

San Francisco Bay Conservation and Development Commission

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May 22, 2015

Application Summary

(For Commission consideration on June 4, 2015)

Number: Consistency Determination No. C2015.002.00
Date Tendered: February 9, 2015
Action Required By: June 23, 2015
Staff Assigned: Brenda Goeden (415/352-3623;
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Summary

Applicant: U. S. Army Corps of Engineers (USACE), San Francisco District

Location: In the Bay and Suisun Bay Primary Management Area, at the following deep water navigation channels (Exhibit A): (1) Oakland Inner and Outer Harbor Channels (Exhibit B); (2) Richmond Inner and Outer Harbor Channels (Exhibit C); (3) Suisun Bay Channel and New York Slough (New York Slough is outside of the Commission's jurisdiction) (Exhibit D); (4) Pinole Shoal Channel (Exhibit E); (5) Redwood City Harbor Channel (Exhibit F); and (6) San Francisco Main Ship Channel (outside of the Commission's jurisdiction) (Exhibit G).

In the Bay, at the state- and federally-designated, dredged sediment disposal sites near Alcatraz Island (SF-11), Carquinez Strait (SF-9), Suisun Bay (SF-16), San Pablo Bay (SF-10) (Exhibit A); beneficial reuse sites including Montezuma Wetland Restoration Project (Exhibit D), Cullinan Ranch Wetland Restoration Site (Exhibit E) and outside the Commission's jurisdiction at Winter Island and the federally authorized ocean disposal sites including San Francisco Bar (SF-8) (Exhibit A), the Ocean Beach Nourishment Site (Exhibit I) and the San Francisco deep ocean disposal site (SF-DODS) (Exhibit G).

Project: During the calendar years 2015, 2016 and 2017, maintenance dredge up to a total estimated volume of 6.075 million cubic yards (cy); conduct knockdown events of sediment from federal navigation channels in San Francisco Bay located within the Commission's jurisdiction, and dispose and/or beneficially reuse the sediment at various sites including the state- and federally-authorized Suisun Bay, Carquinez Strait, San Pablo Bay and Alcatraz in-Bay disposal sites, and the San Francisco Bar and deep ocean disposal site, as well as a number of beneficial reuse and upland sites adjacent to the Bay.

In 2015, the USACE proposes to dredge a maximum: (1) 450,000 cy of sediment from Oakland Inner and Outer Harbor Channels; (2) 350,000 cy of sediment from Richmond Inner Harbor Channel; (3) 250,000 cy of sediment from Richmond Outer Harbor Channel; (4) 175,000 cy of sediment from Suisun Bay and New York Slough Channel; (5) 150,000 cy of sediment from Pinole Shoal Channel; (6) 600,000 cy of sediment from Redwood City Harbor Channel; for a total of 1.975 million cubic yards of dredging within the Commission's jurisdiction, and (7) dredge a maximum 350,000 cy sediment from the San Francisco Main Ship Channel, outside the Commission's jurisdiction. In 2015, under their "federal standard" alternative, the USACE proposes to dispose of 925,000 cy of sediment at in-Bay disposal sites (47%), 1,175,000 cy of sediment at SF-DODS (53%), and place no sediment at beneficial reuse sites. Their LTMS alternate plan includes disposal of 925,000 cy of sediment at in-Bay disposal sites (47%), 250,000 cy of sediment at SF-DODS (12%), and place 800,000 cy of sediment at beneficial reuse sites (41%).

In 2016, the USACE proposes to: (1) dredge a maximum 700,000 cy of sediment from Oakland Inner and Outer Harbor Channel; (2) dredge a maximum 400,000 cy of sediment from Richmond Inner Harbor Channel; (3) dredge a maximum 250,000 cy of sediment from Richmond Outer Harbor Channel; (4) dredge a maximum 200,000 cy of sediment from Suisun Bay and New York Slough Channel; (5) dredge a maximum 200,000 cy of sediment

from Pinole Shoal Channel; (6) potentially dredge a maximum 250,000 cy of sediment from the Redwood City Harbor Channel; for a total of 2.0 million cy of dredging within the Commission's jurisdiction, and (7) dredge a maximum 500,000 cy of sediment from the San Francisco Main Ship Channel, outside the Commission's jurisdiction. In 2016, under their federal standard alternative, the USACE proposes to dispose of 900,000 cy of sediment at in-Bay disposal sites (45%), 1.1 million cy of sediment at SF-DODS (55%), and place no sediment at beneficial reuse sites. The applicant's LTMS alternate plan includes disposing of 900,000 cy of sediment at in-Bay disposal sites (45%), no sediment at SF-DODS (0%), and placing 1.1 million cy of sediment at beneficial reuse sites (55%).

In 2017, the USACE proposes to: (1) dredge a maximum 700,000 cy of sediment from Oakland Inner and Outer Harbor Channel; (2) dredge a maximum 400,000 cy of sediment from Richmond Inner Harbor; (3) dredge a maximum 250,000 cy of sediment from Richmond Outer Harbor; (4) dredge a maximum 200,000 cy of sediment from Suisun Bay and New York Slough Channel; (5) dredge a maximum 200,000 cy of sediment from Pinole Shoal; (6) dredge a maximum 350,000 cy of sediment from the Redwood City Harbor Channel; for a total of 2.1 million cy of dredging from within the Commission's jurisdiction, and (7) dredge a maximum 500,000 cy of sediment from the San Francisco Main Ship Channel, outside the Commission's jurisdiction. In 2017, under their federal standard alternative, the USACE proposes to dispose 925,000 cy of sediment at in-Bay disposal sites (48%), 1.1 million cy of sediment at SF-DODS (55%); and place no sediment at beneficial reuse sites. The applicant's LTMS alternate plan includes disposal of 925,000 cy of sediment at in-Bay disposal sites (40%), no sediment at SF-DODS (0%), and placement of 1.1 million cy of sediment at beneficial reuse sites (55%).

The USACE also proposes “knockdown events” in their consistency determination. Knockdown events involve dragging sediment from one or more shoals within the dredging footprint into areas below the project depth within dredging footprint using an I-beam that is pulled or pushed by a tugboat or barge. This is done in lieu of a full dredging episode. During the three-year consistency determination, the USACE proposes to conduct knockdown events on an as needed basis of up to five percent of the total maximum volume for any channel, or up to 15,000 cy, whichever is greater (the largest knockdown would be up to 22,500 cy under this scenario).

Issues

Raised:

The staff believes that this consistency determination raises three primary issues: (1) whether the volume of sediment proposed for in-Bay disposal is consistent to the maximum extent practicable with the Long Term Management Strategy for the Placement of Dredged Material in the Bay Region (LTMS) Management Plan and the San Francisco Bay Plan (Bay Plan) policies on Dredging; (2) whether the proposed minimization measures are sufficient to protect native species and their habitat, specifically species that are experiencing steep population decline, including state and federally listed species; and (3) whether the proposed maintenance dredging of federal navigation channels is consistent to the maximum extent practicable with the Commission’s laws and the San Francisco Bay Plan (Bay Plan) policies regarding dredging; fish, other aquatic organisms, and wildlife; subtidal areas; mitigation; water quality; and navigation safety and oil spill prevention.

Background

The U.S. Army Corps of Engineers (USACE) has the responsibility to maintain the federal navigation channels in San Francisco Bay to provide a reliable federal navigation system that is essential to the economic well-being and national defense of the country. To accomplish this goal, the USACE annually dredges deep water navigation channels used by the US Coast Guard, ports, refineries and other commercial, as well as recreational users. The USACE estimates that between 4,000 and 5,000 deep draft vessel enter the Bay and use the navigation channels annually. According to the USACE, the goods-movement industry accounts for 51 percent of the total regional economic output and 32 percent of the total

regional employment.¹ The Bay Area ports and harbors play a major role in efficient movement of goods throughout the region, as well as in California and the West Coast of the United States. Ensuring that the federal deep-draft navigation channels, which provide navigation access to and from these ports and harbors, are maintained is vital to the region's economy. Maintaining the deep-draft channels is vital to reducing the risk of vessel collisions, groundings, allisions, and oil spills. This consistency determination requests concurrence for deep water channel maintenance only as the shallow draft channels are not funded or scheduled for dredging between 2015 and 2017.

Federal Law. The USACE undertakes maintenance dredging of federal navigation channels and the disposal of dredged sediment under 33 Code of Federal Regulations (CFR) 335 through 338, and in accordance with Section 404(b)(1) of the Federal Clean Water Act ([33 U.S.C. 1251](#) *et seq.*) as administered by the San Francisco Bay Regional Water Quality Control Board (Water Board) and the Marine Protection, Research, and Sanctuaries Act of 1972 ([33 U.S.C. 1401](#) *et seq.*) (commonly referred to as the Ocean Dumping Act (ODA)) as administered by the US Environmental Protection Agency (EPA) and Section 307(c) of the Coastal Zone Management Act of 1976 ([16 U.S.C. 1456](#) (c)), as amended and administered by the Commission.

These regulations describe the processes the USACE should undertake in evaluating the proposed project and requesting authorization to proceed from the Water Board, EPA and BCDC. In addition, the applicants state in part:

“The Corps of Engineers undertakes operations and maintenance activities where appropriate and environmentally acceptable. All practicable and reasonable alternatives are fully considered on an equal basis. This includes the discharge of dredged or fill material into waters of the U.S. or ocean waters in the least costly manner, at the least costly and most practicable location, and consistent with engineering and environmental requirements.”²

“The USACE has stated that the proposed project must be conducted in accordance with the “federal standard,” and that any alternative that increases cost beyond the federal standard is not practicable. The federal standard means “the dredged material disposal alternative or alternatives identified by the Corps which represent the least costly alternatives consistent with sound engineering practices and meeting the environmental standards established by the 404(b)(1) evaluation process or ocean dumping criteria.”³

Further, practicable as described by the Federal Code of Regulations means “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.”⁴ However,

¹ California Department of Transportation. 2014. *San Francisco Bay Area Freight Mobility Plan, Final Report*. March 2014. Available at: <http://www.dot.ca.gov/hq/tpp/offices/ogm/regionallevel/FR3SFBAFMSFinalReport.pdf>. (Accessed on 5 April 2015).

² 33 CFR 335.4

³ 33 CFR 335.7

⁴ *Ibid.*

33 CFR 337.2(a) states “District engineers should cooperate to the maximum extent practicable with state agencies to prevent violation of Federally approved state water quality standards and to achieve consistency to the maximum degree practicable with an approved coastal zone management program. Further, 33 CFR 336.1(c) includes evaluation factors that the USACE should consider including navigation and the federal standard; water quality; coastal zone consistency; wetlands; endangered species;...fish and wildlife; and additional factors, described as “(ii) Where officially adopted state, regional, or local land use classifications, determinations, or policies are applicable, they normally will be presumed to reflect local views and will be considered in addition to other national factors.”⁵

The LTMS Management Plan is an officially adopted federal, state and regional program and includes policies applicable to the USACE maintenance dredging program.

Coastal Zone Management Act. 16 USC Section 307(c) of the Coastal Zone Management Act of 1976 directs the USACE to seek consistency with the provisions of the federal Coastal Zone Management Act of 1972, as amended (CZMA). NOAA’s regulations, under the Department of Commerce, govern the Commission’s decisions on federal consistency matters. The Commission’s coastal management program is based on the provisions and policies of, among other things, the McAteer-Petris Act, the Suisun Marsh Preservation Act of 1977, the San Francisco Bay Plan (Bay Plan), the Suisun Marsh Protection Plan, and the Commission’s administrative regulations. Under the CZMA, the USACE is required to carry out their activities and programs in a manner “consistent to the maximum extent practicable” with the Commission’s coastal management program.⁶ The term “consistent to the maximum extent practicable” means fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency.⁷ 15 CFR 930.32 further states that federal agencies shall not use a general claim of a lack of funding as a basis for being consistent to the maximum extent practicable with an enforceable policy of a management program. In cases where the cost of being consistent with the management program was not included in the Federal agency’s budget and planning processes, the Federal agency should seek additional federal funds necessary to be consistent with the management plan. Federal agencies should include the cost of being fully consistent with the management programs in their budget and planning processes to the same extent they would plan for the cost of complying with other federal requirements⁸. The Coastal Zone Management Plan for San Francisco Bay includes the Bay Plan and, therefore, the USACE should endeavor to plan and fund their projects in a way that is consistent with enforceable Bay Plan policies.

