DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
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SAN FRANCISCO, CALIFORNIA 94103-1398

AND

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 HAWTHORNE STREET
SAN FRANCISCO, CALIFORNIA 94105

October 6, 2010

Mr. Robert S. Hoffmann
Assistant Regional Administrator for Habitat Conservation
National Marine Fisheries Service, Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

SUBJECT: Response to Programmatic EFH Conservation Recommendations for Maintenance Dredging Conducted Under the LTMS Program (Tracking Number 2009/06769)

Dear Mr. Hoffman:

In our letter dated July 21, 2009, the United States Army Corps of Engineers (USACE) and the United States Environmental Protection Agency (USEPA) requested programmatic consultation with National Marine Fisheries Service (NMFS) pursuant to the Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). This consultation pertains to maintenance dredging projects conducted in accordance with the Long Term Management Strategy for Placement of Dredged Material in the San Francisco Bay Region (LTMS or the LTMS Program). In response, your July 13, 2010 letter provided Conservation Recommendations (CRs) resulting from your staff's technical analysis under the consultation.

A key goal of the LTMS program is managing dredging and dredged-material placement in the San Francisco Bay Region in the most environmentally-sound manner. We agree that further reductions in impacts to EFH are possible and should be realized whenever practicable. As the LTMS is also a collaborative program that includes substantial coordination with stakeholders, we appreciate your flexibility and assistance in ensuring stakeholders had an opportunity to comment on the CRs at the LTMS Management Committee meeting of August 26, 2010. Having considered public comment and the objectives of the proposed CRs, we are pleased to propose the enclosed, comprehensive suite of conservation measures.

The LTMS Program has been remarkably successful in achieving its environmental goals, including significantly reducing the effects of dredging and dredged-material placement on fisheries and aquatic habitat as well as improving the quality and quantity of fisheries and aquatic habitat. Thus, we are disappointed that the success of the LTMS Program in providing benefits to EFH has not been adequately credited or acknowledged in this consultation.

Since 2001, we have reduced maximum in-Bay dredged material placement by approximately 75 percent (to ~1.6 million cubic yards from a pre-LTMS limit of 6.7 to 7.7 million cubic yards (cy). In 2012, the final in-Bay placement volume limit of 1.25 million cubic yards per year will be achieved. The LTMS Program is a net remover of contaminants from the Bay, both through the absolute reduction of in-Bay dredged-material placement and the sampling procedures of DMMO, which target locations most likely to harbor contamination. We have successfully managed a complex set of Environmental Work Windows (Windows) to ensure dredging occurs when the most sensitive species are not present. To date, over 15 million cubic yards of dredged material has been redirected to beneficial uses under LTMS, most of which include significant benefits to fishery habitat. We will continue to add more beneficial-use capacity in the Bay region for the future. Finally, from 2003 through 2010 the LTMS Program has funded a total of approximately $7.5 million in scientific studies, including some specifically recommended by NMFS, to help address critical data gaps and/or identify ways of improving dredged-material management.

We believe that several of the NMFS CRs appear to reflect assumptions about adverse impacts on EFH that lack an adequate scientific nexus with dredging and dredged-material placement, or are overstated or unsupported. For example, most of the dredging projects managed under the LTMS Program and addressed in NMFS's assessment have undergone maintenance dredging for years; in some instances longer than 100 years. Although an "undisturbed" condition might be desirable from a habitat perspective, it is neither realistic nor the appropriate baseline condition upon which to base an analysis of maintenance dredging or the LTMS program. Coupling the benefits the LTMS Program has already had on EFH with the very small percentage of Bay bottom disturbed by maintenance dredging in any given year (~1.5%), NMFS's conclusions about the need for additional compensatory mitigation are questionable. We further believe that some of the CRs do not adequately justify the need for compensatory mitigation, while others recommend measures that are either infeasible or would fail to achieve the intended benefit.

Finally, key beneficial reuse projects—including Hamilton Wetland Restoration, Inner Bair Island, Montezuma Wetlands, and Sonoma Baylands—were not undertaken to provide compensatory mitigation for any impacts. Rather, they are examples of the overall success of the LTMS program in facilitating creation and enhancement of aquatic habitat, much of which benefits EFH-managed species in the Bay.

Despite these concerns, we are pleased to present a comprehensive package of additional conservation measures that we believe to be feasible and appropriate, and which will further benefit EFH in San Francisco Bay. We consider that these measures, summarized below and discussed in detail in the enclosure, fully address EFH-related issues for all maintenance dredging and associated aquatic disposal conducted under the LTMS program.

Summary of CR Responses

Conservation Recommendation	Conclusion	Comments
1. Benthic recovery study	Agree with modification	Study could be valuable, and inform potential LTMS pilot projects, but implementation of compensatory mitigation is currently neither feasible nor justified.
2. Reduce dredging/disturbance frequency	Agree	We will continue practicable implementation of these measures on a project-specific basis.
3, 9, and 11. Fund a NMFS staff position	Disagree	Independent of legal and policy constraints, completing this (and the pending ESA) consultation should free NMFS resources for participation in DMMO & LTMS.
4. Eelgrass indirect effects - BMPs	Agree with modification	We will apply individual measures on a case-by-case basis as deemed appropriate by the USACE and USEPA. In addition, light monitoring results will be compiled and analyzed to determine future monitoring needs and necessary spatial extent of the buffer. An annual report will provide details to NMFS on how the measures were applied.
5. Eelgrass direct effects - mitigate losses in eelgrass "zones"	Agree with modification	We will implement Option #3 by continuing to require mitigation on a case-by-case basis, but will begin investigating the legal and logistical potential for developing a mitigation bank for use by either federal or non-federal dredging projects.
6. Reduce in-Bay disposal	Agree	We will continue implementation of these measures as practicable on a project-specific basis.
7. Bioaccumulation testing	Agree with modification	In the near term, we will implement more systematic bioaccumulation testing consistent with NMFS CR language. Longer-term modifications to this approach may involve method updates, and independent scientific review.
8. Residuals testing	Agree with modification	We will implement more systematic residuals testing consistent with the NMFS CR language.
10. Reintroduce native benthic infauna	Agree with modification	An LTMS workgroup to evaluate feasibility and develop potential pilot studies will be convened, but there is an inadequate nexus to maintenance dredging to justify compensatory mitigation.
12. Map SAV, report results, provide mitigation plan as needed	Request additional information	There is no information presented in the assessment or CR about where other SAVs are present or where surveys would be needed. Request additional information about existing native species extent and location. Will continue to work with NMFS on this issue and potential conservation measures.
13. Provide Annual Reports to NMFS	Agree	DMMO correspondence and annual reports (provided to NMFS) already provide the requested information.
14. Notify when eelgrass is affected or elevated contaminants are encountered	Agree	

