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MOFFETT FIELD
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RESPONSES TO CLARIFICATIONS ON THE REVISED DRAFT FINAL STATION-WIDE FEASIBILITY STUDY REPORT RESPONSE TO COMMENTS MOFFETT FEDERAL AIRFIELD OCTOBER 30, 1998

1.0 INTRODUCTION

This document presents the Navy's responses to clarifications from the regulatory agencies on the June 9, 1998 response to comments for the revised draft final station-wide feasibility study (SWFS) report for Moffett Federal Airfield (MFA) dated January 9, 1998. The comments below were received from Dr. Lynn Suer of the U.S. Environmental Protection Agency (EPA) on July 31, 1998 and from Mr. Joseph Chou of the California EPA, San Francisco Bay Regional Water Quality Control Board (RWQCB) on August 12, 1998.

2.0 RESPONSES TO EPA COMMENTS

2.1 GENERAL COMMENTS

1. Comment: **The Navy's response to comment 36 is insufficient. Even though the Inland Surface Water Plans and Enclosed Bays and Estuaries Plan are not in force, the Porter-Cologne Water Quality Control Act is an applicable ARAR for which the Water Quality Control Plan (Basin Plan) for the Regional Water Quality Control Board, San Francisco Bay Region is a requirement. The Basin Plan implements actions for setting soil or sediment cleanup levels when water quality is threatened. The water quality objectives set forth in the Basin Plan are, therefore, applicable standards.**

   In addition, the U.S. EPA ambient water quality criteria (AWQC) are action-specific ARARs, as potential exceedances of these criteria must be considered in setting clean-up goals for contaminated sediments. The Proposed California Toxics Rule (Federal Register Vol. 62, No. 150, Tuesday, August 5, 1997), which promulgates numeric criteria for priority

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toxic pollutants for the State of California, should also be considered since these criteria will supersede the U.S. EPA Ambient Water Quality Criteria when the Rule is finalized.

The above-cited ARARs should be included in the Final FS Report.

Response: The above-cited requirements are discussed in Section 2.1.5 of the final FS report. However, neither the Basin Plan nor AWQC are considered applicable or relevant and appropriate requirements (ARARs) for this FS. From the results of the Phase II site-wide ecological assessment (SWEA), surface water bioassay results indicated low to no likelihood of adverse effects to ecological receptors due to surface water. Consequently, surface water is not a medium of interest in this FS and surface water is not included as a remedial action objective (RAO). Therefore, no ARARs are identified for surface water.

2. **Comment:** **The Final FS Report should provide the contaminant concentrations that correspond to the hazard quotients (HQs) proposed as alternative clean-up levels.**

Response: The contaminant concentrations that correspond to the HQs proposed as allowable exposure levels are presented in Section 2.1.4 of the station-wide FS report. For total polychlorinated biphenyls (PCBs) in bulk sediment for HQ equal to 1, the cleanup level is 23 microgram per kilogram (μg/kg). For total PCBs, an HQ_3 for the most sensitive avian receptor (great blue heron) equal to 1 has a cleanup level of 127 μg/kg. For an HQ_4 equal to 1, the cleanup goal is 71 μg/kg.

3. **Comment:** **The rationale for establishing sediment cleanup levels based on hazard quotient values is not well supported. Attached are comments by Dr. Clarence Callahan on this topic. These comments must be addressed in the development of cleanup levels for the proposed plan.**

Response: Specific responses to comments from Dr. Clarence Callahan are presented in Section 2.2.

4. **Comment:** **The long-term monitoring plan has not been discussed in detail, and the Navy proposes that it be developed during the remedial design phase. EPA recommends that the scope of the monitoring plan, including contingencies for further remedial action, be incorporated into the record of decision. We look forward to working on this plan in conjunction with the Navy, other agencies, and resource trustees.**

Response: In the final FS report, four of the six alternatives presented involve excavation of the Eastern Diked Marsh, Northern Channel, and Marriage Road Ditch. As all the contaminated sediment and unacceptable risk levels will be removed from these areas, monitoring is not planned.

Sediment in the stormwater retention pond is not included in this FS. Because the levels of PCBs in the sediment are moderate to low, excavation of the sediment may cause greater ecological damage than leaving the site undisturbed. For the stormwater retention pond, an ecological validation study is being designed in conjunction with the regulatory agencies and will be conducted to assess the possibility of risk to flora and fauna. The results of the study will be incorporated into the remedial decision process.

2.2 SPECIFIC COMMENTS (FROM DR. CLARENCE CALLAHAN)

Comment: **<u>Page 4, Number 18.</u> Use of various HQ estimates. As stated in the EPA comments, there are many problems with the use of the HQ approach and even more uncertainty and even more inaccuracy with the various estimates of HQs i.e., HQ_1, HQ_2, etc. EPA does not agree that an HQ_3 should be used for avian and mammalian receptors and HQ_4 in other areas. There are other comments related to this problem (No. 23, 31, and 33) that could be addressed simply by recognizing that the estimates of risk at Moffett like other Navy sites is directly related to exposure**

concentrations as well as other factors. The most realistic and logical approach, however, to estimating risk at any site is to estimate the range of exposure for site receptors. Again, the Navy approach in using four estimates of HQ does not provide the range of exposure for receptors that best represents the site because the exposure estimates are based in artifacts of the approach. Life history information (e.g., young of the year, adult, food choices, residency time, etc.) should be integrated with the site conditions (e.g., contaminant distribution, concentration of contaminants, etc.) to produce a realistic range of exposure doses that should be compared to the Navy-BTAG threshold reference values (TRVs). In this process, a range of HQs would be estimated from which a significant risk would be identified.

The use of the most realistic HQ estimate would seem to be a logical strategy for estimating potential risk at Moffett. This is an area of the overall approach that needs for clarification and discussion between the Navy and the agencies.

