individual dredging projects. Consequently, they come out to the dredging industry as individual and relatively small dredging projects. Non-local dredging contractors do not typically pursue these projects due to their inability to overcome their mobilization disadvantage on such a small overall contract amount and they cannot be comfortable that even if they try to 'buy their way into the market' on one job they will be successful winning succeeding projects. Thus, the District realizes very limited competition on their overall O&M dredging program, which may result in increased costs and schedule conflicts due to the limited pool of equipment available to perform the work within the allowable work period.

Description of Alternative Concept: This alternative encompasses several related concepts that all have the goal of increasing competition by increasing the size of the advertised dredging contract in order to entice more contractors to pursue the project.

The following concepts are embodied in the VE alternative:

- IC-1: Consolidate similar projects under a smaller number of contracts.
- IC-2: Consolidate non-federal projects by balancing across numerous projects.
- IC-8: Increase size of contracts.
- IC-9: Issue one contract for all O&M.
- IC-10: Use multi-year contracts.
- IC-33: Use a prime-contractor-type contract.

Advantages:

- By increasing competition the District would anticipate a commensurate reduction in overall dredging program costs.
- Increased contract size will enable new contractors to overcome their mobilization disadvantage by amortizing mobilization costs over a greater contract value.
- Use of multi-year contracts is an easy way to increase the overall contract value which results in attracting greater contractor interest and resulting competition.
- By consolidating projects the District should be able to more cost-effectively utilize beneficial reuse by including offloading services within the dredging contract (similar to Hart-Miller Island and Poplar Island) allowing the contractor to efficiently utilize the offloader rather than having substantial downtime associated with a 'multi-user available' offloader.
- Non-federal projects can time their projects with the District's O&M contracts in order to realize cost benefits resulting from - mobilization and the economy of scale afforded by a larger contract; but must still pay their own contractors.
- Promotes a cooperative venture where the District works with owner(s) to mutually agree on timing of government and private work, to fit the government cost – and a better fit for the private user cost.
- Other non-federal projects (not included in this contract) would be able to negotiate separately with the dredging contractor for offloading services, if desired.
- Reducing the number of contracts reduces District costs for design and construction management.

VE ALTERNATIVE IC-1

Contract consolidation

Disadvantages:

- May reduce opportunities for small business concerns in some instances.
- Non-performance issues affect multiple projects at once.
- Has a negative impact on locally-based dredging contractors.
- Increased complication in project development if non-federal projects participate.
- Need to monitor overall contract size so that contract does not grow to a size that exceeds contractor bonding and performance capability and in turn results in a reduction in competition.

Discussion: This alternative hopes to garner more contractor interest by consolidating multiple dredging contracts under one (or more) larger dredging contracts. This approach can be further enhanced by making the contract span multiple years by having the government exercise yearly options if the work is being satisfactorily accomplished. This concept was implemented at the District approximately five years ago for the Richmond and Oakland federal O&M dredging and did attract significantly more contractor interest. Both Weeks Marine and Great Lakes Dredge & Dock bid on the project, in addition to local companies Dutra and Manson, with Great Lakes ultimately being selected through a RFP procurement method. Implementation of the contract was not successful due to a severe under run in dredging at Richmond and complications resulting from the commencement of dredging for the Oakland (-)50-foot Deepening Project. However, the goals of increased competition and reduced project costs were realized as a result of this approach.

It is noted this only works if over the long term, the project(s) continue to be dredged at the existing level or greater. This approach will not be successful if the total number of dredging projects- especially the larger projects – are slowly removed from the public venue.

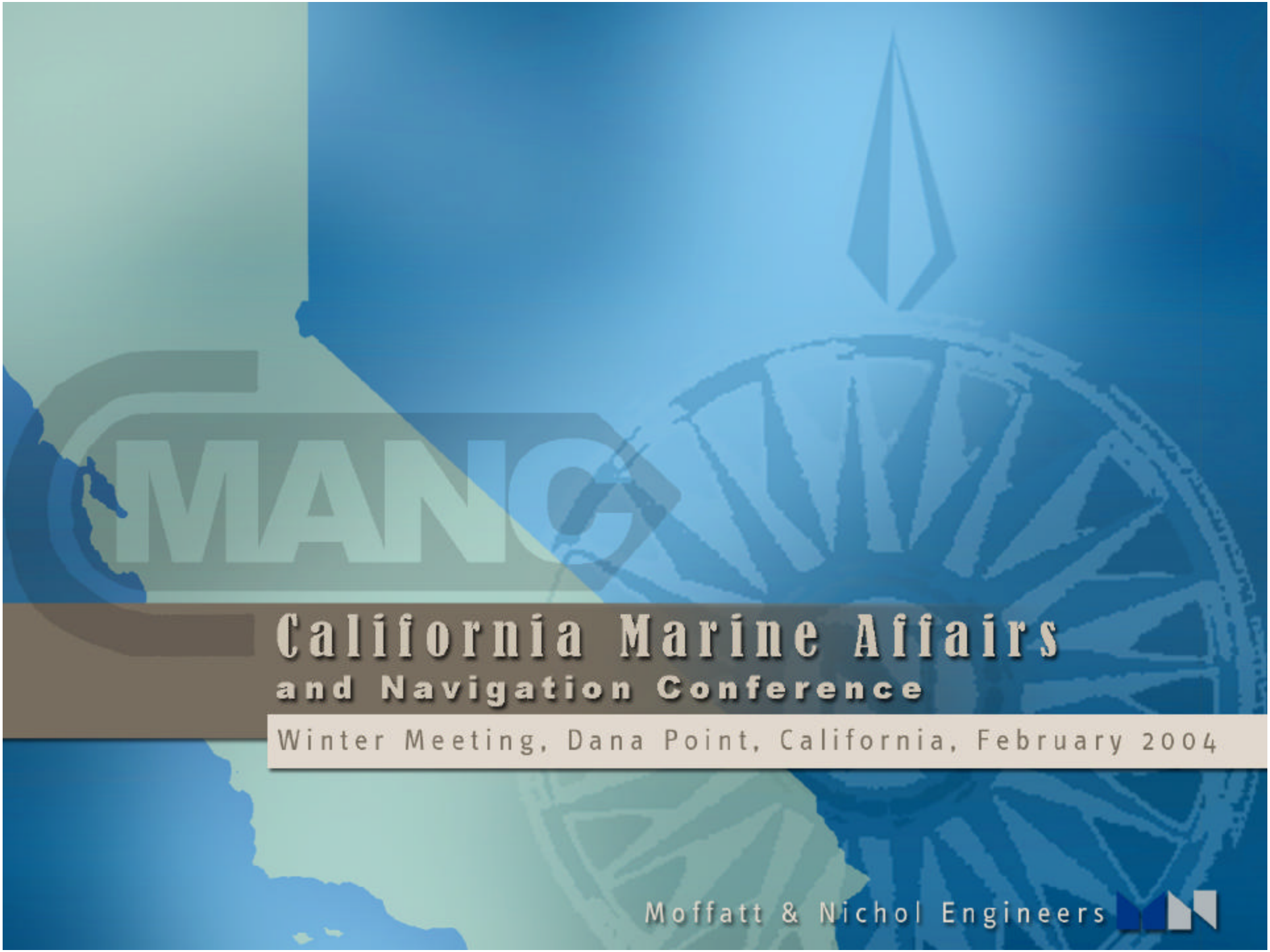
Project Management Considerations: Overall project management and contract management demands should be reduced by administering fewer contracts resulting in additional cost savings for the District.

See the attached Moffatt and Nichol PowerPoint presentation presented to CMANC Winter Meeting at Dana Point, California, 2004. Although seven years old, the data are still relevant for the purposes of this VE study and the correlation between the quantity of bidders and pricing.

Cost / Quality Impact: As noted in the PowerPoint presentation below, as the number of bids increase, lower overall costs are achieved relative to the government estimate. Savings ranged between 2.18% for two bids to as high as 16.2% for four bids. Although these reductions cannot be guaranteed nor expected every bidding period, they are indicative of the potential savings increased competition can bear on a project.

Assumptions:

- The District can consolidate two or more dredging projects into one contract consistent with current operational guidelines.
- It is assumed that increasing contract size in turn increases competition which in turn decreases overall project costs.


MANC
California Marine Affairs
and Navigation Conference
Winter Meeting, Dana Point, California, February 2004
Moffatt & Nichol Engineers

We All Know:

Less Bids = Higher Price (generally)

What We Don't Know Is:

How Much?

Data Set

- Navigation Data Center
- USACE Contract Awards from 1992 – 2001
- 2,364 Projects
- Includes “New Work” and “O&M”
- All Districts
- Uses Government Estimates as “Baseline”

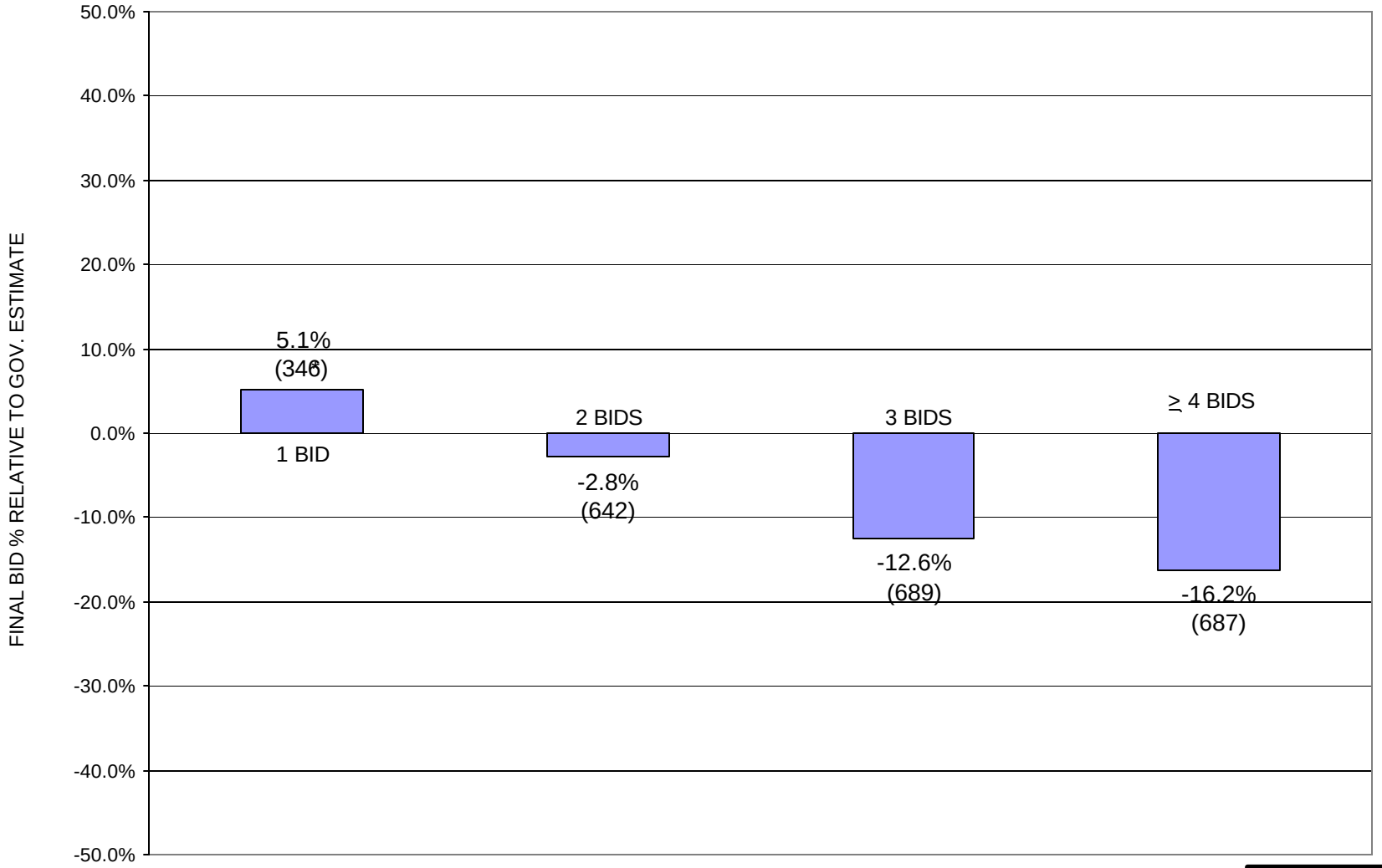
Dredge Types - Hopper

Dredge Types - Hydraulic

Dredge Types - Mechanical

DREDGING CONTRACTS AWARDED 1992-2001

BY NUMBER OF BIDS

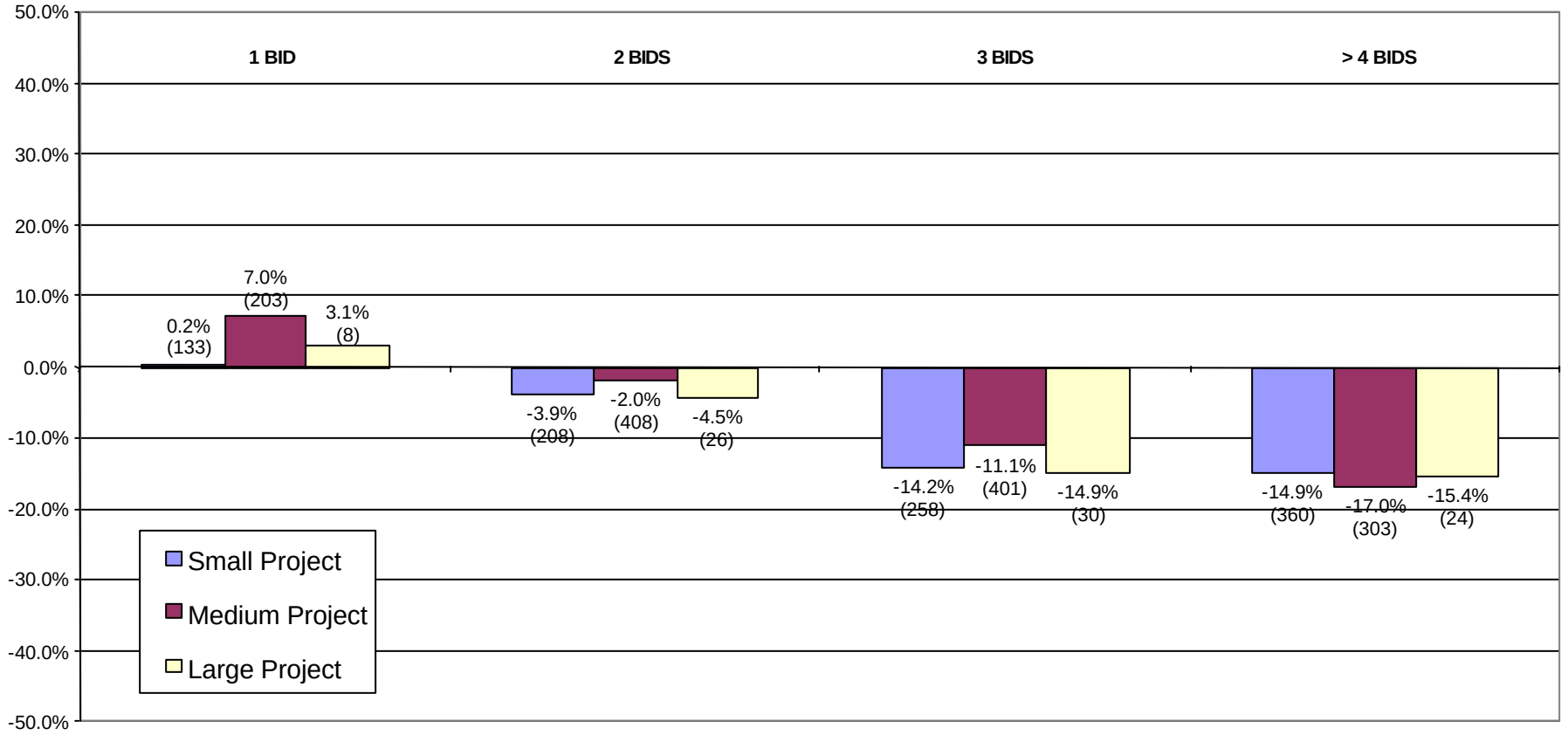


*Number in parenthesis indicates number of contracts falling into that category.

Moffatt & Nichol

DREDGING CONTRACTS AWARDED 1992-2001

BY PROJECT SIZE



Project Size

Small: Gov. Est. < $1,000,000

Medium: $1,000,000 ≤ Gov. Est. < $10,000,000

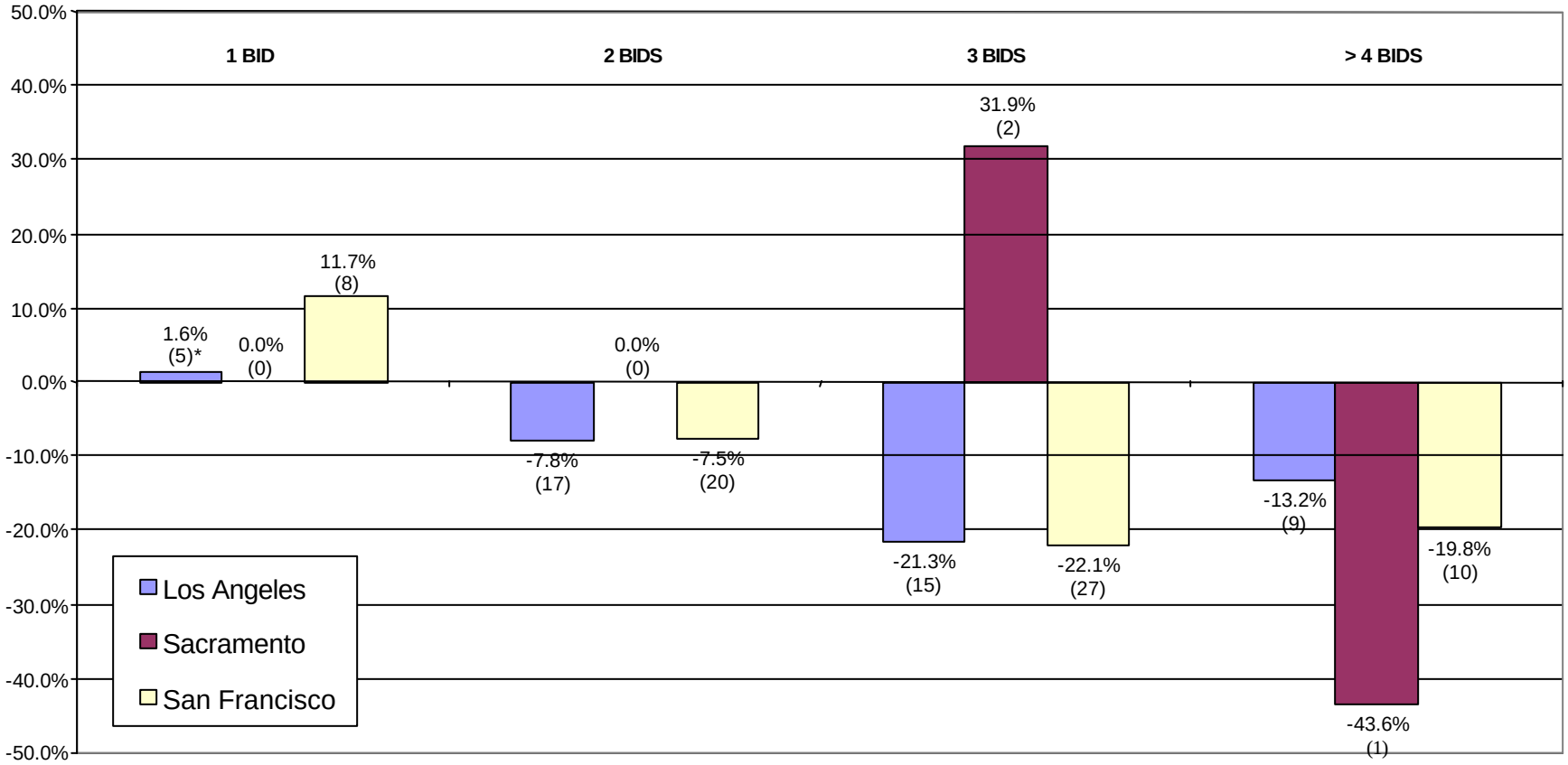
Large: $10,000,000 ≤ Gov. Est.

*Number in parenthesis indicates number of contracts falling into that category.