We look forward to completing this programmatic consultation and implementing feasible and appropriate additional conservation measures. Completing this programmatic consultation will result in additional benefits to Essential Fish Habitat quality and quantity in the San Francisco Bay region, and streamline the dredging approval process for both permit holders and staff. We are particularly hopeful it will allow NMFS staff to be more available to participate in other aspects of dredging project review, and our ongoing LTMS planning efforts.

If there are any questions regarding this letter, please contact us or Ms. Cynthia Jo Fowler of USACE (415.503.6870, or Cynthia.J.Fowler@usace.army.mil); Mr. Robert Lawrence of USACE (415.503.6808, or Robert.J.Lawrence@usace.army.mil); or Mr. Brian Ross of USEPA (415.972.3475, or Ross.Brian@epa.gov).

A copy of this letter was sent to Mr. Chris Yates, Mr. Bryant Chesney, and Mr. Dick Butler of the NMFS; Mr. Bruce Wolfe, Ms. Beth Christian, and Ms. Naomi Feger of the SFRWQCB; Mr. Will Travis, Mr. Steve Goldbeck, and Ms. Brenda Goeden of BCDC; Ms. Susan Moore and Mr. Ryan Olah of the USFWS; Ms. Maria Vojkovich and Ms. Vicki Frey of the CDFG; and Mr. Cy Oggins and Mr. Donn Oetzel of the SLC.

Sincerely Yours,

Alexis Strauss
Director, Water Division
U.S. EPA Region 9

Torrey DiCiro
Lieutenant Colonel, U.S. Army
Commander, San Francisco District

Enclosure

USACE and USEPA Responses to NMFS Programmatic EFH Conservation Recommendations for the LTMS Program

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A. Soft bottom habitat permanent disturbance (prey loss)

1. To minimize adverse effects to soft bottom benthic foraging habitat, NMFS recommends that the USEPA and USACE conduct a benthic recovery study to validate the assumptions in the effects analysis that recovery of benthic community occurs in areas that are dredged less frequently than once per year. If the results of the study indicate that recovery takes 1 to 2 years, minimization measures will be required to account for approximately 664 acres of soft bottom foraging habitat; if the study indicates that recovery takes longer than 3 years, minimization or mitigation will be required for up to 3,312.3 acres of soft bottom foraging habitat; if the study indicates that recovery takes 1 year or less, then effects may be considered accounted for by current LTMS Environmental Protective Measures and no further actions will be required.

We agree to convene a scientific working group, with input from NMFS, to investigate benthic recovery following dredging. However, the Conservation Recommendation as written is somewhat vague, and the effects analysis on which it is based is incomplete. We believe it is premature to determine that compensatory mitigation is necessary, especially if the Bay is not soft bottom habitat limited. We will implement an alternative, but consistent approach that will result in adequate mitigation of any significant impacts identified via the working group's peer-reviewed efforts.

Your assessment included a variety of information; however, there has now been additional literature review regarding potential impacts on soft bottom benthic habitats. We agree that there is variability in benthic recovery rates; however, they may be faster than discussed in your effects analysis. Rates can vary based on sediment grain size (some benthic organism are specific to grain size); overburden during dredge material placement (studies indicate that organisms can vertically migrate through 20 to 30 centimeters of sediment and still survive); sediment compaction; water depth; and edge-to-surface ratio (increasing the amount of undisturbed edge remaining after dredging will allow for faster recovery of benthic communities because organisms can horizontally migrate) (Wilber *et al* 2008; Clarke and Wilber; Wilber, Clarke, and Rees 2006; Rhoads and Germano 1986; Diaz and Schaffer 1990). Studies indicate that following initial disturbance, pioneering species (small opportunistic stage I benthic species) would quickly invade the disturbed surface and, over time, this assemblage would be replaced by longer-lived, deeper burrowing stage II species, until the last mature stage III benthic community colonizes the impacted area (Wilber *et al* 2008; Clarke and Wilber; Rhoads and Germano 1986). Further, several of the navigation channels, ports and marinas also experience a high level of shallow- and deep-draft navigation which may also disturb the soft bottom habitat within these channels on a daily or weekly basis, leaving the channels permanently disturbed. A literature review conducted by Ray (2005) on dredging impacts of shallow, unvegetated estuarine habitats describes how vessel traffic in shallow water affects benthic communities; it could be applied to

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deep draft vessels with a very small under keel clearance. In San Francisco Bay, the under keel clearance requirement is 2 feet or more (San Francisco Bar Pilots 2010).

USACE/USEPA Action: Based on the effects analysis conducted by the NMFS and the literature review conducted by the USACE and USEPA, we will convene a scientific working group to evaluate whether the Bay's soft bottom foraging habitat is limiting for EFH-managed species, and to develop a study plan to validate the assumptions on soft-bottom benthic recovery rates in the Estuary. If soft-bottom habitat is determined to be limiting for EFH-managed species, then the working group will evaluate what kinds of mitigation actions may be feasible in the Bay and where, and identify potential pilot project(s). Pilot project results will then be considered, in consultation with NMFS, in developing any specific compensatory mitigation implementation plan(s) for soft-bottom habitat effects related to dredging and aquatic dredged material placement. The working group should closely coordinate this task with the invasive species evaluation (Conservation Recommendation 10) such that any soft bottom habitat pilot study is consistent with any invasive species pilot study.

