

San Francisco Bay Conservation and Development Commission

455 Golden Gate Avenue, Suite 10600, San Francisco, California 94102 tel 415 352 3600 fax 415 352 3606

May 11, 2018

TO: Commissioners and Alternates

FROM: Lawrence J. Goldzband, Executive Director (415/352-3653; larry.goldzband@bcdc.ca.gov)
Brenda Goeden, Sediment Program Manager (415/352-3623; brenda.goeden@bcdc.ca.gov)

SUBJECT: Staff Recommendation on Consistency Determination No. C2018.003.00; U.S. Army USACE of Engineers, San Francisco District; Operations and Maintenance Dredging Program 2018 and 2019
(For Commission consideration on May 17, 2018)

Recommendation Summary

The San Francisco Bay Conservation and Development Commission conditionally concurs with the U.S. Army Corps of Engineers, San Francisco District (USACE) consistency determination, dated March 21, 2018 and amended on April 27, 2018 and May 4, 2018, that the 2018 and 2019 Operations and Maintenance Dredging Program for six federal deep draft navigation channels and two federal shallow draft navigation channels (Exhibit A), and the disposal or placement of dredged sediment at a variety of sites including four in-Bay disposal sites, two beneficial reuse sites, an authorized upland site, the San Francisco deep ocean disposal site, and the Ocean Beach Demonstration Site as conditioned herein is consistent to the maximum extent practicable with the Commission's Amended Coastal Zone Management Program for San Francisco Bay.

The USACE's program is described as follows: in San Francisco Bay, during the calendar years 2018 and 2019, the program allows maintenance dredging up to a total of 5.35 million cubic yards (mcy) from six federal deep draft channels and two shallow draft channels, within the Commission's jurisdiction, including deep draft Oakland Harbor, Richmond Harbor, Pinole Shoal, Suisun Bay and Redwood City Harbor channels; shallow draft Petaluma River and Petaluma Across the Flats; and the Main Ship channel located outside the Commission's jurisdiction. The USACE also proposes disposing of the dredged 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 San Francisco deep ocean disposal site; as well as beneficial

reuse at Montezuma and/or Cullinan Ranch Wetland Restoration Projects; and disposing at Schollenberger Park upland site adjacent to the Petaluma River, both within and outside the Commission's jurisdiction. Dredging, disposal and beneficial reuse sites are located in Sonoma, Solano, Contra Costa, Marin, Alameda and San Francisco counties.

In 2018, the USACE proposes to dredge a maximum of 2.375 mcy of sediment within the Commission's jurisdiction, and a maximum 350,000 cy sediment from the San Francisco Main Ship Channel, outside the Commission's jurisdiction. The USACE has proposed to dispose of 1.075 mcy of sediment at in-Bay disposal sites (45%), 700,000 cy of sediment at SF-DODS (30%), and place 600,000 cy of sediment at beneficial reuse sites (25%).

In 2019, the USACE proposes to dredge a maximum of 2.375 mcy of sediment within the Commission's jurisdiction, and a maximum 350,000 cy sediment from the San Francisco Main Ship Channel, outside the Commission's jurisdiction. The USACE has proposed to dispose of 1.325 mcy of sediment at in-Bay disposal sites (45%), 1.65 mcy of sediment at SF-DODS (55%), and no beneficial reuse.

Due to consistent shoaling in the Bulls Head Reach of Suisun Channel, the USACE proposes to conduct advanced maintenance dredging if needed in 2018 and 2019 to reduce the need for additional dredging episodes. The project description for each channel in the authorization section below includes the proposed maximum volume to be dredged and disposed of to accommodate the variability of sedimentation from year to year. The USACE will provide more accurate estimates to the Commission prior to dredging each project through its episode approval request.

Staff Recommendation

I. Agreement

- A. The San Francisco Bay Conservation and Development Commission concurs with the determination of the US Army Corps of Engineers, San Francisco District (USACE) that, as further conditioned by the Commission herein, the USACE's 2018 and 2019 Operations and Maintenance Program is consistent to the maximum extent practicable with federal Coastal Zone Management Act, as Amended, and the San Francisco Bay Coastal Zone Management Program as follows:

In the Bay and the Suisun Marsh Primary Management Area:

1. In 2018 and 2019, dredge from Oakland Inner and Outer Harbors (project depth: -50 feet MLLW, plus two feet over-dredge depth) a maximum of 950,000 cy of sediment each year and dispose of the dredged sediment at either the federally authorized San Francisco deep ocean disposal site (SF-DODS) or beneficially reuse at an approved site;
2. In 2018 and 2019, dredge from Richmond Inner Harbor (project depth: -38 feet MLLW, plus two feet over-dredge depth) a maximum of 350,000 cy of sediment each year, for a total of 700,000 cy of sediment and dispose of the dredged sediment at the federally authorized SF-DODS or beneficially reuse at an approved site;
3. In 2018 only, dredge from Richmond Outer Harbor (project depth: -45 feet MLLW, plus two feet over-dredge depth) a maximum of 500,000 cy of sediment and dispose of the dredged sediment in the Bay at the state and federally authorized Alcatraz Island (SF-11) and/or San Pablo Bay (SF-10) disposal sites;
4. In 2018 and 2019, dredge from Suisun Bay Channel (project depth: -35 feet MLLW, plus two feet over-dredge depth) a maximum of 225,000 cy of each year, for a total of 550,000 cy of sediment and dispose of the sediment in the Bay at the state and federally authorized Suisun Bay (SF-16) and/or Carquinez Strait (SF-9) disposal site or beneficially reuse at an approved site;
5. In 2018 and 2019 as needed, conducted up to 50,000 cy of advanced maintenance dredging to a depth of -37 MLLW plus two feet of over dredge depth allowance at the Bulls Head Reach area within Suisun federal navigation channel boundaries (between station 62+00 and 88+00) and dispose of the sediment in the Bay at the state and federally authorized Suisun Bay (SF-16) and/or Carquinez Strait (SF-9) disposal site or beneficially reuse at an approved site;
6. In 2019 only, dredge from Pinole Shoal (project depth: -35 feet MLLW, plus two feet over-dredge depth) a maximum of 500,000 cy of sediment and dispose of the sediment at the state and federally authorized Carquinez Strait (SF-9) and/or San Pablo Bay (SF-10) disposal site;
7. In 2018 and 2019, dredge from Redwood City Harbor (project depth: -30 feet MLLW, plus two feet over-dredge depth) a maximum of 300,000 cy of sediment each year, for a total of 600,000 cy of sediment and dispose of the dredged sediment in the Bay at the state and federally authorized Alcatraz Island (SF-11) disposal site or the federally authorized SF-DODS;
8. In 2019 only, dredge from the Petaluma River (project depth: -8 feet MLLW, plus two feet over-dredge depth) a maximum of 350,000 cy of sediment and dispose of the dredged sediment at Schollenberger Park disposal site located in the City of Petaluma, Sonoma County;

9. In 2019 only, dredge from the Petaluma River Across the Flats Channel (project depth: -8 feet MLLW, plus two feet over-dredge depth) a maximum of 250,000 cy of sediment and dispose of the dredged sediment in the Bay at the state and federally authorized San Pablo Bay (SF-10) disposal site; and
10. In 2018 and 2019, dredge from the San Francisco Main Ship Channel (project depth: -55 feet MLLW, plus two feet over-dredge depth) a maximum of 350,000 cy of sediment each year, for a total of 700,000 cy of sediment and dispose of the sediment at the federally authorized 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).

The USACE would dredge each of the proposed projects annually with the exception of Richmond Outer Harbor, Pinole Shoal, Petaluma River and Petaluma Across the Flats. In 2017, the USACE adopted what it has referred to as "Course of Action # 2," under which it determined that, in order to comply with the Commission's reduced hydraulic dredging condition in its conditional concurrence for the USACE's 2015-2017 dredging program, the USACE would only dredge Richmond Outer Harbor or Pinole Shoal Channel with a hydraulic dredge in alternating years, while deferring dredging at the other of these two channels in alternating years, rather than continuing to dredge each channel annually as it had done in the past and had previously planned to do in the future. However, the Commission's reduced hydraulic dredging condition (see Special Condition II - 1.2.a below) envisioned that the USACE would comply with that condition by dredging both Richmond Outer Harbor and Pinole Shoal Channel every year, one with a hydraulic dredge and the other using a mechanical dredge.

Petaluma River and Across the Flats are dredged periodically, 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 proposed program, the USACE may limit the volume of sediment dredged or depth to which any channel is dredged, to accomplish its dredging priorities for that year.

- B. This agreement is given based on the information submitted by or on behalf of the USACE in its letter dated March 21, 2018 and addendums submitted on April 26, 2018, and May 4, 2018, including all accompanying and subsequent correspondence and exhibits. As described this agreement expires on December 31, 2019.

II. Special Conditions

If the USACE does not agree to comply with the following conditions or fails to incorporate them into the projects, the USACE shall notify the Commission immediately of its refusal to agree or to incorporate the conditions into the project and this conditional concurrence shall be treated as an objection. The USACE shall also immediately notify the Commission if the USACE determines to go forward with the project despite the Commission's objection.

- A. **Limits on Dredging.** This consistency determination authorizes maintenance dredging only within areas as shown on Exhibits B through H to the project depths for each channel as listed in the authorization section above plus two feet allowable over-dredge depth and a total volume of 5.35 mcy: 2.375 mcy in 2018, and 2.975 mcy in 2019. No dredging in other areas or additional volume is authorized.

- B. **Limits on Disposal.** The USACE shall reduce its annual in-Bay disposal volume to a maximum of twenty percent of the sediment proposed for dredging each year. Further, to ensure consistency with the Bay Plan's enforceable policies on dredging, including but not limited to the policy to maximize the use of dredged material as a resource, as discussed further below in Section III - A (Findings and Declarations, Consistency of Dredging Activities with Bay Plan's Dredging Policies and the Long-Term Management Strategy (LTMS) Management Plan, the USACE shall take a minimum of forty percent of its program's dredged sediment to beneficial reuse sites annually, and to the extent feasible, shall take additional dredged sediment to designated beneficial reuse sites through further reduction proposed for ocean and in-Bay disposal.