Response: The response to EPA comment 18 may have been unclear. The Navy does not intend to evaluate cleanups in the station-wide FS by using HQ_3 in some areas and HQ_4 in other areas. Rather, all areas are evaluated using HQ_3. Areas with HQ_4 are also presented for comparison.

The Navy's opinion is that HQ_3 (most protective [lowest] TRV and average dose) is adequately protective and that HQ_4 is overly conservative. HQ_4 is based on the most protective TRV and the maximum dose and is overly conservative primarily because it relies on the maximum exposure. This is highly conservative considering the very heterogeneous distribution of contaminant concentrations observed in the study area. The highest chemical concentrations are very sporadically distributed and receptors, especially birds with their large ranges, would be unlikely to contact only the most highly contaminated areas. Furthermore, both HQ_3 and HQ_4 use the most protective TRV. The low TRV represents an exposure level at which <u>no</u> ecological affects are anticipated.

TRVs were based on a wide range of peer-reviewed, published data and were selected by consensus of a technical working group composed of the Navy and the regulatory agencies.

The Navy recognizes that the HQ approach does not provide a precise measurement of risk, but only a screening level for further evaluation. The use of a range of HQ values was intended to provide a means to set approximate bounds to risks likely to affect ecological receptors. Subsequent discussions with the regulatory agencies throughout the preparation of the station-wide FS have led to the use of only the HQs that consider the no adverse affects level TRVs (HQ_3 and HQ_4). Because these HQs represent no affects levels, the use of HQs provides a conservative and protective screen for selection of potential areas requiring cleanup. More detailed evaluations incorporating actual measurements of affects on site receptors, such as those planned for the stormwater retention pond, would be expected to reduce the area requiring remediation, not expand it. Consequently, using the HQ values to evaluate potential cleanup areas is inherently very conservative and protective.

Receptor life history information is incorporated in the HQ approach through the average and high dose estimates. For example, there were different assumptions of diet composition in the dose estimates for mallards. These assumptions were used to account for laying females consuming a greater proportion of animal flesh in their diet than males or non-laying females.

In summary, the Navy believes that the use of the HQ approach is useful in setting conservative and protective bounds on risks to ecological receptors and to provide meaningful information to the risk managers to evaluate potential cleanup options.

2. **Comment:** **HQs and HIs for avian and mammalian receptors. See comments above for response to comment Number 18. EPA doesn't believe that the response addresses the comment. The comment states that the difference estimates of HQ values as performed by the Navy is not acceptable, so maps displaying these values will be of no use.**

Response: See response to specific comment 1.

3. **Comment:** **<u>Page 7, Number 26.</u> "...most common benthic macroinvertebrates..." EPA requests a citation to support the statement. Whether or not the statement is quoted from the SWEA is immaterial. Please provide a citation from relevant literature or remove the statement because it is not supported by any data collected from the site.**

Response: The most common benthic macroinvertebrates (that is numerically dominant) in the South Bay mudflats are (1) the clam, *Gemma gemma*, (2) the tube-dwelling amphipod, *Ampelisca abdita*, and (3) the tube-dwelling polychaete, *Streblospio benedicti* (Nichols and Thompson 1985).

4. **Comment:** **<u>Page 7, Number 27.</u> HQ_3 should not be used, see comment 18. The paragraph may be a direct quote from the SWEA, however, questions still remain about its accuracy especially after the site visit by Keith Miles. The paragraph should be rewritten to reflect the actual situation with the incorporation of material by Dr. Miles.**

Response: It is unclear which response this comment is addressing. Comment 27 refers to uncertainty associated with risk assessments.

In the site visit by Dr. Keith Miles on May 27, 1998, no benthic investigation was conducted. The site visit included visual observations of algal and invertebrate communties within the water column in the stormwater retention pond. Organisms identified included immature corixids, ostracods, copepods, mosquito larvae, daphnia, and small fish.

5. **Comments:** **<u>Pages 8-9, Number 31</u>. RAOs. HQ_3 should not be used.**

Response: See response to specific comment 1.

6. **Comments:** **<u>Page 9, Number 33.</u> Allowable Exposure Levels. HQ_3 should not be used.**

Response: See response to specific comment 1.

7. **Comment:** **<u>Pages 10-11, Number 40</u>. Areas of Attainment. HQ_3 should not be used.**

Response: See response to specific comment 1.

8. **Comment:** **<u>Page 11, Number 44</u>. Innovative Technologies. EPA would like to be involved in the "Bench- and pilot-scale treatability studies..." performed by the Navy.**

Response: EPA will be included in the scoping and review of the pilot-scale field work plan as well as the review of the resulting data.

9. **Comment:** **<u>Page 12, Number 47</u>. HQ_3 should not be used.**

Response: See response to specific comment 1.

10. **Comment:** **<u>Page 13, Number 48.</u> HQ_3 should not be used.**

Response: See response to specific comment 1.

11. **Comment:** **<u>Page 13, Number 48.</u> HQ_3 should not be used.**

Response: See response to specific comment 1.

12. **Comment:** **<u>Page 14, Number 52</u>. Long-term Monitoring. EPA and other resource agencies would like to discuss the requirements for long-term monitoring.**

Response: In the final FS report, four of the six alternatives presented involve excavation of the Eastern Diked Marsh, Northern Channel, and Marriage Road Ditch. As all the contaminated sediment and unacceptable risk levels will be removed

from these areas, monitoring is not planned.

Sediment in the stormwater retention pond is not included in this FS. Because the levels of PCBs in the sediment are moderate to low, excavation of the sediment may cause greater ecological damage than leaving the site undisturbed. For the stormwater retention pond, an ecological validation study is being designed in conjunction with the regulatory agencies and will be conducted to assess the possibility of risk to flora and fauna. The results of the study will be incorporated into the remedial decision process

13. **Comment:** **The Navy's responses to comments 53-60 are the same as comment 52 with the implication that all of these comments are related to the long-term monitoring effort. Using this approach, the Navy places a lot of expectations in the monitoring plan suggesting a very comprehensive, thorough and well planned document. EPA is eager to participate in the discussion of such a plan.**

Response: See response to specific comment 12.