2. To minimize adverse effects to soft bottom benthic foraging habitat, NMFS recommends that the USACE and USEPA encourage practices that reduce the frequency of dredging in an area when possible and when not in conflict with sensitive areas (i.e., eelgrass) recommendations. This may include:

a. Dredging areas to the authorized design depth (not including overdepth) in a single episode, rather than dredging to lesser depths in multiple episodes.

We agree, and already implement this practice where possible. Unnecessary dredging in the Bay is not encouraged; however, we cannot require project proponents to dredge more than their economics allow. Only those areas that are shallower than the design depth are authorized to be dredged – dredging only the overdepth is not authorized. This minimizes impacts by decreasing the footprint of the dredge area and minimizing the volume dredged and placed at aquatic disposal sites. However, an overdepth allowance must always be included in project authorizations and in fact helps to reduce the need for more frequent dredging.

b. Discourage the initiation of dredging at times when it is unlikely that dredging will be completed in a single episode.

We agree. We already implement this practice where possible, and will continue to do so. When projects are proposed late in the dredge work window, the DMMO requests that the project proponent provide evidence that the project can be completed within the work window. If dredging on the project must begin but cannot be completed within the work window, it is required to stop at the end of the work window and resume the following year when the work windows reopen, unless it is granted an extension from NMFS based on project-specific ESA consultation.

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c. Rotating areas within a project footprint to be dredged when the entire area cannot be dredging to the authorized design depth (not including overdepth) in a single episode. This would result in the dredging of one area to design depth in a single episode and dredging of another area to design depth in a subsequent episode rather than dredging smaller amounts from both areas simultaneously in multiple episodes.

We agree. We already implement this practice where possible, and will continue to do so. Project proponents typically do not dredge the same area in subsequent episodes, unless that area continually shoals. Shoaling patterns in the Bay are dynamic and, as a result, we cannot dictate where dredging is to take place. In some cases, a hazardous shoal occurs in the same place every year and it must be removed to allow safe navigation. In addition, project proponents will sometimes phase the work for reasons such as economics, equipment availability, or logistics. In such a situation, project proponents will sometimes fully dredge one area as a single episode, and another area will be dredged in a subsequent episode. Depending on deposition rate, several years might pass before a given area is dredged again, or the same area may require dredging every year. Whatever the necessary frequency, as noted above, an overdepth allowance must always be included in project authorizations and in fact helps to reduce the need for more frequent dredging at that location.

3. To minimize or mitigate for uncompensated adverse effects to soft bottom benthic foraging habitat, NMFS recommends that the USACE and USEPA fund a single NMFS fishery biologist position to specialize in all dredge related activities. This position would help address loss of fish foraging habitat by allowing NMFS to actively participate in the LTMS Science Committee. The USACE, USEPA and NMFS are authorized to enter into an Interagency Reimbursable Agreement pursuant to the Economy Act (31 U.S.C. 1535), which provides that an agency may place an order with a major organizational unit within another agency for goods or services.

In previous meetings and discussions with NMFS, we have highlighted that there are a number of legal difficulties that could constrain our ability to comply with this request. In particular, we agreed to provide further discussion about provisions of the Economy Act for NMFS's information. That discussion is provided below.

However, we also discussed concerns about whether NMFS's request would constitute an inappropriate augmentation of Congressional appropriations. Basically, an inappropriate augmentation of appropriations occurs when the work to be done is for the benefit of the agency receiving the augmentation, as opposed to benefitting the agency providing the augmentation. In this case NMFS has asked for USACE and USEPA to fund a NMFS position in order to allow NMFS to better carry out its own responsibilities, by participating more fully in DMMO and LTMS activities.

Finally, even if we could successfully navigate these legal difficulties, we do not believe it is necessary to do so. The LTMS agencies have always encouraged and continue to encourage

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NMFS's active participation in DMMO and the LTMS Program, and completion of this programmatic EFH consultation should free resources sufficiently to allow NMFS to dedicate staff to participate more fully if NMFS so chooses (completion of the pending, separate programmatic ESA consultation for LTMS will further free overall NMFS staff resources). For these reasons, we will not fund a NMFS fishery biologist position.

Economy Act Discussion

The USACE and USEPA have no authority to fund a NMFS fishery biologist position in dredged-related activities. The Economy Act statue reads:

(a) The head of an agency or major organizational unit within an agency may place an order within the same agency or another agency for goods or services if:

(1) Amounts are available;
(2) The head of the ordering agency or unit decides the order is in the best interest of the United States Government;
(3) The agency or unit to fill the order is able to provide or get by contract the ordering goods or services;
(4) The head of the agency decides ordered goods or services cannot be provided by contract as conveniently or cheaply by a commercial enterprise.

Even conceding that conditions 1, 2 and 4 are applicable (i.e., that the amounts are available, the order is in the best interest of the United States, and we could not obtain the services as conveniently or cheaply by a commercial enterprise), we are still left with the need to find an authority to provide or get by contract a fisheries biologist position to participate in the LTMS Science Committee for purposes of complying with a 'non-mandatory' recommendation by NMFS. There is no authority in any Water Resources Development Acts. However, if Congress were to make special legislation (authorization/appropriations) to comply with this Conservation Recommendation, then we would be able to meet condition 3 of the Economy Act.

Additionally, there is another fiscal law concerned with the subject of this Conservation Recommendation. In a legal opinion, Government Accountability Office found that one organization within the Department of Homeland Security pooled its appropriations to fund what it refers to as shared services (similar to funding NMFS to participate in the LTMS Science Committee). Pooling funds across appropriations is for transfer, and unless otherwise authorized by law, transfer of funds between agency appropriations accounts are prohibited by law. Likewise, the pooling of the USACE appropriations and USEPA appropriations for shared services is prohibited by law (the Honorable Robert C. Byrd, B-308762, September 17, 2007).