Moffatt & Nichol

DREDGING CONTRACTS AWARDED 1992-2001

BY DISTRICT

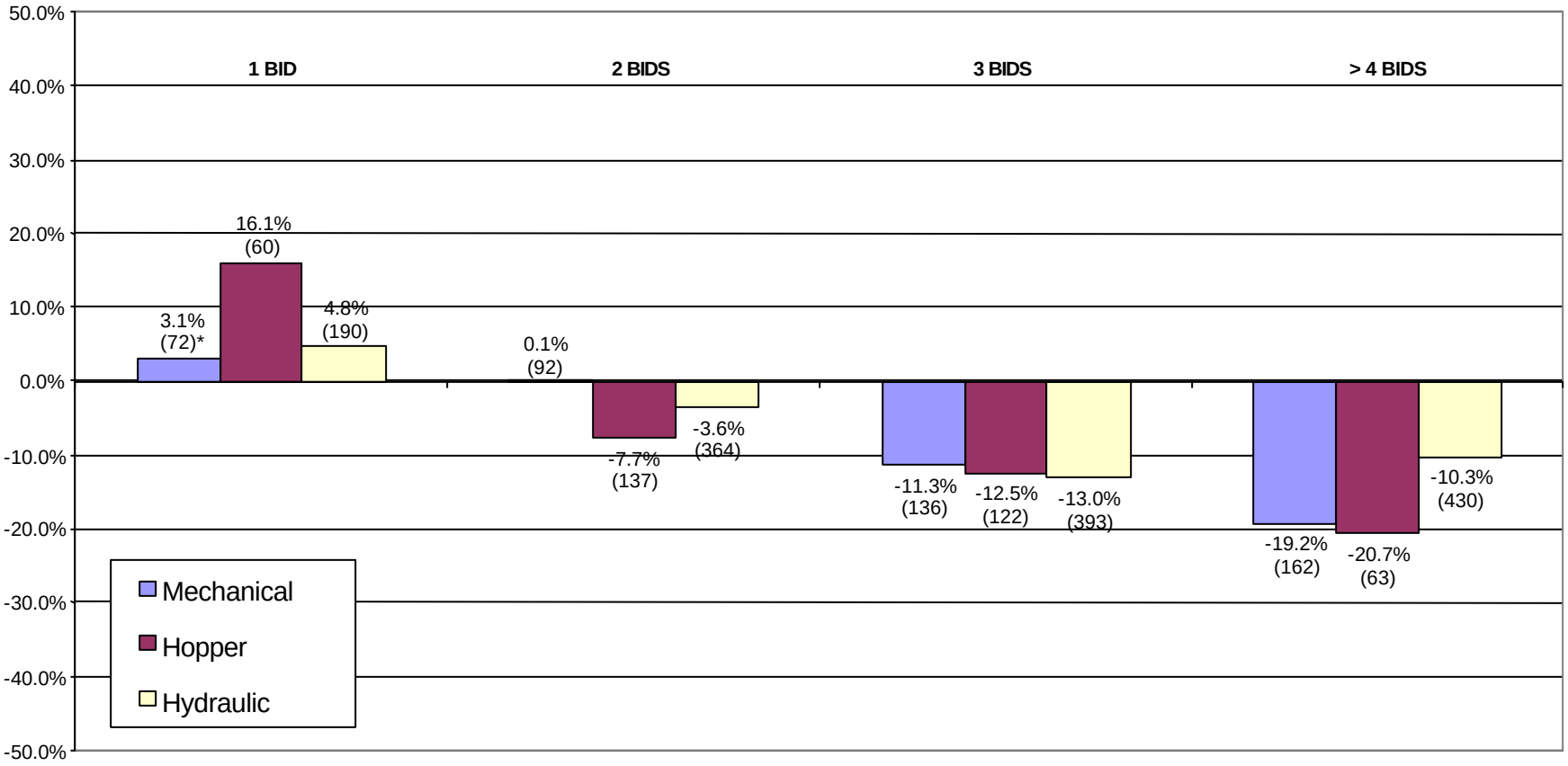


*Number in parenthesis indicates number of contracts falling into that category.

Moffatt & Nichol

DREDGING CONTRACTS AWARDED 1992-2001

BY DREDGE TYPE



*Number in parenthesis indicates number of contracts falling into that category.

Moffatt & Nichol

Methods to Increase Competition

- Advance Notification
- Adequate Bid / Mobilization / Construction Durations
- Clear & Concise Bid Documents
- Allow Maximum Flexibility of Methodology
- Multi-Year / Multi-Project Contracts
- Coordinate Timing w/Other Project Sponsors

Questions

VE ALTERNATIVE IC-4

USE an array of disposal sites rather than single-source disposal site

Description of Baseline Concept: A typical government contract for dredging is a two word concept: *Dredging and Disposal*. The disposal sites are identified in the drawings and required to be used in the contract document. The concept is to provide the bidder an equal basis for dredging estimate, and assure USACE SPN the disposal option is acceptable environmentally as well as technically.

Description of Alternative Concept: Consider implementation of dredging contracts that either identify multiple sites for disposal, or allow contractor to identify disposal site(s) with options for disposal within the contract bid.

This alternative would allow the contractor more flexibility to identify the disposal site or sites to be used and/or for USACE SPN to select the most advantageous site from among the identified sites. The sites would need to be permitted before contract release or award. The cost to use the sites is included in the bid total.

The following concept is embodied in the VE alternative:

- ICP-7: Identify Beneficial Reuse Disposal Sites in Contract.

Advantages:

- Each contractor bid is most likely to be their lowest cost bid for the project because the contractor has selected a disposal option that best fits their dredging equipment and capability to complete the project.
- Each contractor can evaluate and find beneficial reuse that someone else is willing to pay for.
- USACE SPN can receive bids for multiple sites that will help select optimal mix of sites among projects for meeting LTMS goals.

Disadvantages:

- If the contractors select the disposal or beneficial reuse sites, it would then be difficult to evaluate the entire project impact in a timely and effective manner because the disposal option is not identified, or the detailed evaluation of the site use cannot be accomplished until bids are submitted with proposed disposal site use. *It is noted this would be a moot issue should the contractor propose "permitted" disposal or beneficial reuse sites*.

Discussion: In completion of the bid process, the government must be assured, and understand the reason for use of the proposed contractor disposal option. USACE SPN must have assurance that it will be environmentally acceptable, and then the Resource agencies must confirm. USACE SPN will need to evaluate the site use and approve in terms of environmental concerns, production estimates, and equipment selection.

Conversely, if the USACE SPN contract were to identify an array of beneficial reuse or disposal sites as part of the contract mechanism/requirements, then the dredging contractors would have the opportunity to select those sites that are most advantages based on their equipment, ability-to-perform and expertise. This situation would preclude another series of approval processes to assure the contractor's selected site were in fact acceptable.

VE ALTERNATIVE IC-4

USE an array of disposal sites rather than single-source disposal site

Project Management Considerations: USACE SPN and Sponsor agencies must be able to agree on the acceptance of the disposal alternative presented by the contractor. If both agencies cannot, this approach becomes a way for agencies or USACE SPN to stop award of project. The concept must include the contractor clearance of the disposal site with agencies and USACE SPN before award.

Cost / Quality Impact: Although difficult to quantify specific savings, certainly the inclusion of several disposal sites available to the contractor allows for better scheduling and equipment usage, ultimately resulting in lower bids.

VE ALTERNATIVE IC-15

Increase communication with contractors

Description of Baseline Concept: USACE SPN does not appear to have adequate or effective communication with dredging contractors during the acquisition process.

Description of Alternative Concept: The purpose of this alternative idea is to invite contractors early on in the acquisition process by having pre-solicitation conferences and holding periodic workshops. Numerous USACE districts have increased their use of pre-solicitation conferences, which has resulted in increased competition.

The following concepts are embodied in the VE alternative:

- IC-16: Pre-solicitation conference(s) with contractors.
- IC-18: Develop and maintain contracting schedule.
- ICP-37: Workshop of dredging contractors to evaluate concerns, constraints, etc.

Advantages:

- Increases understanding of industry concepts.
- Reduces bid protest.
- Produces a better specification.
- Reduces cost to dredge by allowing contractors to plan better.
- Increases competition.
- Reduces redundancies.

Disadvantages:

- May cause delays in acquisitions process if not properly planned beforehand.

Discussion: USACE SPN communication with the contractors is performed before start of the acquisition process and after the solicitation has been advertised and solicited. USACE has annual meetings with contractors and other professionals within the Washington, D.C. area. Similar approach for annual meetings could be undertaken within the USACE SPN.

USACE SPN communication with the contractor is done through RFI, wherein contractors submit their questions to USACE SPN to clarify certain requirements which may result in amendments to the solicitation which can lead to schedule delays.

Project Management Considerations: Improved communications with contractors early on in the acquisition process will produce a better product/project. This can include annual meetings with bidders (contractors) to review projects approved for bidding. Furthermore, additional means of communications could be undertaken that could include but not limited to:

- Quarterly contracting seminars.
- Periodic “brown bag” lunches to increase “face time” with USACE SPN personnel and discuss various topics at each meeting (see Alternative ICP-6 – maintain PDT continuity).
- Periodic environmental discussion panels with Sponsor agencies and the contracting community.
- Periodic workshops to discuss general concerns, constraints and improved relationships.

VE ALTERNATIVE IC-15

Increase communication with contractors

- Yearly events status meeting with the dredging community to explore new and better methodologies, lessons learned at other USACE districts, and other international results.
- Potential mentoring programs to encourage newer dredging contactors to “enter the game.”

Cost / Quality Impact: An increase in communication with the dredging community will result in a two-way-street quality improvement. For the government, better specifications and contract documents could be attained, resulting in lower/elimination of bid protests. Simultaneously, the contracting community would have a clearer understand of the work to be undertaken resulting in more favorable bids as better planning and scheduling can be undertaken.

VE ALTERNATIVE IC-25

Focus market research appropriately to improve competition

Description of Baseline Concept: Market search surveys are conducted using a "shotgun" approach to identifying the prospective contractors from SBA and/or 8(a) [The 8(a) program is SBA's effort to promote equal access for socially and economically disadvantaged individuals to participate in the business sector of the nation's economy] communities.

Description of Alternative Concept: More effort should be placed into further 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.

Advantages:

- May reduce cost if customers/users would be willing to pay for dredged material.
- Focused contractors may be more efficient and cost-effective.

Disadvantages:

- Requires more up-front investigation effort.
- May require additional training of market research question writers.

Discussion: Support of the SBA and 8(a) communities often comes with additional cost/time associated with a less well equipped or capable contractor. This alternative proposal should require market research respondents to list equipment they identify and can lease or rent. As an example, when going to the deep ocean disposal site, there are about 10 barges that can make the trip. The contracting specialist should also require respondents to provide company information such as owned equipment and past dredging construction projects, past equipment utilization, etc.

Project Management Considerations: Market survey effort may need to begin sooner and may require more funding for the research effort and should not be limited to SBA's 8(a) program but also to other smaller dredging contractors who may already have the necessary experience and equipment to perform the anticipated work within the Bay area and are willing to do business in USACE SPN's area of responsibility. The survey effort should not be limited in breadth and scope but be more encompassing to assure as much competition as possible in the near future. This could also include other larger business concerns.

Cost / Quality Impact: This alternative aggressively pursues additional dredging contractors to "enter the game," and thereby increasing the pool of qualified dredging contractors. As noted in Alternative IC-1, with a greater the number of bidders, better bid results can be expected leading to savings between 2.18% and 16.2% versus the government estimate.

VE ALTERNATIVE ICP-1

Get individual contracts out on time

Description of Baseline Concept: USACE SPN presents a yearly schedule to contractors at the beginning of each fiscal year. USACE SPN accepts schedule slips without apparent consequences.

Description of Alternative Concept: USACE SPN should put more effort into ensuring the published schedule at the beginning of each fiscal year is maintained.

Advantages:

- Ensure all projects will be funded adequately and completed within the work window.
- Contractors can better plan their work and compete for more contracts, which will defray overhead costs and provide lower bids.
- Allows Ports to better plan their cargo movements.

The following concepts are embodied in the VE alternative:

- IC-19: Complete contracts and advertize earlier.
- IC-21: Focus on end-date work window rather than start date.
- ICP-2: Provide NTP At Least 30 Days Prior To Window Opening.
- ICP-3: Award contracts earlier.
- ICP-4: Align projects in order of open work windows.

Disadvantages:

- Requires more effort on the part of the USACE SPN
- Requires a change in USACE SPN's philosophy to "do whatever is necessary" to ensure the schedule does not slip.

Discussion: USACE SPN should make all feasible adjustments to the "process for developing the plans and specs" schedule so that contracts can be awarded as early as possible. This allows more contractors to move and relocate equipment more efficiently. USACE SPN should focus more on when contracts will be completed to allow contractors more flexibility, which leads to lower costs. NTP should be issued at least 30 days prior to the start of any environmental work window to allow for earlier mobilization of equipment. Projects should be scheduled and awarded based on the schedule for when applicable work windows begin to give the contracts the greatest opportunity for completion and success. In addition, standard contracts that are repeated annually/routinely should be relatively consistent and straightforward in preparation of plans and specifications. The published schedule should be realized.

Project Management Considerations: The PM is the driver for the schedule but often lacks the authority needed to enforce direction and compliance. The PM should make better use of a project management plan to help guide PDT members.

Assumptions:

- Budget is available in a timely manner.
- IAA/DMMP/CD approved in advance.
- Schedules well thought out and realistic relative to permit/resource agency requirements.

VE ALTERNATIVE ICP-1

Get individual contracts out on time

Cost / Quality Impacts: Allowing dredging contractors the ability to properly plan their work schedule based on end dates versus start date and advertising earlier will result in lower costs and potentially shortened work durations.

VE ALTERNATIVE ICP-1

Get individual contracts out on time

FY 2011 CONTRACT DREDGING PROGRAM-COMPLETE LIST

District	Seq #	Job Status	Job Name	Advertised Date	Bid Open Date	Estimated Start Date	Estimated Stop Date	Estimated CY	Work Class	Dredge Type	Unit of Measure	Disposal Type	Dollar Range	Set Aside	Contract Type	Point of Contact	Contact Phone
San Francisco	8	A	Crescent City			3/14/11	5/16/11	27,639	M	P	Y	U	D	A	F&R	Jessica Burton Evans	415-503-6862
San Francisco	6	A	Redwood City Harbor	3/1/11	4/1/11	6/1/11		150,000	M	X	Y	X	E	N	F&R	Joel Pliskin	415-503-6736
San Francisco	1	A	Richmond Inner Harbor	2/1/11	3/3/11	6/1/11		400,000	M	B	Y	X	E	N	F&R	Peter Mull	415-503-6733
San Francisco	5	A	Richmond Outer Harbor	2/1/11	3/3/11	6/1/11		200,000	M	B	Y	X	D	N	F&R	Peter Mull	415-503-6733
San Francisco	2	A	Oakland Inner & Outer	4/4/11	5/4/11	8/1/11		500,000	M	B	Y	X	E	N	F&R	Al Paniccia	415-503-6735
San Francisco	4	A	Suisun Bay	4/1/11	5/3/11	8/1/11		175,000	M	Z	Y	X	D	N	F&R	Karen Rippey	415-503-6747
San Francisco	7	P	San Rafael	2/1/11	3/3/11	8/8/11	11/30/11	50,000	M	B	Y	O	D	A	NEG	Jessica Burton Evans	415-503-6862

VE ALTERNATIVE ICP-6

Maintain Project Delivery Team continuity

Description of Baseline Concept: The membership of USACE SPN's PDTs has been known to change regularly during the project delivery, adversely impacting the PMP.

Description of Alternative Concept: Provide for the continuity of PDT membership during the life cycle of the project to the maximum extent possible.

Advantages:

- Maintains project schedule.
- Prevents additional project costs due to "bringing new staff up to speed."
- Simplifies the complexity of the PDT by not having to recreate numerous times.
- Precludes unnecessary "repeat business" between PDT members and the construction community.
- Eliminates less than full participation and effectiveness of the PDT.
- Allows for PDT members to fully understand and participate in the entire process from cradle to grave.

Disadvantages:

- Perceived limitation of team members to take advantage of opportunities such as training and interim positions.

Discussion: PDT's are the collaborative methodology used by USACE SPN to deliver projects. Through the PDT communications with all internal and external stakeholders is developed and maintained leading to excellent and timely product delivery.

USACE SPN's Project Management Business Process provides for the concept of *one project, one team, one PM*, collectively the team and manager are responsible for the management and leadership of the project. PDT members are responsible for the completion of their portion of the project as outlined in the PMP. The ***Project Manager*** is the primary interface for the local sponsor; however, all team members may and should communicate in a timely fashion back to the PM on issues, local sponsor concerns, and circumstances of the project.

Maintaining a schedule is crucial to perform maintenance dredging due to the restrictions on when dredging may take place in San Francisco Bay and tributaries. Changes in the PDT may lead to delays in the schedule as new team members may receive their appointment after their predecessor has already left; new members need to be educated about the project, and coordination among team members may be temporarily impacted during the transition period.

Changing PDT members requires greater staff hours to be invested which leads to increased costs that are not directly put into project construction (dredging), nor anticipated when the PMP was developed.

Changes in the PDT also have a potential to negatively impact relations with the local sponsors or other key stakeholders as previous communication outcomes may be skipped or a lag in future communications may take place.

VE ALTERNATIVE ICP-6

Maintain Project Delivery Team continuity

Project Management Considerations: May conflict with personal career development, USACE SPN resource (personnel) needs, or project and program budget constraints.

As noted above, the primary POC for all matters associated with a given project is the PM and becomes the person responsible for the effective and efficient delivery of the documents and ultimately the product, i.e., the maintenance dredging contract. USACE SPN's project management cadre must assure the PM is assigned full time to the given project and support the necessary effort to ensure this takes place. Notwithstanding the known shortcoming of staff and personnel, limited experience, volume of work assigned to individuals/departments, etc., every effort should emphasize the PM's key role in the entire process and assure the PMs have not only the responsibility, but the authority to discharge their duties as effectively as possible.

See related Alternative ICP-24, Move O&M dredging to one branch.

Cost / Quality Impacts: A consistent PDT provides for better management of a given project, resulting in reduced bidding time and decreased potential for change orders once awarded. Inconsistent direction, untimely delivery of information, and lack of knowledge are avoided by establishing consistency within the management team.

VE ALTERNATIVE ICP-14

Use multi-year EAs

Description of Baseline Concept: The USACE SPN currently performs an EA for each of its dredging projects on an annual basis. Conducting an annual EA does add to the PMP time line.

Description of Alternative Concept: In November 2007 it was proposed there be a greater use of "categorical exclusion" clause within 33 CFR 230: "an Environmental Assessment is to provide information to the district commander on potential environmental effects of the proposed action and, if appropriate, its alternatives, for determining whether to prepare an EIS or a FONSI.

Another approach would be a three-year EA tied to the IAA and CD. This should not be exceedingly difficult for updating as the majority of work is annual/routine with the required update for delta changes minimal and repetitive. Updates should be completed only as needed for changes at the dredge or disposal site. This could add some flexibility into the EA process.

Advantages:

- Reduces project delivery time to ensure completing annual dredge projects within the timelines of the Biological Opinions prepared under the ESA.
- As project delivery time is reduced more funds can go towards performance of the dredging types of IAA/CD.
- Streamlines process of getting to contract award consistent with moving to multi-year contracts for less frequent dredging.

Disadvantages:

- There will be some short term effort necessary to coordinate the process with the BCDC and RWQCB.

Discussion: Using a multi-year process will reduce the time needed in any given year to deliver dredging projects during the time period dredging may take place on San Francisco Bay and Estuary.

Whether an EA is or is not performed does not relieve a project from complying with a variety of laws such as the CWA or ESA.

Currently, the San Francisco BCDC Consistency Determination for Maintenance Dredging of Federal Navigation Channels requires an annual EA as the environmental effects of each maintenance dredging project in San Francisco Bay was originally presented in 1975.

The O&M VE process conducted by the South Pacific Division in November 2007 recommended the use of the "categorical exclusion" rule from 33 CFR 230.9 as a way to similarly save time and money. That same document also recommended looking at investigating longer time periods to work maintenance dredging under the same EA documentation without major revisions or study time to document there are no changes in engineering or environment.

Project Management Considerations: This will remove one task from the critical path on the schedule and increases the potential for maintaining the schedule and completing the contract on time and/or allowing the contract to be awarded earlier.

VE ALTERNATIVE ICP-14

Use multi-year EAs

Cost / Quality Impacts: The removal of a single important task such as this from the critical path will result in the potential of not only maintaining the work schedule but of reducing end-of-work scrambling which usually attains poor results. A corollary to this is the potential of reducing the time to award, and thus allowing contractors the ability to produce more favorable bids.

VE ALTERNATIVE ICP-18

Decouple "Environmental Review" from engineering/contract process

Description of Baseline Concept: Currently, USACE SPN pursues projects in an integrated fashion with regards to BCOE review. Given the range of environmental requirements projects must meet, projects are often delayed due to internal USACE SPN concerns over environmental compliance. In particular, contracting does not proceed until all aspects of BCOE are completed. For O&M dredging projects, environmental review cannot be completed until sediment testing is complete and waiting for the results of sediment testing often delays the balance of the project from moving forward.

Additional ideas considered in this alternative include:

- Idea No. ICP-19: Redistribute risk where the Corps assumes more risk
- Idea No. ICP-20: Decouple sampling results with design
- Idea No. ICP-23: Maximize use of Approval of Tier I testing protocol (including Tier III pre-dredge prior year)

Description of Alternative Concept: This alternative suggests decoupling the environmental review process from the other engineering tasks allowing these two tracks to proceed in parallel and reduce project delays as a result.

Advantages:

- Reduced project delays.
- Increased ability to complete project within allowable work windows.

Disadvantages:

- Minimal potential for re-work of engineering if significant unanticipated changes are required as a result of environmental review.

Discussion: For the past 15 years, the vast majority (>95%) of the O&M dredged sediments are found to be "clean" upon completion of testing. Unfortunately, due to the natural sediment deposition cycles, testing of sediments cannot begin until May/June of any given year and typically takes 6 to 8 weeks to complete. This often results in engineering specification completion being held up until receipt of these testing results in order to determine where the dredged material is suitable for placement.

Given the history of testing, it is believed that decoupling the environmental review from the engineering in O&M dredging projects poses minimal risk and offers the potential to significantly improve project schedules. Furthermore, the LTMS/DMMO agencies should ensure that maximum use of Tier I exclusions to testing is being applied given the history of sediment testing over the past 15 years and/or reliance on prior year Tier III testing results for the current years dredging.

If the past 15 years of "clean" sediments is a concern, then confirmation could be obtained with sampling every third or fifth year of maintenance or after a major oil spill or other event in the waterway.

Project Management Considerations: Requires the USACE SPN PM to manage parallel tracks during project development.

VE ALTERNATIVE ICP-18

Decouple "Environmental Review" from engineering/contract process

Assumptions: Most USACE SPN projects and/or most reaches have a demonstrated history of clean sediment testing that continues into the future.

Cost / Quality Impacts: It is conceivable that as much as two weeks could be reduced on specification preparation and final engineering resulting in overall earlier contract awards. Early awards always favor the ability of completing the work within the allowable windows.

VE ALTERNATIVE ICP-30

Reduce internal design/specification review period

Description of Baseline Concept: USACE SPN has a design process that involves two separate reviews of the design package before it is sent to contracting for solicitation. The two independent reviews are (1) ITR and (2) BCOE. The purpose of these reviews is to provide a quality design and specification package. They occur at separate times and occasionally concurrently. It takes approximately three to four weeks for the BCOE and two to three weeks for the ITR.