⁵ 33 CFR 336.1(11)ii

⁶ 16 USC Section 307(c)(A)(1)

⁷ 15 CFR 930.32(a)(1)

⁸ 15 CFR 930.32(a)(3)

LTMS Management Plan. Historically, most of the material dredged from the Bay was disposed of in the Bay. During the late 1980s and early 1990s, dredging became highly controversial due to the capacity problems at the Alcatraz disposal site and concerns raised by the resource agencies, and the environmental and fishing communities regarding the impacts of the disposal of dredged sediment on Bay natural resources and water quality. As a result, the LTMS was developed and adopted by the USACE, the EPA, the Water Board, the State Water Resources Control Board (SWRCB), and the Commission, collectively the LTMS agencies. The overarching goal of the LTMS was to gradually decrease in-Bay disposal by implementing beneficial reuse and other disposal alternatives, including the ocean as a stop-gap measure when beneficial reuse was infeasible. The LTMS Management Plan is incorporated into the Bay Plan dredging policies and has become the dredging management plan for the region. The four goals include:

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

As part of the implementation of the LTMS Management Plan, a twelve-year transition period from the historic practice of in-Bay disposal to maximizing beneficial reuse was included to allow the dredging community time to plan and budget for the change in practice and for beneficial reuse sites to be brought on line. The twelve-year transition period was completed in 2012. At that time, the in-Bay disposal target volume was reduced to 1.25 million cubic yards per year, as averaged over a three-year period. 2015 marks the end of the current three-year averaging period. Currently, to meet the LTMS goals, eighty percent of material from all large and medium sized dredging projects should be placed out of Bay, preferably at a beneficial reuse site, and twenty percent at the in-Bay disposal sites. Most dredging projects are meeting those goals, with ocean disposal being used when beneficial reuse is not feasible. In the event that the dredging community does not voluntarily meet the LTMS goals, the dredging policies provide for the Commission to consider initiating an allocation strategy. To date, the LTMS program has consistently met the reduced in-Bay disposal targets, alleviating the need to implement regulatory allocations.

As an LTMS partner and the largest dredger in the Bay, the USACE has been instrumental in implementing the LTMS Program. In 1999, at the completion of the environmental review process, the USACE signed the Record of Decision, stating that the LTMS program alternative selected in the state and federal environmental documents incorporated all the policy level minimization measures and therefore includes all practical means to avoid or minimize harm as required by the National Environmental Policy Act (NEPA). Prior to the issuance of the LTMS Management Plan, the USACE worked to beneficially reuse dredged sediment at a number of sites throughout the Bay Area to reinforce levees and to restore marsh habitat;

and to reduce in-Bay disposal through upland placement at disposal ponds, and ocean disposal. During the LTMS transition period, the USACE has placed approximately 19.8 million cy at beneficial reuse sites, including Montezuma, Hamilton Wetland Restoration Project, Winter Island, and the Middle Harbor Enhancement Project; 19.8 million cy of sediment was disposed of at the San Francisco Deep Ocean Disposal Site (SF-DODS); and 19.5 million cy was disposed of in the Bay. Much of the beneficial reuse during this period was possible due to the Port of Oakland 50-Foot Deepening Project, which had a large volume of dredged sediment (17 million cy), a federal funding stream and a local project sponsor. The deepening project was completed in 2009, and since that time, the dredging activity undertaken by the USACE in the Bay has been only maintenance of existing federal channels.

Current beneficial reuse and upland disposal options are limited but include Montezuma Wetland Restoration Project, Cullinan Ranch Restoration Project, Van Sickle Island levee project, and Winter Island levee project. Eden Landing, the South Bay Salt Ponds, Bel Marin Keys and Skaggs Island are in planning phases.

Project Description

Project

Details:

The USACE 2015-2017 consistency determination describes the project as follows:

In the Bay and the Suisun Marsh Primary Management Area:

1. Dredge from Oakland Inner and Outer Harbors (project depth: -50 feet MLLW, plus two feet over-dredge depth) a maximum of 450,000 cy of sediment in 2015, and a maximum of 700,000 cy of sediment each year in 2016 and 2017, for a total of 1,850,000 cy of sediment over three years. Disposal of the dredged sediment at either the San Francisco deep ocean disposal site (SF-DODS) or beneficially reuse at an approved site;
2. Dredge from Richmond Inner Harbor (project depth: -38 feet MLLW, plus two feet over-dredge depth) a maximum of 350,000 cy of sediment in 2015, and a maximum of 400,000 cy of sediment each year in 2016 and 2017, for a total of 1,150,000 cy of sediment over three years. Disposal of the dredged sediment at either the San Francisco deep ocean disposal site (SF-DODS) or beneficially reuse at an approved site;
3. Dredge from Richmond Outer Harbor (project depth: -45 feet MLLW, plus two feet over-dredge depth) a maximum of 250,000 cy of sediment each year in 2015, 2016 and 2017, for a total of 750,000 cy of sediment over three years. Dispose of the dredged sediment in the Bay at the Alcatraz Island (SF-11) disposal site;
4. Dredge from Suisun Bay Channel (project depth: -35 feet MLLW, plus two feet over-dredge depth) over three years a maximum of 175,000 cy of sediment in 2015, and a maximum of 200,000 cy of sediment each year in 2016 and 2017, for a total of 575,000 cy of sediment and dispose of the

sediment in the Bay at the Suisun Bay (SF-16) or Carquinez Strait (SF-9) disposal site. Conducted advanced maintenance dredging to a depth of minus 37 MLLW at the Bulls Head Reach area within and adjacent to Suisun Channel;

5. Dredge from Pinole Shoal (project depth: -35 feet MLLW, plus two feet over-dredge depth) a maximum of 150,000 cy of sediment in 2015, and a maximum of 200,000 cy of sediment each year in 2016 and 2017, for a total of 550,000 cy of sediment over three years and dispose of the sediment at the San Pablo Bay (SF-10) or Carquinez Strait (SF-9) disposal site;
6. Dredge from Redwood City Harbor (project depth: -30 feet MLLW, plus two feet over-dredge depth) a maximum of 600,000 cy of sediment in 2015, and a maximum of 250,000 cy of sediment in 2016, and 350,000 cy of sediment in 2017, for a total of 1,200,000 cy of sediment from over three years. Dispose of the dredged sediment in the Bay at the Alcatraz Island (SF-11) disposal site or SF-DODS;
7. Dredge from the San Francisco Main Ship Channel over three years a maximum of 350,000 cy of sediment in 2015, and a maximum of 500,000 cy of sediment each year in 2016 and 2017, for a total of 1,350,000 cy of sediment and dispose of the sediment each year at the San Francisco Bar Channel (SF-8) disposal site or at the Ocean Beach nourishment site (SF-17), (both dredging and disposal sites are outside the Commission's jurisdiction); and
8. Conduct annual "knockdown events" of up to five percent of that channels proposed volume.
9. The proposed projects are dredged annually and according to the USACE, are reliant on sufficient annual Congressional funding to accomplish their work plan. If Congressional funding is not sufficient to support the full program, the USACE may limit the volume of sediment or depth of any channel, to accomplish their dredging priorities for that year.

Public

Benefits:

The proposed project would result in the maintenance of existing deep water channels, thereby ensuring that such channels remain navigable as well as safe and efficient for use by commercial, military, and recreational vessels. Dredged sediment taken to the Montezuma, or Cullinan Ranch restoration projects would augment the natural sedimentation process at these locations, thereby accelerating the creation of tidal marshes and improving the overall health of the Bay ecosystem while providing these projects with a better chance of maintaining marsh vegetation as sea level rises. Placement of dredged sediment at the deep ocean disposal site or other upland locations would reduce in-Bay disposal and further the goals of the LTMS Management

Plan. However, these disposal options would waste sediment, which is a critically needed resource at restoration sites. Reducing in-Bay disposal would improve water quality and further protect fish and wildlife in the Bay.

Schedule: The USACE expects that the project would begin June 1, 2015, and be completed by December 31, 2017.

Staff Analysis

A. **Issues Raised.** The staff believes that the consistency determination raises three primary issues: (1) whether the volume of sediment proposed for in-Bay disposal is consistent to the maximum extent practicable with the LTMS Management Plan; (2) whether the proposed minimization measures are sufficient to protect native species and their habitat, and specifically species that are experiencing a steep population decline, including state- and federally- listed species; and (3) whether the proposed maintenance dredging of federal navigation channels is consistent to the maximum extent practicable with the Commission’s laws and the Bay Plan policies regarding dredging; fish, other aquatic organisms, and wildlife; subtidal areas; mitigation; water quality; and navigation safety and oil spill prevention.

Section 6666.3 of the McAteer Petris Act states “the Legislature hereby finds and declares that because of the shallowness and high sedimentation rate of San Francisco Bay, dredging is essential to establish and maintain navigational channels for maritime commerce, which contributes substantially to the local, regional and state economies, as well as for military navigation, flood control, recreational boating and other public purposes.” It is USACE’s primary mission to maintain safe navigation of its channels, and maintenance dredging of the federal deep-draft navigation channels is vital to ensuring safe and efficient movement of good to and from Bay Area ports and harbors.

1. **LTMS Management Plan and Dredging Policies.** The Legislature amended the McAteer Petris Act Sections 66663 through 66666 and the Commission amended its Bay Plan policies and regulations to incorporate the LTMS Management Plan’s goals and measures. The LTMS program provides for economically and environmentally sound dredging while providing programmatic efficiencies to the regulatory process, creating more certainty for the dredging, resource and regulatory communities. All maintenance dredging projects are coordinated and managed through the LTMS program.

The Bay Plan Dredging Policy No. 1 states, in part, that “[d]redging and dredged material disposal should be conducted in an environmentally and economically sound manner. Dredgers should reduce disposal in the Bay over time to achieve the LTMS goal of limiting in-Bay disposal volumes to a maximum of 1.0 million cubic yards per year....”The policy also describes a regulatory disposal volume allocation strategy if the “voluntary targets” are exceeded. The one million cubic yards per year described in the Bay Plan polices does not include the 250,000 cy assigned to small dredgers on an average year.

The Bay Plan Dredging Policy No. 2 states, in part, that “[d]redging should be authorized when the Commission can find: (a) the applicant has demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose; (b) the materials to be dredged meet the water quality requirements of the San Francisco Bay Regional Water Quality Control Board; (c) important fisheries and Bay natural resources would be protected through seasonal restrictions established by the California Department of Fish and Game, the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service, or through other appropriate measures; (d) the siting and design of the project will result in the minimum dredging volume necessary for the project; and (e) the materials would be disposed of in accordance with Policy 3.”

The Bay Plan Dredging Policy No. 3 states, in part, that “[d]redged materials should, if feasible, be reused or disposed outside the Commission's Bay and certain waterways jurisdictions. Except when reused in an approved fill project, dredged material should not be disposed of in the Commission's Bay and certain waterways jurisdiction unless disposal outside these areas is infeasible and the Commission finds: (a) the volume to be disposed is consistent with applicable dredger disposal allocations and disposal site limits adopted by the Commission by regulation; (b) disposal would be at a site designated by the Commission; (c) the quality of the material disposed of is consistent with the advice of the San Francisco Bay Regional Water Quality Control Board and the interagency Dredged Material Management Office (DMMO); and (d) the period of disposal is consistent with the advice of the California Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.”

Bay Plan Policy 4 states “if an applicant proposes to dispose dredged material in tidal areas of the Bay that exceeds either disposal site limits or any disposal allocation that the Commission has adopted by regulation, the applicant must demonstrate that the potential for adverse environmental impact is insignificant and that non-tidal and ocean disposal is infeasible because there are no alternative sites available or likely to be available in a reasonable period, or because the cost of disposal at alternate sites is prohibitive. In making its decision whether to authorize such in-bay disposal, the Commission should confer with the LTMS agencies and consider the factors listed in Policy 1.

Bay Plan Dredging Policy 5 states, in part, that “[t]o ensure adequate capacity for necessary Bay dredging projects and to protect Bay natural resources, acceptable non-tidal disposal sites should be secured and the deep ocean disposal site should be maintained. Further, dredging projects should maximize use of dredged material as a resource consistent with protecting and enhancing Bay natural resources, such as creating, enhancing, or restoring tidal and managed wetlands, creating and maintaining levees and dikes, providing cover and sealing material for sanitary landfills, and filling at approved construction sites.”