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B. Eelgrass indirect effects (refugia loss)

4. To avoid and minimize adverse effects of turbidity on eelgrass, NMFS recommends that the following BMPs be implemented for any dredge project identified as having the potential to indirectly affect eelgrass (Table 6). To determine which BMP is appropriate for an individual project, a systematic approach has been developed as an easy to use flowchart (Appendix 2).

a. Avoidance: Under the following conditions, no turbidity effects are expected, therefore no additional minimization BMPs required:

(i) Using a hydraulic dredge, no overflow,
(ii) Dredging in sand (>80% sand) substrate,
(iii) Physical barriers or site-specific hydrodynamics prevent turbidity plumes from dispersing to the adjacent eelgrass.

We agree with the avoidance measures listed above, in that these types of equipment, sediments and physical structures avoid impacts from increased turbidity during dredging projects. We further note that the in-Bay placement sites are located in deep water, at good distances from established eelgrass beds, and therefore do not constitute a concern for indirect effects related to turbidity. We also appreciate the clear decision tree represented by the flowchart in Appendix 2.

b. Minimization: Under the following conditions, turbidity effects are expected, therefore additional minimization BMPs are required:

(i) Using a mechanical dredge
(ii) Dredging in fine sediment (<80% sand) substrate
(iii) Currents may disperse suspended sediments to adjacent eelgrass.

Examples of turbidity minimization measures include silt curtains, light monitoring, and any other operational control, subject to NMFS approval.

(a) Silt Curtains
(b) Light Monitoring

We understand this recommendation to be applicable to projects that have eelgrass in the immediate vicinity of dredging operations without physical barriers to limit the extent of turbidity plumes. There are approximately 30 dredging projects listed in table 6 as having potential indirect impacts on eelgrass beds within 250 meters of the project. While this table lists projects individually, some have several components such as the Port of San Francisco or Port of Oakland. In these cases, only certain areas within the overall project are within 250 meters of eelgrass. In addition, in some cases, the use of turbidity curtains is limited or inappropriate due to current speed or specific conditions of the site. Therefore, we will implement these measures

on a case-by-case basis, and provide the results of these determinations in the annual report discussed later in this response.

Regarding the light monitoring recommendation, this measure would provide additional information about turbidity plumes and their associated potential impacts on eelgrass beds. For example, if light monitoring was conducted over a range of tide cycles during a dredging project, it may show whether or not further monitoring is necessary during future episodes for a particular project footprint, as long as the distance to the nearest eelgrass remains the same. Examination of at up to three episodes will be the minimum needed to consider as a basis for determining necessary future light monitoring. We will compile and analyze data from any light monitoring projects to determine if there is applicability to other similar dredging projects. Once sufficient information is gathered, it will be provided to NMFS for further consideration of the 250 meter buffer and this minimization measure; as we believe that a 250 meter buffer needs further consideration and would be best supported through a body of scientific information. It is anticipated that such information may take a few years to obtain. The USACE and USEPA will implement this measure on a case-by-case basis and provide information regarding the required monitoring in the annual report as well. In addition, we propose to convene a scientific working group to evaluate the compiled data and recommend and/or confirm the best course of action to protect this resource.

(c) <u>Additional Operational Controls:</u> The following list of operational BMPs should be employed maximally for all dredging projects. However, they should be applied more judiciously when indirect turbidity effects on eelgrass are possible. When implementation of any of the above avoidance and minimization BMPs is not feasible, then the following should be considered in combination with light monitoring to verify their effectiveness.

(i) Increased cycle time / reduced bucket deployment: longer cycle times reduce the velocity of the ascending bucket through the water column, which reduces potential sediment wash from the bucket.

(ii) Consider alternate equipment: if all other avoidance and minimization measures have failed to effectively reduce turbidity effects on eelgrass, consider equipment with lower likelihood of generating turbidity, *e.g.*, use an environmental bucket instead of an excavator.

We agree with the potential for operational controls to reduce turbidity and will include such measures in permits for projects deemed to have potential indirect impacts to eelgrass, as appropriate. It is anticipated that most projects would be able to apply at least one of the techniques listed above. Where that is not the case, USACE would separately discuss other measures with NMFS regarding indirect eelgrass effects for that specific project (see below).

c. <u>Exclusion:</u> If USACE or USEPA determine that none of the above avoidance or minimization measures are implementable or provide sufficient turbidity reduction

for a specific project, then that project is not covered by this programmatic consultation and must undergo individual consultation with NMFS.

We agree that separate consultation with NMFS must occur regarding indirect eelgrass impacts for projects (or episodes) in table 6 that cannot implement sufficient turbidity reduction. However, these projects (or episodes) should not necessarily be excluded from other aspects of this overall consultation, to the extent that other measures under this consultation adequately address other potential EFH-related impacts of the project. We expect to separately consult on individual projects only regarding those issues in this consultation that cannot be adequately implemented on those individual projects.

C. Eelgrass direct effects (refugia loss)

5. In all cases where eelgrass is found directly in the dredge project area, NMFS recommends that every effort be made to avoid direct removal or burial. In cases where avoidance is not possible, impacts to eelgrass must be mitigated for to achieve no net loss of eelgrass or suitable eelgrass habitat. Populations of eelgrass are highly dynamic, and the exact location and extent of eelgrass beds can change across seasons and years. As discussed in V.D.3.b above, the 45 m buffer around the 2003/2009 mapped eelgrass extent accounts for areas between patches, temporal variation in bed extent, and area for potential bed expansion. Therefore, in all cases where the project area overlaps with the 45 m buffer around eelgrass (table 6) NMFS recommends that the project must mitigate for those direct effects using one of the options described below.

Independent of which mitigation option is chosen, a mitigation plan shall be prepared in accordance with the USACE's 2004 Final Mitigation Guidelines and Monitoring Requirements, acknowledging that mitigation within subtidal and marine waters does not always fit well within all aspects of this guidance.

Mitigation Option #1

USACE and USEPA may establish an eelgrass mitigation bank to compensate for direct impacts to eelgrass within their project footprints that they are unable to avoid.