3.0 RESPONSES TO RWQCB COMMENTS

3.1 GENERAL COMMENTS

1. **Comment:** **The Regional Board is pleased to know that the Navy will use HQ_3 or HQ_4 greater than 1 (HQ_3 and HQ_4 are hazard quotients derived from low Toxicity Reference Values) to establish cleanup goals for avian and mammalian receptors and HQ greater than 1 for benthic community at Moffett Field. However, it is not clear to us if HQ_3 greater than 1 or HQ_4 greater than 1 will be selected. Please provide more information in the Final FS.**

Response: Bulk sediment HQs of greater than 1 (for total PCBs) for benthic invertebrates

will be used to determine the area of cleanup in the Northern Channel. Sediment with HQ_3 greater than 1 (for total PCBs) for the most sensitive indicator species evaluated in the SWEA (great blue heron) will be used to determine the area of cleanup in the Eastern Diked Marsh and the Marriage Road Ditch. This is presented in Section 2.2.1.2 of the final FS report. The areas with HQ_4 greater than 1 (for total PCBs) are also presented for comparison. Costs associated with excavation and treatment of the contaminated sediment from areas with HQ_4 greater than 1 are presented in Appendix C of the final FS report.

2. **Comment:** **The following State regulatory requirements should be considered as ARARs and incorporated into the Final SWFS:**

<u>San Francisco Bay Basin Plan</u>

Establishes water quality objectives, including narrative and numerical standards, that protect the beneficial uses and water quality objectives of surface and ground waters in the region. Describes implementation plans and policies and provide comprehensive water quality planning. The San Francisco Bay Basin Plan also includes implementation actions for setting soil cleanup levels for soils which threaten water quality. Specific applicable portions of the Basin Plan also include beneficial uses of affected water bodies and water quality objectives to protect those uses. Any activity, including, but not limited to, the discharge of contaminated soils or waters, must not results in actual water quality exceeding water quality objectives.

Response: The Basin Plan is included for discussion in Section 2.1.5 of the final FS report. However, the Basin Plan is not considered an ARAR for this FS. From the results of the Phase II SWEA, surface water bioassay results indicated low to no likelihood of adverse effects due to surface water. Consequently, surface water is not a medium of interest in this FS and surface water is not included as a RAO. Therefore, no ARARs are identified for surface water.

RWQCB, San Francisco Bay Basin Plan, "Policy for Application of Water Quality Objectives"

This policy defines water quality objectives and explains how the Regional Water Board applies numerical and narrative water quality objectives to ensure the reasonable protection of beneficial uses of water and how the Regional Water Board applies Resolution No. 68-16 to promote the maintenance of existing high quality waters. It applies to all cleanups of discharge that may affect water quality.

Response: The above-cited requirement is included for discussion in Section 2.1.5 of the final FS report. However, as stated in general comment 2, no ARARs are identified for surface water.

State Water Resources Control Board Resolution No. 68-16 ("Antidegradation Policy")

Requires that high quality surface and ground waters be maintained to the maximum extent possible. Degradation of waters will be allowed (or allowed to remain) only if it is consistent with the maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial uses, and will not result in water quality less than that prescribed in RWQCB and SWRCB policies. If degradation is allowed, the discharge must meet best practicable treatment or control, which must prevent pollution or nuisance and result in the highest water quality consistent with maximum benefit to the people of the state.

Response: The above-cited ARAR is included for discussion in Section 2.1.8 of the final FS report. This regulation applies to remedial action activities that cause active discharge to surface water. No discharge to surface water will occur under any alternative and therefore this regulation is not an ARAR.

State Water Resources Control Board Resolution No. 92-49 (As amended April 21, 1994)

Establishes requirements for investigation and cleanup and abatement of discharges. Among other requirements, dischargers must clean up and abate the effects of discharge in the manner that promotes the attainment of either background water quality, or the best water quality that is reasonable if background water quality can not be restored. Requires the application of Title 23, CCR. Section 2550.4 requirements to cleanup. The "92-47" applies to all cleanups of discharge that may affect water quality.

Response: See response to general comment 2.

Title 27, California Code of Regulations (CCR), Division 2, Subdiv. 1 (Section 20080 et seq.), Title 23, CCR, Division 3, Chapter 15, (Section 2510 et seq.)

Established waste and siting classification systems and minimum waste management standards for discharges of waste to land for treatment, storage, and disposal. Engineering alternatives that are consistent with Title 27/Title 23 performance goals may be considered. Establishes corrective action requirements for responding to leaks and other unauthorized discharges. Applies to all discharges of waste to land for treatment, storage, or disposal that may affect water quality.

Response: The above-cited requirements are included for discussion in Section 2.1.8 and are considered ARARs in this FS.

4.0 REFERENCES

Nichols, F.H., and J.K. Thompson. 1985. "Persistence of an Introduced Mudflat Community in the South San Francisco Bay, California." *Mar. Ecol. Prog. Ser.* Vol 24. Pages 83-97.

RESPONSE TO COMMENTS ON THE REVISED DRAFT FINAL STATION-WIDE FEASIBILITY STUDY REPORT MOFFETT FEDERAL AIRFIELD

1.0 INTRODUCTION

This document presents the Navy's responses to comments from the regulatory agencies and the Silicon Valley Toxics Coalition on the revised draft final station-wide feasibility study (SWFS) report for Moffett Federal Airfield (MFA), dated January 9, 1998. The comments addressed below were received from Mr. Michael Gill of the U.S. Environmental Protection Agency (EPA) on March 10, 1998, from Mr. Joseph Chou of the California EPA, San Francisco Bay Regional Water Quality Control Board (RWQCB) on April 4, 1998, and from Mr. Peter Strauss, representing the Silicon Valley Toxics Coalition, on March 5, 1998.