Description of Alternative Concept: The purpose of this alternative idea is to reduce the time period for each review, and thus have a better chance to be ready to dredge when the work windows open.

The following concept is embodied in the VE alternative:

- ICP-31: Reduce ITR time period.

Advantages:

- Allows more time for contracting to prepare contract documents for solicitation
- Allows more time to dredge earlier.
- Contracts out on-time and possibly early. (See Alternatives ICP-1 and ICP-18)
- More preparation time for construction.

Disadvantages:

- Greater potential for design and specifications errors.
- Potential for multiple amendments to the solicitation.
- Potential for multiple contract modifications.

Discussion: The USACE SPN is responsible for dredging numerous project sites within its district boundaries. These are divided into annual and non-annual projects. A comment was made that dredging projects for most sites are very likely to be similar year after year. Therefore the design effort should be less than the previous year, and likewise the review period and contract preparation.

Project Management Considerations: An ITR should be commensurate with the scope, complexity, risk, and cost of the project. Therefore, routine annual maintenance dredging with disposal at previously authorized and used sites should receive a “de minimis” review, such as an “over the shoulder” review with all parties present: the designer, reviewers, stakeholders, other interested parties to possibly include sponsor and local agencies. Lessons learned from AARs would greatly benefit the potential of reducing the ITR and BCOE and should be incorporated into said review cycles.

Cost / Quality Impacts: In a manner similar to Alternative ICP-18, it is conceivable that as much as two weeks could be reduced on specification preparation and final engineering, resulting in overall earlier contract awards. Early awards always favor the ability of completing the work within the allowable windows.

VE ALTERNATIVE EE-1

Dredge deeper less frequently

Description of Baseline Concept: At present the maintenance dredging contracts identify a uniform depth and width of dredging for the reaches of navigation channels based on the established design depth. The design depth (and width) was determined primarily during new work design prior to new work (first time) dredging:

- New Work dredge depth includes: (1) required depth for vessel draft plus under-keel clearance; (2) depth for future advance maintenance dredging; and (3) allowable overdepth to account for accuracy of dredging to a required depth.

- Routine future maintenance, after the first time new work event, can be defined as the removal of routine shoaling (annual or multi-year) that occurs within the navigation channel boundaries, and reduces the depth of navigation in the maintained channel above the design depth.

Description of Alternative Concept: The concept is the hydrodynamic consideration of where and why there is river, estuary, or coastal entrance channel shoaling at specific locations in the waterway, and whether the shoaling events occur uniformly or non-uniformly throughout the project. Can **individual and limited** reaches of the river, estuary, or coastal channel be removed to a depth that is deeper than the presently authorized depth plus allowable overdepth, thereby delaying the need to return on an annual basis (or longer time period) to dredge the entire waterway to the traditional required plus allowable overdepth elevation?

The completion of this analysis will require identification of fast shoaling reaches and the relative amount of shoaling downstream created by eventual downstream transport from these fast shoaling reaches. This can be accomplished by hydrodynamic modeling of transport using survey and sampling data from long term monitoring of the waterways. The shoaling information should be based on data obtained since completion of the new work project.

This concept is very similar to the concept of advance maintenance dredging to create a sediment sump or catch basin.

The following concepts are embodied in the VE alternative:

- EE-2: Redefine advance maintenance dredging.
- EE-3: Greatly expanded use of knockdown and other non-extractive dredging methods.
- EE-4: Reduce or eliminate annual dredging.
- EE-7: Reduce disturbance caused by dredging.
- EE-8: Consider the use of non-settling dredging.
- EE-13: Realign projects to take advantage of deep waters.
- IC-11: Dredge bi-annually.

Advantages:

- Reduces frequency of shoaling to an elevation greater, i.e.; shallower, than the authorized project depth.
- Assures vessel passage on a year-round basis.

VE ALTERNATIVE EE-1

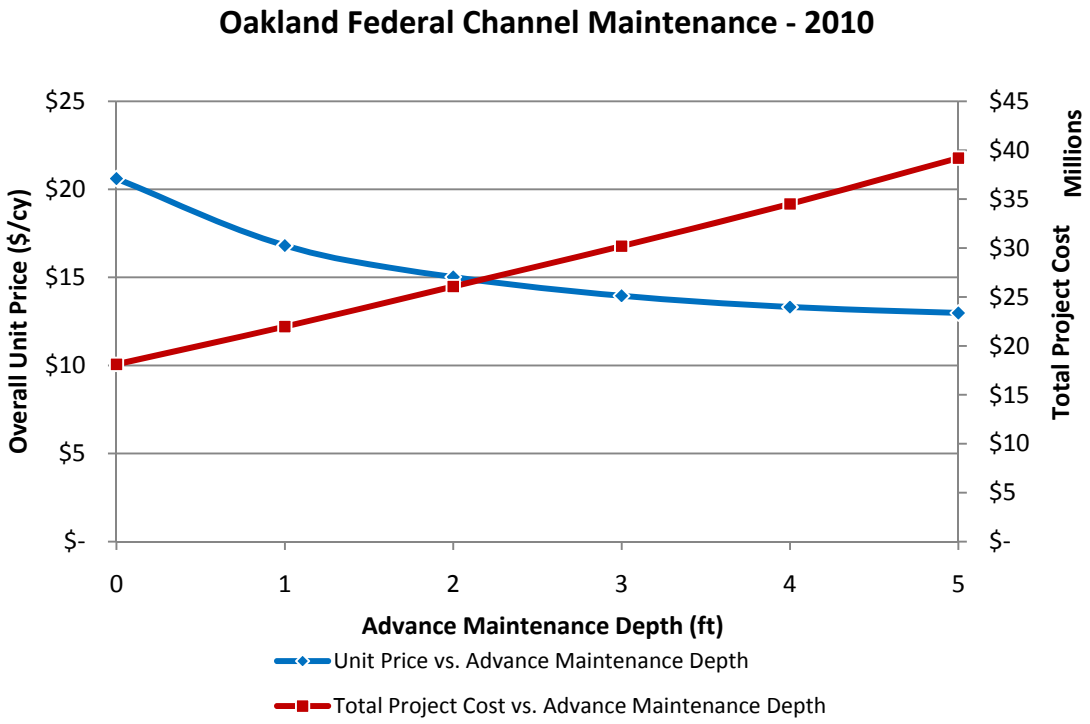
Dredge deeper less frequently

- Results in reduced mobilization/demobilization and increased dredging efficiency (reduced costs).
- Less frequent dredging results in less environmental disturbance and greater benthic recovery between episodes.
- Reduces disturbance frequency caused by annual dredging.
-

Disadvantages:

- Extreme storm events can still create excess annual shoaling beyond the design limit.
- Agencies may consider it to be "deepening" if applied to entire project, especially if dredging frequency is *not* reduced.

Discussion: It is noted this alternative does not require a new work channel deepening project status. By definition, deepening of a full channel width and length beyond the required depth plus allowable overdepth for the first time is defined as new work. However, if it is a limited reach of channel, and/or isolated shoaling, it has been accomplished under maintenance programs; e.g., Pillar Rock Shoal on Columbia River, Water Forum 81, ASCE Conference, San Francisco (1981). Therefore, this alternative is for maintenance of the existing authorized channel depth and width. The product would be a first-time dredging to a depth in isolated locations for **maintenance** purposes. This should not be tied down to new work requirements because it is not a 100% new work project deepening due to the change of vessel draft. It is maintenance of authorized navigation channel depth, and should result in short-term cost benefits. To do this, the engineering study to establish channel hydrodynamics for the existing waterway must be funded and completed in O&M funding.



VE ALTERNATIVE EE-1

Dredge deeper less frequently

The previous graph depicts what the advanced maintenance depth as the x-axis. The cost analysis takes into account the volume attributed to the "required" plus "x-feet advanced maintenance" (identified on the graph) plus "one-foot overdepth." The graph indicates a "sweet spot" of around two-feet that achieves 75% of the cost savings; i.e., from approximately $20.60/CY to about $15.00/CY.

Project Management Considerations: This is a redefined form of advance maintenance dredging. The concept of additional dredging must be reviewed with Resource Agency personnel. The concept is to reduce frequency of dredging, which in general is a beneficial action to the environment. Deeper areas created within the waterway may have beneficial and/or detrimental impacts on the environment which need to be worked out early in the evaluation study.

To do this, the engineering study to establish channel hydrodynamics for the existing waterway and the resolution of environmental issues should be funded and completed under O&M funding. Also, coordination regarding sampling and analysis of material to deeper depths must be approved in advance, with EPA, RWQCB, BCDC, etc.

Assumptions: This action is applicable to use of knockdown dredging during the years when full maintenance dredging is not required. The knockdown would allow maintenance of areas where limited sedimentation occurs above the channel authorized depth.

To be acceptable, this must provide routine success of years when full maintenance dredging is not required.

Cost / Quality Impacts: As indicated on the graph above, 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.

VE ALTERNATIVE EE-6

Identify new in-Bay beneficial reuse opportunities

Description of Baseline Concept: The interagency LTMS ROD and Management Plan (signed onto by USACE SPN, and implemented in California regulations and policies) calls for reducing in-Bay disposal and increasing “beneficial reuse" of dredged material to the maximum extent practicable. (Offshore ocean disposal is the "safety valve" for achieving in-Bay disposal reductions when beneficial reuse options are not feasible at any time.) Under the LTMS program, millions of cubic yards of dredged material have been successfully reused for beneficial purposes, including wetlands restoration and other habitat development mostly due to the Oakland Channel deepening project.

Although much of the reuse to date has been much more costly than in-Bay disposal, the great majority has occurred in relation to large scale civil works projects using funding largely separate from the O&M budget. Now that there are no major Bay Area civil works projects under construction, the USACE SPN O&M program is being looked to in order to meet a much greater extent of the LTMS goals for beneficial reuse; however, the O&M budget is not expected to be able to substantially assist in meeting the LTMS goals in the future if the same kinds of beneficial reuse projects remain the primary alternatives for the Bay area.

At the same time, environmental conditions (in particular regarding sediment sources and dynamics of the Bay) have changed compared to the understandings at the time the LTMS plan was developed. There is growing concern that removing sediment from the Bay system, e.g., via ocean disposal, may be detrimental in the long run. While the definition of beneficial reuse is broad, in the Bay area little attention has been paid in the past to systematically seeking or evaluating unconventional approaches. This may be in part because the large scale reuse projects alone helped meet the LTMS goals, so there was little need to look farther. Now, with direct placement of substantial volumes at traditional reuse sites economically problematic under the O&M budget, and with ocean disposal representing a generally undesirable loss of sediment to the Bay system, it is imperative to look for new, affordable opportunities to beneficially reuse material within the Bay system.

Description of Alternative Concept: 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. There may be opportunities for both direct and indirect beneficial reuse within the Bay. For example, direct placement could be done to cap remediation sites, cover legacy pollutants that are being exposed by natural processes, or protect eroding shorelines (including placement of sacrificial material). Indirect beneficial reuse could include placing material where currents and tides will redistribute a substantial portion of it to a desired location such as an eroding mudflats/shallow or a depositional wetland restoration site, etc. Indirect reuse could also include strategic stockpiling to locations convenient to a known future reuse need (although this would not normally be done in-Bay, it could be an affordable approach especially in combination with direct hydraulic placement).

Advantages:

- Can be more affordable than ocean disposal or "traditional" reuse projects.
- Can help O&M projects contribute to meeting existing LTMS goals.
- Can retain more sediment within the Bay system (interface with RSM).
- Can provide direct benefits to the reuse identified (wetlands, etc.) – i.e., reuse is desirable over waste disposal.

VE ALTERNATIVE EE-6

Identify new in-Bay beneficial reuse opportunities

- Lends itself to scientific studies (e.g., modeling) and pilot projects that could be pursued under the LTMS program structure.
- Has potential to bring new local sponsors into play.
- Could increase competition among the dredging contractor community.
- May result in lower cost dredging projects.

Disadvantages:

- Would not be considered "reuse" by the regulatory agencies without substantial evidence/expectation that a majority of the sediment would get to the reuse location.
- Would not be considered "beneficial" by the resource or regulatory agencies without substantial evidence/expectation that benefits outweigh initial placement impacts, and initial impacts are not unacceptable (ESA, etc.).
- Likely to take several years of studies/pilots before becoming a standard practice.
- May be difficult to identify projects capable of managing substantial volumes and/or difficult to work into ongoing annual O&M planning.
- May ultimately require some policy changes (especially State).

Discussion: This concept has already been initiated under the LTMS program. Hydrodynamic modeling, brainstorming of potential pilot projects, and coordination with RSM planning, has recently begun. USACE is strongly supporting initiating at least some pilot projects as soon as possible. However, with stakeholder involvement a number of other potential pilot project ideas may be identified that could be implemented relatively quickly (with monitoring). It is recommended that a focused stakeholder-involved process be initiated for this purpose. This should include pilots for alternative dredging methods, in addition to alternative placement/reuse methods.

Project Management Considerations: Individual PMs must coordinate with O&M program manager and LTMS PMs for opportunities to initiate pilot or demonstration projects to support modeling efforts.

By potentially using in-Bay reuse approach, energy savings associated with ocean disposal alone would warrant further investigation. As an example, 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 as much as 50%.

Other Related Ideas:

- Idea No. EE-10, Redefine/re-evaluate environmental impacts: The idea here is to ensure that assumptions about risks or impacts are ground-truthed, or at least allowed to be validated/confirmed via monitoring, both long- and short-term. Tacitly built into the above approach to pursue modeling, pilot studies, and monitoring of potential new in-Bay reuse concepts.
- Idea No. EE-11, Redefine LTMS goals: Recommendation is for the agencies to at least be open to reconsidering the LTMS goals in light of new economic and environmental circumstances.

This is already allowed for under the LTMS program, especially the upcoming 12-year program review (which will include public and stakeholder involvement).

- Idea No. EE-12, Focused application of beneficial reuse: This idea relates to having a beneficial reuse contract to separate from larger individual O&M projects, perhaps coupled with individual reuse sites (such as Cullinan Ranch, etc.). See Alternative IC-12.
- In-Bay disposal fees to subsidize other reuse sites/costs.
- Workgroup to evaluate individual dredging sites (marinas, etc.) re new/different disposal and/or reuse opportunities (incl. possible non-settlement techniques or flow-lane disposal in certain specific locations, etc.)

Cost / Quality Impacts: See "**Project Management Considerations**" on the previous page for cost/quality impacts.

VE ALTERNATIVE IC-3

Alternative contracting methods

Description of Baseline Concept: The current method of contracting for dredging projects in the District is solicited as IFB and awarded as a FP contract. Even though payment will be based on the quantity (cubic yards) of material dredged, the basis of award and payment is FP. Per FAR 16.301, "Fixed-price types of contracts provide for a firm price or, in appropriate cases, an adjustable price."

Description of Alternative Concept: There are several alternative contracting mechanisms USACE SPN uses to accomplish construction work. These include Indefinite Delivery Indefinite Quantity (IDIQ), Request for Proposals (RFP), Design-Build (D-B), Cost-Reimbursement (CR), Time and Materials (T&M), Early Contractor Involvement (ECI), Equipment Rental (ER), and Equipment Purchase (EP). Other possibilities that were associated with other main ideas are a Multiple Award Task Order Contract (MATOC), and an Incentive Contract (IC). Brief descriptions of these mechanisms follow:

IDIQ: "An indefinite-quantity contract provides for an indefinite quantity, within stated limits, of supplies or services during a fixed period. The Government places orders for individual requirements. Quantity limits may be stated as number of units or as dollar values." A partial statement of its application includes, "*Contracting officers may use an indefinite-quantity contract when the Government cannot predetermine, above a specified minimum, the precise quantities of supplies or services that the Government will require during the contract period*…" FAR 16.5

RFP: "RFPs are used in negotiated acquisitions to communicate Government requirements to prospective contractors and to solicit proposals." "*The purpose of exchanging information is to improve the understanding of Government requirements and industry capabilities, thereby allowing potential offerors to judge whether or how they can satisfy the Government's requirements, and enhancing the Government's ability to obtain quality supplies and services, including construction, at reasonable prices, and increase efficiency in proposal preparation, proposal evaluation, negotiation, and contract award.*" FAR 15.2

D-B: ""Design-build" means combining design and construction in a single contract with one construction contractor." FAR 36.102

CR: "Cost-reimbursement types of contracts provide for payment of allowable incurred costs, to the extent prescribed in the contract." A partial statement of its application includes, *"Circumstances do not allow the agency to define its requirements sufficiently to allow for a fixed-price type contract."* FAR 16.3

T&M: A partial statement of the application of a T&M contract includes, "*A time-and-materials contract may be used only when it is not possible at the time of placing the contract to estimate accurately the extent or duration of the work or to anticipate costs with any reasonable degree of confidence."* FAR 16.6

ECI: "Early Contractor Involvement" is a contracting method to get a contractor involved during the design process. It is different than a D-B contract because the designer and contractor are contracted to the Owner separately. An option for construction can be/is included in the contract. ECI is a Fixed-Price Incentive Project. "A fixed-price incentive contract is a fixed-price contract that provides for adjusting profit and establishing the final contract price by application

of a formula based on the relationship of total final negotiated cost to total target cost. The final price is subject to a price ceiling, negotiated at the outset." FAR 16.403

ER: For "Equipment Rental" type contracts, the contractor provides a fully crewed and equipped dredge and performs dredging and disposal as directed by USACE SPN. Payment is by the day for dredging and reduced for equipment moves or stand-by.

EP: Equipment Purchase was used in the Santa Cruz Harbor project to provide the equipment necessary for the local sponsor to perform and be responsible for, including funding, the maintenance dredging effort.

The following concepts are embodied in the VE alternative:

- IC-14: Use RFP Process Source Selection For Contracting To Improve Quality of Competition.
- IC-26: Use a MATOC Contract.
- IC-27: Use Incentive Contract.
- IC-28: Use A DB Contract.
- IC-29: Use Fixed-Price Contracts.
- IC-30: Use Cost-Reimbursement Contracts.
- IC-31: Use Time And Materials Contracts.
- IC-32: Use Early Contractor Involvement Contracts.
- IC-34: Use Dredge Rental Contract.
- ICP-38: Provide Alternate Contract Schemes (e.g. Santa Cruz).

Advantages:

- RFP:
  - ✓ Government and contractors have the opportunity to discuss scope of work and negotiate price.
  - ✓ Streamline the process by selecting the most qualified contractor to perform the work early on in the process.
  - ✓ Negotiate labor and equipment rates up front.

- IDIQ:
  - ✓ Effectively and quickly maintain channels when the quantities, or depth, necessary to provide the design dimensions is small.
  - ✓ Easily perform emergency or on-call dredging.
  - ✓ Expand the number of contractors – especially small business contractors – that are contracted to perform work.
  - ✓ Negotiate labor and equipment rates up front.
  - ✓ Possibly less environmental impact because disturbed areas are much smaller.

- D-B:
  - ✓ Can obtain contractor input during the design process.

- ✓ Reduce the time required to provide an NTP for dredging work.

- CR:
  - ✓ Can reduce or eliminate design time.
  - ✓ Can use in an emergency project.

- T&M:
  - ✓ Similar to CR.

- ECI:
  - ✓ Similar to D-B, but also
  - ✓ Ability to use the contractor to perform the work (select the construction option) if the ceiling is not exceeded.
- ER:
  - ✓ Allows USACE SPN to direct the work to the specific humps in the federal channel(s).
  - ✓ Can reduce or eliminate design time.

- EP:
  - ✓ Removes USACE SPN from the annual O&M process.
  - ✓ Local sponsor will have direct responsibility for obtaining funding and controlling schedule.

Disadvantages:
- RFP:
  - ✓ The review process may take up to a month or longer.
  - ✓ The unit price to perform the work is unknown at the time of selection so the project may be more costly than through competitive bid. A short list could be developed that could then be used to conduct competitive bidding.
  - ✓ Requires the development of goals.

- IDIQ:
  - ✓ Eliminates competitive bidding.
  - ✓ Could not be used for advance maintenance dredging.
  - ✓ Unknown permitting requirements and timing required for these small contract delivery orders.
- D-B:
  - ✓ Will be difficult for the contractor to submit a price for dredging when dredge quantities, disposal sites, and permit conditions are unknown or not finalized.
- CR:
  - ✓ Requires additional administration.
  - ✓ May ultimately be more expensive.

- T&M:
  - ✓ Same as CR.

VE ALTERNATIVE IC-3

Alternative contracting methods

- ECI:
  - ✓ Length of time to issue an NTP may increase if the construction ceiling is exceeded and negotiations with contractor are unsuccessful.
- ER:
  - ✓ Incentive clauses maybe necessary to maximize effort as the contractor is being paid by the day
- EP:
  - ✓ USACE SPN has less control over the federal navigation channel.

Discussion:

Issue: Is the current contracting method the only and/or best way to perform dredging work at different sites with different conditions?

There are enough contracting methods available that the best method should be used to maximize the overall O&M dredging program and to improve the O&M of individual projects.

Small Depth/Quantity Dredging. An IDIQ contract would make sense for removing small shoals that might be impacting navigation but would be costly to put out in a separate bid package. This method could be used to reduce annual dredging contracts to bi-or tri-annual dredging contracts by keeping the worst areas clean. In other words, let the majority of the project catch-up, or shoal-in, to the worst areas. This contracting method could substantially reduce multiple year dredging costs by having smaller episodes separated by larger episodes. Multiple IDIQ dredging contracts could be made for separate areas of the Bay. These contracts could be either small business set asides or unlimited.

CR and T&M contracts could also be used to maintain channels when small depths/quantities are involved, but there is more risk that it might not be cost effective.

Whereas IDIQ contracting could be a standard contracting method for small depth/quantity dredging, CR and T&M should only be considered when absolutely necessary.