The Bay Plan Dredging Policy No. 6 states, in part, that “[d]redged materials disposed in the Bay and certain waterways should be carefully managed to ensure that the specific location, volumes, physical nature of the material, and timing of disposal do not create navigational hazards, adversely affect Bay sedimentation, currents or natural resources, or foreclose the use of the site for projects critical to the economy of the Bay Area.”

Lastly, Dredging Policy 12 directs the Commission to continue to participate in the LTMS, the Dredged Material Management Office, and other initiatives conducting research on Bay sediment movement, the effects of dredging and disposal on Bay natural resources, alternatives to Bay aquatic disposal, and funding additional costs of transporting dredged materials to non-tidal and ocean disposal sites.

As described above, in order to maintain safe navigation in the Bay, the USACE proposes to dredge and dispose/place 6.075 million cy of sediment from five federal channels over three years.

Table 1

2015 Proposed Dredging and Disposal/Placement			
Channel	Maximum Volume (cy)	Federal Standard Plan	LTMS Plan
Oakland Harbor	450,000	Ocean	Beneficial Reuse
Richmond Inner Harbor	350,000	Ocean	Beneficial Reuse
Richmond Outer Harbor	250,000	SF-11	SF-11
Pinole Shoal	150,000	SF-10/9	SF-10
Suisun Bay	175,000	SF – 16/ SF-9	SF – 16/ SF-9
Redwood City Harbor	600,000	SF-11/Ocean	SF-11/Ocean
Total	1,975,000		

	In-Bay	Beneficial Reuse	Ocean
LTMS Goals	20% (minimize)	40% (maximize)	40% (stop-gap)
Federal Standard	47%	0%	53%
LTMS Plan	47%	41%	12%

Table 2

2016 Proposed Dredging and Disposal/Placement			
Channel	Maximum Volume (cy)	Federal Standard Plan	LTMS Plan
Oakland Harbor	700,000	Ocean	Beneficial Reuse
Richmond Inner Harbor	400,000	Ocean	Beneficial Reuse
Richmond Outer Harbor	250,000	SF-11	SF-11*
Pinole Shoal	200,000	SF-10/SF-9	SF-10*
Suisun Bay	200,000	SF-16/SF-9	SF-16*
Redwood City Harbor	250,000	SF-11/Ocean	SF-11/Ocean*
Total	2,000,000		

	In-Bay	Beneficial Reuse	Ocean
LTMS Goals	20% (minimize)	40% (maximize)	40% (stop-gap)
Federal Standard	45%	0%	55%
LTMS Plan	45%	55%	0%

*If a clamshell dredge is used, the solicitation will include beneficial reuse, but the least cost bid would be selected, which is likely in-Bay disposal.

Table 3

2017 Proposed Dredging and Disposal/Placement			
Channel	Maximum Volume (cy)	Federal Standard Plan	LTMS Plan
Oakland Harbor	700,000	Ocean	Beneficial Reuse
Richmond Inner Harbor	400,000	Ocean	Beneficial Reuse
Richmond Outer Harbor	250,000	SF-11	SF-11*
Pinole Shoal	200,000	SF-10/SF-9	SF-10*
Suisun Bay	200,000	SF-16/SF-9	SF-16*
Redwood City Harbor	350,000	SF-11/Ocean	SF-11/Ocean*
Total	2,100,000		

	In-Bay	Beneficial Reuse	Ocean
LTMS Goals	20% (minimize)	40% (maximize)	40% (stop-gap)
Federal Standard	48%	0%	52%
LTMS Plan	48%	52%	0%

*If a clamshell dredge is used, the solicitation will include beneficial reuse, but the least cost bid would be selected, which is likely in-Bay disposal.

In-Bay Disposal, Ocean Disposal and Beneficial Reuse of Sediment. In the Bay Area, there are three general options for disposal or placement of dredged sediment. The in-Bay sites are dispersive sites and so are located in areas where fast moving currents quickly move the sediment away from the site. The ocean disposal site is a depositional site and material that is placed there, stays there. In-Bay disposal historically has been the primary option for most dredgers. Currently there are four in-Bay disposal sites: Alcatraz Island (SF-11), which due to its proximity to most dredging projects in Central Bay is the most heavily used; San Pablo Bay (SF-10); Carquinez Strait (SF-9); and Suisun Bay, which is reserved specifically for use by the USACE when dredging the Suisun Channel. Because these sites require simply transporting the sediment to the site and bottom dumping from the scow, they are the least expensive and can be used by all dredging projects.

Ocean disposal is similar to in-Bay disposal in that sediment is bottom dumped by the scow. The San Francisco Deep Ocean Disposal site is approximately 50 miles out to sea, take about 24 hours round trip, and requires larger, ocean going vessels, and must transit through the marine sanctuary. It is also subject to weather delays, especially late in the dredging season, but can occur at anytime when windy or stormy conditions create rough seas. For safety reasons, small dredging equipment cannot transit to the ocean disposal site. Due to the distance traveled, larger equipment, additional fuel cost and time to complete the round trip, ocean disposal is more expensive than in-Bay disposal.

Beneficial reuse of sediment has many forms. The most familiar is the placement of dredged sediment at a wetland restoration project to raise elevations to create habitat. This may be the most beneficial of the options as it provides habitat sooner, supports endangered and other species, and the wetlands created provide storm surge and flood protection. For projects with more than eighty percent sand, placement at a nearby ocean disposal site (SF-8) feeds coastal beaches. Dredged sediment can also be reused as levee material, daily landfill cover and general construction fill where appropriate. Because all of these options include offloading the sediment from the barges using additional equipment and staffing, additional costs are incurred. This cost can be paid by the dredging project, or by the site using the sediment. Further, beneficial reuse sites are often at a greater distance from the dredging project than in-Bay disposal, taking additional time to transit. Also, in general, it takes more time to offload sediment than bottom dumping from a scow, although as projects in the Bay Area have become more efficient with offloading sediments, this time has been greatly reduced. However, in relation to ocean disposal, beneficial reuse sites located around the Bay shoreline rarely engender weather delays, and can be a closer distance than the ocean disposal site.

The LTMS program and the Bay Plan policies direct the dredging project sponsors to maximize beneficial reuse unless it is infeasible, but recognize there are factors, that make it infeasible.

In the consistency determination concurrence request regarding Dredging Policy 1, and in-Bay disposal targets, the USACE stated, “the tentative 5-year WQC board order allows for USACE to place a total of 3.5 million cubic yards at in-bay sites. Whatever the authorized volume, USACE will comply with the in-bay disposal limits of the final 5-year WQC. Further, as shown, the San Francisco Bay dredging community as a whole has not exceeded annual in-bay placement limits and is not expected to do so over the course of this CD.” The Water Board’s WQC/WDR limited in-Bay disposal as described at 3.5 mcy per five years, which is approximately 700,000 cy per year, though the Water Board did not specify annual limits. It is assumed that the USACE would not plan to use up their in-Bay disposal volume limit imposed by the Water Board prior to the end of their WQC/WDR authorization. However, as described in the request to the Commission, the volumes are considered the maximum that would be dredged, and there is potential for less sediment to accumulate in the channels, and thereby require less dredging and disposal, but the Commission must consider the full proposal against the policies.

Given the in-Bay disposal targets in the LTMS of 1.25 mcy, in proposing to dispose of an average of 925,000 cy in-Bay per year, the USACE would leave 325,000 cy per year in-Bay disposal volume remaining for all other dredgers including ports, refineries, marinas and homeowners. 250,000 cy of that volume is dedicated to small dredgers who are exempt from requirements to beneficially reuse sediment or ocean disposal because those options are infeasible due to necessary equipment size limitations, safety concerns and costs for small facilities. Ports, refineries, and other medium and large dredging projects have been diligently working to meet the LTMS goals and have been taking approximately eighty percent of their sediment to beneficial use or ocean disposal. This collective action greatly reduces the in-Bay disposal needs, but if the USACE disposes of 925,000 cy in-Bay or more, it is very likely that the LTMS in-Bay disposal targets may be exceeded. The LTMS agencies have included a 250,000 cy contingency volume in the LTMS Plan for high dredging years. If the targets are exceeded, the LTMS agencies may need to use the contingency volume for the first time since the implementation of the program.

Table 4

Designated Disposal Site	Monthly Target Volume (cy)	Annual Target Volume (cy)
Alcatraz Island (SF-11)		
October – April	400,000	NA
May – September	300,000	NA
Carquinez Strait (SF-9) – Any month	1,000,000	NA
San Pablo Bay (SF-10)	500,000	
Suisun Bay (SF-16) USACE Only		200,000
Three Year Average Total (In-Bay)		1,250,000*

*This volume does not include an allowable contingency volume of 250,000 cy per year, but does include the 250,000 small dredger allowance.

The in-Bay disposal targets are averaged on a three-year basis to allow some flexibility due to high and low volume dredging years. 2015 is the last year of the current three-year averaging period. Taking into consideration the final numbers for 2013, the estimated volume for 2014 (final numbers are still coming in), and the proposed USACE dredging and disposal only for 2015, the total remaining volume for all other dredgers is approximately 740,000 cy. While this may appear to be a significant volume, this is likely to be high volume dredging year with many small dredgers (exempt from out of Bay disposal requirements) proposing to dredge

However, if the three-year average of in-Bay volumes is exceeded beyond the contingency volume, the LTMS must consider in-Bay disposal allocations to each dredger. If allocations become necessary, a staff report with analysis of the issues would be prepared with a recommendation for the Commission. The Commission would need to vote affirmatively for the allocations in order to implement this portion of the LTMS program.

Regarding Dredging Policy 2, maintenance of navigational channels is clearly needed to serve a water-oriented use. As described by the USACE “maintenance dredging of the federal deep-draft navigation channels is vital to ensuring safe and efficient movement of good to and from Bay Area ports and harbors.” The USACE has committed to meeting the water quality requirements of the Water Board as described in the Water Quality discussion below. Similarly, measures to protect species and habitats of the Bay are discussed in the Natural Resources section beginning on page 24, but of note is the USACE’s commitment to dredge within the environmental work windows or seek additional consultation with the Resource Agencies.

Dredging Policy 2 also directs the Commission to consider whether the siting and design of the project results in the minimum amount of dredging necessary for the project. The federal navigation channels are sited along the naturally deep spine of the Bay. However as ships have increased in size over the years, their deeper drafts have required deeper depths. Sediment depositing and moving through the channel shoals in areas making navigation more hazardous.

Maintenance dredging is an expensive endeavor, and requires significant permitting and contracting efforts. They are limited by the channel depth and width, and proposed dredging volume is calculated by identifying the volume necessary to reach design depth of the channel and then one to two feet of over depth volume is included to allow for the inaccuracies of using large equipment in deep water, with limited control over environmental factors such as currents and tides. In addition, the USACE's budget is limited, and they rarely have excess funds. As a result, some projects are often not dredged to full project depth. This results in ships either timing their arrival with high tide or lightening their cargo to accommodate shallower draft. For example, the USACE reported, "to reduce the risk of groundings and other safety concerns, in San Francisco Bay, the required under keel clearance for oil tankers is 3 feet Mean Lower Low Water (MLLW) and the required under keel clearance for other vessels is 2 feet MLLW. Shippers typically maximize the volume of goods in a vessel to reduce shipping costs and even a small amount of reduced depth can result in significant increase in transportation costs, particularly for petroleum products."

In addition to normal maintenance dredging activities, Suisun Bay channel, at Bull's Head Reach (just east of the Benicia Bridge), has a persistent shoaling problem and requires advanced maintenance dredging. Advanced maintenance dredging can take many forms, but in this instance, the problematic area is dredged deeper (minus 37 rather than minus 35 feet MLLW), and wider than the channel boundaries in the shoaled area. This allows for more sediment to accumulate below design depth before the annual maintenance episode is undertaken.