2.0 RESPONSES TO EPA COMMENTS

2.1 GENERAL COMMENTS

1. **Comment:** **The FS does not provide enough choices from which to select a protective remedial alternative. During discussions at the remedial project managers (RPM) meeting in December, the regulators were asked to comment on a draft version of one of the document's tables (Table 9). At that time, we responded that even the most conservative modeled HQs (i.e. HQ_4) should be considered when developing remedial alternatives. The document provides many of the Theissen polygon maps, but the alternatives are not as complete.**

   Response: The final SWFS will contain alternatives using the more conservative modeled hazard quotients (HQs) for the protection of avian receptors (HQ_3 and HQ_4) in the stormwater retention ponds and the eastern diked marsh (EDM) and HQ<1 for the protection of benthic communities in the Northern Channel (NC). The number of alternatives to be evaluated will be increased to cover these options. The descriptions of the alternatives will be reviewed and revised to provide more complete descriptions of each alternative.

2. **Comment:** **In order to effectively communicate to the public what remediation according to HQs really means, the document should provide back calculations from HQs to cleanup levels. Levels of contaminants that will remain in the environment after remediation should be estimated.**

   Response: The final SWFS will contain back calculations to show the concentrations of polychlorinated biphenyl (PCB) compounds that would be allowed to remain in soil based on the various modeled HQs that are being considered as cleanup goals.

3. **Comment:** **EPA's comment 32 (letter of January 31, 1997) regarding contaminants of concern (COCs) was apparently misunderstood. EPA believes that all calculated risks should be communicated in the FS, regardless of whether**

they are considered "acceptable risks" after a risk management decision. This means that all references to risks from metals to both human and ecological receptors should be put back into the document. After their mention as part of the total risk, if the Navy believes that certain contaminants are due to background (i.e. metals), then this should be stated. We have only been able to find mention of metals once in the main text (page 3) and then in Appendix B. Metals are dealt with in Appendix B (page B-6) by stating, "In conclusion, no remedial action is recommended for metals in the wetland areas of MFA, based on data for similar environments, as well as the lack of a site-specific source of metals and the general agreement of MFA metals concentrations with the composition of stormwater pond sediments and estuary sediments." The logic for eliminating metals from consideration in the FS appears sound. However, contaminants that contribute to the risk should not be eliminated from consideration before a risk management decision is made.

Response: The discussion of metals in soil will be added to the final SWFS as part of the discussion of total risk. The rationale for removing metals from the list of contaminants requiring cleanup will be moved from the appendix to the main body of the report to eliminate confusion about the Navy's position on this point.

4. **Comment:** **Some comments on the previous version of this document (EPA comments of January 31, 1997) were not addressed. The document has changed quite a bit, but some of these comments are still applicable. They are repeated below.**

Response: Comment noted. The Navy will respond to the EPA comments on the draft final SWFS included in the comments below and change the final SWFS to address the comments where Navy agrees with EPA. Comments where disagreements remain will also be noted.

5. **Comment:** **There are insufficient details provided for biological testing, chemical sampling, decision points, and biological surveys. There is nothing provided to show when the Navy needs to stop monitoring or continue with monitoring. No information is provided to show how the various tests will be summarized or integrated to make decisions.**

Response: The Navy has not agreed that biological monitoring is necessary following the actions taken as the remedy for the site. The outline presented for biological monitoring in Appendix C will not be expanded until the Navy and the regulatory agencies are nearer to agreement on the proposed remedy.

2.2 SPECIFIC COMMENTS

6. **Comment:** **<u>Section 1.2.4.1, Page 14, Paragraph 2</u>. Please provide any updates to the OU1 construction schedule.**

Response: This section will be updated with current conditions.

7. **Comment:** **<u>Section 1.2.4.2, Page 14</u>. Please describe the conclusions the Base Realignment and Closure (BRAC) Cleanup Team (BCT) arrived at regarding beryllium in soil at OU2-East: even though beryllium is present in the soil, it poses "no unacceptable risks" to human health and the environment at these sites.**

Response: A no-action record of decision (ROD) has been signed for this operable unit by the Navy, EPA, and California EPA. The ROD contains additional discussion of the soils in OU2-East. A sentence referring to this agreement and the "Final Statistical Analysis of the Occurrence of Beryllium in Soils Technical Report" (PRC and IT 1994) will be added to this paragraph.

8. **Comment:** **<u>Section 1.2.4.4, Page 15, Paragraph 2</u>. Please provide any updates to the east-side aquifer treatment system (EATS) construction schedule.**

Response: This section will be updated.

9. **Comment:** **<u>Section 1.2.4.5, Page 15, Paragraph 3</u>. Please add the statements made in Navy's response to old EPA comment 17 regarding how Site 12 groundwater is being addressed.**

Response: This text has been added.

10. **Comment:** **<u>Section 1.2.4.6, Page 17, Paragraph 6</u>. This sentence should be changed to read: "The Northern Channel will be most likely be dredged by National Aeronautics and Space Administration (NASA) in the next few years to maintain stormwater transfer capacity."**

Response: The words "by NASA" will be added to this sentence.

11. **Comment:** **<u>Section 1.2.5.2, Page 23, Paragraph 2, Sentence 2</u>. This sentence states that PCBs "...do not readily degrade or volatilize." Recent studies have shown that PCBs in sediment do have the ability to volatilize. Please review the attached summary of these studies and determine if they have any applicability to the PCBs in sediment at Moffett Field.**

Response: Although the attached material indicates that two researchers have found that PCBs are volatile, the continued presence of PCBs in sediments at MFA appears to show that the process is probably not capable of removing PCBs from sediment in less than several years. The statement that "PCBs do not readily degrade or volatilize" is still correct.