Mitigation Option #2

The USACE and USEPA may continue to mitigate on a project-by-project basis:

a. For individual projects with eelgrass occurring in the project footprint, prior to the start of dredging operations, eelgrass and potential eelgrass habitat directly within and adjacent to the dredge footprint will be mapped and measured for area and density. The extent of adjacent areas to be mapped should be determined on project-

by-project basis depending on site-specific conditions. An area and density survey report of the eelgrass will be submitted to NMFS for approval within 30 days of the start of dredging activities.

b. To protect eelgrass outside the project footprint, BMPs to avoid and minimize indirect effects of turbidity (section VI.B.4, Appendix 2) will be strictly employed as appropriate.

c. Eelgrass directly adjacent to the dredge footprint will be marked with buoys to ensure vessel traffic/barges avoid those areas. Dredging equipment will not be located to the maximum extent possible, temporarily or at anchor, in eelgrass areas outside the project footprint.

d. If NMFS determines dredging has adversely impacted eelgrass in the project area based on monitoring observations or comparison of pre- and post-dredging surveys, the applicant must provide NMFS with an eelgrass Mitigation Plan within 60 days of completing the post- dredge survey. All Mitigation Plans that have not been previously approved by NMFS will be subject to any existing or forthcoming NMFS Eelgrass Mitigation Policies (currently the Southern California Eelgrass Mitigation Policy, Appendix 4).

Mitigation Option #3

Alternative mitigation plan: The USACE and USEPA may develop an alternative in-kind mitigation plan for impacts to eelgrass from dredge related activities subject to NMFS approval. This programmatic consultation will not cover projects listed in table 6 with direct impacts to eelgrass as determined by direct overlap with the 45 m buffer until the alternative mitigation plan is approved by NMFS and implementation is successful. Until the alternative plan is developed, approved, and implemented, mitigation will be done on a project-by-project basis as described in Mitigation Option #2.

We greatly appreciate NMFS consideration and flexibility in developing the various mitigation options for direct impacts to eelgrass. At this time we will implement Option #3. USACE and USEPA will continue to work with NMFS to require mitigation on a project-by-project basis as described in Option #2 and as currently required for the actual footprint of any dredging episode. At this time we will use the 45 meter buffer to determine where surveys are needed and surveys will be conducted in the actual dredge footprint only. However, we will convene a science working group to evaluate the adequacy this buffer zone. We will also work through the LTMS program in conjunction with NMFS to determine the feasibility and applicability of developing a mitigation bank that could be used by the federal government and/or the non-federal dredging community. There are both legal and logistical issues to be investigated as well as potential locations, success criteria and other, yet to be determined issues associated with developing an eelgrass mitigation bank. In the interim period, we will provide information annually to NMFS

regarding the eelgrass beds directly impacted by dredging projects and the mitigation that was subsequently required.

D. Turbidity

6. <u>Reduce in-Bay disposal:</u> To avoid or minimize adverse effects from disposal related turbidity, NMFS recommends that USACE and USEPA further reduce in-Bay disposal. This may include:

a. Outfitting USACE hopper dredges to be compatible with and to use offloader equipment for out-of-Bay placement of sediment.

Possible hopper dredge retrofit is out of local USACE control, but is being considered separately by USACE (nationally).

b. Encouraging or facilitating non-federal dredge projects to use available offloaders for out-of-Bay placement of sediment.

We agree. We already implement this practice where possible, and will continue to do so. USACE was able to successfully include provisions in the most recent federal contract for operation of the offloader at the Hamilton Wetland Restoration Project that would allow non-federal dredging projects to offload suitable material to the site at a reasonable cost. This provision will make non-federal use of the offloader much more feasible for this project and may serve as a model for future federal offloader contracts in the region.

E. Contaminants

7. <u>Bioaccumulation testing:</u> NMFS recommends that USEPA and USACE discretionary authority to require bioaccumulation evaluations (and/or alternatives to in-Bay disposal) be more clearly defined, with clear triggers for testing and subsequent permitting decisions. Specifically, bioaccumulation testing should be required for in-Bay disposal when dredged material contains PCBs, PAHs, DDTs, Dieldrin, chlordane, dioxins/furans, or mercury above Bay ambient levels or above bioaccumulation triggers used elsewhere in the Northern Pacific. If bioaccumulation is confirmed, the dredged material must be declared unsuitable for in-Bay disposal. This procedure is to remain in place until other sediment bioaccumulation trigger levels, or other tools to assess bioavailability, are developed.

DMMO directs dredged material testing in accordance with joint USACE/USEPA National sediment testing manuals and published local implementation guidance. However, we agree with the need to more clearly define when bioaccumulation testing will be required for in-Bay placement. However, neither Bay ambient sediment concentrations, nor bioaccumulation

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triggers used elsewhere in the Northern Pacific, are necessarily the most appropriate triggers for all of the bioaccumulative compounds listed. For example, in some cases Bay ambient sediment concentrations are not expected to result in bioaccumulation to levels of significant concern for biological effects, and the increased expense of bioaccumulation testing would not be justified in such cases. Therefore we will implement an approach that uses a variety of bases for establishing initial trigger levels for the different contaminants. Note that in some cases we may have adequate bioaccumulation information from past testing of an area, such that we could determine additional testing is not needed for each episode. Also note that, interpretation of bioaccumulation results is not straightforward. By itself, it involves consideration of test tissue concentrations relative to reference results, appropriate toxicity reference values (TRVs), and other measures.

But our final suitability determinations also must take into account project-specific issues such as practicability of available alternatives, aquatic dredged material placement volumes, and other factors that may affect whether risks associated with disposal are avoidable or unacceptable. Since this evaluation must occur on a case-by-case basis, we cannot presently establish a bright-line threshold for bioaccumulation results that would pre-determine sediments to be unsuitable for aquatic placement in all cases.