Streamline Process/Shorten Timeline. D-B or ECI contract would/should reduce the time required to obtain an NTP for dredging. This would occur because the construction bidding process would be eliminated. Cost information is known early on, but change orders may occur due to unknown permitting conditions, etc at the time of contracting, or the price ceiling could be exceeded in the ECI contract.

ER contracts have been successfully used at other USACE districts with some success beyond emergency/immediate necessity work. This type of contract could direct the contractor to dredge all areas within one-quarter of the channel width from channel centerline that currently does not meet "*x*" feet of depth.

ECI is a newer form of contracting that might be tried on a "trial basis" to determine the advantages and disadvantages to the San Francisco District.

VE ALTERNATIVE IC-3

Alternative contracting methods

Project Management Considerations: Small Depth/Quantity Dredging. Will small/multiple dredging episodes accomplish the long-term maintenance goals? This should occur if these small dredging efforts are periodically coupled with larger individually bid episodes for the same project. Streamline Process/Shorten Timeline. Will need to aggressively manage the project (design/permitting) to ensure that the project is "close-to" what the contractor bid on so that potential change orders and/or ceilings are not exceeded. If this occurs the process and timeline could be lengthened.

Assumptions:

Small Depth/Quantity Dredging. Removal of isolated shoals will achieve objective of providing project depths and ensure safe navigation.

Currently, under the fixed-price alternative, the contractor bids as dredging a particular reach to its authorized depth and width at a "per cubic yard" price. When funds are constrained, the full dimensions of the channel may not be dredged. The area of the channel that gets dredged may not be the area(s) that are most important to the navigation industry.

Cost / Quality Impacts: The ultimate contracting vehicle is the responsibility of the District; however, the quality of the end product – in this case, dredging, and how it is to be contracted – is improved if the right vehicle is used for the right application. In other words, the "one size fits all" should not be applied carte blanch but instead determined based on the best interest of the government, taxpayers, and contractor.

VE ALTERNATIVE IC-7

Reduce size of dredging contracts

Description of Baseline Concept: The current size of annual dredging contracts is approximately $2 million - $4 million each primarily for the: Humboldt Harbor – Interior Channels; Humboldt Harbor – Bar and Entrance; San Francisco Harbor; Richmond Harbor – Outer; Richmond Harbor – Inner; Oakland Harbor – Inner; Oakland Harbor – Outer; Suisun Bay / New York Slough; Pinole Shoal; and Redwood City Harbor. See Table 1 below, providing the O&M dredging cycle for each project with the appropriate authorization. As noted on this table, many smaller contracts are also let to accomplish dredging that occurs at various frequencies.

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PROJECT AUTHORIZATION

The following table provides the O&M dredging cycle for each project with the appropriate Authorization.

Table 1

Project Name	Dredging Cycle	Authorization
Humboldt Harbor – Interior Channels	Annual	Rivers & Harbors Act 1910, 1930, 1935, 1937, 1952, 1968
Humboldt Harbor – Bar and Entrance	Annual	Rivers & Harbors Act 1910, 1930, 1935, 1937, 1952, 1968
San Francisco Harbor	Annual	Rivers & Harbors Act 1927, 1930, 1935, 1965, 1968
Richmond Harbor – Outer	Annual	Rivers & Harbors Act 1917, 1930, 1935, 1938, 1945, 1954
Richmond Harbor – Inner	Annual	
Oakland Harbor – Inner	Annual	Rivers & Harbors Act 1910, 1922, 1927, 1928, 1930, 1945, 1974 WRDA 1986
Oakland Harbor – Outer	Annual	
Suisun Bay / New York Slough /	Annual	Rivers & Harbors Act 1927, 1930, 1935, 1960
Pinole Shoals	Annual	Rivers & Harbors Act 1902, 1911, 1917, 1938, 1945, 1965, 1968 Sec 117
Redwood City Harbor	Annual	WRDA 2007, 1986, 1999, Sec 107
Noyo Harbor	2-years(2009)	Rivers & Harbors Act 1930, 1945, 1960, 1962, WRDA 1976, 1986
Moss Landing Harbor	3-years (2008)	Rivers & Harbors Act 1945
Crescent City Harbor	5-years (2009)	Rivers & Harbors Act 1935, 1946
Bodega Bay Harbor	11-years (2005)	Rivers & Harbors Act 1938
Napa River – Up-stream portion	6-years(1998)	Rivers & Harbors Act 1938
Napa River – Down-stream portion	6-years (1998)	Rivers & Harbors Act 1880, 1930
Petaluma River Channel	4-years (2003)	Rivers & Harbors Act 1938
Petaluma River – Across the Flats	3-years (1998)	Rivers & Harbors Act 1880, 1930
San Rafael – Inner Canal	4-years(2003)	Rivers & Harbors Act 1919
San Rafael – Across the Flats	7-years (1998)	Rivers & Harbors Act 1919
San Leandro Marina (Jack D. Maltester)	4-years (2009)	Rivers & Harbors Act 1965, WRDA 1986, 1992
Santa Cruz Harbor (maintained by Sponsor)	Year-round cycle	WRDA 2007Rivers & Harbors Act 1958
Suisun Slough	Infrequent (1990)	Rivers & Harbors Act 1910, 1913, 1937
Monterey Harbor	Not maintained	Rivers & Harbors Act 1930, 1935, 1945, 1960, 1988
Larkspur Ferry Channel (Non-Federal)	4-years (2002)	WRDA 2007, 1986, 1999, Sec 107

VE ALTERNATIVE IC-7

Reduce size of dredging contracts

Description of Alternative Concept: Use more, smaller dredging contracts (in terms of size, dollars, and length/depth) to encourage participation of additional dredging contractors.

Advantages:

- Increases the number of contractors available for dredging.
- Encourages participation by smaller dredging contractors.
- Could help fulfill/augment the USACE SPN's small business program.
- Demonstrates to the local communities the USACE SPN's willingness to expand its pool of dredging contractors.
- Potential to promote LTMS for the placement of dredged material to more beneficial reuse sites due to smaller quantities of material.
- May result in optimal work window utilization by shortening the time-to-construction process with smaller contracts.
-

Disadvantages:

- Requires additional USACE SPN administration compliance/oversight time and effort.
- Increases the number of simultaneous dredging contractors within a given area of the Bay.
- Could result in higher overall costs; e.g., each contactor will have mobilization/demobilization costs; administration cost, tipping fees, bonding fees, etc.
- Potential lack of appropriate dredging equipment for use by smaller contractors.
- Limited smaller dredging contractors within the Bay area.
- Potential reluctance (or financial capability) by small dredging contractors to invest in the appropriate/necessary equipment.
- May result in longer dredging durations.
- Need for additional disposal sites within reach of smaller equipment.
- Could be perceived as a negative impact on small, non-federal projects that are competing for contractors to perform work.
- May compete with private dredge projects, e.g., terminals and marinas.
- Known past experience has indicated that some smaller dredging contractors needed to extend work effort beyond the work window vs. larger contractors.

Discussion: The USACE SPN would like to encourage the participation of additional dredging contractors for their annual O&M dredging program. One means of achieving this undertaking is the use of smaller (in terms of dollar amount, duration [time and distance], daily output [cubic yards], reaches, etc.) size contracts to attract additional, smaller dredging contractors into their mix/pool of available dredging contractors for San Francisco Bay.

For example, if the current philosophy is to have a dredging contractor complete the necessary O&M dredging of entire 4± miles of the Oakland Harbor – Inner, consider breaking that distance into two 2± miles or three 1.33± miles smaller (or any combination thereof) dredging contracts to allow for small business dredging contactors the opportunity of bidding on the smaller dredging effort in terms of distance, daily cubic yards, use of disposal sites, etc.

VE ALTERNATIVE IC-7

Reduce size of dredging contracts

This alternative could be coupled with Alternatives IC-12 for “separate beneficial reuse contracts” or IC-13 for “on call” contracts.

Project Management Considerations: Although numerous other means of encouraging increased participation of smaller dredging contractors (joint venturing, subcontracting, equipment rental, etc.) are available, past experience indicates use of overall smaller dredging projects appears to be the most appealing to smaller dredging contractors which allows those contractors the most flexibility given their available equipment, staff and knowledge/experience.

Assumptions: It is assumed that additional smaller dredging contractors do exist within the San Francisco Bay or within a relatively short distance from the Bay area, to warrant a change to the current contracting philosophy. Barring a catastrophic or climactic event, smaller dredging contractors should be able to accomplish the work currently undertaken by larger dredging contractors.

Cost / Quality Impacts: The quality of smaller contracts can be better achieved due to their tendency to be simpler and readily adaptable to different contracting vehicle. See related Alternative IC-3.

VE ALTERNATIVE IC-12

Use separate beneficial reuse contracts

Description of Baseline Concept: Currently the goal of the federal navigation program is to dredge channels and then place the material somewhere in accordance with the LTMS goals, as well as the federal standard, considering the beneficial reuse of dredged material. To date, individual channel contracts have specified disposal and/or reuse sites. Doing this up front for each channel contract may forsake reuse opportunities due to timing or permitting uncertainties, etc.

Description of Alternative Concept: This recommendation starts from the concept of looking at where the material is going and allows for the removal of material from the navigation channel to provide for the beneficial reuse of the dredged material for wetlands or upland purposes. A reuse contract can be tied to specific reuse sites, e.g., Cullinan Ranch, so appropriate equipment, etc., is already in place. Material to be delivered to that site can then be assigned from multiple channels and reaches without complicating or delaying the "normal" channel maintenance contract. Furthermore, this concept decouples meeting LTMS reuse goals from individual O&M contracts by separating contracts to take specified material to reuse; perhaps from multiple locations.

Advantages:

- Could accelerate the beneficial reuse of dredged material to meet the LTMS goals.
- Could increase competition by having property owners or environmental organizations lease dredge equipment or joint venture with a dredging contractor to perform the dredging.
- Could be a mechanism for a small business contract.
- Could guarantee a base volume for reuse.

Disadvantages:

- May require a different approach within the federal process to oversee that the federal channel is completely dredged in accordance with laws and regulations.
- May increase current schedule constraints to include another contract solicitation prior to the solicitation of the dredging contract.

Discussion: USACE SPN is currently looking at the dredging of sand from the Suisun Channel by contractors who remove sand from San Francisco Bay and tributaries for commercial purposes rather than using traditional dredging contractors. This expands on that concept by allowing for those sites that use or need dredged material for beneficial purposes such as Montezuma Wetlands or Carneros River Ranch to contract for dredged material.

USACE SPN would entertain proposals from those who have permitted wetland or upland sites to accept dredged material for the opportunistic removal of dredged material. The proposer would be responsible for the excavation (which is different from a USACE SPN dredging contract where the proposer is not the responsible for dredging and transport to the offloading site), transport, and disposal at a proposer-furnished disposal site. The proposer would be responsible for ensuring that all legal and acceptability requirements of the proposed beneficial reuse site are met. USACE SPN could perform market search for interested parties to receive dredged material via USACE SPN maintenance dredging contract. If there are enough potential bidders, then USACE SPN would solicit for the service.

VE ALTERNATIVE IC-12

Use separate beneficial reuse contracts

Cost / Quality Impact: 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 with requirements for beneficial reuse added to support placement of the dredged material. Single task contracts can be deliberately adjusted to the specifics, resulting in better quality control, improved scheduling, and potentially lower overall costs.

VE ALTERNATIVE IC-13

Use separate on-call contracts

Description of Baseline Concept: Federal navigation channels are contracted to be dredged completely on a "regular" schedule. This precludes the ability to promptly respond to unanticipated shoaling or minor/cleanup dredging.

Description of Alternative Concept: Develop a contract process to provide for the dredging of shoals within potentially multiple federal navigation projects that cause significant draft restrictions between scheduled (full) dredging projects.

Advantages:

- One "on call" contract can cover multiple channels.
- Reduces response time to unanticipated shoals.
- Reduces inefficient "veneer" dredging by helping to reduce "full" episode frequency.
- Allows for the "quick" removal of an impediment to controlling depth.
- Reduces the pressure to fast-track the acquisition of annual channel dredging.
- Reduces overall disturbance that would occur with more frequent "full" dredging episodes.

Disadvantages:

- Requires additional staff time to develop and execute a contract.
- May require multiple mobilization/demobilization costs.
- Could have a risk of losing large local dredging contractors if there is a decrease in the dredging market.

Discussion: One shoal in the center or across an entire channel can and does reduce the effective draft of vessels that can use the channel. As discrete sediment loads are a result of a variety of localized and regional factors the location of shoals cannot always be predicted and accounted for through the use of tools such as advanced maintenance dredging during the annual dredging process.

A frequent contracting tool used in other USACE districts is the rental of a dredge with attendant plant and operators for the removal and disposal of material as directed by the contracting officer's representative. Use of such a tool would allow for the maintenance dredging of shoals in a variety of channels, while using a variety of disposal options. If coupled with reduction of annual projects, this would allow for emergency maintenance in non-dredge years.

This proposal does not eliminate or reduce the need for regular channel maintenance. Having an on-call contractor would help in those "emergency" conditions when a dredging contractor is needed. The CD issued by the BCDC already provides for up to 90,000 CY of emergency dredging per year within navigation channels. There is a separate proposal from this VE process suggesting the move to biannual rather than annual dredging. Having an on-call dredge would be extremely beneficial if that proposal moves forward.

Project Management Considerations: If the uses of biannual on-call contracts are deployed, then USACE SPN should explore the possibility of increasing the amount of emergency dredging material from 90,000 CY to, say, 190,000CY with the BCDC and other Sponsor agencies.

See related VE Alternative ICP-29, Minimum dig face.

VE ALTERNATIVE IC-13

Use separate on-call contracts

Cost / Quality Impacts: Similar to Alternative IC-12, the quality of the contracts can be improved when they are focused on a given tasking, such as in an on-call contract, as the specifics can be deliberately focused resulting in better quality control, improved scheduling, quicker response time, and potentially lower overall costs.

VE ALTERNATIVE ICP-8

Review of contract language

Description of Baseline Concept: Currently, there exists no formal process by which contract documents are periodically reviewed to re-evaluate contract language in order to confirm the inclusion of such language and provisions are still relevant and necessary.

Description of Alternative Concept: It is recommended to establish a procedure by which the USACE SPN staff will periodically review contract language and provisions for assessment as to relevancy and necessity at this time.

This alternative includes the following ideas identified by the VE ream along this line of thinking:

- ICP-12: Avoid one-size-fits-all contract package
- ICP-13: Reuse contract from previous year for similar projects
- ICP-16: Audit past awarded contracts over a 3-year period to review changes to process and design
- ICP-17: Improve submittal process

Advantages:

- Reduced procurement periods resulting from clearer more concise bid documents.
- Less time lost during procurement results in greater ability to get projects done within the allowable work windows.
- Reduced number of amendments.
- Reduced number of submittals.
- Increased number of bidders.
- More competitive bids.

Disadvantages:

- Could increase USACE SPN's internal administration and management time.
- Could initially result in considerable changes to the typical contract language implementation and manner of doing business.
- Will most likely require the legal input when major changes are anticipated in the contract language.

Discussion: Contractors do not like receiving poorly written contract packages that require clarifications via amendments. More focused and clear contract documents typically result in an increased number of bidders and more competitive and tighter bids.

Some of these additional ideas relate to the fact that not all dredging contracts are the same. Where they are similar in nature, reuse the contract documents from past successful projects. Where they are dissimilar, i.e., different dredging method and/or disposal practice, take this into account in the development of the construction package.

USACE SPN often issues numerous amendments during the bidding period. It is believed that an audit of recent contract packages should be conducted to determine if amendments and/or change orders are being issued, why amendments are being issued, and evaluate how long the actual

design/bid/award process is taking based on actual projects bid. The outcome of this analysis would be to identify what steps in the process are causing delays and remedying these problems.

A comprehensive review of the submittal requirements should be conducted for each project to eliminate unnecessary submittals requirements and evaluate submission dates and reviews periods for logic and consistency.

Project Management Considerations: Requires more effort on the project management team to ensure the USACE SPN design staff is getting feedback from PM and Construction as to lessons-learned and transforming this input into improved bid documents. Additionally, the PDT, contractors, Ports, and Bar Pilots should be involved to some degree in this review process.

This review is intended as a "lessons learned" effort to improve the product (i.e., contract language) versus finding fault with any department, agency, or individual(s).

As an example of the potential effort to improve the contract language consider the following:

- Initial comprehensive contract review by all parties.
- Contract review after every internal or external regulatory change.
- Then, at least every three years, on a rotating basis of the types of contracts under consideration.

Assumptions: Assumes room for improvement exists within the contract documents.

Cost / Quality Impacts: Although costing could be reduced with better contract documents, it is the quality of the product being addressed: the contract itself. Lengthy, voluminous, ambiguous, repetitive, and unclear contract language results in overbidding on behalf of the contractors in order to "cover the bases" if misinterpretation or re-interpretations are provided by the government.

VE ALTERNATIVE ICP-9

Have all permitting as part of solicitation package

Description of Baseline Concept: USACE SPN's Environmental Sections are responsible for creating the EAs for each individual project along with the Sampling and Analysis Plans, analysis results and reports, and finally, the suitability determination issued by the DMMO. The Environmental Branch also signs the BCOE compliance certification prior to bid open. Furthermore, the Environmental Branch provides and/or ensures that all applicable WDRs and CDs are complete before solicitation. The Engineering Branch is responsible for including permits in the solicitation/contract so that the contractors know what is required. Currently, portions of "permits" are included in the specifications, or interpretations of the "permit" conditions are included in the specifications.

Description of Alternative Concept: Once the permits are attached to the specification as an appendix, the ITR and PDT team members need to review the specification and make every effort to eliminate any duplication throughout the specification, and make sure all permits are part of the bidding process. The team should create a cover page and address where the permits are located in the specification.

The following concept is embodied in the VE alternative:

- ICP-10: Remove repetitive language as art of bidding.

Advantages:

- Eliminates duplication of effort.
- Identifies location where the appendices are attached.
- Reduces RFIs.
- Reduces ambiguous language in the specifications.
- Reduces contractor concerns regarding compliance risks.

Disadvantages:

- None apparent.

Discussion: By attaching the "permits" and making it part of the specifications while removing all interpretations, ambiguity is removed from the bid package. Additionally, the contractor knows exactly its responsibilities.

Cost / Quality Impacts: As noted in Alternative ICP-8, elimination of ambiguous and unclear language from a contract not only improves the contracting vehicle, but could result in better bid values.

VE ALTERNATIVE ICP-11

First quarter Project Team meeting

Description of Baseline Concept: The PMs are required to have a PDT "kick off" meeting at the beginning of the fiscal year; however, this does not occur consistently.

Description of Alternative Concept: For each project, ensure each PM conducts a first-quarter project delivery team 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 base line/ template work as soon as possible. The sponsor and representative resource agencies should attend to ensure that their needs and expectations are also understood and addressed. Include the local sponsor and resource agencies as members of the PDT.

Advantages:

- Ensures all PDT member have the same understanding of what is expected and when it is expected.
- All team members can identify schedule conflicts with other projects that they support.
- Overall, the USACE SPN can better execute the program.

The following concepts are embodied in the VE alternative:

- ICP-26: First Quarter Planning Meeting For The Whole Program.
- ICP-27: PDT Should Include Local Sponsors And Regulatory Agencies.

Disadvantages:

- None apparent.

Discussion: USACE SPN is not currently consistent with the management of all the O&M projects, nor do the "kick off" meetings include all the essential team members. A first quarter PDT meeting would ensure that the PDT is on the same page.

Project Management Considerations: The O&M PM should coordinate with the PMs to ensure that all projects are in compliance. LTMS PMs can represent the resource agencies.

Assumptions: It is assumed there is no standard project management plan for O&M dredging projects.

Cost / Quality Impacts: This alternative addresses the potential of improving the quality of the work product – design, management, and execution of the dredging program – that could result in lower bids and increased contactor participation. Lessons learned are valuable tools (not to find fault) to improve the quality and effectiveness of the effort to undertake the program. When "fine tuned," the appropriate contracting vehicle will be selected, the contract will be concise yet comprehensive, realistic schedules and deadlines developed, and the language will be unambiguous with the expectation of better bid results and shortened/achieved work schedules.

VE ALTERNATIVE ICP-15

Expand Consistency Determinations to 10 years

Description of Baseline Concept: A USACE SPN CD (a CZMA requirement administered for the Bay by BCDC) is currently provided to BCDC every three years, covering the overall O&M program - all projects proposed for the three year period. Part of the USACE SPN's submittal provides an IAA for all its O&M projects over that same 3 year period. The IAA identifies where USACE SPN proposes to place dredged material from each O&M project, and shows how the LTMS goals will be met overall during that 3-year period for the program as a whole. USACE SPN is unable to provide proposed dredge and disposal volumes, the actual or number of projects to be dredged in any one year as part of this determination. Therefore, USACE SPN provides a best estimate based on past dredging volumes – both proposed and maximums for each project for each year and the target disposal or beneficial reuse site and a proposed "back up" site if for some reason the proposed site is not available. USACE SPN then provides a schedule and any changes to the proposed dredging program at new fiscal year. Often the CD is presented to the BCDC late and incomplete, such that it cannot be approved and in place on a timeframe consistent with the current planning/contracting process, or at times even before dredging needs to start. Consequently, some projects are delayed such that environmental work windows are jeopardized and/or conflicts with other projects, equipment availability, contractor capacity, etc. occur. Further, as part of this process and as required by 404(b) 1 guidelines [*Guidelines for Specification of Disposal Sites for Dredged or Fill Material*], USACE SPN must receive a water quality certificate and/waste discharge requirement from the San Francisco Bay RWQCB. BCDC needs this WQC prior to acting on the consistency determination due to state regulations. The RWQCB's timeline require that all documents be complete and a staff report written two months prior to the Board hearing.

Description of Alternative Concept: Produce multi-year CDs. Preparing CDs less frequently could reduce or eliminate some project delays and timing complications; or, more importantly, have the USACE SPN staff coordinate with each other and provide timely and accurate documents to the agencies.