In-Bay disposal of dredged sediments shall not exceed the monthly or annual disposal site targets set forth in the Commission's regulations and the LTMS Management Plan. The USACE shall limit its annual in-Bay disposal volumes to 20% of the total volume proposed, and in accordance with direction from the Inter-Agency Dredged Material Management Office (DMMO) to ensure there is adequate total in-Bay disposal volume to accommodate other dredgers, particularly the small dredging community. In the event that annual or monthly in-Bay disposal site limits are reached, the USACE shall redirect disposal at the direction of the DMMO, to a site that has not approached its limits. If, in any instance, the USACE determines that the LTMS disposal targets (either individual in-Bay sites or total) would be exceeded, at the next Commission meeting a USACE representative shall present to the Commission the purpose and need of exceeding those limits.

- C. **Annual Schedule.** No later than November 30th of each year, the USACE shall provide the DMMO agencies a schedule of the projects confirmed for execution in the following calendar year. An updated schedule shall be provided to the Commission staff quarterly if changes are made to the schedule affecting execution of the project. If a project receives funding after November 30th of any year, the USACE shall provide a project description and schedule to the DMMO agencies within two weeks of receiving funding.
- D. **Water Quality Approval.** By April 30, 2019, and prior to the commencement of any 2019 dredging episode authorized herein, the USACE shall submit to the Executive Director a water quality certification, waste discharge requirements, or any other required approvals from the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board). Failure to obtain and comply with such certification prior to the commencement of any 2019 dredging episode shall terminate the Commission's concurrence for that episode. The Executive Director may, upon review of the Water Board's approval, either: (1) approve the dredging episode consistent with the Water Board's authorization; or (2) amend this authorization, as necessary, to ensure consistency to the maximum extent practicable with water quality-related policies of the Commission's federally-approved Amended Coastal Zone Management Program. If the Executive Director amends this authorization pursuant to this Special Condition II - D, unless the USACE agrees to the amended authorization in the manner specified by the Executive Director, this consistency determination shall become null and void for that episode.

- E. **Sediment Quality.** Sediment to be dredged and disposed/beneficially reused shall be tested to ensure that the sediment is physically, chemically and biologically suitable for the proposed placement site. The sediment testing program shall be in accordance with the Inland Testing Manual or the Ocean Testing Manual, as modified for the San Francisco Bay Region. The Sampling Analysis Plans shall be consistent with the protocols, advice and decisions of the DMMO, and should be submitted a minimum of one week before the DMMO meeting occurs. Once testing has occurred, the Sampling Analysis Results shall be submitted in report form to the Commission staff and the DMMO for review and decision on the suitability of the sediment for the proposed placement site. The USACE shall abide by the decisions of the DMMO.
- F. **Overflow/Decanting During Mechanical Dredging.** No water entrained during dredging (i.e., overflow or decant water) shall be discharged from any vessel containing dredged material containing greater than 20 percent fines (silt- and clay-size particles), with the exception of spillage incidental to clamshell bucket operations. Decanting is allowed when the fine-grain content of the dredged sediment is greater than 80 percent sand.

Exceptions may be granted on a project-specific basis if the USACE submits an overflow or decanting monitoring plan, acceptable to the Water Board and Commission, at least 90 days prior to the anticipated dredging start date. The plan shall describe the process for monitoring compliance with the following receiving water limits within 500 feet of the dredge footprint (a shorter distance may apply in Richmond and Oakland Inner Harbors depending on the distance to the nearest eelgrass bed or patch) including:

1. Turbidity ≤ 50 Nephelometric Turbidity Units (NTU) (or up to 10 percent greater than turbidity at a background reference location sampled concurrently with the dredging location, if the background turbidity is greater than 50 NTU);
2. Dissolved oxygen ≥ 5.0 mg/L (≥ 7.0 mg/L east of the Carquinez Bridge); and
3. $6.5 \leq \text{pH} \leq 8.5$.

In addition, the monitoring plan shall: (1) describe how the temporal and spatial extent of the suspended sediment plume associated with overflow/decant discharge will be characterized and compared to non-overflow conditions; (2) describe reporting format and frequency; and (3) include a contingency plan in the event of an observed exceedance of one or more water quality objectives caused by overflow/decant discharges. The USACE shall provide the project-specific overflow monitoring plan a minimum of 90 days prior to anticipated dredging start date. Overflow and/or decanting may not commence until the plan is approved in writing by Water Board and BCDC staff.

In the event the USACE wants to standardize the practice of overflow/decant water discharge and reduce or eliminate water quality monitoring for this activity, it should submit a summary of its findings from monitoring in years 2015 through 2017, analyze these findings and suggest either a modified monitoring program or rationale to terminate monitoring. This report and a request to reduce or eliminated monitoring shall be submitted to Commission and Water Board staff concurrently and not less than 60 days prior to overflow/decant water discharge on any relevant project for review and approval. If the Water Board and Commission staff do not approve a reduction or elimination of required monitoring, the monitoring shall continue as required above.

G. **Overflow During Hopper Dredging.** Return water overflow from hopper-type hydraulic dredges shall be limited to no longer than 15 minutes at the dredge site for each hopper load except in channels where the shoaled material contains greater than 80 percent sand. There is no overflow restriction if the dredged material is greater than 80 percent sand.

H. **Dredging and Disposal Activity**

1. **Pre-Dredging, Disposal Report and Notice.** At least 30 days before the commencement of any dredging, disposal and/or placement episode authorized herein, the USACE shall submit to the Commission's Executive Director for review and approval:
 - a. A bathymetric map showing the location of all areas authorized to be dredged, the proposed depth including over-dredge depth based on MLLW, the volume of sediment proposed to be dredged, and the approximate date of project commencement. At least two (2) weeks prior to any dredging episode, the USACE shall notify the Commission staff of the commencement date by telephone, email or in writing. If the date of commencement changes, an updated schedule shall be provided as soon as it is available.
 - b. A written statement to the Executive Director that contains: (1) the proposed disposal or placement site and quantity of sediment to be disposed or placed, and dates within which the disposal/placement episode is proposed; (2) if applicable, a discussion as to how the volume proposed for disposal is consistent with in-Bay disposal allocations and disposal site limits; (3) the results of chemical and biological testing of sediment proposed for disposal; and (4) an annually updated alternatives analysis or integrated alternatives analysis to explain why beneficial reuse of dredged material, upland placement or ocean disposal at SF-DODS is infeasible.
 - c. If advanced maintenance dredging is necessary, the USACE shall provide: (1) the advanced maintenance footprint; (2) any test results characterizing the sediment; (3) proposed depth; (4) volume; (5) disposal or beneficial reuse location; (6) schedule for the project; and (7) rationale for the purpose of and need for the advance maintenance to the Commission staff for review and approval.
2. **Authorization of In-Bay Disposal.** The authorization for the proposed in-Bay disposal shall become effective only if the Executive Director: (1) informs the USACE in an episode approval letter or email that the episode is consistent with the authorization provided herein, beneficial reuse or alternative disposal options are infeasible, the volume proposed for disposal is consistent with the disposal site limits, and the sediment is suitable for in-Bay disposal, beneficial reuse or ocean disposal; or (2) does not respond to the USACE's episode approval request within 30 days of its receipt. If the Executive Director determines that: (a) ocean disposal, upland disposal, or beneficial reuse of the material is feasible; (b) the sediment proposed for disposal is

unsuitable for the Bay; or (c) the proposed disposal is inconsistent with in-Bay disposal site limits, the Commission's concurrence for in-Bay disposal for that episode shall be terminated. The USACE shall adhere to any special conditions contained in the episode approval letter, beyond those contained in this consistency determination concurrence.

3. **Post-Dredging Requirements.** Within 60 days of completion of each dredging episode or advanced maintenance event, authorized by this agreement, the USACE shall submit to the Commission a bathymetric map showing the actual area(s) and depths dredged including over-dredge depth based on MLLW, any dredging that occurred outside the area or below the depths authorized herein, and a written statement indicating the total volume of sediment dredged and disposed, the disposal locations and the volume of sediment placed at each site.
- I. **Biological Resource Protection.** Dredging, and dredged sediment disposal have impacts to the biological resources of the Bay. Therefore, the USACE shall undertake the following avoidance, minimization and mitigation measures:
 1. **Seasonal Limitations.** To reduce impacts to Bay species whose population are in decline, and specifically those that federal and state governments have listed as candidate, threatened or endangered, as well as those that use the Bay as spawning grounds, the USACE shall confine dredging and disposal operations to the amended work windows consistent with Tables F-1 and F-2 of Appendix F, "In-Bay Disposal and Dredging" and Figures 3.2 and 3.3 of the Long-Term Management Strategy Management Plan (2001) as amended by the U.S. Fish and Wildlife Service (USFWS) on May 28, 2004 and NOAA's National Marine Fisheries Service (NMFS) LTMS Amended Programmatic Biological Opinion dated July 2015. No work inconsistent with the time and location limits contained in these tables may be conducted without the written approval of the Executive Director. Such approval may only be issued after the Executive Director has sought the advice of the appropriate resource agencies and determined that dredging and disposal outside of the work window would be consistent with the Commission's Coastal Zone Management Program.

In the event that the USACE dredges outside of the salmon work window anywhere within San Francisco Bay, the USACE shall place the sediment dredged during that time at a designated beneficial reuse site that will benefit fish habitat, consistent with the NMFS 2015 Amended LTMS Programmatic Biological Opinion. If it is infeasible to do so during that dredging episode, the USACE shall place an equivalent volume of dredged sediment the following dredge season.
 2. **Longfin and Delta Smelt.** Both the longfin smelt and Delta smelt populations are in extreme decline, as noted by the listing of both species. Longfin smelt is listed as threatened by the California Department of Fish and Wildlife (CDFW) and is a candidate species for listing by the USFWS. Delta smelt is listed as endangered by CDFW and threatened by USFWS.