We understand that NMFS would prefer to define "ambient" sediment concentrations in the Bay using only the most recent sampling data and using different ambient values for different segments of the overall Bay. We are not following NMFS recommendation in this regard for several reasons. Included among them are:

(1) the established Total Maximum Daily Loads (TMDLs) for mercury and PCB adopted the selected approach following a substantial public involvement process and in consideration of practicability issues for the various industries affected – the approach allows improvements in source control as well as natural recovery to proceed, and ensures steady improvement in environmental conditions in an economically responsible manner;
(2) these TMDLs appropriately recognize that, as managed under the LTMS Program, dredging represents a substantial net remover of contaminants from the Bay, such that remaining in-Bay placement need not be managed via specific mass allocations in the TMDLs;
(3) the designated in-Bay placement sites in different portions of the Bay are effectively managed by the LTMS agencies as a unit – that is, due to site-specific in-Bay placement volume limitations, Environmental Windows considerations, or other factors we at times require placement at an in-Bay site other than that originally proposed by the permittee – as such, suitability determinations typically apply to all of the in-Bay placement sites; and
(4) the dispersive nature of the designated in-Bay placement sites, coupled with wind-and tidal current patterns, means that some of the sediments dispersed from each of the aquatic placement sites can be re-deposited virtually anywhere within the Bay system –

therefore different "standards" based on a subset of conditions in the immediate vicinity of each site are not justified and would not be effective.

USEPA/USACE Action: Starting with in-Bay placement proposed for 2011, for USACE and "medium" dredger projects as defined in the LTMS Management Plan we will require up front bioaccumulation testing when and where we have reason to believe (e.g., based on past testing) that sediment concentrations are likely to exceed any of the values in the following table. If we did not initially require bioaccumulation testing for a project, but the sediment chemistry results show any substantial exceedences of the levels in table 1.0, we will allow the project proponent the following options: 1) conducting bioaccumulation testing on that sediment; 2) conducting higher-resolution chemical evaluation in order to identify the smallest volume needing bioaccumulation testing; and/or 3) proposing an alternative to in-Bay placement. If only very minor exceedences of the values in table 1.0 are found, we may in some cases determine that the additional testing is not needed to reach a suitability determination. Also, in most cases we will not require up front bioaccumulation testing for the "small dredger" class, as defined in the LTMS Management Plan. The small dredger class is generally exempt from alternatives analysis requirements, and as a group accounts for an average of only 250,000 cubic yards of dredging per year or less. Individual projects are generally much smaller than this; and the risks associated with placement of small volumes of material with only small exceedences of the values in the table are minimal. However, even small dredger projects may be required to conduct bioaccumulation testing when substantial exceedences of the values in table 1.0 are expected or found, especially if their dredging episode volume is relatively large. In such cases we would expect to offer small dredgers the same options as described above for USACE and medium dredgers.

In the longer term, modifications/improvements to this general approach may be made based on evaluation of accumulated testing results, advancements in testing or evaluation tools, changes in Bay ambient sediment concentrations, etc. Significant proposed changes will involve independent scientific review prior to implementation.

Consistent with the NMFS recommendation, the initial chemical trigger levels in table 1.0 are based on the following hierarchy: (1) use limits set in established local TMDLs where such exist (mercury and PCBs); (2) use current San Francisco Bay ambient sediment concentrations where appropriate (PAHs); (3) use published bioaccumulation trigger levels or other values used in the Pacific Northwest where 1 and 2 above don't apply (DDTs, Chlordane, and Dieldrin); and (4) use national and west coast background concentrations (dioxins/furans).

For identifying "ambient" chemical concentrations of mercury and PCBs in San Francisco Bay sediments, we have adopted the approach reflected in the California-established and EPA-approved TMDLs for these contaminants. This approach uses the 99th percentile of the running 10-year area weighted cumulative distribution function of RMP randomized data from appropriate Regional Monitoring Program (RMP) sediment sampling stations, removed from direct pollutant sources. However, beginning in 2002, the RMP improved the manner in which

these stations were selected, by further randomizing stations to remove any regional bias. This change made it inappropriate to include pre-2002 data. Therefore at this time the value based on only the most recent 7 years of sampling data (2002-2008). By the time 2011 data are collected and included in the calculations, a 10-year running average will again be the basis of these ambient calculations.

For PAHs, we agree with NMFS that the 1998 ambient value (based on the 85th percentile of early RMP data, and used in guidance from that time defining "cover" versus "non-cover" sediment) should be updated. We will update the value based on the 85th percentile of the running 10-year area weighted cumulative distribution function of RMP randomized data from appropriate RMP sediment sampling stations removed from direct pollutant sources.

San Francisco Bay ambient concentrations are inappropriate to use as bioaccumulation triggers for DDTs, Chlordane, and Dieldrin. For DDTs and Chlordane, as NMFS recommends, we will initially use published marine sediment bioaccumulation trigger levels from Puget Sound, Washington. However, there is no published bioaccumulation trigger level for Dieldrin. Instead, for Dieldrin we will use the published "SL2" level from the Pacific Northwest Sediment Evaluation Framework.

Finally, for dioxins/furans we will use a value slightly above national and west coast background concentrations, but below the USFWS-established maximum value for wetland restoration at the local Hamilton Wetland Restoration Project. This value is also consistent with the Puget Sound limit for unconfined aquatic placement. EPA's extensive 2000 survey of San Francisco Bay sediment for dioxins/furans found that less than 10 percent of all the stations sampled exceeded this level. Note that dioxin/furan testing for in-Bay placement will only be required in areas that are expected or have been shown (e.g., via EPA's 2000 Estuary-wide survey, ongoing RMP monitoring, or past project-specific testing) to have elevated dioxin/furan levels.