Advantages:

- Increased certainty and/or flexibility in project planning and contract award processes.
- Potentially reduced contract costs due to reduced uncertainty and/or reduced potential for equipment/timing conflicts.
- Reduced project delays and increased potential for projects to be completed within environmental work windows.
- Potentially reduced USACE SPN overhead costs, especially if only need to revise CD (and IAA) rarely.

Disadvantages:

- Rework of CD required whenever changes occur on individual projects covered by the multi-year CD (which has been every year to date).
- IAA needs to be better coordinated internally at USACE SPN to minimize changes.
- May not actually reduce USACE SPN overhead costs.
- May potentially increase agency approval timing to process changes to CD itself.
- May need to revise CD at least every 3 years to coincide with any IAA changes.
- May not be the real issue.

VE ALTERNATIVE ICP-15

Expand Consistency Determinations to 10 years

Discussion: USACE SPN is often late in providing information to the RWQCB in order for them to meet their legal timelines. BCDC and the RWQCB have coordinated efforts and meet with USACE SPN simultaneously on these actions, as well as coordinate their permit and consistency determination conditions. These entities meet with the USACE SPN staff and provide draft documents in advance of the meetings so that the USACE SPN is aware of and can, in theory, meet the requirements. The USACE SPN is in arrears on both the RWQCB and the BCDC requirements at this time.

Project Management Considerations: USACE SPN internal coordination in creating IAA and CD, and in coordinating between them, would need to be improved. BCDC policies regarding how long CDs may be in force, and regarding whether minor revisions could involve expedited processing, need to be researched.

Assumptions:

- IAA (upon which a CD is based on) is well-written, realistic, and approved in advance.
- The USACE SPN program can realistically stick to the IAA plan (mix of placement sites and volumes that meets LTMS goals overall).

Cost / Quality Impacts: Here too is another alternative seeking improved quality by preparing CDs less frequently which could reduce or eliminate some project delays and timing complications by having the USACE SPN staff coordinate with each other and provide timely and accurate documents to the agencies.

VE ALTERNATIVE ICP-22

Periodic audit workshop related to regulatory (permit) requirements

Description of Baseline Concept: Multiple agencies have permit requirements covering both dredging and disposal aspects of O&M projects. Therefore a potential for redundant, confusing, or even conflicting requirements that can complicate bidding/contracting or unnecessarily increase project costs is highly plausible. Some agencies already periodically review their own permit conditions (BCDC does this every 3 years), and DMMO did one coordinated review of multi-agency conditions several years ago. However, that review has not been finalized or released, and the results have not been systematically considered or applied.

Description of Alternative Concept: Just as it is recommended that USACE SPN periodically review its contract clauses/requirements for current relevance and clarity, the LTMS/DMMO agencies should also 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.

Advantages:

- Potential to reduce or eliminate unnecessary (duplicative or out-of-date) requirements.
- Potential to reduce costs by reducing compliance "overhead."
- Allows for all parties having a stake in the process the opportunity to voice noted discrepancies and be part of the solution.

Disadvantages:

- None apparent.

Project Management Considerations: Some LTMS/DMMO agency staff resources would need to be applied to the process. The previous DMMO effort (draft report) could be a good starting point. The agencies need to commit to openly considering the value/effectiveness of current conditions/requirements.

Cost / Quality Impacts: From a quality view point, and just as it is recommended that SPN periodically reviews its contracts for current relevance and clarity, the LTMS/DMMO agencies should also review the full range of permit conditions jointly applied to O&M dredging projects.

VE ALTERNATIVE ICP 24

Move O&M dredging to one branch

Description of Baseline Concept: USACE SPN's Engineering and Technical Service Division has three branches: Planning, Engineering, and Construction. All three branches are involved in the dredging program during the year. The dredging program in the USACE SPN uses government plant (Hopper Dredges) for some of the dredging, which falls under the Engineering Branch and PPMD. The rest of dredging is accomplished via private dredging contracts issued from the Engineering Branch. The Construction Branch provides contract oversight/inspection of the dredging contracts. Annual and regularly scheduled maintenance dredging projects need to have continuity in the leadership and control of O&M projects. At this time the O&M projects are completed by all three branches, depending on government plant utilization.

From another point of view, USACE SPN performs maintenance dredging of the federal navigation channels with a PM assigned from the Programs and Project Management Division and the majority of the PDT come from Engineering and Technical Services Division. The PM, in addition to the responsibilities associated with leading the PDT, is responsible for coordinating/meeting with contractors, sponsor agencies, local sponsors and other stakeholders, coordinating project budget and maintaining the schedule.

See the attached USACE SPN organization chart for an understanding of the relationship between Branches and Division.

Description of Alternative Concept: There are two potential ways of looking at this alternative:

A - Consider a contract lead for a project (or group of projects) regardless of government-owned plant performing the dredging, or contractor bid. This would require a knowledgeable and most probably a **senior engineer** with continuing responsibility on a project basis instead of the program basis. The concept is to assure development of an annual scheduling of the maintenance dredging projects, either accomplished by government plant, or by contract advertisement and award on a project basis.

B - Consider moving the maintenance dredging function to the Operation and Readiness Division, which has responsibility for navigation debris removal, and operations and maintenance of USACE SPN lakes. Regardless, maintenance dredging with or without government plant needs to be under the control of one office, not multiple. The O&M Branch is logical as the work is O&M funded. This would remove the PPMD from maintenance dredging.

Advantages:

- Individual provides point of contact and primary responsibility for project scheduling, advertisement and award.
- Project Engineer has expertise and understanding of environmental and political problems to be addressed in development of contract (dredging and disposal).
- Streamlines the maintenance dredging process.
- Less onerous process – maintains maintenance expertise within maintenance experts.

VE ALTERNATIVE ICP 24

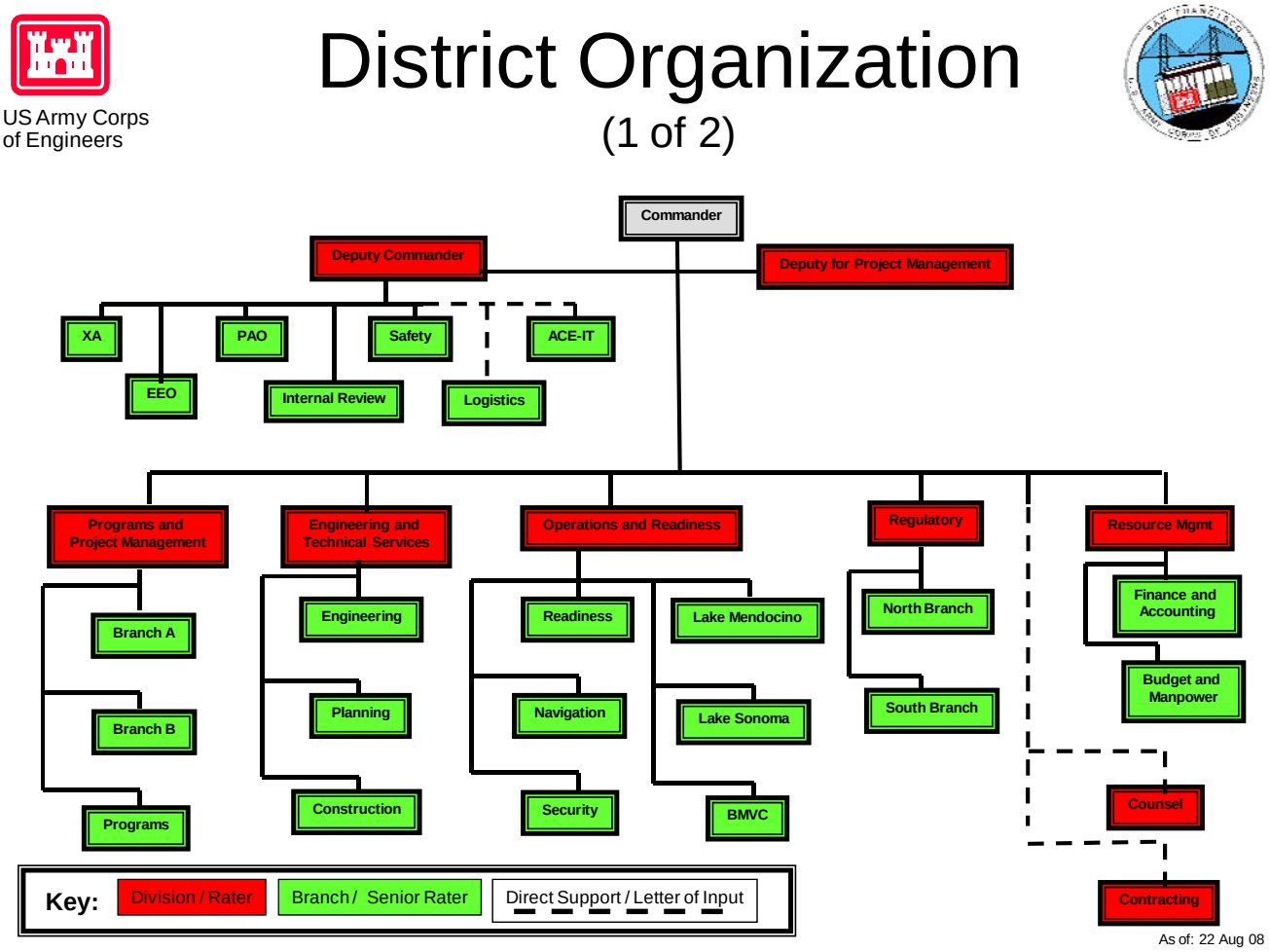
Move O&M dredging to one branch

Disadvantages:

- A short term (1 to 3 years) in position with early departure requires replacement training and time for experience on site before transition as the new Individual lead.

Discussion: Current methodology relies upon a coordinated "team" approach to achieve project success. The individual members of the team have separate chains of command up to the district level, or in some contracting cases, even to the division level. As such, where in the district should the engineer, or the project knowledge, be developed or expected? Past experience indicates that spreading the responsibility among numerous branches or divisions has not worked optimally. A further internal USACE SPN study should be undertaken to investigate the possibility of having "ownership" of the maintenance dredging program in one location rather than the current dispersal mode.

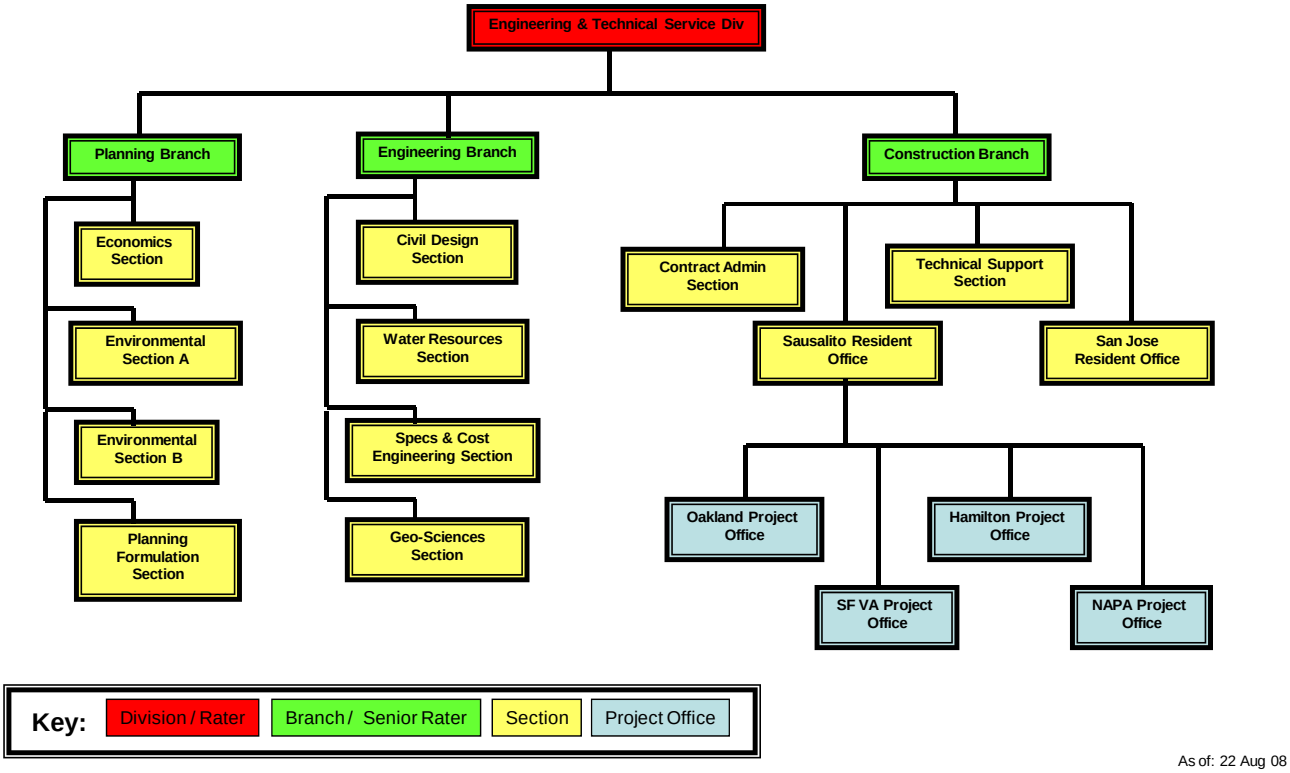
See related alternative ICP-6, Maintain Project Team continuity.



US Army Corps of Engineers

District Organization

(2 of 2)



As of: 22 Aug 08

Cost / Quality Impacts: 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.

VE ALTERNATIVE ICP-29

Minimum dig face

Description of Baseline Concept: Currently, in the absence of advanced maintenance dredging, many channels are being dredged frequently due to the presence of minor shoaling within the channels. Condition surveys identify these minor shoaling conditions and the San Francisco Bar Pilots review the condition surveys and impose draft restrictions on the channels resulting in impacts to shipping companies. USACE SPN is forced to respond by issuing dredging contracts to remove these shoals. The dredging contractor is forced to pursue these minor shoals but is not allowed to take over-depth material in adjacent areas, resulting in inefficient application of their dredging equipment. When a contractor is required to pursue thin cuts of dredged material over large areas, the dredge often becomes limited by its ability to cover the area required rather than the volume being pursued. This results in what is referred to as an 'area coverage' project. Since dredging contractors base their bid on their daily costs, if the dredge is limited by 'area coverage' the unit prices bid can become very high since the daily cost (numerator) is divided by a low daily dredging quantity (denominator). Often, this results in unanticipated project cost increases which exceed the available funding.

Description of Alternative Concept: By restricting dredging to areas with a specified minimum dig face, i.e., depth of cut, "area coverage" concerns and resulting impacts can be eliminated; however, in the absence of other factors, this would in most cases result in draft restrictions being imposed on navigation channels. In order to avoid such restrictions, the use of advanced maintenance dredging and/or sediment redistribution methods, i.e., knockdown, etc., should be employed to remove minor localized shoaling in between cost-effective, thicker dig cut, maintenance dredging events.

Advantages:

- Reduced dredging costs.
- Potential for less frequent dredging events.
- Reduced environmental impacts resulting from less frequent dredging activities.
- Reduced demands on constrained dredging resources, such as equipment, personnel, etc. resulting in lower costs.

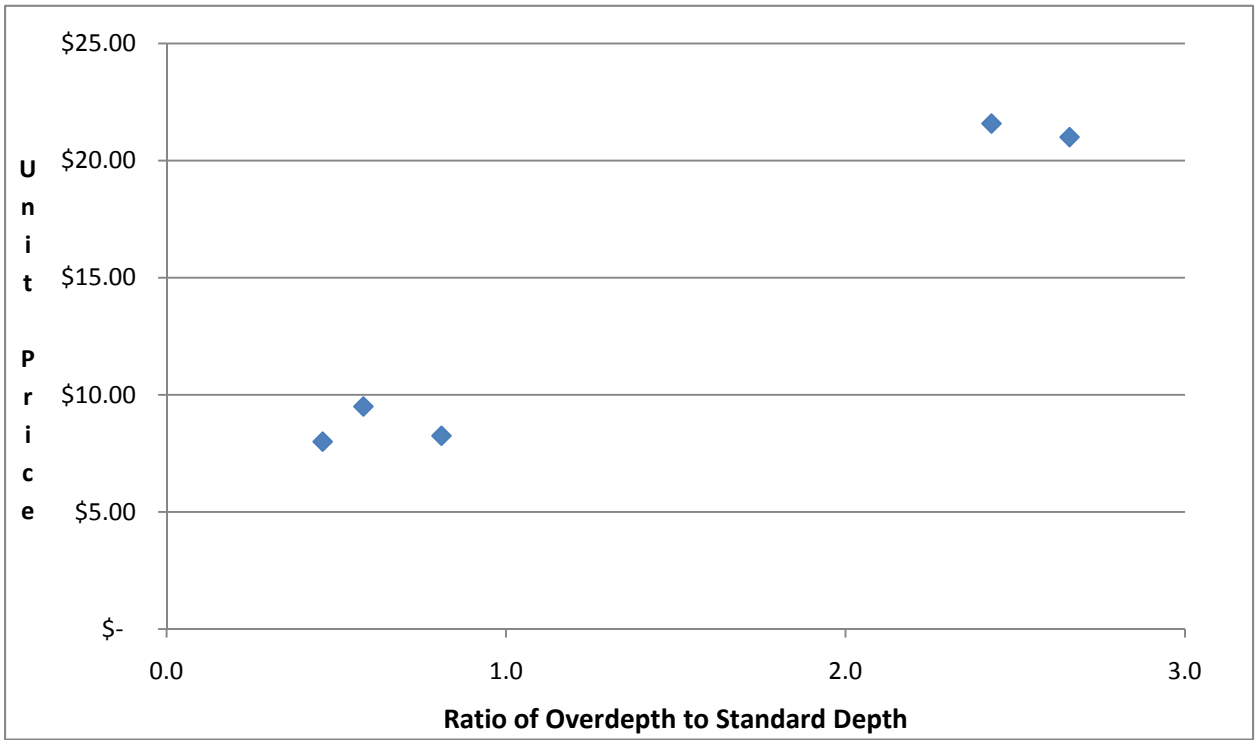
Disadvantages:

- Continued draft restrictions unless other advanced maintenance dredging and/or sediment redistribution methods are employed as noted above.

Discussion: Dredging areas of low dig face is an extremely inefficient means of dredging. It is necessitated by the efficient use of channel designs wherein the vessels are often using the maximum draft possible. In doing so, there is often little to no flexibility in channel depths or revised channel alignment to accommodate even minor amounts of shoaling. Consequently, frequent dredging of minor depths of shoaling is often required.

The bid results (for Manson Construction) from the recent Oakland Inner and Outer Harbor Channel Maintenance Dredging Project (Contract No. W912P7-10-C-0030, Government Furnished Site) clearly demonstrates the relationship between dig face and dredging unit price (see graph below). In this analysis, the ratio of overdepth dredging to standard dredging (ratio = OD/SD) to serve as a proxy for dig face was calculated. The logic being if the ratio is below 1.00 it is indicative of a higher dig face project resulting in more efficient dredging presumably resulting in lower unit prices bid. A ratio above 1.00 is indicative of a low dig face project resulting in higher unit prices. The graph clearly

illustrates such a correlation for this particular project. In fact, the relationship resulted in a unit price differential of approximately 2.5.



Therefore, full dredging episodes should only be conducted when the parameters for such dredging allow for efficient application of the dredging process. In the absence of such conditions, alternative means of maintaining specified channel depths should be employed. Examples of such methods include, but are certainly not limited to, use of advanced maintenance dredging and/or application of sediment redistribution methods, i.e., knockdown, water-injection-dredging, etc., or contracting methods that are designed to address small dredging depths/quantities.

Project Management Considerations: The most significant project management considerations entail: (1) determining the most prudent locations to apply the use of advanced maintenance dredging. Sediment transport studies can be conducted to assist in the determination of such locations, and (2) additional contracting provisions will need to be arranged and maintained to facilitate the application of other sediment redistribution methods.

Assumptions:

- The District can authorize advanced maintenance dredging.
- The District can set aside funding for a secondary contract to cover the costs of other sediment redistribution methods. (See VE Alternative IC-13, Use separate on-call contracts.)

Cost / Quality Impacts: Although only having the ability to analyze one dredging contract bid results, it demonstrated with a fair share of certainty that restricting dredging to areas with a specified minimum dig face, concerns, and resulting impacts can be eliminated. The use of advanced

maintenance dredging and/or sediment redistribution methods, e.g., knockdown, water-injection-dredging, etc., should be employed to remove minor localized shoaling in between cost-effective, thicker dig cut, maintenance dredging events. Savings are evident in the graph above.

VE ALTERNATIVE ICP 32

Expand participants of annual program AAR

Description of Baseline Concept: An AAR is an important component of the annual O&M program. As stated in Alternative ICP-33, the AARs are prepared on selected projects. AAR team members and reviewers presently consist of PDT members and staff. Stakeholders, including non-federal sponsors, are invited to participate in the AAR process on occasion.

Description of Alternative Concept: Prepare an AAR for the entire program, in addition to selected projects and invite all interested stakeholders to include non-federal sponsors, bar pilots, resource/regulatory agency staff, Ports, and members of the Harbor Safety Committee to participate in the AAR process.

Advantages:

- Provide all project partners with a better idea of O&M process.
- Obtain ideas for process and quality improvement.
- Obtain support for program funding.
- Disseminate lessons learned and incorporate same in subsequent program year.

Disadvantages:

- Resource intensive.
- May be difficult to arrange for a schedule that includes all participants.

Discussion: Although AARs are currently prepared on selected projects, the value is not readily apparent to non-federal sponsors and stakeholders who continue to experience the same frustrations with respect to federal channel maintenance year after year (insufficient funding, incomplete execution, failure to achieve authorized project depths). Theoretically, the AAR process may be able to 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. A "programmatic" AAR, reflecting all of the annual projects could incorporate lessons learned and recommendations for program / process improvement as an executive summary. It will be important to include all projects and reasons for success or otherwise (lack of funding, environmental issues, equipment, weather, etc.). It will be important to pose the AAR on the USACE SPN's website.