- a. **Reduced Use of Hydraulic Dredge.** To ensure consistency with the Bay Plan's enforceable policies on Fish, Aquatic Organisms and Wildlife, including but not limited to the policies to protect native fish species, as discussed further below in Section III.B. (Findings and Declarations, Natural Resources, the USACE shall reduce impacts from entrainment to these and other fish species by reducing the use of a hydraulic hopper dredge for use in a maximum of one federal in-Bay channel annually (either Richmond Outer Harbor or Pinole Shoal). Other channels shall be dredged using mechanical equipment.
- b. **Hydraulic Dredge Minimization Measures.** To reduce entrainment of longfin and Delta smelt, the USACE shall implement the following minimization measures when using a hydraulic dredge:
 - (1) No dredging would occur in water ranging from 0 to 5 parts per thousand salinity between December 1st and June 30th of any year;
 - (2) The USACE shall designate a qualified biologist to provide a worker education and training program regarding special status 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 for all special status species. The training program shall be conducted prior to the use of a hydraulic dredge in San Francisco Bay;
 - (3) At the beginning and end of each hopper load, pump priming, drag head clearing, and suction of water would be conducted within three feet of the seafloor;
 - (4) Hydraulic drag head suction pumps would be turned off when raising and lowering the drag arms from the seafloor;
 - (5) Maintaining contact of drag head, cutterheads, and pipeline intakes with the seafloor during suction dredging;
 - (6) Keeping the drag head water intake doors closed to the maximum extent feasible in locations most vulnerable to entraining longfin and Delta smelt. In circumstances when the doors need to be opened to alleviate clogging, the doors would be opened incrementally;
 - (7) In the event Suisun Channel is dredged using hydraulic equipment, dredge between August 1st and September 30th of any year, to avoid impacts to spawning adult longfin and Delta smelt;
 - (8) Conduct hydraulic dredging in San Pablo Bay (Pinole Shoal) and Central Bay (i.e., Richmond Outer Harbor) between August 1st and November 30th, to the extent feasible, to avoid impacts to young-of-the-year and spawning adult longfin smelt; and

- (9) The USACE shall immediately notify the Commission staff in writing if it determines that it is not in compliance with any of these measures, including but not limited to any actual or anticipated failure to implement minimization measures.
- c. **Entrainment Monitoring for Hydraulic Dredges.** To increase the accuracy of the existing estimated entrainment rates for longfin and Delta smelt, the USACE shall:
- (1) Conduct entrainment monitoring as describe in the 2017 Monitoring Plan, acceptable to the Executive Director, to collect entrainment data for Delta smelt, longfin smelt, and other fish species that occurs during hydraulic hopper dredging activities in San Francisco Bay. If an alternate plan is proposed, such plan shall, at a minimum, include the following elements:
 - (a) On-board monitoring during active dredging;
 - (b) Sampling during all phases of the dredging cycle;
 - (c) Sampling both drag-arms to capture a greater percentage of the pump volume during active dredging;
 - (d) Sampling associated with flood/ebb tides and spring/neap tides;
 - (e) Visual monitoring of vessel hull for fish that are not captured by sampling screens during active dredging; and
 - (f) Presence/absence fish monitoring in the immediate vicinity of the dredge during active dredging to understand if sampling is effective.

The plan shall also describe procedures for evaluating the effectiveness of the minimization measures described in Special Condition II – I.2.b and include a schedule for completing the monitoring and submitting a final report to the Water Board and Commission.

- (2) When hydraulic dredging occurs in the Petaluma River Channel between October 1st and June 30th, monitor water temperatures in the morning prior to the start of work at 3 feet above the river bottom and at the river bottom in the dredging footprint, at 541 meters (1,775 feet) upstream and 541 meters downstream from the dredging activity that day. The temperature readings shall be logged and provided to Commission staff via email each Friday by 5 pm PST of any week that work is occurring to assist in assessing mitigation credit requirements.
- (3) Implement the entrainment monitoring plan when using a hydraulic hopper dredge in San Francisco Bay, and provide a report within 6 months of completion of each monitoring event.

d. **Compensatory Mitigation Measures**

- (1) **Use of Hydraulic Dredges.** Compensatory mitigation is necessary to offset the impacts of hydraulic dredging in 2018 and 2019. If the USACE uses a hydraulic dredge in Pinole Shoal, Richmond Outer Harbor, the USACE shall purchase at a minimum 0.92 acres mitigation credit at Liberty Island Conservation Bank based on a conservative estimate to mitigate for potential impacts to longfin and Delta smelt. If the volume of sediment actually dredged is beyond the estimated amount used for the migration credit calculations, the USACE shall revise the calculations and purchase the appropriate amount of credit for the volume of sediment actually dredged.

If in 2018 or 2019, another CDFW- and USFWS-approved conservation bank opens, which provides habitat benefitting listed smelt species, the USACE may purchase credits at that bank if it is located closer to the dredge site than Liberty Island. If Pinole Shoal is dredged with a hydraulic dredge the USACE shall purchase no less than 0.19-acres of mitigation credit per year and if Richmond Outer Harbor is dredged with a hydraulic dredge, the USACE shall purchase no less than 0.34 acres of mitigation credit per year.

In finalizing the annual compensatory mitigation purchases, the USACE shall coordinate with the Commission staff, the Water Board, USFWS and CDFW, to reach agreement on the additional compensatory mitigation required for purchase, and provide documentation that the purchase has occurred to the Commission staff by March 30th of the year following the dredging activity.

- (2) If Petaluma River Channel is hydraulically dredged when conditions are conducive to the presence of longfin smelt (water temperature less than 22 degrees Celsius), the USACE shall use the temperature measurements from Special Condition II – 1.2.c(2) to determine the number of days that dredging occurred when conditions were appropriate for longfin smelt. Using the volume of water pumped during dredging, calculate and purchase mitigation credit commensurate with the volume of sediment dredged while those conditions were present as with the hydraulic hopper dredge.

If a mitigation option that would be of greater benefit to smelt becomes available, the USACE shall work with the Commission staff in consultation with the CDFW and USFWS to determine the type and amount of mitigation appropriate to compensate for the potential impacts to smelt from hydraulic dredging in the Petaluma River Channel, subject to agreement by the Executive Director.

3. **Herring.** Pacific herring is an important forage and commercial fishery fish that spawns on hard surfaces, aquatic plants, and seaweed in San Francisco Bay. To protect this species' spawning habitat, the USACE shall implement the following measures when dredging between November 30th and March 15st of any year.

By November 15th of each year, the USACE shall notify the Commission staff, the Water Board and CDFW if dredging is proposed between November 30th and March 15st of any year within a herring spawning area in San Francisco Bay. If dredging is to occur in potential spawning habitat between November 30th and March 15th of any year, the USACE shall implement the following measures:

- a. A qualified and trained herring observer shall be present during all dredging or in-water work (day and night), and observing shall be his/her sole duty. Training includes, at a minimum, annual attendance at a CDFW administered herring training. The USACE shall provide a copy of observers' qualifications to the Commission, the Water Board and the CDFW not later than November 20th in years that dredging would occur after the herring closure;
 - b. The observer shall monitor for herring spawn from an area that allows a full range of view of the 500-meter buffer zone. Observations may be conducted from the dredge, shore, or by a separate vessel;
 - c. The observer shall conduct a shoreline survey within the 500-meter buffer zone at least one hour prior to the start of dredging when there is a lag time of eight hours or more between dredging activities and/or following dredging at night;
 - d. All in-water work shall stop immediately and Commission staff and CDFW shall be notified if spawning Pacific herring are detected within 500 meters of the dredging site. If spawning occurs within the 500-meter buffer, work may not continue until spawning has ended and herring embryos have hatched (14-21 days). Dredging can restart with approval from CDFW and notification to the Commission staff;
 - e. The observer shall keep a daily log of observations, which shall be submitted to Commission staff and the CDFW on a weekly basis by 5:00 pm on Friday; and
 - f. To further protect herring during their spawning season, if dredging occurs between December 1st and March 15th of any year, the Oakland Harbor and Richmond Inner Harbor channels shall be dredged beginning in the outer reaches to the inner reaches.
4. **Eelgrass.** Eelgrass is a known productive aquatic plant that provides significant habitat value for certain Bay species. When a dredging footprint is within 45 meters of an eelgrass bed, the USACE shall conduct pre-dredge and post-dredge eelgrass surveys to determine whether the project is impacting eelgrass beds. The USACE shall provide a copy of the pre-dredge eelgrass survey 30 days prior to project commencement of dredging. Once dredging is complete, the USACE shall provide a post-dredge eelgrass survey within 45 days of project completion and provide them to the Commission staff, the Water Board, NMFS, and CDFW for review and consideration. If a dredging project is completed during the eelgrass dormancy period, perform the post-dredge eelgrass survey in the spring, and provide the post-dredge eelgrass survey within 45 days of completion, in compliance with the LTMS Programmatic Essential Fish Habitat Consultation (2011).

5. **Fish Habitat.** In order to reduce impacts to habitat from the dredging and disposal projects, the USACE shall comply with the Conservation Measures set forth in the June 9, 2011, Programmatic Essential Fish Habitat (EFH) Consultation Agreement between USACE, the EPA, and NOAA Fisheries. The Conservation Measures are intended to enhance the environmental protectiveness of the LTMS program for EFH, which the Magnuson-Stevens Fishery Conservation and Management Act defines as “waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity,” for all managed fish species.
6. **Hazardous Materials and Fuels.** The USACE shall immediately stop/repair and clean up any fuel or hazardous waste leaks or spills from dredging or disposal activities at the time of occurrence. The USACE shall properly contain hazardous products and dispose of any unused or leftover hazardous products off-site.

This consistency determination agreement does not allow for the take, including incidental take, of any special status species. The USACE is required, as prescribed in the State and Federal Endangered Species Acts, to consult with or obtain appropriate take authorization from the appropriate agencies prior to undertaking dredging activities in San Francisco Bay which may affect any federally or state listed species and is not in compliance with the LTMS Programmatic Biological Opinions, or individual biological opinions currently in effect. If the USACE initiates consultation with one or more resource agencies, once consultation is complete the USACE shall provide a copy of the biological opinion to the Commission staff for consideration and potential amendment as required by the Commission. The USACE shall use the appropriate protocols, as approved by the CDFW, NMFS, and/or USFWS, to ensure that project activities do not adversely affect rare, candidate, threatened and endangered species, as a public benefit of San Francisco Bay and its tributaries.