12. **Comment:** **<u>Section 1.3.1, Page 24, Paragraph 1.</u> Please describe the risks associated with the point (sample by sample) risk approach. How different were these risks from the exposure area approach?**

Response: The first paragraph of Section 1.3.1 states that the sample-by-sample risk assessment is described in Appendix H of the final station-wide remedial investigation report. The sample-by-sample risk assessment approach did not identify any areas with excess risks that were not identified by the EPA-approved exposure area approach. A comparison of the two approaches is provided in Section 6.0 of the final station-wide remedial investigation report. The sample-by-sample risk assessment approach results were not used in preparing the feasibility study.

13. **Comment:** **<u>Section 1.3.1</u>. Text describing various exposure scenarios that appeared in the previous version of the FS (page 14) were deleted in this revised draft final. It provided helpful descriptions and should be considered for inclusion in the final.**

Response: The two paragraphs from the draft final SWFS mentioned in the comment will be added to the final SWFS.

14. **Comment:** **<u>Section 1.3.1.1, Page 26</u>. See old EPA comments 3 and 22 regarding risk range. This comment also applies to Tables 1 and 10. Even though these risks do not necessarily warrant action, they should still be communicated to the reader. Then the risk management decision can be made. EPA considers the risk point of departure to be 10^{-6}, not 10^{-4}.**

Response: Grids with risks of $1x10^{-6}$ or greater will be discussed in Section 1.3.1.1 and added to Table 1. A risk of $1x10^{-6}$ or greater will be used on Table 10.

15. **Comment:** **<u>Section 1.3.1.1, page 26, Occupational Scenario</u>. Two of the four grid areas noted here (3974, 4312) are not in the Eastern Diked Marsh. Please correct this discrepancy.**

Response: This sentence has been revised to state, " Four grid areas (3782, 3974, 4140, and 4312) with risks above $1x10^{-6}$ are located in the northeastern corner of the Eastern Diked Marsh (grids 3782 and 4140), Patrol Road Ditch (grid 3974), and the Northern Channel (grid 4312)."

16. **Comment:** **<u>Section 1.3.2.2, Page 30, Paragraph 4</u>. Please elaborate on NASA's work on soil removal in the stormdrain and the Lindbergh Avenue ditch. How much sediment was removed? When did the work occur? What cleanup level was used?**

Response: A reference to the *Soil Removal Project, Storm Drain Channel, Area of Investigation 6 (AOI 6), Moffett Federal Airfield, California* (SAIC 1997) has been added to this paragraph.

17. **Comment:** **<u>Section 1.3.2.2, Page 31, Paragraph 1</u>. Please provide a brief description of a congener-specific bioaccumulation factor (BAF).**

Response: The sentence has been removed.

18. **Comment:** **<u>Section 1.3.2.2</u>. The use of HQs to set cleanup levels is a misuse of the approach because the method does not have enough accuracy (as calculated by the Navy) and precision (as applied by the Navy) to adequately define the concentrations of contaminants that pose a significant risk and therefore a clean-up level. Accuracy is called into question because for the sediment receptors, the Navy used the Long and Morgan (1991) numbers as "literature derived benchmarks" (see page 32) and it is not clearly stated here whether the effects range-low (ER-L) or the effects range-median (ER-M) was used. Either way, a bioassay approach is the most accurate approach for determining the exposure response relationship for the receptors at MFA.**

EPA's old comment 36 questions the use of ER-Ls and ER-Ms in the process for setting clean-up levels. In Navy's February 5th response to comments letter, it is stated: "The discussion of effects range-low (ER-L) and effects range-median (ER-M) have been removed from the SWFS". However, the use of these numbers has not apparently changed as evidenced by the statements and references in the text of the FS, (page 32, paragraph 3). What is the truth? The citation is the document in which the ER-Ls and ER-Ms are published. What data are you citing? What table of information is used from the Long and Morgan document? If the Navy wants to use the ER-Ls for setting clean-up levels, the Navy will be cleaning up many areas that may not need cleaning. If the Navy is still using ER-Ms

for setting clean-up levels, then the Navy is not following EPA nor National Oceanic and Atmospheric Administration (NOAA) guidelines and is not being exactly clear about the approach they are using.

If the Navy wants to use a set of benchmarks that are relevant geographically, i.e., San Francisco Bay, then the Water Board should be requested to provide numbers that are more relevant than the "national" numbers provided in Long and Morgan (1991).

Precision is called into question because the HQ process defined by the Navy (see page 33) provides a broad range of estimates of the HQ from HQ_1 to HQ_4 depending upon the input data. Although the Navy proposes that this range of estimates "provides more information," the use of four HQ estimates only increases the variability in the estimate of the HQ. A single HQ estimate should be used and EPA suggests HQ_4 is the appropriate one.

A widely recognized concept of interpretation of the HQ is that the magnitude of HQ estimates and even increasing HQ values have little or no suggested toxicological significance and certainly not ecological significance. This viewpoint is shared by the Navy (see page 32) where it actually argues for limiting the use of the HQ approach to its original intended application (USEPA, 1986). Limitations to the quotient approach were reported very early by Urban and Cook (USEPA, 1986) who stated that, "...the ratio or quotient method for assessing risk (1) does not adequately account for effects of incremental dosages, (the basis for the Navy's statement above) (2) does not compensate for differences between laboratory test and field populations, (3) cannot be used for estimating indirect effects of toxicants (e.g., food chain interactions), (4) has an unknown reliability, (5) does not quantify uncertainties, and (6) does not adequately account for other ecosystem effects (e.g., predator-prey relationships, community metabolism, structural shifts)."