Project Management Considerations: As stated in Alternative ICP-33, the program and project managers should consider AARs / lessons learned as an important resource and tool in program and project management. The information gleaned can be used for process / quality improvement in subsequent years.

Assumptions: Assume that non-federal sponsors and stakeholders will allocate sufficient resources to the AAR program and process.

Cost / Quality Impacts: This alternative also addresses quality issues. Since AARs are currently prepared on selected projects, the value is not readily apparent to non-federal sponsors and stakeholders who continue to experience the same frustrations with respect to federal channel maintenance year after year (insufficient funding, incomplete execution, failure to achieve authorized project depths). 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.

VE ALTERNATIVE ICP-33

Have Construction assume responsibility of AARs

Description of Baseline Concept: At present, the AARs are prepared on select projects at the direction of ETS Division Chief upon completion of the projects. Following the AARs, a meeting is scheduled with the PDT members. As a standard practice, the Section Chief of the CDS is responsible for the AARs and chairs the meeting. Besides the PDT members, other staff members are also invited and may also participate at their discretion. USACE SPN staff believes only approximately 20% of projects have AARs.

Description of Alternative Concept: The responsibility of the AARs should be transferred to the CB. Furthermore, the AARs should be prepared for each and every project upon completion of the construction. The AAR meeting should be chaired by the CB Chief. 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). Lessons Learned should be recorded as appropriate and should be available to the entire district.

Advantages:

- AARs will include all the issues related to the design and construction of the projects.
- Lessons learned will be comprehensive.
- PMs will be able to take advantage of this information to the full extent.
- Reduces the risk of project delays and cost overruns for future projects.
- Savings will vary depending on the individual project.

Disadvantages:

- Resource intensive.
- May be difficult to arrange for a schedule that includes all participants.

Discussion: Normally there are some schedule delays and in a few cases, cost overruns. By incorporating the lessons learned during the early stages of the project, the PMs can avoid some of the project delays and control certain cost overruns.

The intent is not to find fault but to improve the product (contract).

Project Management Considerations: The PMs and PDT members should consider the AARs/lessons learned an important resource and tool in managing their projects and take full advantage of the information gleaned. The PMs and PDT should incorporate AARs into the PMP.

Assumptions: It is assumed that USACE SPN is staffed with well qualified and experienced personnel in various departments.

Cost / Quality Impacts: This alternative again addresses quality issues associated with using the AAR process for betterment. The responsibility of the AARs should be transferred to the CB and chaired by the CB Chief. 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. Lessons learned could easily translate into better construction documents, from specification to engineering drawings through contracting.

VE ALTERNATIVE ICP-35

Improve coordination between contract creation and Construction

Description of Baseline Concept: The project delivery team is comprised of several individuals from different sections within USACE SPN. They have several responsibilities which include preparing design and specifications, participate in BCOE review, and etc.

Description of Alternative Concept: Construction needs to be involved in the PDT as a permanent member as in other District sections. One important team member of the PDT should be a construction representative, who can provide input and insight that is very helpful in developing a quality design package. In addition, involvement in the PDT would be beneficial to the construction representative because it offers information to prepare in advance for construction administration and quality control inspections. However, construction representatives are not informed of the specifics of a dredging project before the contract is awarded or before construction begins.

Advantages:

- Construction is aware of the designer's intentions, and assumptions.
- Construction contract administrators will be familiar with previous and current contracts, and therefore be able to administer the contract (within constructions legal rights) more effectively.
- Improve construction inspections and quality control.

Disadvantages:

- Staff utilization must also be taken into account, and if needed, augmented.
- Will require more labor funds for construction personnel participation.
- Potentially significant travel time may be required to be actively involved in the PDT.

Discussion: Construction is not getting the necessary information that would be helpful in administering the contract.

Project Management Considerations: Construction has not been involved as much with PDTs due to the distance between construction field offices and the district office. However, this is no more onerous than PMs and other PTD members having to attend other review meetings with sponsor and local agencies outside the USACE SPN office.

It is extremely beneficial to have Construction be a permanent and participating member of the PDT.

Cost / Quality Impacts: As with other alternatives suggesting quality improvements, this one too addresses the issue of involving Construction as a permanent member of the PDT as in other District sections. The construction representative can provide input and insight in developing a quality design package. In addition, involvement in the PDT would be beneficial to the construction representative because it offers information to prepare in advance for construction administration and quality control inspections.

VE ALTERNATIVE ICP-39

Fund O&M program rather than individual projects

Description of Baseline Concept: Each O&M dredging project is a line item in USACE SPN's budget. It is difficult to formally reprogram among projects in order to manage the overall O&M budget.

Description of Alternative Concept: Project sponsors should lobby Congress to fund USACE SPN's O&M program. Create a regional dredging program and or allow greater flexibility to manage the overall budget to move the most mud.

The following concept is embodied in the VE alternative:

- EE-14: Redefine "reprogramming."
- ICP-25: Provide a separate O&M capability within Engineering.

Advantages:

- Allows less complicated redistribution of funds (reprogramming).
- Leads to more efficient use of funds on any one particular project.
- More efficient sediment management.

Disadvantages:

- Local sponsors may not get their "piece of the pie."

Discussion: It is possible this change in funding process could make it possible to reduce the number of, if not eliminate, all current annual dredging projects. By making this change in funding, fewer projects would be dredged each year, making more efficient use of funds. More funds would be available for each project in the year the project was scheduled to be dredged. The additional accumulation of sediment coupled with the suggestion for maximizing the use of advance maintenance will make for a more efficient dredging project for the contractor. This, in turn, will lead to lower unit costs to dredge, including reducing mobilization/demobilization expenses from a yearly expense to a two- or three-year expense. See Alternative EE-1, Dredge deeper less frequently, for a cost analysis of advance maintenance/non-annual dredge projects.

Project Management Considerations: This alternative will require that all of the project sponsors are in agreement and will support the change in procedure.

Assumptions: The USACE SPN cannot lobby on behalf of this change in funding appropriation.

Cost / Quality Impacts: This alternative proposes a change in the funding process to reduce the number of, if not eliminate, all current annual dredging projects. 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. See Alternative EE-1, Dredge deeper less frequently, for a cost analysis of advance maintenance/non-annual dredge projects.

PROJECT INFORMATION

PROJECT INFORMATION

BACKGROUND

The USACE SPN Navigation O&M dredging projects include 10 deep-draft annual maintenance projects and another 13 shallow-draft projects that are dredged less frequently. An important part of this congressionally mandated mission is to operate and maintain these navigation projects within SPN's area of operation to provide safe, reliable, efficient, and environmentally sustainable waterborne commerce. SPN's navigation O&M dredging projects are executed in accordance with mandated congressional authorization and the U.S. OMB guidance authority; i.e., successful project completion requirements include a 95% obligation of allocated work allowance funds in the year for which funds are received, USACE HQ/San Francisco Division (SPD)/SPN mission accountabilities, and environmental principles consistent with the USACE's commitment to proactively balance economic considerations with beneficial ecosystem stewardship and preservation. It is important to note that shallow-draft navigation O&M dredging projects that are maintained less frequently; projects with multi-year dredging cycles are usually funded for maintenance work through sponsor-solicited congressional additions to the President's budget. Maintenance dredging of SPN's navigation projects is either performed by USACE owned/operated plant – the *Essayons* and *Yaquina*, both self-propelled sea-going hopper dredges – or by contracting work to the private sector.

DREDGER ESSAYONS

DREDGER YAQUINA

It is noted that after 15 years of dredge contracting, the USACE SPN has experienced significant delays in releasing maintenance dredging projects for bid in a timely manner. During these 15 years there has been limited (less than 5 percent) environmental problems with maintenance.

PROJECT DESCRIPTION

The focus of the VE study was the evaluation of: (1) current contracting strategies and practices to determine whether they could be revisited and restructured to invite ***greater competition among the dredging contractor community***; (2) 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 each project's budget; and (3) look at maximizing the use of upland sites where appropriate and cost effective; in order to meet current Long-Term Management Strategy (LTMS) for the placement of dredged material goals, as well as structuring contracts to incorporate the latest environmental considerations.

The following table provides the O&M dredging cycle for each project with their corresponding authorization.

TABLE 1

Project Name	Dredging Cycle	Authorization
Humboldt Harbor – Interior Channels	Annual	Rivers and Harbors Act 1910, 1930, 1935, 1937, 1952, 1968
Humboldt Harbor – Bar and Entrance	Annual	Rivers and Harbors Act 1910, 1930, 1935, 1937, 1952, 1968
San Francisco Harbor	Annual	Rivers and Harbors Act 1927, 1930, 1935, 1965, 1968
Richmond Harbor – Outer	Annual	Rivers and Harbors Act 1917, 1930, 1935, 1938, 1945, 1954
Richmond Harbor – Inner	Annual	
Oakland Harbor – Inner	Annual	Rivers and Harbors Act 1910, 1922, 1927, 1928, 1930, 1945, 1974, WRDA 1986
Oakland Harbor – Outer	Annual	
Suisun Bay / New York Slough	Annual	Rivers and Harbors Act 1927, 1930, 1935, 1960
Pinole Shoal	Annual	Rivers and Harbors Act 1902, 1911, 1917, 1938, 1945, 1965, 1968 Sec 117
Redwood City Harbor	Annual	WRDA 2007, 1986, 1999, Sec 107
Noyo Harbor	2-Years (2009)	Rivers and Harbors Act 1930, 1945, 1960, 1962, WRDA, 1976, 1986
Moss Landing Harbor	3-Years (2008)	Rivers and Harbors Act 1945
Crescent City Harbor	5-Years (2009)	Rivers and Harbors Act 1935, 1946
Bodega Bay Harbor	11-Years (2005)	Rivers and Harbors Act 1938
Napa River – Up-Stream Portion	6-Years (1998)	Rivers and Harbors Act 1938
Napa River – Down-Stream Portion	6-Years (1998)	Rivers and Harbors Act 1880, 1930
Petaluma River Channel	4-years (2003)	Rivers and Harbors Act 1938
Petaluma River – Across the Flats	3-years (1998)	Rivers and Harbors Act 1880, 1930
San Rafael – Inner Canal	4-years(2003)	Rivers and Harbors Act 1919
San Rafael – Across the Flats	7-years (1998)	Rivers and Harbors Act 1919
San Leandro Marina (Jack D. Maltester)	4-years (2009)	Rivers and Harbors Act 1965, WRDA 1986, 1992
Santa Cruz Harbor (maintained by Sponsor)	Year-Round Cycle	Rivers and Harbors Act 1958, WRDA 2007
Suisun Slough	Infrequent (1990)	Rivers and Harbors Act 1910, 1913, 1937
Monterey Harbor	Not Maintained	Rivers and Harbors Act 1930, 1935, 1945, 1960, 1988
Larkspur Ferry Channel (Non-Federal)	4-years (2002)	WRDA 2007, 1986, 1999, Sec 107

INFORMATION PROVIDED TO THE VE TEAM

The following project documents were provided to the VE team for their use during the study:

- Sample Dredging Contract entitled: "Oakland Inner and Outer Harbor Channel Maintenance Dredging" that included Drawings, Specifications and Bidding Schedule;
- Sample Dredging Contract entitled: "Richmond Inner Harbor Channel Maintenance Dredging" that included Drawings, Specifications and Bidding Schedule; and
- Sample Dredging Contract entitled: "Suisun Channel, Bullshead Channel and New York Slough Maintenance Dredging" that included Drawings, Specifications and Bidding Schedule.

PROJECT DRAWINGS

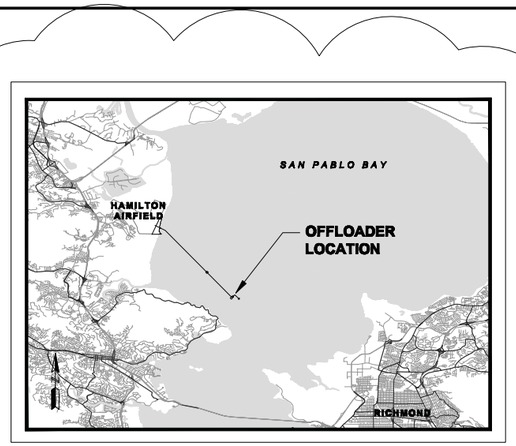
Selected sheets from the project drawings are included on the following pages.

PROJECT COST ESTIMATE

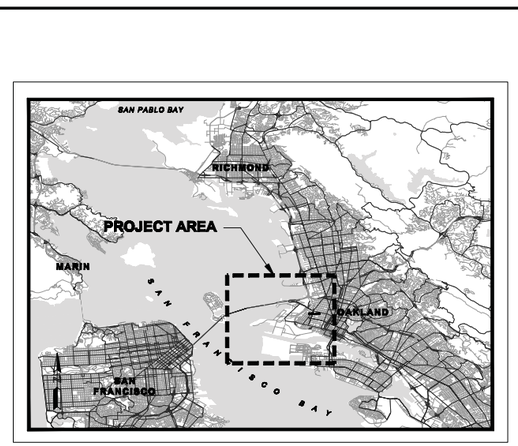
Although a "project" cost estimate was not available due to the nature of the study, it was noted that operation and maintenance dredging is programmed at approximately $30,000,000 yearly.

OAKLAND INNER & OUTER HARBOR CHANNEL -50 FOOT MAINTENANCE DREDGING PROJECT

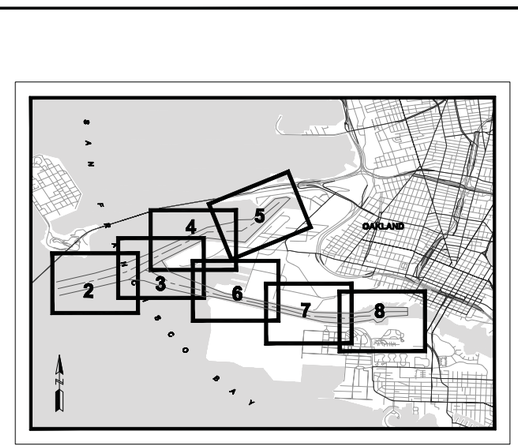
ALAMEDA COUNTY, CALIFORNIA



DISPOSAL SITE
NOT TO SCALE

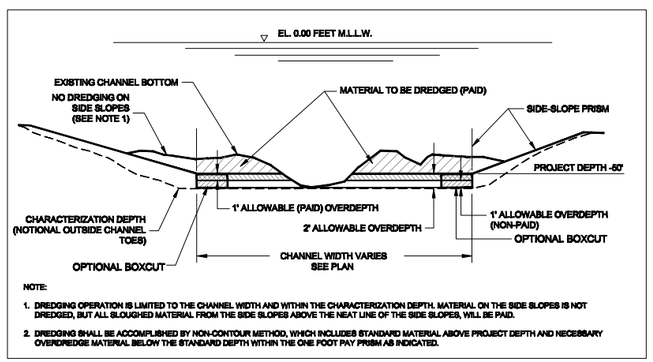


VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

7



NOTE:
1. DREDGING OPERATION IS LIMITED TO THE CHANNEL WIDTH AND WITHIN THE CHARACTERIZATION DEPTH. MATERIAL ON THE SIDE SLOPES IS NOT DREDGED, BUT ALL SLOUGHED MATERIAL FROM THE SIDE SLOPES ABOVE THE NEAT LINE OF THE SIDE SLOPES, WILL BE PAID.
2. DREDGING SHALL BE ACCOMPLISHED BY NON-CONTOUR METHOD, WHICH INCLUDES STANDARD MATERIAL ABOVE PROJECT DEPTH AND NECESSARY OVERDREDGE MATERIAL BELOW THE STANDARD DEPTH WITHIN THE ONE FOOT PAY PRISM AS INDICATED.

TYPICAL DREDGING SECTION
NOT TO SCALE

GENERAL NOTES:

1. SURVEYS WERE DONE BY THE CORPS OF ENGINEERS, S.F. DISTRICT ON 18 - 20 MAY 2010.
2. SOUNDINGS ARE BASED ON THE DATUM OF MEAN LOWER LOW WATER AT THE LOCALITY NAVD 1988 DATUM.
3. DRAWINGS ARE NOT TO BE USED AS NAVIGATION CHARTS.
4. INFORMATION SHOWN ON THE DRAWINGS IS BASED ON SURVEYS MADE ON THE DATES INDICATE AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
5. SOUNDINGS WERE TAKEN BY FATHOMETER AND ARE SHOWN TO THE NEAREST TENTH OF A FOOT.
6. COORDINATES ARE BASED ON THE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83), LAMBERT CONFORMAL PROJECTION ZONE III PUBLISHED BY THE NATIONAL OCEAN SURVEY.
7. BASE MAPS WERE COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY FLOWN AUG.10, 1998.

7

ACCEPTANCE REACHES:

INNER HARBOR:
- REACH 1: STA 0+00 TO 64+00
- REACH 2: STA 64+00 TO 110+00
- REACH 3: STA 110+00 TO 175+00
- REACH 4: STA 175+00 TO 205+00
- REACH 5: STA 205+00 TO 230+00
- REACH 6: STA 230+00 TO 244+35

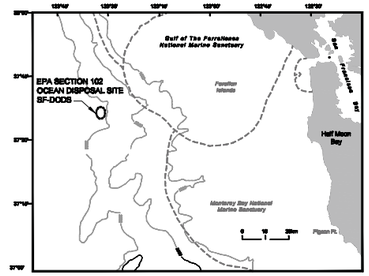
OUTER HARBOR:
- REACH 7: STA 0+00 TO 56+00
- REACH 8: STA 56+00 TO 80+00
- REACH 9: STA 80+00 TO 96+00
- REACH 10: STA 96+00 TO 133+49

VERTICAL CONTROL:

1. TOWILL RESET TIDAL BM - USACE DISK-NORTHWEST CORNER OF BERTH 38 / 37. BEN E. NUTTER TEMINAL. ELEVATION:13.54 MLLW - NAVD88 DATUM. ELEVATION CREATED USING MON.4777 A 1977 - NATIONAL OCEAN SERVICE DISK. PUBLICATION DATE: 04/21/2003. TIDE GAUGE LOCATION - BERTH 37.
2. MON. GPS-2-PORT OF OAKLAND DISK - ANGLE POINT OF BERTH 30. TRANPAC TEMINAL. ELEVATION:13.85 MLLW-NAVD 88 DATUM. TOWILL DECEMBER 2004 CONTROL SURVEY. 2122581.620N, 6035102.090E. TIDE GAUGE LOCATION -BERTH 7.

HORIZONTAL CONTROL:

COAST GUARD D-BEACON



OVAL SHAPED SITE, L COORDINATES:
37°39.0'N
123°29.0'W

4 NAUTICAL MILES(NM) LONG (NORTH / SOUTH) AXIS
2.5 NAUTICAL MILES SHORT (EAST / WEST) AXIS

SCHEDULE OF DRAWINGS		
DRAWING NO.	SHT. NO.	TITLE OF DRAWINGS
2-1-210	1	VICINITY MAP, LOCATION MAP, DISPOSAL SITE, SCHEDULE OF DRAWINGS, AND TYPICAL DREDGING SECTION.
2-1-210	2 - 5	OUTER HARBOR DREDGING PLAN
2-1-210	6 - 8	INNER HARBOR DREDGING PLAN

US Army Corps of Engineers
San Francisco District
1455 Market Street
San Francisco, CA 94103

Mark	Amendment 7	Date	Appr.
		08/2010	

DESIGNED BY: FS | DRAWN BY: PDT
DATE: 5 May 2010 | CHECKED BY: PDT
SHEET NO. 1 of 8 | DRAWING NO. 2 | 1 | 210

APPROVED: LT. COLONEL, C.E., DISTRICT COMMANDER

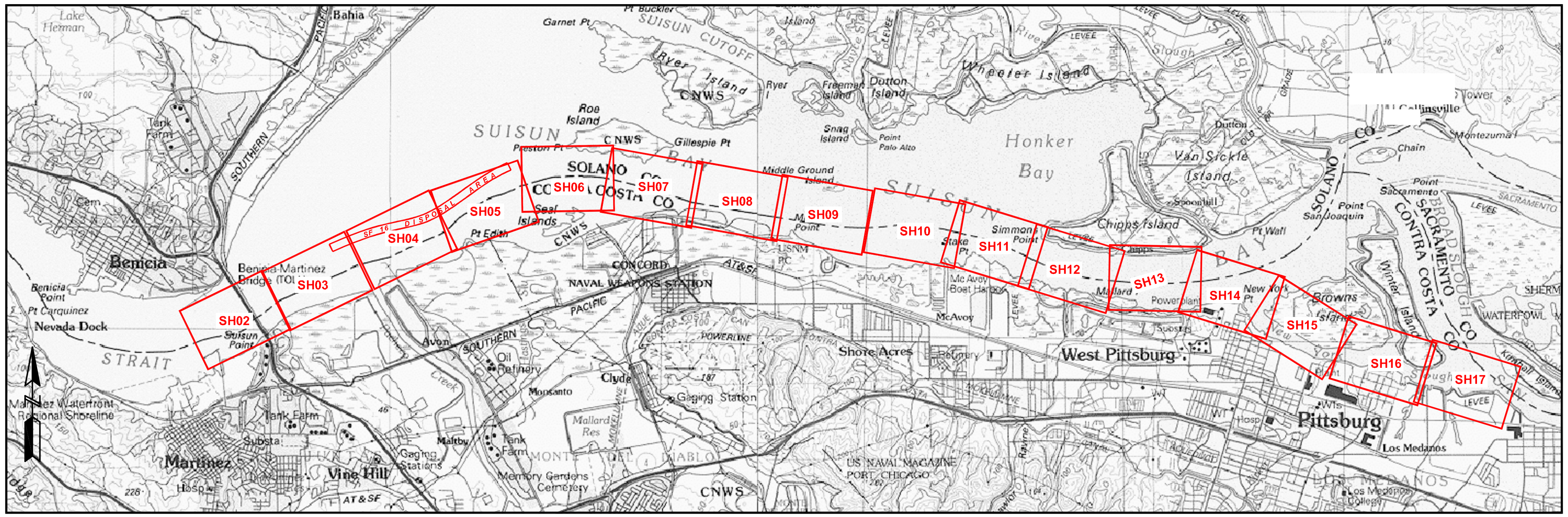
SUBMITTED: Chief, Civil Design Branch
APPROVAL RECOMMENDED: Chief, Engineering Division
APPROVED: Chief, Engineering & Technical Services Division