Knockdown events are another sediment management technique that can alleviate an isolated shoaling issue without requiring the mobilization of a full dredging episode. While, a cost savings results from this activity, it also minimizes dredging activity as the sediment is kept within the dredge footprint until such time that a full dredging episode is necessary while providing for safe navigation, as with advanced maintenance dredging. With the siting of the channels, design requirements of the channels, and sediment management techniques of advance maintenance and knockdowns, it appears that the proposed dredging is the minimum amount necessary for the project needs.

The Bay Plan Dredging Policies 3, 4 and 5 together provide guidance on when in-Bay disposal is appropriate and the analysis that should be undertaken, and promote beneficial reuse of dredged sediments. Policy 3 states, in part, that "[d]redged materials should, if feasible, be reused or disposed outside the Commission's Bay and certain waterways jurisdictions." It further states that, dredged material should not

be disposed of in the Commission's Bay and certain waterways jurisdiction unless disposal outside these areas is infeasible and the Commission finds: disposal would be at a site designated by the Commission; the sediment quality is suitable for the proposed disposal/placement site per the Water Board and DMMO's advice; and the disposal period is consistent with the advice of the resource agencies (The last two items of this list will be discussed in other sections of this report). Dredging Policy 4 further describes the Commission's considerations when a project proponent proposes to conduct in-Bay disposal when the disposal would exceed disposal site. In this instance, the project proponent must demonstrate that the potential for adverse environmental impact is insignificant and that non-tidal and ocean disposal is infeasible because no sites are available, or because the cost of disposal at alternate sites is prohibitive. Lastly, Policy 5 states in part, that to ensure capacity for other Bay dredging projects and to protect natural resources, non-tidal disposal sites and the deep ocean disposal site should be secured and maintained, respectively. It goes on to state that dredging projects should maximize beneficial use of dredged sediment as a resource (e.g. in wetland restoration, maintaining levees, etc.) consistent with protecting and enhancing Bay natural resources.

In response to these three policies the consistency determination states, "[the] USACE has complied with the in-Bay disposal limitations in all but two incidences, both at the Suisun Bay disposal that is reserved for USACE use only. It has committed to complying with the in-Bay disposal limits in 2015, 2016, and 2017." It further stated that "the USACE is committed to beneficially using dredging material to the maximum extent feasible.... However, as discussed, USACE is also constrained by the federal standard when placing dredged material. To make using a beneficial use site feasible, its cost must be comparable to the cost of the federal standard or a sponsor must fund the incremental cost above the federal standard." The USACE further stated that, in previous years, there has been adequate capacity for all dredgers in the Bay Area (but did not note that the LTMS twelve year transition period had substantially higher target volumes that were reduced over time). In addition, over the next 3 years, USACE stated it will dredge in accordance with the 5-year WQC, which specifically developed limitations for USACE in-Bay disposal limitations to both comply with the LTMS goal or reduced in-bay disposal and allow for adequate placement for other dredgers.

The Commission staff has discussed the proposed dredging volumes with the USACE, raising four main concerns: (1) notwithstanding the USACE's assertion, the proposed in-Bay disposal volumes do not appear to provide for adequate disposal volume for the remaining dredging projects; (2) the percentage of in-Bay disposal is more than double the twenty percent targeted by the LTMS goals; (3) the high volume of dredged sediment proposed for disposal at the ocean disposal site, and the low volume of sediment proposed for beneficial reuse; and (4) the USACE's interpretation of the federal standard appears to arbitrarily limit its ability to consider use of alternate sites—an issue of long and protracted contention between the agencies,

and that does not appear to be consistent with the Coastal Zone Management Act. The Commission staff has been working diligently with the USACE staff to address these concerns.

In subsequent correspondence, the USACE District Engineer, Lt. Colonel John Morrow, formally acknowledged the concerns and clarified the USACE's position. Regarding the adequacy of in-Bay disposal volumes, he stated that the disposal volumes are conservative, but realistic estimates, and that:

“the total in-Bay volume planned for 2015, 925,000 cy and 47% of our total program, is reflective of our statutory authorities, our actual funding, and is based on forecasted shoal volumes from historical data. This volume is a substantial portion of the total in-Bay volume limit of 1.25 million cy per year that is described in the LTMS Management Plan, and the 1 million cy per year limit that is described in Dredging Policy 1 of the Bay Plan. Notwithstanding the fact that our program, including in-Bay placement, remains constrained by our authorities and the federal standard, the proposed quantity of in-Bay placement from the federal deep-draft channels is environmentally acceptable because it is timed to occur during the dredging and placement work windows, thereby avoiding impacts to listed species. Further the use of the dispersive in-Bay sites keep the sediment within the Bay system, addressing a concern raised recently to the Water Board.”

Lt. Colonel Morrow further asserted,

“the LTMS Management Plan, as referenced in Dredging Policy 1, describes the public and collaborative process by which formal allocations for in-Bay placement would be triggered if placement exceeds an annual average 1,250,000 cy over a 3-year period. We estimate that non-USACE dredgers would need to place over 800,000 cy in-Bay for the formal allocation process to be automatically triggered for the 2013-2015 evaluation period. In consideration of that possibility, I would like to emphasize the need and benefits, which accrue from maintaining the federal navigation channels in San Francisco Bay. As you are well aware, our deep-draft navigation channels are the maritime highway through which ALL of the waterborne commerce moves in San Francisco Bay – which is about 4,000 to 5,000 deep-draft vessels that arrive every year. It is critical to our economy and environment that the navigation channels are maintained to ensure safe and efficient movement of goods to Bay Area ports and Harbors.”

Sedimentation levels, funding and equipment availability all affect the volume of sediment dredged and disposed each year. Over the past twelve years, the total volume dredged has been between 1.5 and 3 million cy per year, staff expects this trend to continue. In addition, medium and large dredgers have LTMS approved Integrated Alternative Disposal Site Analyses (IAA) that provide flexibility to the

project sponsor over three to five years, with regard to the year(s) that they will use in-Bay disposal. These dredgers include the ports, refineries, ferry systems and other federal agencies. As a result of these factors the volume of in-Bay disposal varies from year to year. 2015 appears to be a year of high in-Bay disposal. Based upon review of the proposed projects for 2015, Commission staff estimates that small dredgers with no feasible alternative to in-Bay disposal may dredge approximately 600,000 cy. As discussed above, given the USACE proposal and in-Bay disposal that occurred in 2013 and 2014, there appears to be approximately 740,000 cy available to all other dredgers in 2015 without implement the 250,000 cy contingency volume. It is understood that the federal channels provide important navigational and economic benefits to the region and the nation. However, providing in-Bay disposal to other projects also provide important public benefits that must be considered.

The USACE's proposed in-Bay disposal volume represents between 45 and 48 percent of their total proposed dredging for each year. In the USACE's IAA, the least cost bid of each dredging project will be used in determining whether to use ocean disposal or beneficial reuse . Over the three-year period, the distribution of sediment between in-Bay, ocean and beneficial reuse remain virtually unchanged.

Per Dredging Policy 3, the Commission must consider whether out of Bay placement at the ocean disposal site or beneficial reuse is feasible. From the USACE's perspective, the evaluation factors for the discharge of dredged material are contained in 33 C.F.R. Part 336.1(c), most notably, navigation and Federal standard. The USACE stated, "the maintenance of a reliable Federal navigation system is essential to the economic well-being and national defense of the country. The district engineer will give full consideration to the impact of the failure to maintain navigation channels on the national and, as appropriate, regional economy. USACE regulates the discharge of dredged material from its projects to assure that dredged material placement occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project. The least costly alternative, consistent with sound engineering practices and selected through the section 404(b)(1) guidelines or ocean disposal criteria, will be designated the Federal standard for the proposed project." The USACE has consistently stated that it is constrained from using a disposal site that costs more than the federal standard, such as beneficial reuse sites or ocean disposal for many of the USACE's projects that traditionally use in-Bay disposal (Richmond Outer Harbor, Pinole Shoal, Suisun Bay and Redwood City). Beneficial reuse or ocean disposal are almost always greater in cost than in-Bay disposal. The Commission staff and the USACE have long disagreed over this issue, as it appears the USACE is only taking into consideration the least cost, rather than inclusion of the environmentally acceptable portion of the USACE's federal standard test, and has argued that the LTMS Management Plan, an adopted regional dredging and disposal program (including adoption by the San Francisco USACE) , as well as the Bay Plan policies and the Water Board's Bay Basin Plan, represent what is environmentally acceptable in this region.

The Coastal Zone Management Act requires the USACE's projects to be consistent to the maximum extent practicable with the Coastal Zone Management Plan for the region. The term "consistent to the maximum extent practicable" means fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency.⁹ It further states that federal agencies shall not use a lack of funding as a basis for being consistent to the maximum extent practicable with an enforceable policy of a management program. In cases where the cost of being consistent with the management program was not included in the Federal agency's budget and planning processes, it should seek additional federal funds necessary to be consistent with the management plan. Federal agencies should include the cost of being fully consistent with the management programs in their budget and planning processes.¹⁰ Therefore, it appears clear that the USACE should request additional funding to support full consistency with the Bay Plan policies that support maximizing beneficial reuse and minimizing in-Bay disposal as described in the LTMS Management Plan.

However, the USACE budget request are submitted two years in advance of receiving funding, and while the USACE San Francisco District may request funding, it may not receive the amount requested. Because the USACE's budget has been submitted for fiscal years 2015 and 2016, funding will not likely be available to increase beneficial reuse until 2017, unless Congress provides additional, unsolicited funds. Therefore, simply due to budgeting, it may be infeasible for the USACE to reduce in-Bay disposal in favor of beneficial reuse or ocean disposal in 2015 and 2016, but it could request funds for 2017.

As the Commission is aware, the Bay is currently in a period of sediment supply decline and many have raised the concern that existing habitat, particularly marshes be sustainable under this new sediment regime, and raise additional concerns due to the confounding issue of rising sea level. As Bay waters rise, shorelines, existing marshes and beaches, as well as restored sites may not keep up with sea level. Therefore beneficial reuse of sediment is of critical importance. In response to concerns over the lack of beneficial reuse, the Lt. Colonel's response stated, "we cannot guarantee to dedicate a specific volume of dredged material for beneficial reuse by program or project in any given year. As we all know, the basic rule is that we can beneficially reuse dredged material if the placement method meets the test of being the least cost environmentally acceptable option (33 USC Section 2211(f))." Following this statement was his commitment to do all within his authority to maximize beneficial reuse. These efforts include measures such as revising the USACE's contracting strategy, and ceasing all in-Bay disposal activities after November 30th and placing any dredged sediment after that date at beneficial reuse sites, which comports with the pending NOAA Fisheries Service amended biological opinion on the LTMS program. The correspondence further described efforts to improve coordination with sponsors of restoration sites around the Bay that could

⁹ 15 CFR 930.32(a)(1)

¹⁰ 15 CFR 930.32(a)(3)

beneficially reuse the dredged material, and investigate the potential to “recharge” marshes and mudflats with dredged sediments. If these efforts are successful, the USACE may be able to increase beneficial reuse under the CN.

Management of In-Bay Disposal Sites. The in-Bay disposal sites are managed by the USACE and the LTMS agencies through the Dredged Material Management Office (DMMO). The consistency determination states,

“the USACE’s primary mission is to ensure safe navigation. In doing so, it maintains its deep-draft channels annually and disposes of material in accordance with the goals of the LTMS to reduce in-bay disposal. Further, it routinely surveys each in-bay placement site [quarterly] to ensure that no site creates a hazard to navigation. Moreover, with respect to the physical and chemical nature of the material, no material is disposed of except in accordance with DMMO approval.”

The DMMO ensures that the amount and timing of disposal does not create navigational hazards and that the individual site volume limits are not exceeded on a monthly or annual basis. When the volume limits at the in-Bay sites are reaching capacity, the DMMO directs dredging projects to alternate sites, or if necessary delays the start of dredging projects to avoid exceeding monthly disposal volume limits, taking into consideration navigational safety.

Prior to implementation of each dredging project, the USACE would provide project specifics, including a pre-dredge survey, proposed dredged volumes, and sediment test results, to the DMMO for review and a determination of the suitability of the sediment for disposal.