If the Navy insists on using the HQ approach throughout the process, the conclusion based on the EPA position for use and interpretation of the hazard quotient is that the HQ_4 estimates presented by the Navy are generally sufficient to show a ranking of the potential risks. From these data, the Navy should show the distribution of HQ_4 above 1 as a continuum. Using this information along with other information (i.e., bioassays, contaminant type and distribution, receptor habitat and receptor distribution), the Navy should characterize the risk from low to high. The distribution of risk levels should be divided into intervals related to risk characterization such that numerous levels of risk are displayed (such as HQ_4>1, >10, >100) and then evaluated for clean-up using the nine criteria.

Response: The last sentence of paragraph 5 on page 32 will be revised to state, "For sediment, *The Potential Biological Effects of Sediment-Sorbed Contaminants Tested in the National Status and Trends Program, Effects Range-Low (ER-L)* (Long and Morgan 1991) were used." Discussion of the ER-L as an ecological preliminary remediation goal (PRG) has been removed from the final SWFS, as stated in the response to old EPA comment 36.

The Navy has now agreed that for avian and mammalian receptors, HQ_3 greater than 1 and HQ_4 greater than 1 will be used in the SWFS as guides to the areas requiring further attention. For benthic receptors, HQ greater than 1 will be used as the guide for remediation.

19. **Comment:** **<u>Section 1.3.2.2, Page 33</u>. The hazard matrix appears incorrect. HQ_2 and HQ_3 should be interchanged in the matrix.**

Response: This table has been corrected.

20. **Comment:** **<u>Section 1.3.2.2, Page 34</u>. The third bullet that appeared in the last version of the document (describing metals) should be retained in this description of potential adverse effects. If the Navy believes that metals should not be considered because of background considerations, than add a reference to Appendix B. Communicating the risks of all contaminants of potential ecological concern (COPECs) should be done before eliminating them because of a risk management decision.**

Response: The discussions on metals presented in the draft SWFS will be included in the final SWFS.

21. **Comment:** **<u>Section 1.3.2.2, pages 35, 36</u>. Combined Results of HQs, hazard indices (HIs) and Bioassays for Surface Water and Benthic Receptors. There is no reason to believe that the HIs or the HQs, for that matter are good predictors of biological response for the bioassays as the Navy seems to expect from the statements in this paragraph. This is analogous to switching the independent and dependent variables in a regression, such that the dependent variable is expected to predict the independent variable.**

Response: The Navy is aware of the limitations of the methodology used in the SWEA. The Navy plans to present alternatives with a potential monitoring component.

22. **Comment:** **<u>Section 1.3.2.2, Page 36</u>. References to metals should be included in the weight of evidence summary, as they appeared in the draft final version of the FS (in numbers 1, 6, 7). If applicable, reference Appendix B prior to making a risk management decision.**

Response: The references to metals will be added to this section for the final SWFS.

23. **Comment:** **<u>Section 1.3.2.2, Page 37</u>. HQs and HIs for Avian and Mammalian Receptors. The use of the various HQ estimates does not provide a range of risk, however, it does provide four different means for estimating an HQ. The use of four estimates of HQ by varying the ingestion and weight of the receptors provides less information than estimating a range of doses based on a range of exposure concentrations. The Navy is strongly encouraged to use the HQ_4 and vary the exposure concentration to estimate the risk.**

The Superfund Guidance (EPA, 1997; page 7-3) states, "Where exposure-response functions are not available or developed, the quotient method of comparing an estimated exposure concentration to a threshold for response can be used... Whenever possible, however, presentation of full exposure-response concentration functions provides the risk manager with more information on which to base site decisions. This guidance has recommended the use of on-site contamination gradients to demonstrate on-site exposure-response functions." And from page 7-4 of the same document, "In addition to developing point estimates of exposure concentrations, as for the hazard quotient approach, it might be possible to develop a distribution of exposure levels based on the potential variability in various exposure parameters...."

Response: Maps showing the areas with contaminant concentrations related to HQ_3 and HQ_4, greater than 1, 10, and 100 will be presented in the final SWFS. Alternatives related to HQ_3 and HQ_4 will be included in the final SWFS.

24. **Comment:** **<u>Section 1.3.2.2, Page 37, Paragraph 1</u>. In response to a Navy request to look at Table 9 at the RPM meeting in December, the regulators stated that figures should be presented that show risk areas for HQs greater than 1, 10 and 100. This is especially important if a proposed remedy is to be based on a particular HQ (i.e. HQ_3). It is necessary to have this data to make an informed risk management decision. Cost data for the more conservative HQ remedies is also necessary to make an informed decision.**

Response: Maps showing the areas with contaminant concentrations exceeding HQ_3 greater than 1 and HQ_3 greater than 10 will be added to the final SWFS. Maps for HQ_3 greater than 100, and HQ_4 greater than 1, 10, and 100 are already included in the revised draft final SWFS. Alternatives using these more conservative HQ values for the cost estimates will also be described in the final SWFS.

25. **Comment:** **<u>Section 1.3.2.2, Page 37, Paragraphs 2, 3</u>. Again, metals should be included in discussions here concerning HQs in order to provide the reader a complete picture of the risk. In paragraph 3, it is stated that HQ_4 ranged "from below unity to more than 11,000 when metals were involved". The previous version of the FS (page 21) said that the upper range was 600,000. This discrepancy seems to be the result of removing pesticides from the calculation. Please include all COPECs in the discussion. A risk management decision will be made after the discussion of the risks.**

Response: The sentence in question has been revised to state, "HQ_4 estimates for both receptors ranged from below unity to more than 600,000 when the metal lead was included in the calculations." Table 8-22 of the final site-wide ecological assessment (SWEA) shows that the HI for the American kestrel for HQ_4 is 6.47×10^5.