CALIFORNIA
ALAMEDA COUNTY
OAKLAND INNER & OUTER HARBOR CHANNEL MAINTENANCE DREDGING
VICINITY MAP, LOCATION MAP, DISPOSAL SITE, TYPICAL DREDGING SECTION & SCHEDULE OF DRAWINGS

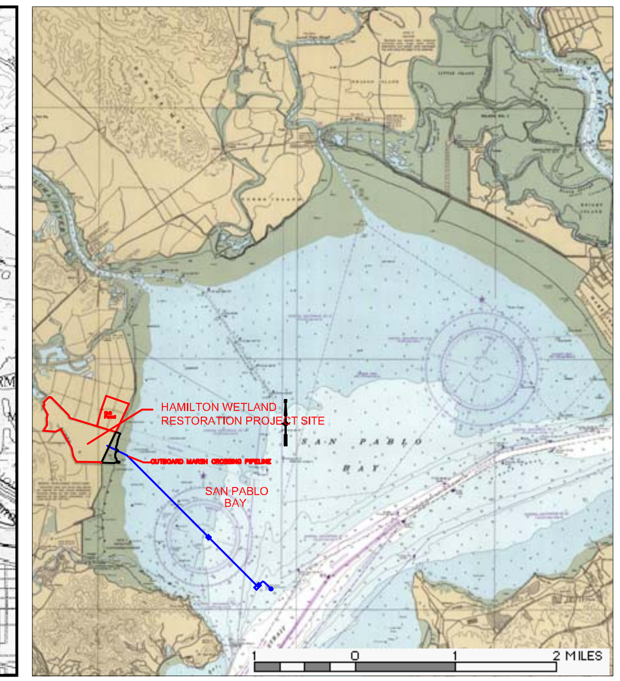
Sheet reference number 1

M:\Branch_Folders\Engineering\Civil_Design\Oakland2010_Inner&Outer_OS&MCAD\ Oakland_InnerOuter2010.dwg 28 Aug 2010 - 3:18pm

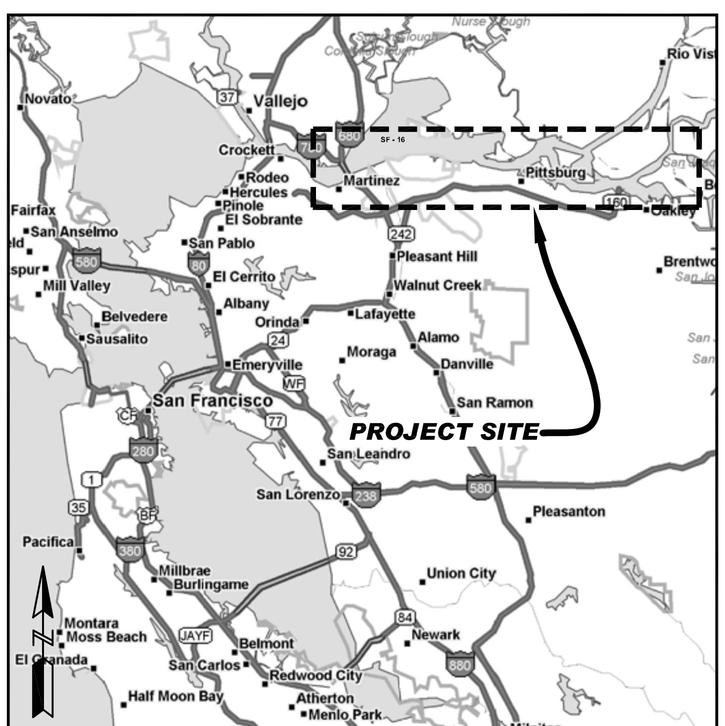
SUISUN BAY CHANNEL AND NEW YORK SLOUGH MAINTENANCE DREDGING PROJECT



LOCATION MAP



HAMILTON DISPOSAL SITE



VICINITY MAP

GENERAL NOTES:

A CONDITION SURVEY OF THE CHANNEL WAS PERFORMED BY THE CORPS OF ENGINEERS, S.F. DISTRICT ON 25 - 29 APRIL 2007.

PLANE GRID, BEARINGS AND COORDINATES ARE BASED ON STATE OF CALIFORNIA COORDINATES SYSTEM, NAD 83, ZONE II, CALIFORNIA.

PROJECT DEPTH IS -35 FEET MLLW. FATHOMETER READINGS ARE TAKEN TO THE NEAREST TENTH OF A FOOT.
SURVEY EQUIPMENT:
SURVEY BOAT - TRIMBLE SERIES 7400 DGPS (P/N31463-00) DIFFERENTIAL POSITIONING SYSTEM
TRIMBLE PROBEACON RECEIVER (P/N 25785-00) DIFFERENTIAL D-BEACON RECEIVER
TSS DMS-25 MOTION SENSOR (HEAVE PITCH ROLL COMPENSATOR) ODUM DF 3200 MK II FATHOMETER (200KHZ & 24KHZ), ODUM DIGITBAR 1100 SERIES (VELOCITY OF SOUND MEASUREMENT),LAPTOP COMPUTER
SURVEY SOFTWARE: HYPACK MAX 4.3 HYDROGRAPHIC SURVEY SOFTWARE.

THE SURVEY DATA ONLY REPRESENTS THE CHANNEL CONDITIONS ON THE DATES OF SURVEY.

THE LOCATION OF ALL NAVIGATION AIDS ARE BASED ON INFORMATION PROVIDED BY THE U.S. COAST GUARD.
HORIZONTAL CONTROL : DESIGNATION SOURCE,XYZ; COAST GUARD D-BEACON.
VERTICAL CONTROL:
(**REACH 1,STA.136+00 TO 150+00**) BENCHMARK 9 1948 USC&GS DISK ELEVATION 14.88 FT. MLLW. NAVD 88
TIDE GAGE LOCATED AT PORT OF BENICIA LINES.

(REACH 2, STA.150+00 TO 510+00) BENCHMARK 5144-P 1990 RESET 1997 ELEVATION 11.83 FT. MLLW. NAVD 88
TIDE GAGE LOCATED AT CONCORD NAVAL WEAPONS STATION TUG DOCK.

(REACH 3, STA.510+00 TO 660+00) BENCHMARK 5144-P 1990 RESET 1997, ELEVATION 11.83 FT. MLLW. NAVD88
TIDE GAGE LOCATED AT CONCORD NAVAL WEAPONS STATION TUG DOCK. AND BENCHMARK "5096-B" USC&GS DISK, ELEV.21.76 FT MLLW. NAVD 88 DATUM. TIDE GAUGE LOCATED AT DIABLO SERVICES DOCK.

(REACH 4, STA.660+00 TO 733+45) BENCHMARK 5096-B (1979) USC&GS DISK 21.76 MLLW. NAVD88. TIDE GAUGE LOCATION: DIABLO SERVICES DOCK.

(REACH 5 NEW YORK SLOUGHS STA. 0+00 TO 232+00) BENCHMARK 5096-B ELEVATION 21.76 FT. MLLW. NAVD 88
TIDE GAGE LOCATED AT DIABLO SERVICES DOCK.

BENCH MARK INFORMATION:
5144 P 1990 RESET 1997

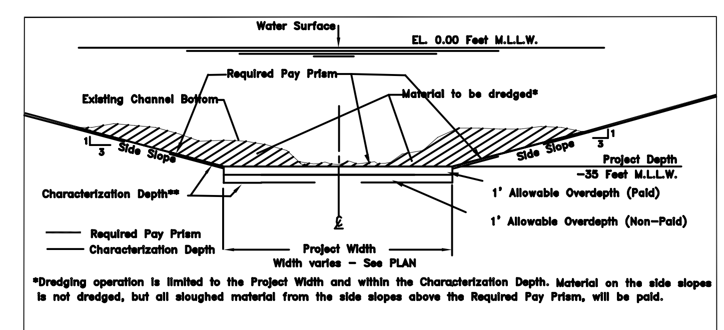
THE BENCHMARK IS IN THE VICINITY ON THE NAVAL WEAPONS CENTER PROPERTY.
THE TIDE GAUGE IS ON THE SE END OF THE TUG PIER. IT IS A DISK SET FLUSH IN THE CONCRETE BASE OF A FLAG POLE AT THE HEAD OF THE TUG PIER, 48.6 FT EAST OF THE EAST SIDE OF A TELEPHONE BOOTH NEAR THE TUG OFFICE, 12.5 FT SE OF THE SOUTHERN END OF A GUARDRAIL, WHICH LEADS TO PIER, AND 1.6 FT SW OF THE FLAGPOLE.

SCHEDULE OF DRAWINGS

DRAWING NO.	SHT. NO.	TITLE OF DRAWINGS
4 - 1 - 67	1	VICINITY MAP, LOCATION MAP, SCHEDULE OF DRAWINGS AND TYPICAL SECTION
4 - 1 - 67	2	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	3	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	4	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	5	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	6	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	7	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	8	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	9	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	10	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	11	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	12	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	13	DREDGING PLAN (SUISUN CHANNEL)
4 - 1 - 67	14	DREDGING PLAN (NEW YORK SLOUGH)
4 - 1 - 67	15	DREDGING PLAN (NEW YORK SLOUGH)
4 - 1 - 67	16	DREDGING PLAN (NEW YORK SLOUGH)
4 - 1 - 67	17	DREDGING PLAN (NEW YORK SLOUGH)

CENTER LINE ANGLE POINTS - SUISUN CHANNEL

POINT NO.	STATION	NORTH	EAST
	SUISUN CHANNEL		
C1	0+00.00	1773412.49	6522323.35
C2	50+03.08	1775815.85	6526711.37
C3	52+01.55	1775911.19	6526885.44
C4	60+00.73	1776288.83	6527589.77
C5	117+98.57	1779028.53	6532699.46
C6	122+94.96	1779260.42	6533138.36
C7	134+07.13	1779693.62	6534162.72
C8	177+55.24	1781248.49	6538223.29
C9	213+56.56	1783249.04	6541217.85
C10	244+90.18	1784989.77	6543823.49
C11	270+55.27	1785786.87	6546288.60
C12	299+53.65	1785904.81	6549158.86
C13	363+07.06	1784382.19	6555353.71
C14	367+35.20	1784280.03	6555769.36
C15	423+66.19	1783625.37	6561362.27
C16	439+95.05	1983642.39	6562991.28
C17	476+51.42	1783680.31	6566621.42
C18	517+11.45	1783164.25	6570674.99
C19	534+56.03	1782943.96	6572405.37
C20	561+21.49	1782104.08	6574907.61
C21	595+25.10	1780601.54	6577991.12
C22	629+86.42	1779096.94	6581078.86
C23	657+80.12	1778177.91	6583717.07
C24	657+64.80	1778157.11	6585328.12
C25	685+73.82	1778141.84	6586510.54
C26	728+59.84	1778592.35	6590772.82
C27	733+45.40	1778643.88	6591255.63
	NEW YORK SLOUGH		
C28A(C27)	0+00.00	1778643.88	6591255.63
C28	2+83.87	1778606.44	6591539.73
C29	22+26.03	1778352.69	6593465.01
C30	35+45.41	1777605.88	6594552.75
C31	54+33.88	1776008.84	6595560.59
C32	62+51.22	1775372.55	6596073.24
C33	70+68.55	1774925.89	6596757.47
C34	86+74.90	1774208.28	6598194.62
C35	97+62.22	1773722.64	6599167.21
C36	103+42.35	1773506.74	6599705.67
C37	109+22.79	1773415.38	6600278.58
C38	141+97.72	1773165.58	6603543.68
C39	150+08.93	1773011.77	6604340.18
C40	158+20.13	1772620.90	6605051.02
C41	161+71.45	1772417.41	6605337.77
C42	164+70.86	1772282.44	6605605.37
C43	172+34.11	1771938.73	6606286.86
C44	182+97.08	1771876.53	6607348.01
C45	202+89.91	1772058.59	6609332.80
C46	220+00.17	1771905.32	6611036.18
C47	232+00.00	1771245.21	6612038.32



SUISUN BAY CHANNEL AND NEW YORK SLOUGH O&M DREDGING
TYPICAL DREDGING SECTION
NOT TO SCALE

US Army Corps of Engineers
San Francisco District
1455 Market Street
San Francisco, CA 94103

Mark	Description	Date	Appr.

DESIGNED BY: GF	CHECKED BY: PDT	DRAWN BY: GF
DATE: 1 - 14 - 2008	SHEET NO. 1 of 17	DRAWING NO. 4 - 1 - 68

LT. COLONEL, C.E., DISTRICT COMMANDER

SUBMITTED: Chief, Civil Design Section
APPROVAL RECOMMENDED: Chief, Engineering Branch
APPROVAL : Chief, Engineering & Technical Services Division

CONTRA COSTA COUNTY CALIFORNIA

SUISUN BAY CHANNEL AND NEW YORK SLOUGH MAINTAINANCE DREDGING

SCHEDULE OF DRAWINGS, LOCATION MAP, VICINITY MAP AND TYPICAL CROSS SECTION

Sheet reference number 1

RICHMOND INNER & OUTER HARBOR CHANNEL MAINTENANCE DREDGING PROJECT

CONTRA COSTA COUNTY, CALIFORNIA

GENERAL NOTES:

1. SURVEYS WERE DONE BY THE CORPS OF ENGINEERS, S.F. DISTRICT ON 12 - 14 MAY 2010 FOR INNER HARBOR CHANNEL;10 - 11 MAY FOR OUTER HARBOR CHANNEL.
2. SOUNDINGS ARE BASED ON THE DATUM OF MEAN LOWER LOW WATER AT THE LOCALITY NAVD 1988 DATUM.
3. DRAWINGS ARE NOT TO BE USED AS NAVIGATION CHARTS.
4. INFORMATION SHOWN ON THE DRAWINGS IS BASED ON SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
5. SOUNDINGS WERE TAKEN BY FATHOMETER AND ARE SHOWN TO THE NEAREST TENTH OF A FOOT.
6. COORDINATES ARE BASED ON THE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83), LAMBERT CONFORMAL PROJECTION ZONE III, AS DESCRIBED IN SPECIAL PUBLICATION NO. 253, PUBLISHED BY NATIONAL OCEAN SURVEY.
7. BASE MAPS WERE COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY FLOWN AUG.10, 1996.

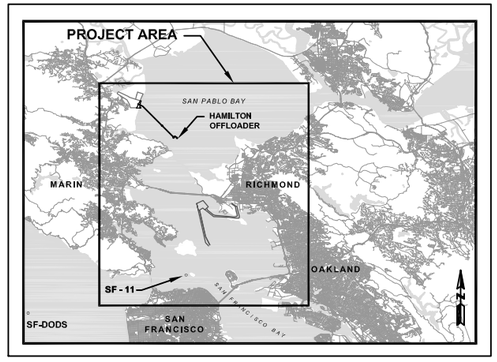
ACCEPTANCE REACHES (INNER HARBOR CHANNEL):

REACH 1: STA 0+79 TO 10+00
REACH 2: STA 10+00 TO 20+00
REACH 3: STA 20+00 TO 30+00
REACH 4: STA 30+00 TO 40+00
REACH 5: STA 40+00 TO 50+50
REACH 6: STA 50+50 TO 65+00
REACH 7: STA 65+00 TO 80+00
REACH 8: STA 80+00 TO 90+00
REACH 9: STA 90+00 TO 120+00
REACH 10: STA 120+00 TO 148+00
REACH 11: STA 148+00 TO 161+00
REACH 12: STA 161+00 TO 172+51
REACH 13: STA 172+51 TO 200+00
REACH 14: STA 200+00 TO 218+00

ACCEPTANCE REACHES (OUTER HARBOR CHANNEL):

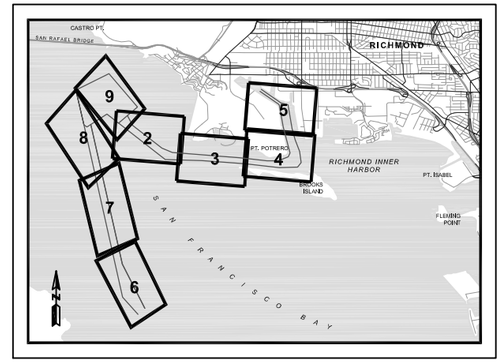
REACH 1: STA 0+00 TO 52+00
REACH 2: STA 52+00 TO 117+79
REACH 3: STA 117+79 TO 171+79
REACH 4: LONG WHARF TURNING BASIN, STA 24+00 TO 38+00

1



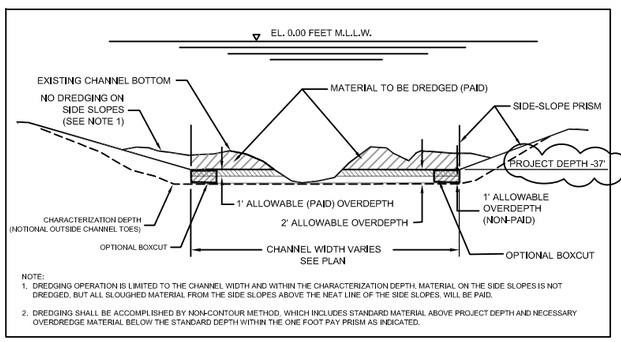
HAMILTON / SF-DODS / SF-11 DISPOSAL SITE

NOT TO SCALE



LOCATION MAP

NOT TO SCALE

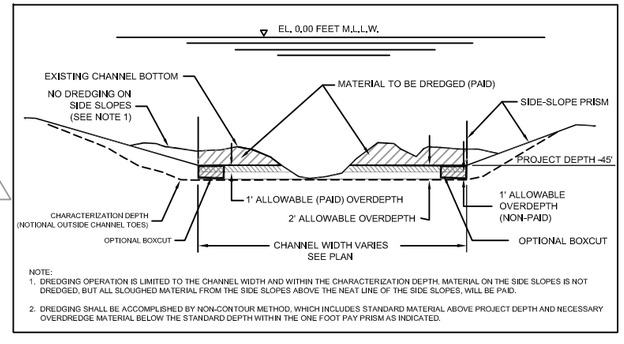


NOTE:
1. DREDGING OPERATION IS LIMITED TO THE CHANNEL WIDTH AND WITHIN THE CHARACTERIZATION DEPTH. MATERIAL ON THE SIDE SLOPES IS NOT DREDGED, BUT ALL SLOUGHED MATERIAL FROM THE SIDE SLOPES ABOVE THE NEAT LINE OF THE SIDE SLOPES, WILL BE PAID.
2. DREDGING SHALL BE ACCOMPLISHED BY NON-CONTOUR METHOD, WHICH INCLUDES STANDARD MATERIAL ABOVE PROJECT DEPTH AND NECESSARY OVERDREDGE MATERIAL BELOW THE STANDARD DEPTH WITHIN THE ONE FOOT PAY PRISM AS INDICATED.

TYPICAL DREDGING SECTION FOR INNER HARBOR CHANNEL

NOT TO SCALE

1



NOTE:
1. DREDGING OPERATION IS LIMITED TO THE CHANNEL WIDTH AND WITHIN THE CHARACTERIZATION DEPTH. MATERIAL ON THE SIDE SLOPES IS NOT DREDGED, BUT ALL SLOUGHED MATERIAL FROM THE SIDE SLOPES ABOVE THE NEAT LINE OF THE SIDE SLOPES, WILL BE PAID.
2. DREDGING SHALL BE ACCOMPLISHED BY NON-CONTOUR METHOD, WHICH INCLUDES STANDARD MATERIAL ABOVE PROJECT DEPTH AND NECESSARY OVERDREDGE MATERIAL BELOW THE STANDARD DEPTH WITHIN THE ONE FOOT PAY PRISM AS INDICATED.

TYPICAL DREDGING SECTION FOR OUTER HARBOR CHANNEL

NOT TO SCALE

SCHEDULE OF DRAWINGS		
DRAWING NO.	SHT. NO.	TITLE OF DRAWINGS
9-1-122	1	VICINITY MAP, LOCATION MAP, DISPOSAL SITE, SCHEDULE OF DRAWINGS, AND TYPICAL DREDGING SECTION.
9-1-122	2-9	DREDGING PLAN

VERTICAL CONTROL (INNER CHANNEL):
BENCHMARK #2: (1932) USC&GS DISK ELEV. 16.0825 M.L.L.W. LOCATED ON HARBOR WAY SOUTH SET VERTICALLY IN THE GRANITE FOUNDATION AT THE NORTHERN MOST ENTRANCE OF THE WEST SIDE OF THE OLD FORD PLANT. PUBLICATION DATE: 4/21/2003. DESCRIPTION AVAILABLE AT NOAA WEBSITE STATION ID:9414849
NAVD 88 DATUM B.M. LS2769 CITY OF RICHMOND DISK PAVEMENT 13.971 FT. M.L.L.W.

TIDE GAGE LOCATION(INNER CHANNEL): MON B-1

HORIZONTAL CONTROL(INNER CHANNEL): COAST GUARD D-BEACON

VERTICAL CONTROL (OUTER CHANNEL):
FOR SOUTHAMPTON SHOALS & LONG WHARF MANEUVERING AREAS: BENCHMARK "10" (1937) USC&GS DISK ELEV. 15.86 FT. M.L.L.W. AND BENCHMARK "11" (1946) ELEV. 15.47 FT. M.L.L.W.

TIDE GAUGE LOCATION (OUTER CHANNEL): AT TIBURON NET DEPOT.