- J. **Management and Monitoring of In-Bay Disposal of Dredged Material.** The USACE shall maintain administrative controls on disposal volumes at the in-Bay disposal sites so the LTMS target volumes are not exceeded. The USACE shall manage overall disposal volumes and disposal locations within each site to prevent build-up of dredged materials at each of the sites.
 1. The USACE shall continue bathymetric monitoring of the in-Bay disposal sites, monthly at SF-11, quarterly at SF-9, SF-10, and SF-16. The USACE shall provide these condition surveys within 60 days of their completion to the Commission staff; and
 2. No later than July 1st of each year, the USACE shall provide to the Commission an annual report acceptable to the Executive Director, analyzing the status of the mounding at the Alcatraz disposal site. This report shall include:
 - a. A description of results of the previous year’s bathymetric surveys and a description of the trends in mound shape and size;
 - b. An estimate of the annual net change in volume of the mound overall, and at depths above –60, –50, –40, and –30 feet MLLW;
 - c. An estimate of the annual volume of dredged material disposal at the site;

- d. An analysis of the relationship between disposal volumes, site management practices, and net change in mound volume;
 - e. Assessment of whether management practices are achieving satisfactory results; and
 - f. Recommendations for future site management practices, as informed by the analysis and assessment of items d and e, above.
- K. **Observation of Dredging and Disposal Operations.** The USACE shall allow the Commission staff and representatives of other state or federal agencies to come aboard the dredge or barge associated with any dredging, knockdown or disposal episode and observe the operation(s) to ensure that these activities are consistent with pre-dredging reports required herein and other terms and conditions of this permit. Further, the Commission reserves the right to have post-dredging reports inspected by a reliable third party familiar with bathymetric mapping in order to verify the contents of these reports.
- L. **Long-Term Management Strategy Program.** If, at any time during the effective life of this agreement, the Commission's laws, Bay Plan policies, or regulations are changed and are in effect regarding dredging, dredged material disposal, and beneficial reuse consistent with the multi-agency Long-Term Management Strategy Program (LTMS), this agreement shall become null and void unless the USACE agrees to amend its consistency to include new conditions to meet the new laws, policies, or regulations in a manner specified by or on behalf of the Commission, if appropriate.

III. Findings and Declarations

This authorization is given on the basis of the Commission's findings and declarations that the work authorized as conditioned herein, is consistent to the maximum extent practicable with the Commission's federally-approved Amended Coastal Zone Management Program for San Francisco Bay, including the McAteer-Petris Act, the Suisun Marsh Preservation Act, and the *San Francisco Bay Plan*, for the following reasons:

- A. **Consistency of the Dredging Activities with the San Francisco Bay Coastal Zone Management Program.** 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.

The USACE maintains six federal deep water navigation channels, and seven shallow draft channels in San Francisco Bay and one deep water channel at the entrance to the Bay to support safe waterborne commerce, transportation, military and recreation. Consistency Determination No. C2018.003.00 is for maintenance of eight channels within the Commission's jurisdiction: the Oakland Harbor, Richmond Inner Harbor, Richmond Outer Harbor, Pinole Shoal, Suisun Bay, Redwood City Harbor, Petaluma River, and

Petaluma Across the Flats channels, and one channel outside the Commission's jurisdiction, the Main Ship channel, during calendar years 2018 and 2019. The maximum volume that would be dredged from the in-Bay channels over two years is 5.35 million cy. The dredged sediment will be disposed of at one of four in-Bay disposal sites, at the Deep Ocean Disposal Site, SF-8 a nearshore disposal site, or beneficially reused at an approved beneficial site, or placed at an approved upland site.

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 in 2002 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 policies 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 [Wildlife], 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 [Wildlife], 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.

- a. **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 are located adjacent to deep water channels. In-Bay disposal historically has been the primary option for most dredgers. The four in-Bay disposal sites include: Alcatraz Island (SF-11); San Pablo Bay (SF-10); Carquinez Strait (SF-9); and Suisun Bay, reserved for USACE dredging of the Suisun Channel. Because these sites require simply transporting the sediment to the site and bottom dumping from the scow, they can be used by all dredging projects with “clean” dredged sediment.

The ocean disposal site is a depositional site. Ocean disposal is similar to in-Bay disposal in that sediment is transported in a scow and bottom dumped once over the disposal site. The San Francisco Deep Ocean Disposal site (SFDODS) is approximately 55 miles out to sea, with a 24 hours transport period, which requires larger, ocean going vessels, and must transit through the marine sanctuary. This site is subject to weather delays, associated with windy or stormy conditions that create rough seas. For these reasons ocean disposal is more expensive than in-Bay disposal, and for safety reasons, small dredging equipment cannot transit to the ocean disposal site.

With the observed decrease in suspended sediment supply from the Delta, increased restoration of subsided baylands, and increasing sea level, concerns have been raised regarding ocean disposal. The community recognizes that this practice, when involving clean sediment, is wasting a valuable resource that is in short supply. The Commission does not have authority over use of the ocean site, so it cannot deny its use for disposal of clean sediment. 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.

Wetland restoration is the most common beneficial reuse of sediment in the Bay Area. This may be the most beneficial use of the sediment because it provides habitat sooner, supports endangered and other species, and provides some wave attenuation and flood water absorption. Projects with eighty percent sand or greater placed at San Francisco Bar disposal site (SF-8) feed the littoral cell and potentially local beaches. Dredged sediment can also be reused as levee material, daily landfill cover and general construction fill where appropriate. Beneficial reuse sites are often at a greater distance from the dredging project than in-Bay disposal, require additional transit time, and require offloading equipment. However, in comparison to ocean disposal, beneficial reuse sites located within the Bay rarely engender weather delays and are closer to the dredging sites in most cases.

Montezuma and Cullinan Ranch Wetland Restoration sites are currently open and operating. Montezuma has a dedicated offloader and Cullinan Ranch requires the contractor to provide the offloading equipment. Difficulties in directing the sediment to restoration sites include the “federal standard,” lack of funds to support the incremental cost above aquatic disposal, and in the case of Cullinan Ranch, the need for offloading equipment. However, in 2016 and 2017, the USACE contracted with Curtin Marine to dredge the Richmond Inner Harbor. Curtin Marine brought an offloader to Cullinan and offloaded over 470,000 cy at this site. However, because the offloader is provided by the contractor, not the placement site, it is only available for use at Cullinan when Curtin Marine is contracted to dredge a project. There is potential for other dredging contractors to “rent” offloading equipment from Montezuma or Curtin Marine.

- b. **Proposed Project.** As described in the authorization section, in order to maintain safe navigation in the Bay, the USACE proposes to dredge and dispose or place 5.35 mcy of sediment from six deep water federal channels and two shallow water federal channels over two years. During this period, the majority of the dredged sediment is proposed for in-Bay or ocean disposal with a limited volume (11% over two years) proposed for beneficial reuse at an approved wetland restoration project.

Table 1. 2018 Proposed Dredging and Disposal/Placement

Channel	Maximum Volume (cy)	Disposal/Placement Site
Oakland Harbor	950,000	350,000 to Ocean/ 600,000 to Beneficial Reuse
Richmond Inner Harbor	350,000	Ocean
Richmond Outer Harbor	500,000	In Bay (SF-11 or SF-10)
Suisun Bay	275,000	In Bay (SF-16/ SF-9)
Redwood City Harbor	300,000	In Bay/Ocean (SF-11)
Total	2,375,000	

2018 Program	In-Bay	Beneficial Reuse	Ocean
Proposed Volume	1,075,000 cy	600,000 cy	700,000 cy
LTMS Goals	20% (minimize)	40% (maximize)	40% (stop-gap)
Proposed Program	45%	25%	30%

Table 2. 2019 Proposed Dredging and Disposal/Placement

Channel	Maximum Volume (cy)	Federal Standard Plan
Oakland Harbor	950,000	Ocean
Richmond Inner Harbor	350,000	Ocean
Pinole Shoal	500,000	In Bay (SF-11/SF-10)
Suisun Bay	275,000	In Bay (SF-16/SF-9)
Redwood City Harbor	300,000	In Bay/Ocean (SF-11)
Petaluma River	350,000	Upland (Schollenberger Park)
Petaluma Across the Flats	250,000	In Bay (SF-10)
Total	2,975,000	

2019 Program	In-Bay	Beneficial Reuse	Ocean/Upland
Proposed Volume	1,325,000 cy	0 cy	1,650,000 cy
LTMS Goals	20% (minimize)	40% (maximize)	40% (stop-gap)
Proposed Program	45%	0%	55%

The LTMS program and the Bay Plan policies direct the dredging project sponsors to minimize in-Bay disposal and maximize beneficial reuse of dredged sediment unless it is infeasible to do so. In the request for concurrence, the USACE describes the evaluation factors it uses for dredging projects involving the discharge of dredged material as follows:

“Navigation and [f]ederal standard. 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. The 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 environmental assessment or environmental impact statement, in conjunction with the section 404(b)(1) guidelines and public notice coordination process, can be used as a guide in formulating environmentally acceptable alternatives. 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 [f]ederal standard for the proposed project.” (33 C.F.R. § 336.1(c))

This position is in direct conflict with the CZMA, which requires the USACE’s projects to be consistent to the maximum extent practicable with the Commission’s Coastal Management Plan for San Francisco Bay. 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.”¹ The CZMA regulations further provide that federal agencies shall not use a lack of funding as a basis for not 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.²

In 2015, the Commission included in its Letter of Agreement, that the USACE request additional funding sufficient to meet the Bay Plan policies to maximize the use of dredged sediment by beneficially reusing at least forty percent of the USACE’s dredging program. Subsequently, Commission staff was informed that

¹ 15 CFR 930.32(a)(1)

² 15 CFR 930.32(a)(3)

the San Francisco District would not request additional funding and would only beneficially reuse dredged sediment consistent with the “federal standard.” It appears from the statement above that the USACE maintains this position for the currently proposed program.

In addition to the conflict with the CZMA provisions, the USACE’s proposed two-year dredging program does not comport with Dredging Policy 1 and the LTMS goals of reducing in-Bay disposal to twenty percent and maximizing beneficial reuse. Regarding this policy issue, the USACE stated “The proposed action would remove shoaled sediment from federal navigation channels and place sediment at the respective project’s federal standard placement site, or other approved site. Disposal would be in compliance with federal policy and law, including the federal standard.” It further states that “The 2015 water quality certification allows for USACE to place a total of 3.5 million cubic yards at in-bay sites [over five years]. The USACE continues to comply with this requirement.” The USACE points out that to date, the San Francisco Bay dredging community as a whole has not exceeded annual in-bay placement limits, and the USACE does not expect an exceedance to occur over the course of this CD.