Table 1.0: Initial Sediment Chemistry Trigger Levels for Bioaccumulation Testing, for Proposed in-Bay Placement at Designated San Francisco Bay Aquatic Placement Sites

	Total PAHs (µg/kg)	**Mercury** (µg/kg)	**Total PCBs** (µg/kg)	**Total DDTs** (µg/kg)	**Chlordane** (µg/kg)	**Dieldrin** (µg/kg)	**Dioxins/ Furans** (pg/g)
Bioaccumulation Trigger (Initial)	3,829	0.46	26	50	37	3.5	10
Basis	1	2	2	3	3	4	5

Basis Notes:

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1. Updated ambient sediment concentration for total PAHs, in *µg/kg* (parts per billion) dry wt, defined as the 85th percentile of the running 10-year area weighted cumulative distribution function of RMP randomized Bay-wide site data (currently for the years 2002-2008).
2. Ambient sediment concentration for mercury and total PCB, in *µg/kg* (parts per billion) dry wt, defined as the 99th percentile of the running 10-year area weighted cumulative distribution function of RMP randomized Bay-wide site data (currently for the years 2002-2008), per established TMDLs for San Francisco Bay.
3. Published bioaccumulation trigger for the chemical class for Puget Sound marine sediments, in *µg/kg* (parts per billion) dry wt.
4. Published "SL2" value from the Pacific Northwest Sediment Evaluation Framework, in *µg/kg* (parts per billion) dry wt.
5. Toxicity Equivalency Quotient (TEQ) in *pg/g* (parts per trillion) dry wt, calculated based on WHO 1998 Toxicity Equivalency Factors (TEFs). Value is consistent with the published Puget Sound limit for unconfined aquatic disposal, and is ½ the established limit for placement at the Hamilton Wetlands Restoration Project site. Note that dioxin testing for in-Bay disposal will only be required in areas that are expected or have been shown (e.g., via EPA's 2000 Estuary-wide survey, ongoing RMP monitoring, or past project-specific testing) to have elevated dioxin/furan levels.

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8. **<u>Residuals:</u> NMFS recommends that if dredging results in the exposure of new surface material having higher chemical concentrations than the sediment that was dredged or which exceeds the ambient concentration of surrounding areas for the contaminants of concern listed in CR 7 above, then the parcel must be managed to prevent exposure to the contamination and further degradation of EFH if testing of the new sediments exposed shows toxicity or bioaccumulation of contaminants. This may warrant over-dredging and subsequent backfill to planned project depth. The exact details will need to be determined on a case-by-case basis.**

We agree with the need to make residuals testing more systematic, and will implement an appropriate testing approach. However, some aspects of the NMFS recommendation are problematic, particularly regarding management or remediation by LTMS when residuals are elevated.

First, a simple increase in the contaminant level of a residual surface, compared to the pre-dredge surface, does not always mean an "impact" to EFH would result such that special management actions or remedial measures should be required. For example, if a minor increase occurs but both pre- and expected post-dredge surface concentrations are below levels of concern, we would not impose additional testing requirements or management restrictions. Similarly, both the magnitude of increase and the areal extent of the increase influence the degree to which EFH quality may be adversely affected. The consequences of localized, small-magnitude increases would be of substantially less concern than widespread, larger-magnitude increases.

Second, LTMS and the state and federal dredged material permitting programs evaluate the sediment that individual project proponents wish to dredge (unlike enforcement-based remediation programs, or regional monitoring efforts not tied to an individual project). In this regard, it is generally not appropriate to require individual navigation dredging project

proponents to undertake sediment testing well outside of their proposed dredging footprints, or to conduct surveys to determine specific background concentrations in their vicinity. All dredging projects that don't conduct their own monitoring (and virtually none do) are required to pay into the RMP to support Bay-wide monitoring studies; and the LTMS Program and DMMO appropriately utilize this more comprehensive data. Nevertheless, information generated from testing for proposed navigational dredging projects can help identify "hot spots" that should be evaluated more closely by other programs. In fact there have been a number of instances where, based on pre-dredge testing, DMMO suspended processing of proposed dredging permits while other state or federal programs with cleanup authority evaluated the sites. We will continue to provide sediment testing information to individual agencies for consideration of the need for cleanup action whenever necessary.

Finally, it is also generally not appropriate to look to the LTMS program to independently require remediation measures such as over-dredging and backfilling. Where sediment contaminant concentrations are found to be substantially elevated at depth, and the source and extent are unknown, the LTMS agencies would typically refer the project to other programs for further investigation (as discussed above).

USEPA/USACE Action: We will require collection and separate archival of residual-depth sediment for all dredging projects where we have reason to believe (e.g., based on recent testing) that overlying sediment concentrations have approached or exceed any of the values in table 1.0 presented under CR 7 (above). If testing of the overlying sediment shows that any of table 1.0 values are exceeded, analysis of the archived residual samples will be required. If residual samples were not taken initially, and the sediment chemistry results show that overlying sediments contain substantial exceedences of the levels in the table, we will require separate pre- or post-dredging sampling and testing of the residual surface to confirm whether contamination persists at depth. If only minor exceedences of the values in the table are found, either in magnitude or in areal extent, we may determine that separate sampling and testing is not warranted. Evaluation of the need for potential additional management actions to address elevated residual surface contamination will be done on a case-by-case basis.

9. To minimize or mitigate for adverse effect to EFH from contaminants, NMFS recommends that the USACE and USEPA fund a single NMFS fishery biologist position to specialize in dredged related activities. This position would minimize adverse effects from contaminants by allowing the NMFS to actively participate in the DMMO. The USACE, USEPA and NMFS are authorized to enter into an Interagency Reimbursable Agreement pursuant to the Economy Act (31 U.S.C. 1535) which provides that an agency may place an order with a major organizational unit within another agency for goods or services.

Please see response to CR 3, above.

F. Invasives

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10. **To minimize adverse effects to EFH from invasive species, NMFS recommends that the USACE and USEPA establish a working group tasked with evaluating the feasibility of enhancing native benthic invertebrate species in the San Francisco Estuary. The working group should assess methodologies, enhancement sites, suitable species, and appropriate monitoring. Based on the outcome of the working group, a pilot study should be designed to determine if reintroduction of the native benthic invertebrate species into the estuary is feasible. If the results of the pilot study determine that this is feasible, then a program should be implemented that will fully compensate for the annual impact to benthic habitat from dredging activities. If determined infeasible, or the scope does not fully compensate for impacts, then the USACE and USEPA will develop alternative measures to compensate for impacts to EFH.**

We believe the NMFS' effects analysis and subsequent CR does not adequately tie dredging and in-Bay dredged material placement to invasive species. However, the USACE and USEPA are stewards of the environment and, as such, agree that a scientific working group within the LTMS Program should be convened to discuss invasive benthic species in the Bay as associated with dredging projects.