Along with careful management of in-Bay disposal sites, Dredging Policy 12 includes a directive for continued Commission support of the LTMS Program’s implementation and furthering the knowledge of impacts of dredging to the Bay’s physical and biological resources. While the USACE acknowledges that the policy is not specifically directed at the USACE, it states “[the] USACE is also committed to continuing its participation in the LTMS and is willing to partner with other agencies to fund the cost of placing dredged material at SF-DODS or beneficial use sites, as long as it is within congressional authority granted to USACE.” Further, the USACE through the federal budget has been appropriated funds to support the LTMS Program. In years past, the USACE has funded numerous studies on the potential impacts of dredging, primarily to the Bay’s biological resources, but has also completed limited modeling of Bay sediment transport and dredged sediment disposal sites. These studies can be found on the USACE’s LTMS website.¹¹ The studies were completed in collaboration with the LTMS agencies and stakeholders. The current LTMS funding through the USACE is funding a study on longfin and Delta smelt entrainment and benthic

¹¹ <http://www.spn.usace.army.mil/Missions/DredgingWorkPermits/LTMS/StudiesSymposia.aspx>

community and fish foraging. The USACE also supports a portion of the Regional Monitoring Program through the US Geological Survey. Lastly, the USACE hosts and provides staffing to the DMMO.

The Commission should determine if the USACE' proposed dredging, disposal and placement of dredged sediment is consistent to the maximum extent practicable with Commission's dredging policies and the LTMS Management Plan.

2. **Natural Resources.** The San Francisco Bay Plan has several policies regarding the natural resources of the Bay, including Fish, Other Aquatic Organisms and Wildlife; Subtidal Areas; and Mitigation.

Fish, Other Aquatic Organisms and Wildlife Policy 1 states: "To assure the benefits of fish, other aquatic organisms and wildlife for future generations, to the greatest extent feasible, the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored and increased."

Fish, Other Aquatic Organisms and Wildlife Policy 2 states: "Specific habitats that are needed to conserve, increase or prevent the extinction of any native species, species threatened or endangered, ... or any species that provides substantial public benefits, should be protected, whether in the Bay or behind dikes."

Fish, Other Aquatic Organisms and Wildlife Policy 4 directs the Commission to "consult with the California Department of Fish and Game and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service whenever a proposed project may adversely affect an endangered or threatened plant, fish, other aquatic organism or wildlife species; and not authorize projects that would result in the "taking" of any plant, fish, other aquatic organism or wildlife species listed as endangered or threatened pursuant to the state or federal endangered species acts, or the federal Marine Mammal Protection Act, or species that are candidates for listing under the California Endangered Species Act, unless the project applicant has obtained the appropriate "take" authorization from the U.S. Fish and Wildlife Service, National Marine Fisheries Service or the California Department of Fish and Game; and give appropriate consideration to the recommendations of the California Department of Fish and Game, the National Marine Fisheries Service or the United States Fish and Wildlife Service in order to avoid possible adverse effects of a proposed project on fish, other aquatic organisms and wildlife habitat."

The Commission's Subtidal Areas policies have similar protective language to the Fish, Other Aquatic Organisms and Wildlife policies in Subtidal Area Policy 2 states that "areas that are scarce in the Bay or have an abundance and diversity of fish, other aquatic organisms and wildlife (e.g., eelgrass beds, sandy deep water or underwater pinnacles) should be conserved. Filling, changes in use; and dredging projects in these areas should therefore be allowed only if: (a) there is no feasible alternative; and (b) the project provides substantial public benefits."

Further, Subtidal Area Policy 1, requires the Commission to fully examine the local and Bay-wide effects of dredging projects on: (a) the possible introduction or spread of invasive species; (b) tidal hydrology and sediment movement; (c) fish, other aquatic organisms and wildlife; (d) aquatic plants; and (e) the Bay's bathymetry. Projects in subtidal areas should be designed to minimize and, if feasible, avoid any harmful effects. Subtidal Areas Policy 5 directs the Commission to support and encourage expansion of scientific information on the Bay's subtidal areas, including: "... (b) the relationship between the Bay's physical regime and biological populations; (c) sediment dynamics, including sand transport, and wind and wave effects on sediment movement; (d) areas of the Bay used for spawning, birthing, nesting, resting, feeding, migration, among others, by fish, other aquatic organisms and wildlife...."

In summary, the Commission's applicable Mitigation Policies, state that projects should be "designed to avoid adverse environmental impacts to Bay natural resources such as...to plants, fish, other aquatic organisms and wildlife habitat, subtidal areas, or tidal marshes or tidal flats." Whenever adverse impacts cannot be avoided, they should be minimized to the greatest extent practicable and then unavoidable adverse impacts to the natural resources of the Bay should be mitigated. "Mitigation should, to the extent practicable, be provided prior to, or concurrently with those parts of the project causing adverse impacts." Further any mitigation should be coordinated with all affected agencies that have jurisdiction or mitigation expertise to ensure, to the maximum practicable extent, the mitigation program satisfies the policies of all the affected agencies. The policies allow for the use of mitigation banks when the bank is acceptable to the Commission and resource agencies and is shown to be ecologically acceptable and there is a scientifically defensible method for determining the timing and amount of credit required. Lastly, the policies state, "mitigation banking should only be considered when no mitigation is practicable on or proximate to the project site."

Due to the nature of dredging, removing sediment in an aquatic setting and either disposing of it aquatically in the Bay or the ocean, has potential to impact the organisms living and feeding in that environment, and water quality. Sediment placement at beneficial reuse sites likely has less potential impacts because these sites are normally in active construction phases during the placement period. The extent of the dredging activity and its location determine in part the type and severity of the potential impacts. In addition, the type of equipment can also influence the potential impacts and the duration of the project. In San Francisco Bay, there are generally three types of equipment used in various sizes: clamshell or excavator dredges classified as mechanical dredges; and two types of hydraulic dredges, hopper and cutterhead dredges. There are other types of dredging equipment but these are the types that are generally used in San Francisco Bay. As part of the USACE's consistency determination request, it describes using clamshell equipment and hopper dredges.

- a. **Equipment.** Clamshell dredges are normally large cranes mounted on a floating platform with a clamshell bucket lowered over the side with the bucket. When the clamshell reaches the bottom, it scoops up the mud or sand in the channel, closes and is drawn up through the water column. Once above the water, the crane moves the clamshell over an adjacent dredge scow where the operator opens the buckets and empties the sediment into the scow. Water that is entrained in the bucket is also released into the scow. Once the scow is full, a tug boat pushes or pulls the scow to the designated disposal site where it is bottom dumped into the aquatic environment or to a beneficial reuse site where the sediment is either pumped off a scow and piped to its final destination or is offloaded using another crane and mechanical bucket to offload the sediment to the site. Once one scow is loaded and begins transiting to the disposal site, another scow is often delivered so that dredging can continue while disposal is taking place. For longer distance disposal or beneficial reuse, clamshell dredges can be more efficient than hopper dredges. They also entrain less fish during dredging due to the lack of pumping activity. However, clamshell dredging creates more turbidity than hopper dredges.

Hydraulic hopper dredges use suction pumps that draw sediment and water into a draghead that is slowly drawn over the bottom. Once in the draghead, the sediment is drawn into the hopper, or basin, within the vessel via a long pipe. Once in the hopper, the sediment remains until the hopper reaches capacity, and then the draghead is turned off and raised out of the water. The entire vessel travels to the disposal site where it opens the hopper and bottom dumps the sediment into the aquatic placement site. While in transit to the disposal site, there is no dredging activity. These dredges tend to be more efficient at dredging to project depth than clamshell dredges and generally create less turbidity in the water. However, hopper dredges entrain more fish than mechanical dredges due to the suction pumps. The hopper dredges that are used in San Francisco Bay are the Essayons and the Jaquina, two government dredges owned by the USACE, that service the federal navigation channels along the west coast, Alaska and Hawaii.

- b. **Environmental Review.** In 2014-15, the USACE and the Water Board circulated and then finalized an Environmental Assessment and Environmental Impact Report (EA/EIR) entitled “Maintenance Dredging of the Federal Navigation Channels in San Francisco Bay Fiscal Years 2015 – 2024.” The joint National Environmental Protection Act (NEPA) and California Environmental Quality Act (CEQA) review considered impacts from the USACE’s dredging program over ten years, including deep and shallow water channels, and the proposed disposal/placement options. The NEPA/CEQA review became necessary to address changed conditions since the 1975 NEPA review, and the 1999 LTMS EIS/EIR, specifically the listing of several endangered species, including longfin and Delta smelt and green sturgeon.

In 2010 and 2011, at the request of the Resource Agencies, US Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), the USACE undertook a limited monitoring effort to assess whether the USACE's hydraulic dredge was entraining Delta or longfin smelt, federally and state and federally listed species, respectively. The monitoring revealed take of both longfin and Delta smelt. Therefore, a CEQA/NEPA review was triggered.

The review analyzed four alternatives. At the conclusion of the process, the Water Board found that the reduced hopper dredge alternatives (use of one hopper dredge or no hopper dredges in the Bay) were environmentally superior to the no project or proposed project alternative, made findings of significance due to the take of listed species. The USACE found that the proposed project alternative had less than significant impacts and, therefore, was the preferred alternative. In all alternatives, use of a hopper dredge was included for the main ship channel (outside the Commission's jurisdiction), due to safety issues at that location. For all other resources examined, both the Water Board and the USACE determined there were less than significant impacts.

The Bay Plan policies on natural resources direct the Commission to examine the impacts of the project on Bay resources, including the potential to introduce or spread invasive species, tidal hydrology and sediment movement, aquatic plants, fish and wildlife, the Bay's bathymetry, and habitat. With the proposed project impacts could occur in the dredged channels, adjacent to the dredged channels, in the water column, to wildlife living in or passing through the dredging footprint, and at aquatic placement sites.

- c. **Invasive Species.** Regarding the introduction or spread of invasive species, the EA/EIR found that because the dredge equipment would comply with United States Coast Guard (USCG) regulations for vessels intended to minimize the spread of invasive nonnative species, the potential for this impact would be minimized. While dredging equipment is used in other locations, the USCG, along with the State Lands Commission have implemented safeguards to lessen the import of invasive species in the Bay. In addition, the equipment is often moved from one embayment to another, which could spread invasive species within the Bay, but it is likely that the salinity differences would limit this type of spread of species. Therefore, project would not be expected to substantially increase the spread of invasive nonnative species.
- d. **Tidal Hydrology, Sediment Movement and Bathymetry.** Because the proposed project is dredging and dredged sediment disposal/placement, it affects tidal hydrology, sediment movement and Bay bathymetry. As described the deep draft channels and in-Bay disposal sites are the primary focus of these changes. Because the channels are dredged on an annual basis to the approved depth, the tidal hydrology likely shows little change from year to year.

The request for consistency determination stated:

“shoaled sediment in the channels is in areas between approximately 30 and 35 feet deep. If dredging does not occur, some sediment would remain in the shoaled area and some of it would be transported to other areas within the channel or to deeper areas adjacent to the channel. Currents that move through the channel are not likely able to transport sediment up over the sides of the deep-draft navigation channel and into shallower areas. Therefore, it is highly unlikely that this sediment in the channels would be transported to areas of shallower water.”

“During dredging, some sediment would be resuspended in the water column and settle out in the channel and adjacent areas. During in-bay placement of dredged material, as the sediment falls through the water column, some of it would also be separated by currents from the descending plume and be transported through the water column. Other than actual dredging of approximately 2 million cubic yards of sediment per year and transporting it to in-bay and ocean sites for placement, the proposed dredging is not expected to result in significant effects on sediment transport in subtidal areas. Sediment transport is likely to be the same as before maintenance dredging occurred.”

Sediment movement throughout the Bay is affected as is the sediment transport to the outer coast. Sediment in the Bay is in constant movement, and once dredged, the channels begin to fill in again seeking natural equilibrium. In addition, the deep water channels are the sediment pathways connecting the embayments and the coast. Of the five channels proposed for dredging within the Commission’s jurisdiction, two channels have sandy sediment: Suisun Bay Channel and Pinole Shoal. Suisun Bay channel is regularly fine grain sized sand with little variation from year to year. Pinole Shoal channel has portions that are sand and portions that are mud, and the amount of either varies from year to year. Sand in both of these channels is likely moving into Central Bay over time, as shown in Dr. Barnard’s work on sediment transport.¹² Sand in Suisun Bay is dredged and disposed of within Suisun Bay, in a disposal site to the west and north of the channel, allowing sand to stay within the system, it is unknown whether this placement impedes or increases sand movement in this area.