The Bay Plan in-Bay disposal target is 1 mcy per year, and as averaged over consecutive three-year periods to allow for inter-annual variability in shoaling and dredging activities.

Table 3. In-Bay disposal site limits from Commission Regulations.

Designated Disposal Site	Monthly Target Volume	Annual Target Volume
Alcatraz Island (SF-11) October – April May – September	400,000 cy 300,000 cy	4 mcy
Carquinez Strait (SF-9) (any month)	1 mcy	2 mcy/3 mcy (wet year)
San Pablo Bay (SF-10)		500,000 cy
Suisun Bay (SF-16) USACE Only		200,000 cy
Three Year Average Total (In-Bay)		1.25* mcy

*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 USACE has proposed to dispose up to 1.075 mcy in 2018 and 1.325 mcy in 2019. If this were to occur, the ports, refineries and recreational marinas would share the remaining 175,000 cy in 2018 and have no in-Bay disposal volume available in 2019, without using the contingency volume. In the LTMS Program, 250,000 cy of the in-Bay disposal volume is dedicated to small dredgers who are exempt from requirements to dispose of sediment outside the Bay, or to beneficially reuse it due to feasibility and safety issues. 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 reuse or ocean disposal each year. This collective action reduces the in-Bay disposal needs. The USACE's proposal challenges the ability of the region to meet the LTMS goals. The LTMS agencies included the 250,000 cy contingency volume in the LTMS Plan for high dredging years. If the in-Bay disposal targets are exceeded, the LTMS agencies may need to use the contingency volume for the first time since the implementation of the program.

Regarding this issue, the USACE states:

“If a particular year went beyond this target limit, USACE would be willing to work with the other LTMS members on an exemption to the target for a respective year. If an exemption is not possible, the USACE would be willing to consider individual allocations on a project-by-project basis. These decisions should be postponed until there is a real impact identified, based on actual dredging volumes for a particular year.”

In 2015 through 2017, the USACE had also proposed high volumes of dredging and disposal, but less was dredged in 2015 and 2016. However, in 2017 due to significant winter rains, more was dredged than expected, approximately 3.4 mcy overall, with 1.22 mcy disposed of at in-Bay disposal sites. The USACE disposed of 882,000 cy at in-Bay disposal sites in 2017, and non-USACE projects disposed of approximately 338,000 cy.

It is possible that the USACE would dredge and dispose of less sediment than currently proposed. 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. Special Condition II-A and B limit the volume dredged, and require the USACE to reduce in-Bay disposal to 20% of its annual program to address this issue.

Regarding Dredging Policy 2, and the requirements that dredging projects serve a water-oriented use, in this case, it is clear that maintenance dredging of navigational channels is necessary and 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 goods to and from Bay Area ports and harbors.” Discussion regarding whether the proposed program meets water quality standards, complies with seasonal work windows, and the requirements of the resource agencies can be found in the Water Quality and Natural Resources section below.

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 deep spine of the Bay, and thereby minimize dredging in shallower areas by taking advantage of naturally deep water. The Petaluma River Channel and the Across the Flats channel are not situated in deep water, but follow the center of the Petaluma River, which ensures a direct route for vessels in and out of the river.

The volume proposed for dredging is generally that required to maintain the channel at a depth safe for navigation. As a planning function, the USACE has proposed the maximum volume likely to be dredged rather than the actual volume due to uncertainties associated with shoaling and funding. If shoaling is high and funding is available, the maximum volume proposed could be dredged. If funding is insufficient, the project may be dredged to a shallower depth. Therefore, the proposed volumes provided in the episode approvals are the minimum amount necessary for the project.

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 (to minus 37 feet MLLW rather than to minus 35 feet MLLW) in the shoaled area. This allows for more sediment to accumulate below design depth before the next annual maintenance episode is undertaken.

Dredging Policy No. 2 is addressed through the authorized volumes and Special Condition II – H. Special Condition II - H requires that the USACE further define its dredging volumes in episode approval requests. These requests will be reviewed for necessary dredging volumes, availability of disposal and placement sites, and sediment suitability prior to being approved for dredging.

The Bay Plan Dredging Policies 3, 4 and 5 together provide guidance on when in-Bay disposal is appropriate, the analysis that should be undertaken and promotes 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 are discussed in the water quality section). 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 volume limits. When this is proposed, 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 further states 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 Policy 3, the USACE states:

“Policy 3 states that dredged material *should, if feasible*, be reused or disposed of outside the Bay and certain waterways and that dredging should not be disposed of in the Bay or certain waterways unless other disposal is *infeasible*. The only requirement in this policy is that the Commission finds that the conditions of (a), (b), (c), and (d) are met prior to disposing of material in the Bay. Although Policy 3 does not express a preference as between beneficial use and disposal "outside the Bay", USACE is committed to beneficially using dredging material to the maximum extent feasible; consistent with the statute and regulations governing the beneficial use of dredged material.”

This interpretation can be reached by reading Policy 3 independently of other Bay Plan policies, particularly Dredging Policy 1. However, all applicable Bay Plan policies are applied to proposed projects, and in reading these policies together, there is a clear preference for maximizing beneficial reuse, and at minimum providing forty percent of the overall program.

The USACE quotes the provisions of the federal standard as a basis for infeasibility of beneficial reuse, stating that the least cost disposal location is typically the Deep Ocean Disposal Site and/or in-Bay disposal. They further explain that a non-federal sponsor has not provided funds to support the incremental cost of going to beneficial reuse for any of the proposed projects, with the exception of the City of Petaluma for the Petaluma River channel dredge, as provided for under 333 C.F.R. Section 335.7. The City of Petaluma is the local project sponsor for this project, and as such is required to provide the disposal site (Schollenberger Park in this instance). In addressing other parts of Policy 3, it states that the projects will comply with sediment testing requirements, the disposal site determination of the DMMO, and dredge and dispose within the LTMS environmental work windows. It further states that if circumstances require dredging outside of the work windows, the USACE would consult with the appropriate federal resource agency and take into consideration CDFW recommendations. Lastly the determination concludes that if a beneficial use site meets the federal standard criteria (least cost), the USACE may choose to use that site. This has occurred twice in the recent past when the Richmond Inner Harbor was contracted to take dredged sediment to Cullinan Ranch, resulting in over 470,000 cy of beneficial reuse in 2016 and 2017, partially to satisfy a NOAA National Marine Fisheries Service (NMFS) biological opinion mitigation requirement owed from dredging outside the work window in 2015. In 2017, beneficial reuse at Cullinan Ranch was the least cost alternative as compared to ocean disposal.

In 2015, the Commission staff discussed the proposed dredging volumes, lack of beneficial reuse and large quantities proposed for in-Bay disposal 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. These same concerns exist with the proposed consistency determination.

The USACE's proposed in-Bay disposal volume represents 45 percent of its total proposed dredging for each year. In regard to maintaining adequate capacity at the in-Bay disposals sites for other important dredging projects, the USACE has not provided an explanation of how the dredging community would be accommodated if the USACE disposed of its sediment as currently proposed. From their proposal, a very limited volume would be available in 2018 and none in 2019. This untenable situation would require the LTMS agencies to invoke the contingency volume and could potentially require the agencies to begin the allocation process described earlier.

The USACE does describe its commitment to the LTMS Program as follows, yet fails to address the needs of other dredging projects:

“To the extent allowed by the federal standard, the USACE is committed to beneficially using dredging material to the maximum extent feasible. Over the period of analysis discussed above (2006 through 2017), USACE has beneficially used approximately 6.85 million cubic yards of maintenance material not including the 6.4 million cubic yards of dredged material beneficially used from Oakland Harbor's 50-foot deepening project or material from the Main Ship Channel. This represents approximately 32 percent of all beneficial use during this timeframe. 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. Finally, over the next 2 years, USACE 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 of reduced in-bay disposal and allow for adequate placement for other dredgers.”

To address Dredging Policy 2 and 3, Special Condition II- B requires the USACE to beneficially reuse at least 40% of sediment dredged at a beneficial reuse site and reduce in-Bay disposal to 20% of the overall program each year. Further, Special Condition II – E requires sediment testing and DMMO approval for disposal or placement options prior to dredging each episode, and Special Condition II – I.1 and I.2.d(2) requires the USACE to dredge within environmental work windows, and consistent with the NOAA 2015 Amended Programmatic Biological Opinion, mitigate for work outside the work windows with beneficial use of the dredged sediment at a restoration site that will benefit fish.

- c. **Management of In-Bay Disposal Sites.** Dredging Policy 6 states that the in-Bay disposal sites should be carefully managed to guard against natural resource, sediment and water quality degradation; creation of hazards to navigation; and foreclosure of sites to projects critical to the region’s economy. The USACE states that it uses these sites in furthering its navigation mission. In cooperation with the LTMS agencies, it manages these sites through the DMMO. The DMMO ensures that the quality, amount, and timing of sediment 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. The USACE routinely surveys each in-bay placement site to ensure that no site creates a hazard to navigation.

Prior to implementation of each USACE dredging project, it 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. Special Condition II – J codifies the USACE’s agreement to continue monitoring and managing the in-Bay disposal sites.

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.”

In 2017, the USACE funded the investigation of additional methods for beneficially reusing sediment entitled “Strategy Placement Framework”. In this effort the USACE and its consultants evaluated whether placing sediment in the nearshore adjacent to marshes or piping it to areas near tidal channels would effectively augment the supply of sediment to marshes. The investigation included conceptual models, and a proposed pilot study and demonstration project. The initial draft of this document is complete, though additional funding

is needed to finalize the document and conduct monitoring, modeling, pilot study and a demonstration project. Additional studies undertaken with funds provided by the USACE LTMS budget from previous years can be found on the USACE LTMS website.

Based on the information above, and the conditions that require compliance with the Commission's laws and policies, the Commission has determined that as conditioned herein, operations and maintenance dredging program proposed by the USACE is consistent to the maximum extent practicable with Bay Plan's enforceable 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 policies that respond to impacts to natural resources.

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. 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...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.

- a. **Equipment.** 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. As part of the USACE's consistency determination request, it describes using

clamshell equipment, a hydraulic hopper dredge (the *Essayons*), and a hydraulic cutterhead dredge in the Petaluma River channel. The analysis and conditions herein are limited to these three dredge types, if additional dredge types are proposed further analysis or an amendment to the the consistency determination could be required.