HORIZONTAL CONTROL(OUTER CHANNEL): COAST GUARD D-BEACON

US Army Corps of Engineers
San Francisco District
1455 Market Street
San Francisco, CA 94103

No.	Description	Date
1	Area to dredged has changed	9 FEB 2010
2	Project depth has been changed	9 FEB 2010

DESIGNED BY: GF | DRAWN BY: PDT
CHECKED BY: GF | DRAWING NO.: 1 | 122
DATE: 5 MAY 2010 | SHEET NO.: 1 of 9 | 9

SUBMITTED: Chief, Civil Design Section
APPROVAL RECOMMENDED: Chief, Engineering Division
APPROVED: Chief, Engineering & Construction Division

APPROVED:
LT. COLONEL, C.E., DISTRICT COMMANDER

CONTRA COSTA COUNTY CALIFORNIA
RICHMOND INNER HARBOR CHANNEL MAINTENANCE DREDGING
VICINITY MAP, LOCATION MAP, DISPOSAL SITE, TYPICAL DREDGING SECTION & SCHEDULE OF DRAWINGS

Sheet reference number
1

M:\Branch_Folders\Engineering\Civil_Design\Richmond_Harbor_O&M\10\Plans\ RichmondCoverAmendment10_Sept.dwg 28 Sep 2010 - 2:03pm

PROJECT ANALYSIS

PROJECT ANALYSIS

SUMMARY OF ANALYSIS

The following analysis tools were used to study the project:

- Key Project Factors
- Function Analysis

KEY PROJECT FACTORS

The first day of the VE study included meetings with the project stakeholders. The following summarizes key project issues identified during these sessions.

Project Issues

The following are some of the issues and concerns associated with the project.

Environmental Parameters:

- Work Windows
- ESA/EFH
- In-Bay Placement
- Sediment Quality
- Characterization Time

Environmental Goals:

- In-Bay <40% of total – 2012
- In-Bay <20% of total – >2013
- Maximize Upland Placement (*Upland* defined as “beneficial use”)

Budget:

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

Other:

- Reduced Competition
- Contracting Restrictions
- Poorly Written Specifications
- Poorly Designed Projects
- Dredging Equipment Availability
- West Coast Dredge Schedule
- Budget Uncertainties

Regulatory Constraints:

- Permitting
- Budget Timing
- Contract Award Timing
- Volume Uncertainty
- USACE "Process"
- Project Management

Limited Entry

- Panama Canal
- California Air Board
- American Bureau of Shipping (ABS) Load Line

FUNCTION ANALYSIS

Function random analysis was performed leading to the development of a Function Analysis System Technique (FAST) diagram which revealed the key functional relationships for the project. These analyses provided a greater degree of understanding of the total program and how the program's performance, cost, time, and risk characteristics are related to the various functions identified.

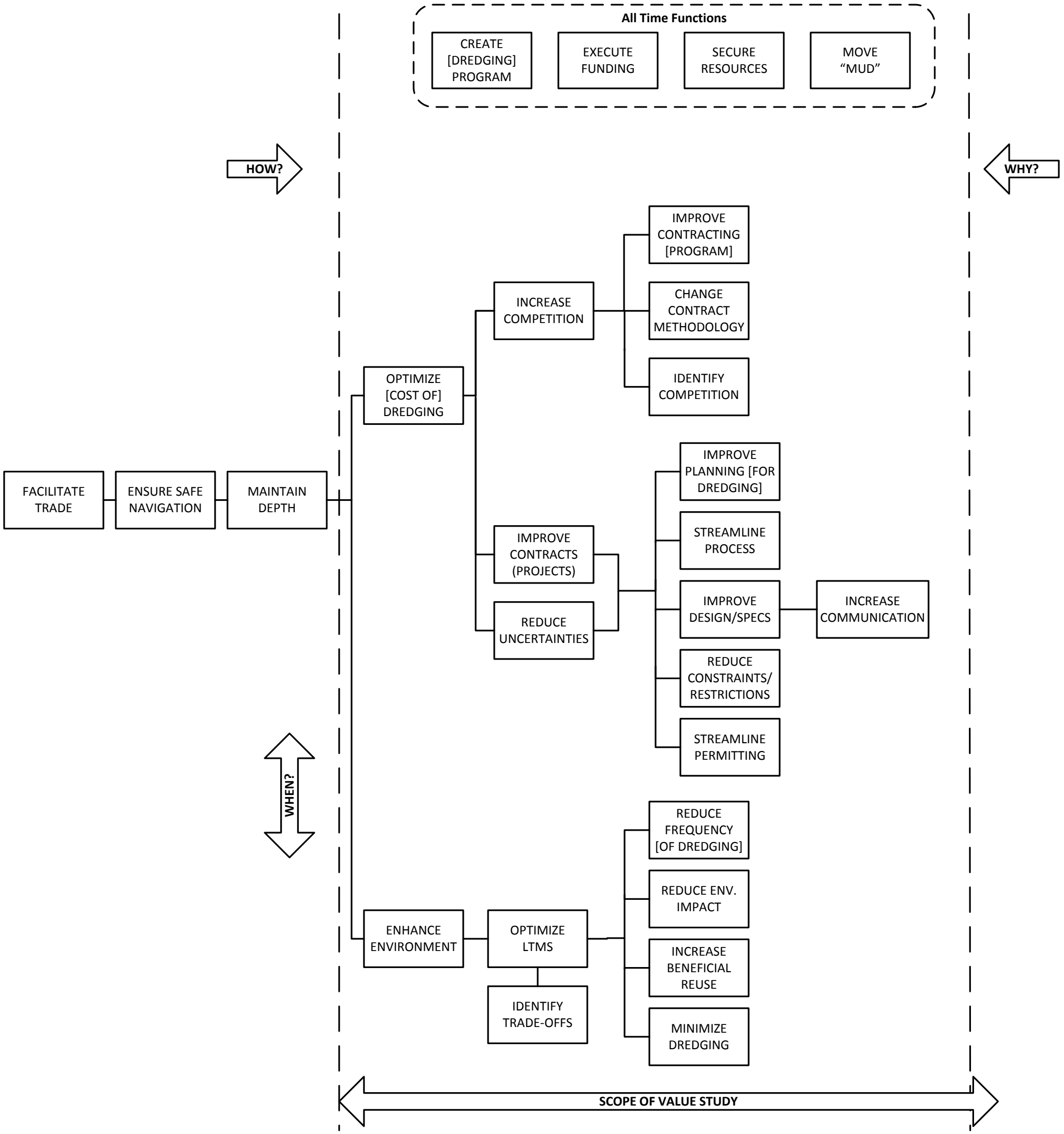
The FAST diagram arranges the functions in logical order so that when read from left to right, the functions answer the question, "How?" If the diagram is read from right to left, the functions answer the question, "Why?" Functions connected with a vertical line are those that happen at the same time as, or are caused by, the function at the top of the column (a "When?" relationship).

Random Function Determination

Function
Facilitate Trade
Optimize Costs [of Dredging] (Program Purpose)
Enhance Environment (Program Purpose)
Ensure Safe Navigation
Maintain Depth
Increase Competition (Program Purpose)
Reduce Uncertainties
Improve [Project] Contracts
Optimize LTMS
Identify Trade-offs
Improve [Program] Contracting
Streamline Permitting

Function
Change Contract Methodology
Reduce Constraints/Restrictions
Identify Competition
Improve Design/Specifications
Improve Planning [for Dredging]
Streamline Process
Reduce Dredging Frequency
Execute Funding
Reduce Environmental Impacts
Move Mud
Increase Beneficial Reuse
Create Dredging Program
Minimize Dredging
Increase Communication
Secure Resources

F.A.S.T. Diagram



IDEA EVALUATION

IDEA EVALUATION

The ideas generated by the VE team were carefully evaluated, and project-specific attributes were applied to each idea to assure an objective evaluation.

EVALUATION PROCESS

The VE team generated and evaluated ideas on how to perform the various project functions using other approaches. The idea list was grouped by function or major project element. Each idea was evaluated with respect to the functional requirements of the project. Performance, cost, time, and risk may also have been considered during this evaluation.

Once each idea was fully evaluated, it was given either a "develop" or "dismiss" rating. Ideas that were rated "develop" were then further developed and those that were found to have the greatest potential for value improvement are documented in the *VE Alternatives* section of this report.

IDEA SUMMARY

All of the ideas that were generated during the Speculation Phase using brainstorming techniques were recorded on the following pages. Ideas received an idea code based upon the function statement under which it was brainstormed. The following table indicates the functions related to each idea code.

Idea Code	Related Function
IC	Increase Competition
ICP	Improve Contract/Project
EE	Enhance Environmental

IDEA SUMMARY LIST

Idea Code and Description		Develop or Combine?
IC-1	Consolidate similar projects under a smaller number of contracts	Develop
IC-2	Consolidate non-federal projects by balancing across numerous projects	Combine
IC-3	Consider use of IDIQ contracts for O&M dredging	Develop
IC-4	Use an array of disposal site rather than single-source disposal site	Develop
IC-5	Identify an array of beneficial reuse sites	
IC-6	Remove restrictions on equipment	
IC-7	Reduce size of contracts	Develop
IC-8	Increase size of contracts	Combine

Idea Code and Description		Develop or Combine?
IC-9	Issue one contract for all O&M	Combine
IC-10	Use multi-year contracts	Combine
IC-11	Dredge bi-annually	Combine
IC-12	Use separate beneficial reuse contracts	Develop
IC-13	Use separate on-call contracts	Develop
IC-14	Use RFP process source selection for contracting to improve quality of competition	Combine
IC-15	Increase communication with contractors	Develop
IC-16	Pre-solicitation conference(s) with contractors	Combine
IC-17	Increase funding for O&M dredging	
IC-18	Develop and maintain a contracting schedule	Combine
IC-19	Complete contracts and advertise earlier	Combine
IC-20	Expand work windows	
IC-21	Focus on end-date of work window rather than start date	Combine
IC-22	Provide bonus clause for early finish	
IC-23	Reduce penalty amount	
IC-24	Have small business set-aside for dredging	
IC-25	Focus market research appropriately to improve competition	Develop
IC-26	Use a MATOC contract	Combine
IC-27	Use incentive contract	Combine
IC-28	Use a DB contract	Combine
IC-29	Use fixed-price contracts	Combine
IC-30	Use cost-reimbursement contracts	Combine
IC-31	Use time and materials contracts	Combine
IC-32	USE Early Contractor Involvement (ECI) contracts	Combine
IC-33	Use a prime-contractor-type contract	Combine
IC-34	Use dredge rental contract	Combine
ICP-1	Get individual contracts out on time	Develop
ICP-2	Provide NTP at least 30 days prior to window opening	Combine
ICP-3	Award contracts earlier	Combine
ICP-4	Align projects in order of open work windows	Combine

Idea Code and Description		Develop or Combine?
ICP-5	Make project manager accountable for schedule	
ICP-6	Maintain project team continuity	Develop
ICP-7	Identify beneficial reuse disposal site in contract	Combine
ICP-8	Undertake periodic workshop review by USACE Contracting of contract language	Develop
ICP-9	Have all permitting as part of bidding	Develop
ICP-10	Remove repetitive language in the contract	Combine
ICP-11	Q1 team (PM, ENV, KOTR) meeting for every project	Develop
ICP-12	Avoid one-size-fits-all contract package	Combine
ICP-13	Reuse contract from previous year for similar projects	Combine
ICP-14	Use multi-year EAs	Develop
ICP-15	Expand Consistency Determinations to 10 years	Develop
ICP-16	Audit past awarded contracts over a 3-year period to review changes to process/design	Combine
ICP-17	Improve submittal process	Combine
ICP-18	Decouple the "E" of BCOE from contracting timeline (parallel vs. linear)	Develop
ICP-19	Redistribute risk where USACE assumes more risk	Combine
ICP-20	Decouple sampling results with design	Combine
ICP-21	Reduce amount of mobilization time	
ICP-22	Periodic audit workshop between regulatory agencies	Develop
ICP-23	Maximize use approval of Tier I testing protocol (including Tier III pre-dredge prior year)	Combine
ICP-24	Move O&M dredging to Operations	Develop
ICP-25	Provide a separate O&M capability within Engineering	Combine
ICP-26	Q1 planning meeting for the whole program	Combine
ICP-27	PDT should include local sponsors and regulatory agencies	Combine
ICP-28	Eliminate ITR	
ICP-29	Avoid contracts where quantity-to-design/depth-to-design is small	Develop
ICP-30	Reduce BCOE time period	Develop
ICP-31	Reduce ITR time period	Combine
ICP-32	Expand participants of annual program AAR	Develop
ICP-33	Have Construction assume responsibility of AARs	Develop

Idea Code and Description		Develop or Combine?
ICP-34	Reevaluate use of contractor-provided quality control (CQC)	
ICP-35	Improve coordination between contract creation and construction	Develop
ICP-36	Have Chief of Contracts certify FAR compliance	
ICP-37	Workshop of dredging contractors to evaluate concerns, constraints, etc.	Combine
ICP-38	Provide alternative contract scheme (e.g., Santa Cruz)	Combine
ICP-39	Fund program versus projects	Develop
ICP-40	Audit of addenda of maintenance dredging contracts	
EE-1	Dredge deeper less frequently	Develop
EE-2	Redefine advance maintenance dredging	Combine
EE-3	Greatly expanded use of knockdown and other non-extractive dredging methods	Combine
EE-4	Reduce or eliminate annual dredging	Combine
EE-5	Create more beneficial use sites	
EE-6	Expand definition of beneficial use	Develop
EE-7	Reduce disturbance caused by dredging	Combine
EE-8	Consider the use of non-settling dredging	Combine
EE-9	Consider a revenue stream from dredged material	
EE-10	Redefine/reevaluate environmental impacts	Combine
EE-11	Redefine LTMS goals	Combine
EE-12	Focus application of beneficial reuse	Combine
EE-13	Realign projects to take advantage of deep waters	Combine
EE-14	Redefine "reprogramming"	Combine

VALUE ENGINEERING PROCESS

VALUE ENGINEERING PROCESS

A systematic approach is used in the VE study. The key procedures followed were organized into three distinct parts: (1) Pre-Study Preparation, (2) VE Study, and (3) Post-Study Procedures.

PRE-STUDY PREPARATION

In preparation for the VE study, the team leader reviews critical aspects of the project and areas for improvement. In the week prior to the start of the VE study, the VE team reviews the documents provided by the designer to become better prepared for the study. In addition, performance attributes and requirements are initially identified that are relevant to the project.

VE STUDY

The Value Methodology (VM) Job Plan is followed to guide the teams in the consideration of project functionality and performance, potential schedule issues, high cost areas, and risk factors in the design. These considerations are taken into account in developing alternative solutions for the optimization of project value. The Job Plan phases are:

- Information Phase
- Function Phase
- Speculation Phase
- Evaluation Phase
- Development Phase
- Presentation Phase

Information Phase

At the beginning of the VE study, the design team presents a more detailed review of the design and the various systems. This includes an overview of the project and its various requirements, which further enhances the VE team's knowledge and understanding of the project. The project team also responds to questions posed by the VE team.

The project's performance requirements and attributes are discussed, and the performance of the baseline concept is evaluated.

Function Phase

Key to the VM process is the function analysis techniques used during the Function Phase. Analyzing the functional requirements of a project is essential to assuring an owner that the project has been designed to meet the stated criteria and its need and purpose. The analysis of these functions in terms cost, performance, time and risk is a primary element in a VE study, and is used to develop alternatives. This procedure is beneficial to the VE team, as it forces the participants to think in terms

of functions and their relative value in meeting the project's need and purpose. This facilitates a deeper understanding of the project.

Speculation Phase

The Speculation Phase involves identifying and listing creative ideas. During this phase, the VE team participates in a brainstorming session to identify as many means as possible to provide the necessary project functions. Judgment of the ideas is not permitted in order to generate a broad range of ideas.

The idea list includes all of the ideas suggested during the study. These ideas should be reviewed further by the project team, since they may contain ideas that are worthy of further evaluation and may be used as the design develops. These ideas could also help stimulate additional ideas by others.

Evaluation Phase

The purpose of the Evaluation Phase is to systematically assess the potential impacts of ideas generated during the Speculation Phase relative to their potential for value improvement. Each idea is evaluated in terms of its potential impact to performance, cost, time and risk. Once each idea is fully evaluated, it is determined whether the each idea will be developed further into a VE alternative, combined with another alternative, or dismissed from further consideration.

Development Phase

During the Development Phase, the highly rated ideas are expanded and developed into VE alternatives. The development process considers the impact to performance, cost, time, and risk of the alternative concepts relative to the baseline concept. This analysis is prepared as appropriate for each alternative, and the information may include a performance assessment, initial cost, and life-cycle cost comparisons, schedule analysis, and an assessment of risk. Each alternative describes the baseline concept and proposed changes and includes a technical discussion. Sketches and calculations are also prepared for each alternative as appropriate.

Presentation Phase

Under normal VE efforts, the VE study concludes with a preliminary presentation of the VE team's assessment of the project and VE alternatives that provides an opportunity for the owner, project team, and stakeholders to preview the alternatives and develop an understanding of the rationale behind them. For this particular VE study, this was not the case; however, an informal oral presentation to SPN and interested stakeholders is currently being considered as a follow-on action.

POST-STUDY PROCEDURES

Typically, a *Preliminary VE Study Report* is prepared after the completion of the workshop. This report summarizes the activities and results of the VE study. Once this report has been reviewed by the owner and project team, an implementation meeting is held in order to determine the disposition of the alternatives presented therein. An implementation plan is developed for those accepted VE alternatives, detailing actions, responsibilities, and key milestones for integrating them into the

project. VE alternatives that are rejected include a summary of the reasons for their rejection. A *Final VE Study Report* is prepared once the implementation results are finalized.

The current Scope of Work for this specific VE study provides for Preliminary VE Study Report to be reviewed by all VE team members. Comments generated from review of the Preliminary VE Study Report are incorporated into the *Final VE Study Report* with corresponsing electronic and hard copies.

Day 1 – Monday, May 16, 2011 (Pine A Conference Room)

8:30 VE Team Set Up
9:00 Project Overview (Presentation by USACE Project Manager and Engineers)
11:30 Lunch
12:30 Project Overview (Continued)
2:30 Issues, Objectives, and Constraints; Costs (All)
3:30 Function Analysis/FAST Diagram (VE Team)
5:00 Adjourn

Day 2 – Tuesday, May 17, 2011 (Room 138)

8:30 Team Creativity
11:30 Lunch
12:30 Evaluation of Ideas
4:00 Team Assignments for Proposal/Design Comments, Review Proposal/Recommendation Development Process, Forms, and Spreadsheets
5:00 Adjourn

Day 3 – Wednesday, May 18, 2011 (Pine A Conference Room)

8:30 Proposal/Recommendation Development
11:30 Lunch
12:30 Proposal/Recommendation Development
5:00 Adjourn

Day 4 – Thursday, May 19, 2011 (Room 138)

8:30 Proposal/Recommendation Development
11:30 Lunch
12:30 Proposal/Recommendation Development
2:00 Completion of Proposal/Recommendation Development
5:00 Adjourn

Day 5 – Friday, May 20, 2011 (Pine A Conference Room)

8:30 VE Team Presentation Preparation
10:00 Presentation of VE Findings *(potential follow-on task)*
12:00 Workshop Concludes

MEETING ATTENDEES

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APPENDIX A

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

O&M .....Operations and Maintenance
AAR .....After Action Report
ASCE.....American Society of Civil Engineers
BCDC.....[San Francisco] Bay Conservation and Development Commission
BCOE.....Biddability, Constructability, Operability, Environmental [Review]
CB.....Construction Branch
CD .....Consistency Determination
CDS.....Civil Design Section
CFR.....Code of Federal Regulation
CMANC .....California Marine Affairs and Navigation Conference
"Corps" .....U.S. Army Corps of Engineers
CR.....Cost-Reimbursement
CWA.....Clean Water Act
CY.....Cubic Yard
CZMA .....Coast Zone Management Act
D-B .....Design-Build
"District" .....[U.S. Army Corps of Engineers] San Francisco District
DMMO.....Dredged Material Management Office
DMMP .....Dredged Material Management Plan
EA.....Environmental Assessment
ECI .....Early Contractor Involvement
EFH .....Essential Fish Habitat
EIS .....Environmental Impact Statement
EP .....Equipment Purchase
ER .....Equipment Rental
ESA.....Endangered Species Act
ETS .....Engineering and Technical Services
FAR.....Federal Acquisition Regulation
FONSI .....Finding of No Significant Impact
FP .....Fixed-Price [Contract]
gal. .....Gallon
IAA .....Integrated Alternative Analysis
IC .....Incentive Contract
IDIQ.....Indefinite Delivery Indefinite Quantity [Contract]
IFB .....Information for Bid
ITR.....Independent Technical Review
LTMS .....Long-Term Management Strategy
MATOC .....Multiple Award Task Order Contract
NTP .....Notice to Proceed
OMB.....Office of Management and Budget
PDT.....Project Delivery Team
PM .....Project Manager
PMP .....Project Management Plan
POC.....Point of Contact
PPMD.....Programs and Project Management Division
RFI .....Request for Information
RFP.....Request for Proposal

ROD.....Record of Decision
RSM .....Regional Sediment Management
RWQCB.....Regional Water Quality Control Board
SBA.....Small Business Administration
SME.....Subject Matter Expert
SPN.....[U.S. Army Corps of Engineers] San Francisco District
T&M.....Time and Materials
USACE.....U.S. Army Corps of Engineers
VE.....Value Engineering
WDR.....Waste Discharge Requirement
WQC .....Water Quality Certification
WRDA .....Water Resources Development Act

Value Management Strategies, Inc.

Offices in Escondido and Sacramento, California; Grand Junction, Colorado; Sarasota, Florida; Marietta, Georgia; Portland, Oregon; Seattle, Washington; Merriam, Kansas; and Great Falls, Montana

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Final Value Engineering Study Report
USACE San Francisco District Navigation Program
NOBLE CONSULTANTS

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