26. **Comment:** **<u>Section 1.3.2.2, Page 38, Paragraph 3</u>. EPA would challenge the statement that, "...the most common benthic macroinvertebrate fauna in south bay area mud flats are polychaetes, bivalves, and amphipods." The Navy neither sampled these areas in sufficient detail to make this statement nor are there any citations or data to support the statement.**

Response: The first sentence of the paragraph in question states, "To characterize the risk of sediments to benthic receptors, it was assumed that the indigenous benthic populations are similar to benthic receptors inhabiting tidally influenced mud flats of the south bay area." This statement is a direct quote from the SWEA.

27. **Comment:** **<u>Section 1.3.2.2, Page 39</u>. Key outputs of the risk characterization are contaminant concentrations in each environmental medium that bound the threshold for estimated adverse ecological effects given the uncertainty inherent in the data and models used.**

Response: Comment noted. Maps showing areas with contaminant concentrations related to HQ_3 and HQ_4 will be presented in the final SWFS.

28. **Comment:** **<u>Section 1.3.2.3, Page 39</u>. Summary of Ecological Risk. EPA disagrees with the statements made in paragraph two which suggests that the "ecosystem"**

was characterized. Habitats and areas of similar characteristics were sampled. Ecosystem is too broad of a term to describe the habitats at MFA. Secondly, the Navy is suggesting that physical characteristics rather than contaminants were the primary factors that resulted in the "low density and diversity of benthic in-fauna" when one observation was made and no samples were collected and examined in a laboratory setting. Under these conditions, nothing could be observed smaller than a 2 mm size, which greatly limits the possible observation of the biological organisms in sediments, even at MFA.

Response: This paragraph is a direct quote from the SWEA. The word ecosystem has been changed to habitat.

29. **Comment:** **Section 1.3.2.3, Page 41. Soil. Please include the risks from lead in soil and its effect on the burrowing owls. These were on page 25, paragraph 2 of the previous version of the FS. A risk management decision can then follow the full discussion of the risks.**

Response: Discussions about lead in soil and its effect on the burrowing owl will be added to this section.

30. **Comment:** **Section 1.3.2.4, Page 41. Please include discussions of risks from metals in all three areas at Moffett, as was done in the previous version of the FS.**

Response: Discussions of risks from metals will be included in the final SWFS.

31. **Comment:** **Section 2.1, Page 42, Remedial Action Objectives (RAOs). Although, the RAOs are stated for sediments, there should be some also for the upland habitats and the surface water. The statement, "There is only one set of RAOs because sediments are the only medium of interest" is inaccurate because it infers that other resources are of no interest. This idea needs further explanation.**

We agree with the Navy's statement from the last version (draft final) of the document, "In general, the RAO for sediments is to adequately protect human health and the environment by limiting exposure to COCs." What is not obvious in this document is the transfer of the information from the SWEA to define the exact RAOs. The Feasibility Study should incorporate the results of the risk assessment by identifying the level of risk to the site receptors identified in ERA as significant risk. The levels of risk established during this ERA should be used as a basis for identifying areas of the site as acceptable, such that the site receptors will not be significantly impacted, thereby limiting the risk to the assessment endpoints.

The Navy estimates of risk are presented as various HQs calculated by different combinations of exposure to the receptors yielding HQs ranging from low protection, HQ_1, to a high level of protection, HQ_4. Intuitively, this is a good approach, but the input data to estimate the various HQs must be of high quality. Based on the work performed to date by the Navy, EPA would suggest that the cleanup levels, i.e., concentrations, be based on a risk level associated with HQ_4. Various options should be presented for ranges of HQ_4, that is HQ > 1, HQ > 10, HQ > 100. Concentrations must then be back calculated from these various levels of risk and then plotted on the maps for comparison to known concentrations i.e., sampled areas.

Response: The sentence "There is only one set of RAOs because sediments are the only medium of interest," has been removed from the final SWFS.

Section 2.1.1 of the final SWFS will be expanded to discuss why sediments are the medium of interest for the SWFS. This discussion will summarize the results of the SWEA presented in Section 1.3.2.3 of the SWFS and in the executive summary of the SWEA.

Section 2.2.1.2 of the final SWFS will be revised to include discussions based on $HQ_3>1$, $HQ_3>10$, $HQ_3>100$, $HQ_4>1$, $HQ_4>10$, and $HQ_4>100$. Concentrations of contaminants contributing to the risk will then be back calculated and presented in a table in the final SWFS.

32. **Comment:** **<u>Section 2.1.1, Page 43</u>. As above, additional justification is required for concluding that sediment is the only medium of interest in Section 2.1.1. For example, the first paragraph of Section 1.3.1 states that there were elevated human health risks from exposure to COCs in groundwater while Section 1.2.4.8 discusses migration of plumes onto MFA from upgradient sources. The rationale why groundwater in not a medium of interest for this FS should be stated in Section 2.1.1, as is stated in Section 2.1.5.**

Response: Section 2.1.1 of the final SWFS will be expanded to discuss why sediments are the medium of interest for the SWFS and why surface water, groundwater, and soil are not included in the SWFS. This discussion will summarize the results of the SWEA presented in Section 1.3.2.3 of the SWFS and in the executive summary of the SWEA.

33. **Comment:** **<u>Section 2.1.4, Page 43</u>. The Navy lists the Allowable Exposure Levels Based on Risk Assessments (AEL). The Navy has proposed the use of HQs for benthic invertebrates of less than 100 for the COPECs [contaminants of potential ecological concern], total PCBs, total chlordane, DDD, and DDE in the Northern Channel, Eastern Diked Marsh and storm water retention ponds areas and alternative proposals that the AEL be set to the combined concentrations of all COPECs to HQ_4 greater than 100 or HQ_4 greater than 10 for the avian and mammal receptors for total PCBs, total chlordane, DDD, and DDE. Again, the Navy has not provided a range of risk estimates, i.e., HQs such that the acceptable range of risk can be identified. The above levels should not be accepted or rejected at this point, but considered by comparison with the other options using the nine criteria.**

Response: Section 2.1.4 will be revised to include HQ>1 for the protection of benthic invertebrates in the Northern Channel and the range of $HQ_3>1$, $HQ_3>10$, $HQ_3>100$, $HQ_4>1$, $HQ_4>10$, and $HQ_4>100$ for protection of avian and mammalian species in the Eastern Diked Marsh and stormwater retention ponds.