For longer distance disposal or beneficial reuse, clamshell dredges can be more efficient than hopper dredges. They also entrain fewer 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 as dredging occurs. These dredges tend to be more efficient at dredging to project depth than clamshell dredges when disposal sites are in close proximity, and generally create less turbidity in the water. However, hopper dredges entrain more fish than mechanical dredges due to the suction pumps. The cutterhead dredge is a hydraulic dredge that has a rotating dredge head placed in the sediment. The sediment and water pulled into the dredge is pumped via pipeline to an adjacent disposal site, in this proposal, Schollenberger Park in Petaluma.

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, impact tidal hydrology and sediment movement, aquatic plants, fish and wildlife, the Bay's bathymetry, and habitat. The proposed project's 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.

- b. **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. The USACE concurs with this conclusion. While dredging equipment is used in other locations, the USCG, along with the State Lands Commission have implement safeguards to reduce the import of invasive species in the Bay. That said, 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.
- c. **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. Because the deep draft channels are dredged on an annual basis to a standard depth, the tidal hydrology associated with these channels likely shows little change from year to year. Dredging in the Petaluma River Channel and "Across the Flats" may increase tidal flows due to the deeper depths after dredging, until the channel silts back in, but this has not been studied.

Suisun Bay Channel and Pinole Shoal Channel are primarily sandy in character. The LTMS agencies have requested that sandy sediment from the Pinole Shoal Channel, when feasible be placed at the San Francisco Bar (SF-16) disposal site to augment the sand supply in the littoral cell. The USACE has responded to this request by taking 1-2 loads (approximately 10,000 cy) to the Bar disposal site as the Essayons completes its dredging.

Richmond, Oakland, Redwood City and Petaluma's sediment are comprised 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 as keeping the sediment within the Bay system, albeit not in sediment transport.

As designed, the in-Bay disposal of sediments at the dispersive disposal sites likely hastens the sediment transport out of the Bay system as shown by modeling exercises completed in 1998 and again in 2011. Proponents of increased in-Bay disposal have suggested that in-Bay disposal increases the amount of sediment in the Bay system, but in fact, at best 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, 55-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.

USACE's proposed dredging program states that "Dredging would occur in deep-draft navigation channels for all but the Petaluma project, with depths greater than 30 feet MLLW. The proposed dredging would remove shoaled sediment from channels that are deeper than 30 feet MLLW each year to maintain safe and efficient navigation of the respective channel. Some of the sediments would be placed back in the Bay system by placing sediment at the in-bay sites, some sediment would be removed from the Bay by placing material at SF-DODS, and some sediment may be beneficially used at upland sites." According to the USACE, effects are limited to temporary and localized increases of suspended sediment and turbidity around dredging operations and disposal sites over varying periods of time based on sediment type being dredged.

The USACE further states that "Dredging could affect sediment movement by dredging it from channels to the respective channel's authorized depth and moving it to placement sites." However, the USACE hypothesizes that this would not result in significant changes to sediment movement or bathymetry, other than actual dredging sediment and transporting it to in-bay and ocean sites for placement. Once completed, the USACE believes that sediment transport is likely to be the same as before maintenance dredging occurred.

Regarding the Petaluma River channel and “Across the Flats”, both shallow draft channels, the dredging would occur in or adjacent to tidal marshes or tidal flats. The USACE states that dredging the river channel or the tidal flats would not affect sediment transport outside the channel. While this may be correct, there are no studies to verify that deepening this area during maintenance dredging would not influence sediment deposition or erosion in the adjacent marsh, mudflats or subtidal shoals that would likely receive sediment that would normally move down stream to the Bay.

- d. **Aquatic Plants.** Aquatic plants cannot grow in the deep water channels due to lack of sufficient sunlight at depth. However, eelgrass beds exist adjacent to the Richmond Inner channel and Oakland Inner Harbor channels. Dredging has the potential to increase turbidity, which can in turn, limit the amount light transmission through the water. As part of the 2011 LTMS Programmatic Essential Fish Habitat consultation with NMFS, dredging projects within two hundred and fifty meters of eel grass (a buffer zone) are required to use silt curtains to reduce the potential of sediment suspended by dredging activity to deposit on the eelgrass beds, reducing their ability to photosynthesize, and projects within 50 meters must survey the dredging footprint to ensure that there would be no direct impacts to eelgrass beds. The USACE has performed pre- and post-dredge eelgrass surveys, and eelgrass mapping at Richmond Inner Harbor and Oakland Inner Harbor since 2010 to determine if maintenance dredging was affecting eelgrass beds. The surveys and mapping have shown no significant changes in eelgrass beds that can be associated with dredging. In addition, according to the USACE’s light monitoring in and adjacent to eelgrass beds during dredging of Richmond Harbor and Oakland Inner Harbor, the required light saturation point of a minimum of 5 hours for eelgrass metabolic demands was met. Special Condition II – I.4 and I.5 requires that the USACE continue the monitoring of eelgrass in these areas as recommended in the NMFS Essential Fish Habitat Programmatic Consultation and that the results of these surveys are provided on an annual basis to the Commission staff and the resource agencies.
- e. **Habitat.** Dredging and aquatic disposal degrades habitat over time by regularly disturbing the bottom of channels and disposal sites through sediment removal or disposal; temporary increases in turbidity and suspended sediments; and entrainment of water and 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 that live in the Bay can be impacted by dredging. Changes in ambient conditions, including turbidity and noise generated from dredging could affect fish and other aquatic organisms at the dredge site.

Clamshell dredging would increase suspended sediment concentrations in the vicinity of dredging and the aquatic placement sites. Suspended sediment concentrations are expected to be higher when dredging areas of finer-grained sediment as shown in the MEC Analytical System's study of Oakland Dredging Plumes in 2004. The study also found that the plume tended to decay with increasing distance from the dredge. The Essayons had also been found to increase turbidity when overflowing water from the hopper. To reduce turbidity effects when using hydraulic dredges, the USACE installed "anti-turbidity valves" on the hopper dredge *Essayons*, reducing the amount of air in the overflow water returning to the Bay, thus reducing potential effects of turbidity on aquatic organisms and habitat.

Fish and invertebrates can be removed or directly injured by a clamshell dredge, dredge spuds, dump scows, or tugs used to maneuver the dredge equipment and scows. A detailed analysis of the effects of the removal of benthic species during dredging operations is provided in Impact 3.6-2 of the Environmental Impact Report and Environmental Assessment (EIR/EA) conducted by the Water Board and the USACE in 2014. The EA/EIR found that dredging would have localized, direct impacts on benthic communities through physical disruption and direct removal of benthic organisms. It found that effects are expected to 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, very limited information exists for San Francisco Bay recovery periods. The USACE is contributing to a local study being conducted by the US Geological Survey 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 using any equipment, entrainment of organisms from the water column can be reduced. The EIR/EA found that use of a clamshell dredge rather than a hydraulic dredge clamshell dredging would entrain fewer fish and other wildlife. Recognizing this impact, the USACE proposed a number of measures to further reduce the level of fish entrainment from hydraulic dredging as discussed in the species section below.

The disposal sites, particularly the Alcatraz Island site (SF-9), 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.

Given these likely impacts, the Bay Plan seeks to protect subtidal habitat via Policy 2, which 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.”

- f. **Species.** The Bay Plan policies on Fish, Other Aquatic Organisms, and Wildlife seek to protect habitats necessary to support native species, and to preserve these 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 solely in response to the listing of species by the CDFW, USFWS and NMFS, although the Commission concurs 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 sediment, a process referred to as entrainment. In general, smaller organisms with limited or no swimming capabilities are more susceptible to entrainment than larger organisms with stronger swimming capabilities. It is generally accepted that mechanical dredging entrains far fewer fish from the water column than hydraulic dredging because of the greater the sphere of influence associated with the hydraulic pumps and because much less water is removed along with the sediment when using a mechanical dredge. Both remove bottom dwelling fish and crustaceans that live in or on the sediment. Fish entrained by a hydraulic dredge are likely to suffer mechanical injury or suffocation, resulting in mortality.

Species of special concern in the Bay are susceptible to impacts from dredging and disposal, include those listed as candidate, threatened or endangered species by the federal and state resource agencies, and include green sturgeon, salmon, least tern, Delta smelt, longfin smelt, Ridgeway’s rail and salt marsh harvest mouse.

Green sturgeon is a bottom dwelling anadromous fish that spends several years as juveniles and adults within the Bay in areas of turbid water, prior to ocean residence. They are found Baywide, but in low numbers. Salmon are also anadromous, spawning in fresh water streams and then traveling downstream to the Bay where they feed and grow prior to migrating out to sea and returning to spawn in the Bay’s tributaries. Dredging and disposal can impact these species through increased turbidity in the water column, and loss of foraging opportunities. However, these species move through the Bay relatively quickly during their well-documented migration period. 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. Dredging impacts this species indirectly by increasing turbidity in shallow water areas where eelgrass grows.

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 susceptible to entrainment in the flow fields created around the intakes of hydraulic suction dredges. The use of a clamshell dredge would likely reduce entrainment. 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 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's annual fall mid-water trawl surveys show that the population of longfin smelt, similar to Delta 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.

Other species of concern managed by NMFS under the Magnuson Stephenson Fisheries Conservation Act are commercially important and include species that live in the water column (pelagic), bottom dwelling fish (groundfish), and salmonids. Environmental work windows, which limit dredging to the time of year certain species are not present and minimizes in-Bay disposal, are important conservation measure used by the regulatory and resource agencies to reduce impacts from dredging. The Commission implements these work windows in accordance with the resource agencies to provide protection for these species, and under its own authority under CZMA for the region.

The environmental work windows were developed through programmatic consultations on the LTMS Program with the NMFS, USFWS, and CDFW under the national and California Endangered Species Act, ESA and CESA, respectively.

These programmatic biological opinions included terms and conditions that set forth the period of time each year for dredging and disposal activity that would reduce impacts to listed species. The programmatic biological opinions were amended by USFWS in 2004 with minor adjustments for clarification, and by NMFS in 2015.