Further, on June 2, 2009, the USACE Headquarters established a national policy that complements the National Invasive Species Act of 1996 (16 U.S.C. § 4701 et seq.) (USACE Invasive Species Policy) to prevent and/or reduce invasive and non-native species. This policy applies to all USACE operations and maintenance projects and will be applied to non-federal dredging projects. The policy requires collaboration with federal, state and local agencies. One of the objectives discussed in this memorandum is to restore native species and habitat conditions and rehabilitate high-value ecosystems and key ecological processes that are impacted by invasive species.

USACE/USEPA Action: Although we feel that the NMFS' effects analysis did not provide a sufficient nexus to maintenance dredging and invasive benthic species, we will convene a scientific working group to develop a study plan to investigate potential methodologies of restoring native benthic invertebrate species in the Bay. The scientific working group will evaluate whether mitigation is necessary and feasible in the Bay and identify potential pilot project(s). Pilot project results will be considered, in consultation with NMFS, in developing any specific compensatory mitigation implementation plan(s) for invasive species effects related to dredging and aquatic placement. The working group should closely coordinate this task with the soft bottom habitat scientific work group (CR 1) such that any invasive species pilot study is consistent with any soft bottom habitat pilot study.

11. **To minimize or mitigate for adverse effect to EFH from invasive species, NMFS recommends that the USACE and USEPA fund a single NMFS fishery biologist position to specialize in dredge related activities. This position would account for**

adverse effects from invasive species by allowing the NMFS to actively participate in the LTMS Science Committee.

Please see response to CR 3, above.

G. Other Submerged Vegetation

12. To avoid adverse effects to EFH and HAPC, in all cases where native submerged aquatic vegetation, other than eelgrass, (e.g., *Ruppia*, *Stuckenia/Potamogetan*), is found directly in the dredge project area, NMFS recommends that every effort be made to avoid direct removal or burial. In cases where avoidance is not possible, mitigation should occur to compensate for adverse effects:

a. For individual projects with native submerged aquatic vegetation occurring in the project footprint, prior to the start of dredging operations, native submerged aquatic habitat directly within and adjacent to the dredge footprint will be mapped and measured for area and density. The extent of adjacent areas to be mapped should be determined on project- by-project basis depending on site-specific conditions. An area and density survey report of the native submerged aquatic vegetation will be submitted to NMFS for approval within 30 days of the start of dredging activities.

b. If NMFS determines dredging has adversely impacted native submerged aquatic vegetation in the project area based on monitoring observations or comparison of pre- and post-dredging surveys, the applicant must provide NMFS with a Mitigation Plan within 60 days of completing the post-dredge survey. The mitigation plan should be prepared in accordance with the U.S. Army Corps of Engineers' (USACE) 2004 Final Mitigation Guidelines and Monitoring Requirements, acknowledging that mitigation within subtidal and marine waters does not always fit well within all aspects of this guidance.

We have no knowledge of the locations and extent of the species listed above in San Francisco Bay. Please provide any existing maps depicting the location or extent of these species and others that NMFS considers special aquatic habitat. Without additional information or mapping, this recommendation appears to be infeasible. It is not appropriate to require every dredging project to undertake pre- and post-dredge surveys for plants that have not been previously identified at their locations in the Bay. Once NMFS provides sufficient mapping of known existing native submerged aquatic vegetation beds and identification tools, the USACE and the USEPA will discuss potential next steps in avoiding or minimizing impacts to this group of species.

H. Reporting Requirements

13. To avoid adverse effects to EFH that may occur from improper utilization of this programmatic consultation, NMFS recommends that the USACE provide annual

reports to the NMFS on all activities conducted under this programmatic consultation. Reports should be submitted to the NMFS within 90 days of the end of each calendar year.

We agree. For its federal dredging, the USACE will provide the information recommended in this Conservation Recommendation. For non-federal dredging, 90 days might not be enough time to collect all the requested information. The DMMO will provide this information to the NMFS as soon as the information is compiled and available for distribution. The federal dredging reports may be provided separately from the non-federal dredging reports.

14. **To avoid adverse effects to EFH that may occur from improper utilization of this programmatic consultation, NMFS recommends that the USACE notify the NMFS of (a) when a project will indirectly affect eelgrass and which BMP is being used (inclusion of the BMP in the Public Notice and submission of the notice to the NMFS is satisfactory); (b) when a project will directly impact eelgrass and what mitigation is proposed; and (c) when a project has contaminant loads above those indicated in Conservation Recommendation 7 and how the material will be disposed.**

For its federal dredging, the USACE will provide notification to the NMFS prior to dredging. The notification will include which projects may directly and/or indirectly impact eelgrass and which BMPs and mitigation measures will be employed as part of the dredging. USACE will also supply the NMFS with annual sediment sampling and testing reports and where dredged sediment will be placed.

For non-federal dredging, the NMFS already receives Public Notices, which include EFH discussions (potential impacts and mitigation measures). NMFS also receives copies of Dredge Operation Plan approvals, which are notices to proceed with dredging. The information regarding direct and indirect impacts on eelgrass and proposed BMPs and mitigation will also be provided to the NMFS via public notices.

Sediment suitability is determined by the DMMO sampling and testing process. The NMFS receives copies of all letters regarding sampling and testing results for non-federal dredging projects. If sediment that is proposed for dredging is found by DMMO to be unsuitable for unconfined aquatic disposal, the NMFS is notified in the copy of the sediment suitability letter. However, it is not always known at that time whether unsuitable material will be immediately dredged, or where it will be disposed. The approval or non-approval for placement of dredged sediment is also contained in the DMMO meeting notes; the NMFS is an advisory resource agency to the DMMO and as such receives copies of these notes. Also, NMFS is always welcome at DMMO meetings to hear these discussions directly.

USACE and USEPA Responses to NMFS Programmatic EFH Conservation Recommendations for the LTMS Program

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