The Pinole Shoal channel is more variable, and the grain size and volume of sand changes from year to year. The sediment from this project has been historically disposed of at the San Pablo disposal site, but in recent years when portions of the channel have been greater than 80% sand the LTMS agencies have urged to USACE to direct the project to SF-8, a disposal site within the coastal littoral cell and considered a beneficial reuse site for sand because it is thought to contribute

¹² Special Issue of Marine Geology 2014, multiple papers by Dr. Patrick Barnard.

to coastal beaches. However, this request has resulted in little success. It is unknown whether sand from the Pinole Shoal channel would feed Bay beaches, but would likely contribute to the Central Bay sand shoals over time.

The remaining channels contain various types of Bay mud with greater or lesser silts and clays depending on the channel. This sediment is of the same type found in marshes and mudflats around the Bay, and therefore the potential for reuse of this sediment is high and would support necessary habitat restoration projects. The LTMS agencies consider placement at beneficial reuse sites keeping the sediment within the Bay system albeit, not in sediment transport.

The in-Bay disposal of sediments at the dispersive disposal sites likely hastens the sediment transport out of the Bay system as shown by model exercises completed in 1998 and again in 2011. Once out of the Bay, the muds join the deeper water fine grain sediment pool just off the outer shelf of the coast. Some have suggested that in-Bay disposal increases the amount of sediment in the system, but in fact, it only redistributes it, and does not provide a net gain in Bay sediment. Deep ocean disposal of dredged sediments takes Bay sediments and places them at a depositional site, 50-miles from the Bay, where they no longer are contributing to the coastal system. LTMS studies of the site have shown that sediment placed at this location remains there, as designed.

In recent years, with the observed decrease in sediment supply from the Delta, increase restoration activity in subsided baylands, and increasing sea level, concerns have been raised by both the environmental community and wetland restoration advocates regarding ocean disposal. The community is recognizing that this practice, when involving clean sediment, is wasting a valuable resource that is in short supply. Difficulties in directing the sediment to restoration sites include lack of funds to support the effort and lack of equipment dedicated to offload the sediment and place it on site. Unfortunately, the Commission does not have authority over use of the ocean site. The EPA has the ability to deny ocean disposal if the feasibility analysis shows other alternatives are feasible under the Clean Water Act 404(b)(1) guidelines.

- e. **Aquatic Plants.** Aquatic plants cannot grow in the deep water channels. Richmond Outer channel and Oakland Inner Harbor channels have adjacent eelgrass beds. As part of the 2011 LTMS NOAA Essential Fish Habitat consultation, projects within a two hundred and fifty meter buffer zone are required to use silt curtains reduced suspended sediments potential deposition on the eelgrass beds, and within 50 meters, must survey the dredging footprint to ensure that there would be no direct impacts to eelgrass beds. In surveys that the USACE has submitted to date, there have been no apparent impacts to the adjacent eelgrass beds.
- f. **Habitat.** Dredging and aquatic disposal degrades habitat over time by regularly disrupting the bottom of channels and disposal sites, through sediment removal or disposal; temporary increases in turbidity and suspended sediments; and

entrainment of organisms. Potential impacts from these actions include: removal of bottom habitat; removal of bottom dwelling organisms; burial of organisms; increased respiratory issues; entrainment of individuals and prey organisms. In evaluating these impacts, the USACE, in accordance with Subtidal Areas Policy 1, has provided minimization measures where it believes they are feasible and warranted.

Regarding these potential impacts, the USACE stated that several fish, other aquatic organisms, and birds utilize the San Francisco Bay waters. Dredging has the potential to affect these organisms. Turbidity and noise generated from clamshell dredging could affect fish and other aquatic organisms at the dredge site. Additionally, fish could be directly injured by a clamshell dredge, dredge spuds, dump scows, or tugs used to maneuver the dredge equipment and scows. These impacts would be limited to the immediate area around clamshell dredging activities, the areas where dredged material would be transported to, and the aquatic placement sites. Additionally, benthic organism would be removed from the dredge site. A detailed analysis of the effects of the removal of benthic species during dredging operations is provided in Impact 3.6-2 of the EA/EIR. The EA/EIR found that dredging would have localized, direct impacts on benthic communities through physical disruption and direct removal of benthic organisms. Effects would be temporary because benthic habitat is quickly recolonized. While there are many studies in other areas regarding the recovery of benthic species that show recovery in anywhere from 3 months to 3 years, the USACE is contributing to a local study that will provide a further understanding of effects of dredging on the benthic community and its forage value to fish.

While removal of bottom habitat and organisms is unavoidable during dredging activities, entrainment from the water column can be reduced. To reduce impacts from entrainment of fish, including special status species, the EIR acknowledged clamshell dredging would have less entrainment of fish and other wildlife than hopper dredges and that the hopper dredge can entrain fish and other organisms. The USACE proposed a number of measures to further reduced the level of entrainment from hopper dredging:

- (1) Dredging Pinole Shoal at a later date (from August 1 through November 30) in the San Francisco Bay LTMS environmental work windows, to the extent feasible. Dredging later would allow young-of-the-year longfin smelt to grow larger and spawning adults to return upstream;
- (2) Dredging earlier in the LTMS work window in Bulls Head Reach, from August 1 through September 30, to reduce impacts to adult longfin and Delta smelt;
- (3) Lowering the draghead completely onto the channel bottom prior to turning on suction pumps;
- (4) Keeping dragheads within 3 feet of the channel bottom should clearing of the pipeline be required;
- (5) Keeping water intake doors closed to the extent feasible (water intake doors are located on the top of the dragheads).

Further, reduce turbidity effects when using hydraulic dredges, the USACE installed “anti-turbidity valves” on the hopper dredge *Essayons* to reduce the amount of air in the overflow water returning to the Bay, thus reducing potential effects of turbidity on aquatic organisms. These measures, serve to reduce impacts to the Bay habitats.

In addition, the funding for scientific research, reports, studies and initiatives that the USACE has undertaken over the previous decade provide evidence of its commitment to thoroughly evaluating the local and Bay-wide effects of maintaining the depth and configuration of navigational channels. The consistency determination further states, “the District believes that only short-term impacts result from our maintenance dredging and disposal actions.” The deep water channels and the in-Bay disposal sites have been maintained and used for many decades. Therefore, the channels are considered a disturbed habitat that is adapted to the periodic disturbance of dredging.

The disposal sites, particularly the Alcatraz Island site, receive large volumes of sediment with each dispose event. Organisms that live at that site must be able to avoid the falling dredged sediment or are buried by it. If buried, it is unlikely that many would survive, but it is assumed that new benthic organisms would emigrate from adjacent sediments or settle out of the water column during the next spawning period, which could be seasonally or annually depending on the species. As with the dredged deep water channels, the disposal sites are considered disturbed habitat and likely offer less value than similar adjacent habitats.

Bay Plan Subtidal Area Policy 2 states, “areas that are scarce in the Bay or have an abundance and diversity of fish, other aquatic organisms and wildlife (e.g., eelgrass beds, sandy deep water or underwater pinnacles) should be conserved. Filling, changes in use; and dredging projects in these areas should therefore be allowed only if: (a) there is no feasible alternative; and (b) the project provides substantial public benefits.” The USACE has stated, “dredging would occur in existing, authorized, deep-draft navigation channels, and there is no feasible alternative to dredging in these areas.” Further, as previously discussed, “the federal deep-draft navigation channels not only provide a substantial public benefit to the region, but also to California and the nation.”

- g. **Species.** The Bay Plan policies on Fish, Other Aquatic Organisms, and Wildlife seek to protect habitats necessary to support native species, and to preserve the species for future generations. Subtidal Area Policy 1 states that dredging projects that occur in a subtidal area should be designed to minimize and, if feasible, avoid harmful effects. It should be noted that the discussion of measures to protect species described herein are in response to these enforceable policies of the Bay Plan and the Commission’s independent authority as required under CZMA, not in response to the listing of species by the CDFW, USFWS and NOAA’s National Marine Fisheries Service (NOAA Fisheries Service), although the Commission

concur with these agencies. The Commission staff has sought the advice of these agencies in accordance with Fish, Other Aquatic Organisms and Wildlife Policy 4(a) and (c).

All forms of dredging have the potential to incidentally remove organisms from the environment with the dredged material, a process referred to as entrainment. Organisms on the dredged material may be entrained in addition to organisms in the water column near the dredging apparatus. In general, smaller organisms with limited or no swimming capabilities are more susceptible to entrainment. Mechanical dredging is generally accepted to entrain far fewer fish than hydraulic dredging, because much less water is removed along with the sediment; it still may remove bottom dwelling fish and crustaceans that live in or on the sediment. Entrained fish are likely to suffer mechanical injury or suffocation during dredging, resulting in mortality. The USACE has sought to reduce entrainment impacts to species through the listed minimization measures.

By partnering in the LTMS Program and adhering to its goals and management measures, such as environmental work windows the USACE has further minimized potential impacts to Bay species. However, it is well known that there are native species that use parts of the Bay for all or a portion of their lifecycle that are experiencing severe declines in their population that can be impacted by the proposed dredging project. These species include Chinook and Coho salmon, steelhead trout, green sturgeon, least tern, Delta and longfin smelt, as well as one species that using the Bay as its spawning grounds, the Pacific herring. Other species of concern are those managed by NOAA Fisheries Service that are commercially important and include species that live in the water column, bottom dwelling fish and salmonids. One tool that is used is environmental work windows, which limit dredging to the time of year certain species are not present and minimizes in-Bay disposal. The Commission implements these work windows in accordance with the Resource Agencies to provide protection for these species, under its own authority as the Coastal Zone Manager for the region.

The salmon are anadromous, meaning they live a portion of their lifecycle in fresh water and portion in salt water, and go through metabolic changes to adapt to these different environments. They spawn in fresh water streams and then travel downstream, to the Bay, feeding and growing along the way, and then migrate out to sea, only to return to spawn. These species are in serious decline due to damming, changes to the Delta and river modification, overfishing and other impacts of development. Dredging and disposal can impact these species as they travel through the deep water channels or by increased turbidity, as well as loss of foraging opportunities. However, these species move through the Bay relatively quickly during their well-documented migration period. The primary measure for reducing impacts from dredging for these species is the implementation of the environmental work windows for dredging set forth in the programmatic biological opinions for the LTMS Management Plan.

These work windows allow dredging during the time of year when salmonids are not present in large numbers, thereby limiting the impacts to these fish. The programmatic biological opinions from NOAA Fisheries Service and the USFWS, as well as the concurrence letter from CDFW provide the Commission staff with measures, including the dredging windows, to reduce impacts to all listed species. The LTMS agencies have instituted these work windows as minimization measures. The USACE has stated in their consistency determination request that they will adhere to the work windows, or seek additional consultation with the Resource Agencies.

The LTMS agencies have requested an amendment to the 1998 NOAA biological opinion which is nearly complete, in which dredging can occur after the salmonid work window has closed if the sediment is dredged with a mechanical dredge and is beneficially reused at restoration site that would benefit NOAA listed species. NOAA has tentatively agreed with this measure, commenting that in-Bay disposal outside of the work windows would presumably have impacts to salmon that could be mitigated for by providing sediment to habitat restoration projects that benefit fish. In correspondence from Lt. Colonel Morrow, the USACE has committed to compliance with the amended biological opinion after the close of the work window, unless further individual consultation with NOAA is completed.

Green sturgeon a bottom dwelling species has a different life strategy than salmon. Although they spawn in fresh water, Green sturgeon spend several years as juveniles and adults with the Bay prior to ocean residence. They are found Bay wide, but in low numbers. As such, the Commission staff has sought the advice of NOAA Fisheries Service for measures that would protect this species from impacts of dredging. Green sturgeon can be impacted by clamshell or hopper dredging because they stay close to the Bay bottom when threatened. NOAA Fisheries did not provide any minimization measures for this species as the main concern are dams in the species spawning grounds, far from the Bay, and entrainment of this species by dredging equipment is considered low.

Least terns, a visually foraging, fish eating bird, migrate every year to the Bay Area and other locations for nesting, breeding and rearing its young before returning south for the winter. The Bay Area hosts the largest breeding colony on the West Coast, at Alameda Naval Station. Dredging impacts this species indirectly by increasing turbidity in shallow water areas where eelgrass grows. Measures to minimize impacts this species include dredging work windows in areas where the birds forage that limit the dredging to when the species are not present.