The NMFS amendment included a measure that allows planned dredging activities outside of the salmonid work windows so long as the sediment generated is beneficially reused at restoration site that would benefit fish habitat (mitigation) in coordination with the LTMS agencies. It also formally delegates the authority to the LTMS agencies to allow minor dredging activities after the close of the salmon work window without additional consultation. This new measure provides benefits to fish habitat through more rapidly constructing new marsh, provides greater flexibility to the dredging community, and reduces workload for the LTMS agencies and NMFS during critical periods of dredging activity. The amended biological opinion also examined the potential impacts to the more recently listed green sturgeon (2009). The review of impacts to green sturgeon did not result in a new work window as it found the salmonid work window was sufficiently protective of this species' life stages.

In 2016 and 2017, the USACE complied with NMFS' amended LTMS programmatic biological opinion by taking sediment dredged outside of the work window, or its equivalent, to beneficial reuse as mitigation for potential impacts to salmon. In its consistency determination request, the USACE states: "...in accordance with the NMFS' 2015 LTMS Biological Opinion, clamshell dredging may be conducted outside of the salmonid working window if material is placed at an upland beneficial use site."

While the environmental work windows provide significant reduction in potential impacts to most listed species, they do not eliminate impacts to species that are present year-round, such as the Delta smelt and longfin smelt. For these two species, hydraulic dredging entrainment is a significant issue during different times of year depending on the channel being dredged. In 2010 and 2011 the USACE conducted limited entrainment monitoring while using the Essayons, a hydraulic dredge, in three federal channels. Due to the technical and logistical limitations of sampling on-board the vessel, only a small fraction, less than one percent of the total volume dredged, was actually sampled. In 2011, the Essayons entrained both Delta and longfin smelt, confirming the concerns of the regulatory and resource agencies.

In 2013, the United States Army Engineer Research and Development Center (ERDC) conducted a modeling study of entrainment potential 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 the USACE's 2010 and 2011 monitoring efforts.

The modeling study estimated that longfin smelt entrainment during hydraulic dredging in 2011 was likely 3,848 fish 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 the potential entrainment by the *Essayons* to date.

In its concurrence request, the USACE summarizes the entrainment data as follows: “Over the course of the 4-year study, 87 longfin smelt were entrained, 4 delta smelt, and 1 green sturgeon. This includes:

- Seventeen (17) longfin smelt entrained (12 in Richmond Outer Harbor, 3 in Pinole Shoal, and 4 in Suisun Bay) and four (4) delta smelt in Pinole Shoal;
- Twelve (12) longfin smelt entrained in 2016 (all in Richmond Outer Harbor); and
- Fifty-nine (59) longfin smelt in 2017 (all in Pinole shoal—56 during Episode 1 in June and 3 during Episode 2 in November) and one (1) green sturgeon (entrained in June).

In addition, but not noted by the USACE, the monitoring program observed a Chinook salmon entrained in 2016. While these numbers may appear low, it is important to remember that it is only feasible to monitor a small portion of the dredge operations, so actual entrainment is likely higher than reported.

In its March 14, 2014 letter CDFW indicated its concern based on the entrainment monitoring and the modeling study, that impacts to Delta and longfin smelt 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. CDFW has further refined its opinion that impacts to longfin smelt would be even more reduced in Central Bay (Richmond) if dredging was limited to August 1 through November 30 and in San Pablo Bay (Pinole) and if dredging was conducted in September through November of any year, because smelt set up for migration upstream spawning in San Pablo Bay.

The USACE has requested annual individual consultation with the USFWS regarding dredging in Suisun Channel and potential impacts to Delta smelt. As a result of these consultations over the past several years, the USACE has agreed to reduce the risk of delta smelt entrainment by using a clamshell dredge in Suisun Bay Channel.

- g. **Environmental Impact Report Measures.** Based on the ERDC entrainment study and guidance from CDFW, the following minimization measures were included in the Final EIR, the Water Board's water quality certification for years 2015 through 2020, and the 2015-2017 Letter of Agreement to protect both Delta and longfin smelt:
- (1) Limit the use of hopper dredges in San Francisco Bay to one federal channel (either Richmond Outer Harbor or Pinole Shoals), and specifically not allow use of a hopper dredge in Suisun Bay Channel;
 - (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 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;
 - (8) Maintaining contact of drag head, cutterheads, and pipeline intakes with the seafloor during suction dredging; and
 - (9) 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.

The USACE did not implement all of the required measures, specifically item 2, as the Napa River Channel was dredged in 2016 in these conditions, but the USACE purchased additional mitigation credits to offset impacts to listed species from this activity. It also did not comply with item 7 due to logistical and scheduling complications associated with the federal dredge, which is shared nationally.

In 2018, the USACE has stated that its Richmond Outer Harbor dredging cannot comply with item 7 due to similar priority and scheduling conflicts with federal channels elsewhere in the nation. The Commission staff, the Water Board, and CDFW have reiterated to the USACE the importance of dredging later in the season, particularly for Pinole Shoal, as evidenced by the significant increase in entrainment in the early summer compared to dredging in the fall – monitoring results from Pinole Shoal in 2017 validated this concern as 56 longfin smelt were entrained in the June dredge episode 1 as compared to 3 longfin smelt entrained during the November episode.

Minimization measure 1 necessitated an increase in the USACE budget to support the use of a clamshell dredge for an additional channel beyond that required by the USFWS in Suisun. Rather than seeking or providing additional funding, the USACE has chosen to defer dredging in either Richmond Outer Harbor or Pinole Shoal each year. In 2017, the USACE deferred dredging in Richmond Outer Harbor which has resulted in draft restrictions and hazardous conditions for fully loaded oil tankers. This has resulted in “light-loading” of tankers coming into the Chevron refinery. Chevron has reported an economic loss of \$500,000 per vessel. A similar effect is expected in 2018, as the USACE has opted to defer dredging in Pinole. If this deferral results in draft restrictions, it is expected to affect a number of oil terminals and potentially the Ports of Stockton and Sacramento.

In 2018 and 2019, the USACE has committed to the following: “To reduce the risk of entrainment of fishes in the Pinole Shoal and Richmond Outer Harbor, the following avoidance and minimization measures will be implemented when hopper dredging. These measures are discussed below.

- Dredging Pinole Shoal later (from August 1 through November 30) in the San Francisco Bay LTMS environmental work windows, *to the extent feasible* (emphasis added). Dredging later would allow young-of-the-year longfin smelt to grow larger and spawning adults to return upstream;
- 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;
- Lowering the draghead to the channel bottom prior to turning on suction pumps;
- Keeping dragheads within 3 feet of the channel bottom should clearing of the pipeline be required; and
- Keeping water intake doors closed to the extent feasible (water intake doors are located on the top of the dragheads).”

These conditions, along with those listed in the Final Environmental Impact Report, have been updated and incorporated in Special Condition II – I in accordance with the Commission’s policies on Fish, Other Aquatic Organisms and Wildlife and Subtidal Areas and are protective of native and listed species and their habitat.

The USACE has also committed to continuing entrainment monitoring aboard federal hopper dredges when dredging Pinole Shoal and Richmond Outer Harbor with a hopper dredge, and mitigation credits will be purchased to mitigate for entrainment impacts. Special Condition II – 1.2.c requires the USACE to continue entrainment monitoring when using a hydraulic dredge in the federal navigation channels, and that it provides the findings to Commission staff to assist in further assessment of impacts to smelt and other native species.

Of note is the lack of commitment to dredge in the Petaluma River (a hydraulic dredge is proposed) at times when salinity and temperatures would reduce potential for entrainment, as provided for in the EIR, or monitor entrainment while this activity is ongoing. However, the USACE has agreed and Special Condition II – 1.c(2) requires water temperature monitoring prior to and while dredging to assist in impact assessment and mitigation needs determination.

Regarding herring, the USACE has agreed, as a matter of comity, to have trained herring monitors observe dredging activities that are conducted outside the work window in areas where spawning is likely to occur in 2018 and 2019. They have further agreed to stop dredging activities with 500 meters of spawning areas for 14 – 21 days to allow the eggs to develop, hatch and larval fish grow sufficiently to avoid high turbidity waters associated with dredging and disposal. Special Condition II – 1.3.a requires the USACE to conduct herring spawn monitoring after November 30th and through March 15th of any year, and stop dredging to allow herring eggs to hatch and larval fish to develop sufficient swimming abilities necessary to avoid high turbidity prior to recommencing dredging, to protect this commercial fishery and native species consistent with the Fish, Other Aquatic Organisms and Wildlife policies.

- 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 in an effort to reduce entrainment of special status species. Because entrainment cannot be avoided, mitigation is required by the Commission’s mitigation policies.

As in the 2015-2017 program, the USACE has offered to purchase mitigation credits at Liberty Island Conservation Bank or other approved conservation bank, to compensate for entrainment of special status fish, including listed smelt and salmon. The USACE has proposed using an equation agreed upon by CDFW and

USFWS to determine the necessary credits. The equation (shown below) used to calculate the amount of conservation credits required for purchase is based on the volume of water estimated to be pumped through the dredge during dredging.

$$\frac{3.0 \text{ million acre-feet}}{800 \text{ acre}} = \frac{X \text{ volume dredged}}{X \text{ acres of habitat}}$$

Using estimated volume of sediment dredged from historic records, the USACE calculated anticipated mitigation credit for dredging in 2018 and 2019. Given that the proposed dredging volumes are higher than historically dredges, it is likely that purchase of additional credits would be necessary once the dredging is complete for each channel. The USACE states, "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. 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 following completion of hopper dredging. The mitigation discussed herein was agreed upon by USACE and CDFW." The USACE qualified the applicability of this statement to only those projects using a hopper dredge, and it is noted here that Suisun Channel is no longer being dredged with hydraulic equipment. Currently, the USACE is only proposing to use the hopper dredge at Richmond Outer Harbor in 2018 and at Pinole Shoal in 2019.

This commitment appears to be the same as proposed for projects dredged between 2015 and 2017 and may not take into account the larger volume of hydraulic dredging resulting from deferring dredging in 2018 and 2019, nor the proposed hydraulic dredging in the Petaluma River channel, and therefore may need to be recalculated to mitigate for potential impacts to listed species from the 2018 and 2019 program. For example 557,000 cy of sediment was dredged at Pinole Shoal in two episodes, due to heavy shoaling in 2017, and required 0.43 acre credits to compensate for impacts to listed smelt rather than the previously proposed 0.19 acre credits. Currently, Richmond Outer Harbor has experienced significant shoaling and dredging was deferred in 2017. As a result, the USACE is estimating that it would need to dredge 500,000 cy at this site, which would likely require more than the 0.34 acre credits proposed based on the 2016 volume estimates. The USACE estimates the mitigation credit prior to dredging and then, based on the volume actually dredged, increases the needed credits as needed. Special Condition II - I.2.d(1) and 2.d(2) require the purchase of mitigation credit at a species appropriate mitigation bank when hydraulic dredging is proposed.

Also of note, is that in limiting hydraulic dredging of Pinole Shoal and Richmond Outer harbor to alternating years, a greater volume of sediment is dredged at that site in a single year. This increase may have additional effects on listed species due to the potential for more species to be entrained in a single year, potentially reducing the breeding population in that year. This change in practice has not been thoroughly analyzed or addressed by the USACE or resource agencies.

The Bay Plan policies further discuss the need for the required mitigation to be coordinated by all agencies with jurisdiction for the project and to, if possible, be located near the location where the impacts occur. In 2014 as part of the CEQA/NEPA review process, discussions occurred between the USACE, USFWS, CDFW, BCDC and the Water Board, and agencies agreed to the mitigation equation, that the type of credit provided by Liberty Island (or Honker Bay mitigation bank when it becomes available) is appropriate to mitigate for impacts to Delta and longfin smelt. While mitigation is not being required for take of salmonids, an individual Chinook salmon was entrained during monitoring. Liberty Island provides credit to compensate for impacts to salmon as well. There is no appropriate mitigation bank available nearer to the project impacts in Central Bay.

Based on the information herein, the USACE's proposed minimization and mitigation measures, and those required herein, the Commission concurs that as conditioned, the 2018 and 2019 program is consistent to the maximum extent practicable with the Bay Plan's enforceable 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).

Sediment quality analysis is performed prior to dredging as described 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 contaminants. In addition, the Water Board has instituted Total Maximum Daily Loads (TMDLs) to reduce specific contaminants loads in the Bay over time. Also instituted Bay-wide in 2011, are testing requirements protective of managed fisheries under the Magnuson-Stevens Fish Conservation and Management Act through a programmatic Essential

Fish Habitat (EFH) consultation for the LTMS program. The LTMS agencies have incorporated the Water Board's TMDL requirements and the NMFS's EFH recommendations in the DMMO sediment testing program and review sediment analysis results consistent with these efforts.

In its consistency determination concurrence request, the USACE stated that dredging activity would not cause adverse impacts to tidal marshes, or subtidal areas, or alter fresh water flow into San Francisco Bay. Further, the USACE would conduct the program in compliance with the 2015 5-year WQC issued for the San Francisco Bay federal maintenance dredging program. The USACE would ensure that all required sediment testing and analysis be completed, and the results of the sediment testing and analysis will be provided to the BCDC, Water Board, and USEPA through the DMMO for review, approval and suitability determination for proposed disposal and placement sites. The USACE has provided sampling and analysis plans for some of the projects proposed for dredging in 2018, including Richmond Inner and Outer Harbor and Redwood City Harbor. The DMMO anticipates the sediment analysis reports will be made available for review shortly for these projects, and prior to receiving requests for dredge episode approvals. Similarly, the DMMO anticipates receiving both sampling and analysis plans and results for the remaining USACE projects prior to issuing episode approvals for 2018 (Oakland Harbor and Suisun Channel) and similar information for 2019 projects.

The USACE has stated that it will place sediment in accordance with the requirements of the respective placement site; if sediment is not suitable to be placed at an in-bay aquatic site, it will be placed at a suitable site, such as SF-DODS or as non-cover material at Montezuma Wetlands. If sediment is not suitable for one of these sites, additional coordination would be conducted to identify and use a suitable disposal site. As proposed, the sediment dredged from and placed in the Bay or adjacent upland sites would not result in permanent adverse effects to the Bay's water quality.

Known chemicals of concern are found at the Richmond Inner Harbor's Santa Fe Channel (Exhibit C), and Redwood City Harbor channel (Exhibit F). Santa Fe Channel is contaminated with DDT, PCB and other legacy contaminants due to the historic production of these chemicals at United Heckathorn and Redwood City Harbor channel had elevated levels of PCBs in 2014 and 2015. The USACE has not proposed to dredge the Santa Fe Channel during the period of this consistency determination. Redwood City Harbor is dredged annually. Per Special Condition II -E, and consistent with the Bay Plan Dredging and Water Quality policies, these sites will be fully tested to ensure the dredged sediment proposed placement is appropriate and would not affect water quality or wildlife.

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 herein (Table 4), 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 it authorized a maximum in-Bay disposal of 3.5 million cy over the same period. The total in-Bay disposal limit 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.

Between 2015 and 2017, according to the USACE, it disposed of 1,991,386 cy of sediment at various in-Bay disposal sites, including 684,300 cy in 2017, 425,086 cy in 2016, and 882,000 cy in 2017. Approximately 1.76 mcy of in-Bay disposal remains in the Water Board's waste discharge authorization for dredging projects in 2018 and 2019. The USACE has proposed a maximum of 1.075 mcy of in-Bay disposal in 2018 and 1.325 mcy of in-Bay disposal in 2019 and does not explain how it plans to address the shortfall of 650,000 cy of in-Bay disposal not authorized in the Water Board's waste discharge authorization. If necessary, it is likely that the USACE would seek additional in-Bay disposal authorization in late 2018 or early 2019. Special Condition II - D requires the USACE to seek an additional Water Quality Certification and Waste Discharge Requirement if they propose dredging or disposal above what is currently approved, consistent with Dredging Policy 2 and 3, and Water Quality Policies 1 and 2.

Regarding the proposed, maximum dredging and disposal volumes, these volumes will be confirmed and tracked in pre-dredge surveys. To facilitate further refinement of the proposed volumes, the USACE has committed to providing a pre-dredge survey for each project to the Commission and requesting approval of both the dredging and disposal proposed. This, in combination with the post dredge surveys, will allow for tracking and managing disposal volumes, and thus impacts to water quality. It is also possible that the actual project volumes would be less than proposed and that some would be higher than the estimated volumes. The LTMS agencies can use this information along with volumes proposed by other dredging projects to monitor in-Bay disposal volumes to ensure targets are not exceeded, or if necessary the contingency volume is used. Special Condition II – J requires the USACE to continue to monitor the in-Bay disposal sites and disposal volumes in coordination with the LTMS agencies in compliance with the Dredging Policies.

For these reasons and as required, the Commission concurs, that as conditioned, the project is protective of Bay water quality and is consistent to the maximum extent practicable with the Bay Plan's enforceable 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....”

In response to Commission Navigation Safety and Oil Spill Prevention policies, the USACE provided information regarding the region's Harbor Safety Committee's and U.S. Coast Guard's procedures and priorities, specifying that they collectively consider shoals to be obstructions that should be removed to ensure safe navigation. They noted the Harbor Safety Plan's critical maneuvering areas, including those in Redwood Creek, San Mateo-Hayward Bridge, Oakland Bar Channel, Richmond Inner harbor, Richmond-San Rafael Bridge, Union Pacific Bridge, and New York Slough, all areas proposed for maintenance dredging its proposed program. The USACE explained that a function of the Harbor Safety Committee is to identify shoals that can result in serious environmental consequences as a result of groundings. The USACE's 2-year dredging program supports this policy by ensuring that obstructions (i.e., shoals) are removed from the deep-draft navigation channels, thus reducing the risk of navigation safety concerns and oil spills.

The USACE regularly conducts surveys of its navigation channels, including pre-dredge (before dredging) and post-dredge (after dredging) surveys. Even if a channel is not proposed for dredging, USACE maintains up-to-date conditions surveys of each channel to determine if hazardous shoaling has occurred. Lastly, the federal dredges and its contracted dredges are 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).

For these reasons, the Commission concurs that the proposed project is fully consistent with the Bay Plan's enforceable 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 ports; and 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 choose to avoid the Bay, using other west coast ports. The maintenance dredging of Petaluma River and "Across the Flats" would facilitate water-borne commerce, specifically sand, to access a local market, and access to berthing areas and San Francisco Bay for recreational boaters. 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, as it would in shallow channels. 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. Due to the infrequent dredging of the Petaluma channels, the benthic organisms would likely recover and repopulate the area. Sediment removed from the channels may impact adjacent marshes and mudflats, but information regarding this potential impact is not available.

The Commission concurs that as conditioned the 2018 and 2019 dredging program is fully consistent with Bay Plan's enforceable policies regarding the public trust.

- B. **Coastal Zone Management Act.** The Commission, pursuant to the Coastal Zone Management Act of 1972, as amended (16 USC Section 1451), and the implementing Federal Regulations in Title 15 Code of Federal Regulations Part 930, is required to review Federal projects within San Francisco Bay and agree or disagree with the Federal agency's determination that the project is consistent to the maximum extent practicable with the Commission's amended coastal zone management program for San Francisco Bay. This letter constitutes such review and comment.

The Commission finds and certifies that the work proposed by the USACE, as described and conditioned herein, and the information submitted, is either within the coastal zone or affects the coastal zone and is consistent to the maximum extent practicable with the Commission's amended coastal zone management program for San Francisco Bay, as approved by the Department of Commerce, so long as the USACE complies with the conditions contained herein.

- 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 (lead agency) found that either of the reduced hopper dredge alternatives would reduce impacts to listed smelt and determined that using one hydraulic dredge in the Bay, (Reduced Hopper Dredge Alternative 1) coupled 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, to allow time for the USACE to adjust its budget. The USACE did not request additional funds to support the reduction of hydraulic dredging in the Bay. Instead, it began deferring dredging of one channel (Richmond Outer Harbor or Pinole Shoal channel) in 2017, and anticipates continuing this process into the future.

In 2015, 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 [Final Environmental Assessment] 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. The USACE did not conduct further environmental review under NEPA prior to adopting its course of action number in 2017, to defer dredging of either Richmond Outer or Pinole Shoal in alternating years

- D. **Conclusion.** For all the above reasons, the Commission finds that as conditioned, the project will sufficiently protect fish and wildlife resources, will mitigate for those impacts that are unavoidable, maintain water quality in the Bay, and assist in implementing beneficial reuse of dredged sediment and the LTMS Management Plan. Therefore, the project, as conditioned, is consistent to the maximum extent practicable with the Commission’s amended coastal zone management program for San Francisco Bay.