Longfin and Delta smelt are small, forage fish that are important to the Bay food web, spawn in fresh water and move into brackish (Delta smelt) and marine waters (longfin smelt). Both fish are not strong swimmers and are presumed susceptible to entrainment in the flow fields created around the intakes of hydraulic suction dredges. It is presumed that these fish would better avoid entrainment by a clamshell dredge. Longfin smelt have the potential to occur in

any of the project areas in any season, with different life stages occurring in different embayments in higher numbers at different times of year. Delta smelt have potential to occur in the portions of the Estuary that include the San Pablo Bay/Mare Island Strait, and Suisun Bay Channel dredge areas during certain seasons. Delta smelt occur in San Pablo Bay in lower numbers than in the Napa River or Suisun Bay; however, they may be present in San Pablo Bay in increased numbers during high water outflow years. Delta smelt are not expected to occur in the other federal channels.

Over the past decade, according to CDFW fish survey data, abundance indices for various life stages of Delta smelt have hit record lows, indicating that the species is in danger of extinction. In response, the State elevated its listing status from threatened to endangered. USFWS examined the potential to reclassify the Delta smelt as endangered and found it warranted, but precluded its listing by other higher priority listing actions.

The CDFW annual fall mid-water trawl surveys show that the population of longfin smelt has declined 99 percent or more in the last 45 years, with record lows in the past decade. The State Fish and Game Commission listed longfin smelt as threatened under CESA. The USFWS reviewed the longfin smelt status in which it concluded that the listing of the longfin smelt as a threatened species is warranted, but precluded its listing by other higher-priority listing actions. As a result, longfin smelt is currently a candidate species for listing under the federal ESA. Because this is a State-listed species only, the USACE has coordinated with CDFW, but has maintained that it is not required under State law to obtain an incidental take permit.

In 2013, the United States Army Engineer Research and Development Center (ERDC) prepared a modeling study of entrainment of longfin and Delta smelt in San Francisco Bay by hydraulic dredges. In the study, the risk of smelt entrainment was assessed by comparing CDFW monthly trawl fish abundance data in the environment to fish collections in entrainment monitoring samples (screened sub-samples of dredged sediment) collected during dredging USACE's hopper dredge, the Essayons in San Francisco Bay in 2010 and 2011. Due to the technical and logistical limitations of sampling on-board the vessel, only a very small fraction less than one percent of the total volume dredged was actually sampled.

Using the entrainment data from the 2011 monitoring study and the trawling data for the same year, modeled estimates of longfin smelt entrainment during hydraulic dredging in 2011 are 3,848 for the low entrainment scenario, 6,528 for the medium entrainment scenario, and 10,260 for the high entrainment scenario (up to approximately 8 percent of the median annual population abundance). Modeled estimates of Delta smelt entrainment during hydraulic dredging are 394 for the low entrainment scenario, 1,444 for the medium entrainment scenario, and 3,694 for the high entrainment scenario (up to approximately 29 percent of

the median annual population abundance). Many factors are associated with the accuracy of these projections. The small sample size of entrained fish (18 longfin smelt and 4 Delta smelt), combined with the low percentage of dredged material sampled, result in a high degree of uncertainty as to the accuracy of the entrainment estimates. However, this is the best available information on this issue to date.

In its March 14, 2014 reply to the Water Board (attached), CDFW indicated that impacts would be significant. It noted the ERDC estimates of entrainment and stated that “the Project, as proposed, would substantially reduce the number of an endangered, rare, or threatened species.” To reduce dredging-related impacts to special status fish species to a less-than-significant level, CDFW recommended reducing hopper dredging to a minimum in San Francisco Bay, limiting any hopper dredging during certain periods and implementing the avoidance, minimization, and measures described below. In an additional letter commenting on the EA/EIR, the CDFW further recommended that for Central Bay, hopper dredging should occur “later” in the suggested work window of August 1st to November 30th of any year.

At the Water Board hearing in this project, the Bay Institute’s staff scientist provided a letter and commented that the proposed Central Bay work window of August 1st to November 30th would likely entrain high numbers of adult longfin smelt because they congregate in large numbers in Central Bay in the fall prior to migrating to their spawning grounds. The BCDC staff has since conferred with CDFW management to clarify this issue and has been advised that hopper dredging operations in Central Bay may be reduced if dredging would be limited to August 1 through November 30. Understanding that densities in the Central Bay are higher in August, CDFW determined that, in combination with the avoidance and minimization measures identified by the USACE and the Water Board, it believes that impacts may be minimized. CDFW further clarified that impacts to longfin smelt would be even more reduced if dredging would begin later in the window, for example, from September through November of any year.

Based on the ERDC entrainment study and guidance from CDFW, the Water Board has implemented the following minimization measures that are protective of both Delta and longfin smelt when a hydraulic dredge is used:

- (1) By 2017, the use of a of hopper dredge use in San Francisco Bay is limited to one federal channel, and no hopper dredge use in Suisun Bay.
- (2) No dredging would occur in water ranging from 0 to 5 parts per thousand salinity between December 1 and June 30.
- (3) USACE will coordinate with the appropriate regulatory and resource agencies to perform compensatory mitigation for hydraulic dredging anywhere when water temperature is below 22.0°C.

- (4) Implementation of a worker education program for listed fish species that could be adversely impacted by dredging. The program would include a presentation to all workers on biology, general behavior, distribution and habitat needs, sensitivity to human activities, legal protection status, and project-specific protective measures.
- (5) At the beginning and end of each hopper load, pump priming, drag head clearing, and suction of water would be conducted on the seafloor.
- (6) Hopper drag head suction pumps would be turned off when raising and lowering the drag arms from the seafloor.
- (7) Completion of hydraulic hopper dredging in Suisun Bay between August 1 and September 30 to avoid impacts to spawning adult longfin and delta smelt.
- (8) Completion of hydraulic hopper dredging in Central Bay (i.e., Richmond Outer Harbor) between August 1 and November 30 to avoid impacts to young-of-the-year and spawning adult longfin smelt.
- (9) Maintaining contact of drag head, cutterheads, and pipeline intakes with the seafloor during suction dredging.
- (10) Keeping the drag head water intake doors closed to the maximum extent feasible in locations most vulnerable to entraining smelt. In circumstances when the doors need to be opened to alleviate clogging, the doors would be opened incrementally (i.e., the doors would be opened in small increments and tested to see if the clog is removed) to ensure that doors are not fully opened unnecessarily.

Minimization measure 1, listed above, would require the USACE to seek additional funding to support the use of a clamshell dredge in two additional channels. The Water Board has required that the USACE request such funding, but understands that Congress may not provide it. In the event that the funding is not provided, the USACE would be in violation of the Board Order, and dredging in channels that previously used hopper dredges may be deferred until a resolution is reached at higher level. If the Commission imposes a similar requirement under its CZMA authority, a similar situation would occur for the Commission's consistency determination. The Commission would then refer the issue to NOAA as laid out in the federal code of regulations. Having both Water Board and BCDC take up the issue in the Order and consistency determination strengthens the case that the USACE should reduce impacts to important Bay species.

Regarding Delta smelt, the USACE requested a ten-year biological opinion from the USFWS in 2011 and offer compensatory mitigation. The USFWS recommended that the request include entrainment monitoring (as did CDFW) to better understand impacts to the species from hydraulic hopper dredges. The USACE responded that it would not be undertaking monitoring, and therefore due

to the lack of information on the potential impact, the USFWS would only provide biological opinions on an annual basis. The BCDC staff and the Water Board agree that monitoring is a necessary element of this activity. In its WQC/WDR, the Water required entrainment monitoring when a hopper dredge is employed in the Bay.

- h. **Mitigation.** The Commission’s Bay Plan policies on mitigation require that when adverse impacts cannot be avoided, they should be minimized to the greatest extent practicable and then unavoidable adverse impacts to the natural resources of the Bay should be mitigated. As described above, there are several minimization measures proposed, many specifically to address impacts from entrainment to special status species. However, when a hopper dredge is used, there is likely entrainment of species that are in critical population decline as reflected in their listed status from the Resource Agencies.

The USACE has offered the following response to the Commission’s policies on mitigation:

“To mitigation for the potential entrainment of fish in hydraulic hopper dredges, USACE proposes to purchase credit at the Liberty Island Conservation Bank, or other approved conservation bank, to compensate for entrainment of special status fish. The equation (shown below) used to calculate the amount of conservation credits purchased for the federal navigation channels was developed by the resource agencies to determine mitigation requirements for other projects with entrainment impacts resulting from pumping water, including the State Water Project.”

- (1) “The mitigation equation: $3.0 \text{ million acre-feet} / 800 \text{ acres} = \text{volume dredged} / x \text{ acres of mitigation habitat.}$ ”

Currently, USACE proposes to purchase 0.92 acres of credits per year—0.19 acre for Pinole Shoal, 0.34 acre for Richmond Outer Harbor, and 0.39 acre for Suisun Bay and New York Slough. The USACE states:

“These estimates are considered conservative because they are based on the largest volume of material dredged over a 12-year period. Each year, mitigation credits would be purchased prior to or concurrent with hopper dredging. The mitigation discussed herein was agreed upon by USACE and CDFW. Mitigation credit would only be purchased on those occasions when hopper dredging occurs. During years where a clamshell dredge is use, the credits would not be purchased because clamshell dredging is considered an appropriate method to avoid and minimize entrainment impacts to special status fish...”

Table 5 provides the maximum amount of compensatory mitigation that would be purchased each year over the next 3 years.

Table 5: Maximum Compensatory Mitigation Proposed for Hopper Dredge Entrainment^{1,2}				
Year	Pinole Shoal (acre)	Outer Richmond (acre)	Suisun Bay / New York Slough (acre)	Total (acre)
2015	0.19	0.34	0	0.53
2016	0.19	0.34	0.39	0.92
2017	0.19	0.34	0.39	0.92
NOTES:				
¹ Mitigation includes purchasing conservation bank credits at Liberty Island or a CDFW-approved conservation bank.				
² Mitigation credits would not be purchased when a clamshell dredge is used.				

The Bay Plan policies further discuss the need for the mitigation required to be coordinated by all agencies with jurisdiction for the project. The mitigation proposed by the USACE has been discussed among the USFWS, CDFW, BCDC and the Water Board, and these agencies are in agreement that the acreage of mitigation to be purchased is appropriate when an hopper dredge is used. The agencies have also agreed that purchasing credit at the Liberty Island or Honker Bay (when it become available) are the only appropriate mitigation banks for Delta and longfin smelt. While mitigation is not being required for take of salmonids, these mitigation banks provide benefits to salmon as well. There is no appropriate mitigation bank available nearer to the project impacts in Central Bay.

Further, it should be noted that, due circumstances beyond the Bay Area, it is highly unlikely that a hopper dredge would be employed at any of the federal channels in the Bay this year. It is also unlikely, but less certain, that a similar circumstance will occur in 2016. Thus reducing impact for these two years and potentially eliminating the need for mitigation. By 2017, the USACE may have succeed in requesting funds to reduce the hopper dredge use to only one channel, which would then reduce the need for mitigation, but not fully eliminate it. The mitigation required at that point would be adjusted to be proportional to the impacts.

The Commission must determine whether the proposed project is consistent with the Commission's policies regarding fish, other aquatic organisms, and wildlife; subtidal areas; and mitigation.

3. **Water Quality.** The Bay Plan Water Quality Policies 1 and 2 state, respectively, that “Bay water pollution should be prevented to the greatest extent feasible. The Bay’s tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality...” and “Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board’s *Water Quality Control Plan, San Francisco Bay Basin* and should be protected from all harmful or potentially harmful pollutants. The policies, recommendations, decisions, advice and authority of the State Water Resources Control Board and the Regional Board, should be the basis for carrying out the Commission’s water quality responsibilities.”

Further, Dredging Policy 2 necessitates that “[d]redging should be authorized when the Commission can find:...(b) the materials to be dredged meet the water quality requirements of the San Francisco Bay Regional Water Quality Control Board...” In addition, the Bay Plan Dredging Policy No. 3(c) requires, in part that “the quality of material disposed is consistent with the advice of the Regional Board and the Dredged Material Management Office” (DMMO).

As part of any dredging and disposal/placement of dredged sediments in San Francisco Bay, the project sponsor must show that the sediment proposed for dredging is relatively free of contaminants, and that the dredging and disposal would not have harmful effects to water quality, habitat or the organisms that live in the Bay. This requirement is met through sediment testing and data analysis as describe by the Inland Testing Manual (for in Bay disposal) or the Ocean Testing Manual (for ocean disposal) and as refined to address known San Francisco Bay contaminates. In addition, the Water Board has instituted Total Maximum Daily Loads (TMDLs) for specific contaminants with the goal of reducing the Bay’s load of these contaminants over time. Also instituted Bay-wide in 2011, are specific requirements to protect managed fish species under the Magnuson-Stevens Fish Conservation and Management Act through a programmatic Essential Fish Habitat (EFH) consultation for the LTMS program. This consultation further refined sediment contaminant limits for dredging and in-Bay disposal. The LTMS agencies have incorporated the TMDL’s requirements and the EFH recommendations in the DMMO testing program.

In its consistency determination request, the USACE stated that because the dredging activity does not alter fresh water flow into San Francisco Bay, it is fully consistent with Water Quality Policy 1. In its statement it did not address the issue of pollution prevention, however, in discussion of Water Quality Policy 2, it discussed the issue of protection of water quality in all parts of the Bay and identified areas of known contamination in or adjacent to federal channels proposed for dredging, primarily Richmond Inner Harbor and Redwood City Channel.

Richmond Inner Harbor, specifically the Santa Fe Channel portion, is contaminated with DDT, PCB and other legacy contaminates due to the historic production of these chemicals. The United Heckathorne site has been designated as EPA superfund clean

up site, and while efforts have been made to remediate the contamination, the site continues to contribute DDT into the Bay. The EPA is actively working to further address clean up of contaminants. As a result, areas adjacent to the superfund site often have elevated levels of contaminants. The USACE does not currently, nor has it proposed to dredge the Santa Fe Channel during the period of this consistency determination. Further, because of the known contamination, the areas proposed for dredging are regularly tested prior to dredging and disposal or placement of the sediment at proposed sites. The 2015 episode testing program is currently under review at the DMMO office and sampling and analysis will be completed prior to dredging activities.

Similarly, portions of Redwood City Harbor Channel has shown elevated levels of contamination, in this case, PCB's in the turning basin area of the channel (Exhibit F). Higher resolution testing of this area is underway and a determination of suitable disposal or placement options will be made by the DMMO agencies once the final results are available, and prior to dredging. The PCB's in this channel seem to be limited to the turning basin and portions of the Port of Redwood City's berthing areas, but have not been identified in other areas of the channel.

The USACE has provided a description of the proposed testing schedule, which appears to be in alignment with the DMMO approved program for the USACE projects. Further the USACE has stated that if additional contamination is revealed beyond what was described, they will coordinate with the DMMO and the resource agencies. The USACE has also committed to providing sampling and analysis plans and test results to the DMMO agencies for review and a suitability determination for disposal/placement options. If the DMMO determines that the sediment is not appropriate for the proposed placement option, the USACE has committed to working with the agencies to identify and use a suitable disposal or placement site.

The Water Board's Order, the LTMS Management Plan as well as the Commission's policies and regulations have set annual and disposal site specific In-Bay disposal volume limits to reduce impacts to water quality, habitat and species. In response to the USACE's request for a WQC, the Water Board adopted Water Quality Certification and Waste Discharge Requirements, issued on May 13, 2015. It included a discussion of the LTMS in-Bay disposal targets and the individual in-Bay disposal site limits. The Water Board Order requires that the USACE continue management and monitoring of the in-Bay disposal site limits for all dredgers, including the USACE. Further it requires the USACE to enforce the limits as shown in Table 4 on page 16, in order to minimize impacts to water quality.

The Water Board's WQC/WDR authorizes the USACE to conduct up to 12.4 million cy of dredging over five years, and a maximum in-Bay disposal of 3.5 million cy over the same period. The total in-Bay disposal limited authorized by the WQC/WDR is based on an average annual in-Bay disposal volume of 700,000 cy per year, although it does not set annual volume limits. The Order discusses the need to provide in-Bay disposal availability for the five ports, seven refineries and multiple small dredging projects

such as recreational marinas and homeowners as described in the dredging policies discussion. According to the WQC/WDR, the Water Board will monitor dredging and disposal/placement volume through the episode approval process, in which the USACE provides equipment type, pre-dredge surveys, volumes for dredging and disposal/placement, and the disposal and/or placement sites on a channel by channel basis for review and approval. The USACE has committed to providing a pre-dredge survey for each project to the Commission prior to commencing the project, which would provide a more accurate project volume. It is also likely that some of the actual project volumes would be less than what is estimated and that some would be slightly higher than the estimated volumes, but the cumulative volumes. In this way, the LTMS agencies can monitor in-Bay disposal volumes to ensure targets are not exceeded, or if necessary the contingency volume is used.

The Commission must determine whether the proposed project is consistent to the maximum extent practicable with the Bay Plan's policies on Water Quality.

4. **Navigational Safety and Oil Spill Prevention.** The Bay Plan Navigational Safety and Oil Spill Prevention policies 1 and 3 state respectively: “[p]hysical obstructions to safe navigation...should be removed when feasible when their removal would contribute to navigational safety and would not create significant adverse environmental impacts.” and that “[t]o ensure navigational safety and help prevent accidents that could spill hazardous materials, such as oil, the Commission should encourage major marine facility owners and operators, the U. S. Army USACE of Engineers and the National Oceanic and Atmospheric Administration to conduct frequent, up-to-date surveys of major shipping channels, turning basins and berths used by deep draft vessels and oil barges....”

The consistency determination states that the purpose of the USACE' maintenance dredging program is to remove obstructions to safe navigation, thereby ensuring the safe movement of maritime vessels, the protection of the surrounding habitat, and the continuation of the economic well-being and national defense of the nation. In addition, as part of the operations and maintenance program, the USACE performs quarterly condition surveys, pre-dredging and post-dredging surveys of the federal channels and all federal maintenance dredging project areas. These surveys are made available on the District's Hydrographic Survey Section webpage and are accessible at the District's office. Further, as part of their contracting process, any USACE contractor is required to maintain oil and hazardous material containment plans and equipment on board the vessel when operating within San Francisco Bay in compliance with the US Coast Guard and the Oil Spill Response Program (OSPR).

The Commission should decide whether the proposed project is consistent with the Commission's policies regarding navigational safety and oil spill prevention.

5. **Public Trust.** The Commission’s policies on public trust state that when it takes an action affecting public trust lands, the Commission should assure that the project is also consistent with the public trust needs of the area. The public trust is a common law doctrine that guarantees the right of the public to use the state’s waterways for navigation, commerce, fisheries, boating, recreation, natural habitat protection, and to preserve lands in their natural state for protection of scenic and wildlife habitat values. Public trust uses of public lands are generally limited to water dependent or water related uses. Further, because public trust lands are held in trust for all citizens of the state, they must be used to serve statewide, as opposed to purely local, public purpose.

In completing its independent evaluation of the project, the Commission must determine if the project is consistent with the public trust needs of San Francisco Bay. Public trust needs include the same categories as the uses. Maintaining the federal navigation channels through dredging and disposal/or placement of the dredged sediment is consistent with public trust needs for navigation; facilitates water borne commerce’s ability to access local port; recreational boating, but may conflict with preservation of natural lands and wildlife habitat. The annual maintenance of the deep water channels allows large, ocean going ships to traverse to Bay and inland ports, refineries and other berthing areas. If the channels were not maintained, commerce would still occur, but at a lower rate, and some companies may chose to avoid the Bay, using other west coast ports. Annual dredging of deep water channels, as described above, likely reduces the abundance and diversity of organisms living in or on the sediments in deep water channels and causes some habitat degradation. However, because these channels have been dredged annually for decades, it is likely that they have formed a steady-state of disturbance and recolonize to the extent possible.

The Commission should determine whether the proposed project is consistent with the Public Trust needs of the Bay.

- B. **Review Boards.** The Engineering Criteria Review Board does not evaluate dredging projects and, as this project does not include any proposed public access, the Design Review Board did not review this project.
- C. **Environmental Review.** In 2014, the USACE and the Water Board completed a joint Environment Impact Assessment and Environment Impact Report (EA/EIR) *Maintenance Dredging of the Federal Navigation Channels in San Francisco Bay Fiscal Years 2015–2024*. The Water Board certified the Final EIR (FEIR) on May 13, 2015. The FEA/FEIR examined four project alternatives, and a number of issues, including: geology, soils and sediment quality; hydrology and water quality; air quality and climate change; biological resources, cultural and paleontological resources; land use; hazards and hazardous materials; and transportation.

The California Environmental Quality Act (CEQA) review identified significant impacts to Delta and longfin smelt in the alternatives that maximized use of hydraulic dredge equipment. The Water Board (the lead agency) found that either of the reduced hopper

dredge alternatives reduced impacts and determined that using one hydraulic dredge in the Bay, coupled (Reduced Hopper Dredge Alternative 1) with minimization measures and mitigation for take of listed species was feasible. In certifying the FEIR, the Water Board made a finding of overriding considerations regarding the delay in implementing the reduced project alternative until 2017, when funding may be available. The considerations balanced the economic, legal, social, technological and other benefits, including the associated unavoidable environmental impacts are acceptable due to the San Francisco Bay's importance to international, national and state navigation, trade, commercial and recreational fishing. In addition, navigational dredging was determined to be critical to safe navigation and safe and efficient waterborne transportation, national security, and recreation. The Water Board included minimization and mitigation measures in its WQC/WDR to further reduce impacts of the project, and required reducing hydraulic dredging in 2017 to further protect the Delta and longfin smelt.

The USACE, through the National Environmental Quality Act (NEPA) review made a Finding of No Significant Impact (FONSI), and found that, "based on a review of the information incorporated in the FEA and supported by the administrative record, the proposed activity would not significantly affect the quality of the physical, biological, and human environment. In addition, avoidance, minimization, and mitigation measures are proposed to further support this determination." The FONSI was signed on May 22, 2015, which completed the NEPA process.

D. Relevant Portions of the McAteer-Petris Act

1. Section 66604 (pages I-3)
2. Section 66605 (pages I-3)
3. Section 66632 (pages I-13)
4. Section 66663 (pages I-34)
5. Section 66664 (pages I-38)

E. Relevant Portions of the San Francisco Bay Plan

1. Bay Plan Policies on Fish, Other Aquatic Organisms and Wildlife (page 16)
2. Bay Plan Policies on Water Quality (page 19)
3. Bay Plan Policies on Tidal Marshes and Tidal Flats (page 23)
4. Bay Plan Policies on Subtidal Areas (pages 28)
5. Bay Plan Policies on Dredging (pages 46 to 48)
6. Bay Plan Policies on Mitigation (pages 86-87)
7. Bay Plan Policies on Public Trust (page 88)
8. Bay Plan Policies on Navigational Safety and Oil Spill Prevention (page 88)

F. Relevant Portions of the Suisun Marsh Preservation Act

1. Section 29002 (page II-1)
2. Section 29003 (page II-1)
3. Section 29008 (page II-3)
4. Section 29114 (page II-8)
5. Section 29500 (page II-25)

G. Relevant Portions of the Suisun Marsh Protection Plan

1. Findings and Policies on the Environment (pages 11-13)
2. Findings and Policies on Water Supply and Quality (pages 14-18)
3. Findings and Policies on Utilities, Facilities, and Transportation (pages 22-27)

H. Relevant Portions of the Solano County Policies on Regulations Governing the Suisun Marsh (The Local Protection Program)

1. Policies on Water Quality (page 18)
2. Policies on Utilities, Facilities and Transportation (pages 22 - 29)

I. Relevant Portions of Federal Laws and Regulations

1. 16 USC Section 307(c)
2. 15 CFR 930.32(a)
3. 15 CFR 930.34(b)
4. 15 CFR 930.39(a)
5. 33 CFR 304(1)

Exhibits

- A. **Vicinity Map, Exhibit A**
- B. **Site and Project Plan(s), Exhibits B-G**
- C. **FEA/FEIR Summary, Exhibit H**