34. **Comments:** **<u>Section 2.1.4, Page 43, 44</u>. The point of departure for risk is 10^{-6}, not 10^{-4}. This needs to be considered when developing the Allowable Exposure Levels (AELs).**

Response: The reference to risks of 10^{-4} have been changed to 10^{-6}.

35. **Comment:** **<u>Section 2.1.4, Page 44, Paragraph 4</u>. Proposals for AELs should also include HQs greater than 1 to allow a more informed risk management decision.**

Response: See response to comment 33.

36. **Comment:** **<u>Section 2.1.7, Pages 46, 47</u>. Potential Federal and State Action-Specific ARARs.**
(a) "California Water Quality Standards for Inland Bays" are discussed on pages 47-48, but are not listed as a potential ARAR [applicable or relevant and appropriate requirements] at the top of page 47 and are not listed in the ARARs table. Please correct this discrepancy.

(b) Are there any wetlands regulations issued by San Francisco Bay Area agencies, such as San Francisco Bay Conservation and Development Commission (BCDC), that should be considered in the FS? While requirements of a local agency, as opposed to those of a state agency, would not be ARARs, they might contain useful standards that should be included in the ARARs discussion as "to be considered."

Response: The Inland Surface Water Plan and the Bays and Estuaries Plan were vacated by a California court in 1994. All this time, the state has not issued a new plan. For this reason, this ARAR has been removed from the final SWFS.

The Navy will review these requirements and add them to the "to be considered" list if appropriate.

37. **Comment:** **<u>Section 2.1.8, Page 48</u>. Please explain why a reduction in exposure to metals are not part of the RAOs.**

Response: Additional discussion on the exclusion of metals as part of the RAOs will be added to this section.

38. **Comment:** **<u>Section 2.2.1.1, Page 49, Paragraph 1</u>. Sediment exposure areas should be identified as those posing risks in excess of 10^{-6}; that is, greater than the point of departure. A proposed remediation goal for each exposure area should then be back-calculated to a cleanup level.**

Response: Section 2.2.1.1 will be revised to discuss all exposure areas with risks exceeding 10^{-6}.

39. **Comment:** **<u>Section 2.2.1.2, Page 51, Paragraph 1</u>. Explain why metals are not considered in the total potential risk in sediments.**

Response: Additional discussion on the exclusion of metals as part of the RAOs will be added to this section.

40. **Comment:** **<u>Section 2.2.1.2, Page 51, Areas of Attainment Based on the SWEA</u>. This paragraph is aimed at the correct approach, but not the correct scale for describing risk. The scale or "system" to evaluate risk as proposed by the Navy based on Menzie et al (1993) is not acceptable as stated. The use of validated estimates of risk (defined here as HQ values) is appropriate. The key word in this acceptance is "validated" because the estimate of risk must be representative of the actual risk on site. As stated elsewhere, the most**

reasonable estimate of risk presented in the Navy document is the HQ_4 estimate, not HQ_1. EPA still believes that bioassays represent the most accurate estimate of effects from which potential risk can be estimated.

Response: The paragraph discussing the approach proposed by Menzie and others will be removed. The bulleted items on pages 51 and 52 will be revised to include HQ>1 for the protection of benthic invertebrates in the Northern Channel and the range of HQ_3>1, HQ_3>10, HQ_3>100, HQ_4>1, HQ_4>10, and HQ_4>100 for protection of avian and mammalian species in the Eastern Diked Marsh and stormwater retention pond.

41. **Comment:** **<u>Section 2.2.1.2, Page 51, 52</u>. This list of areas proposed for remediation should be broadened to include HQs greater than 1, especially HQ_4. This was requested by the regulators in our December 17th phone call (between EPA and TtEMI).**

Response: See response to comment 40.

42. **Comment:** **<u>Section 2.2.2, Page 54, Mitigation</u>. Please elaborate on the rationale used to define how mitigation is done; that is, what drives the acre-for-acre mitigation offset? How did this rationale lead to the proposals presented in Section 2.3.2.7?**

Response: Some additional text presenting the rationale used to decide on how the amount of mitigation was evaluated will be added to this section.

43. **Comment:** **<u>Section 2.3.2, Page 55, Paragraph 2, Screening of Remedial Technologies</u>. EPA would agree with the Navy, that "A technology is considered applicable if it can reduce the toxicity, mobility, or volume of sediments to be remediated." This position also recognizes that a suitable method for evaluating the efficacy of the remedial technology must be identified and used.**

Response: Comment noted.

44. **Comment:** **<u>Section 2.3.2.4, Page 59, Innovative Technologies</u>. Any proposal for biodegradation of PCBs or any other contaminant using Phanerochaete chrysosporium must be well described and shown to be a viable option. The efficacy of this method, of course, must be verified with appropriate techniques including chemistry and bioassays to show that the method is effective to reduce the toxicity to soil/sediment organisms. Some research performed through the Superfund Innovative Technology Evaluation (SITE) program gave mixed results using this technique for polynuclear aromatic hydrocarbon (PAH) and PCB contaminants. This may not be a viable approach. Any material received by the Navy should be considered highly preliminary and very much dated.**

Response: Bench- and pilot-scale treatability studies will be conducted by the Navy on any innovative biological methods proposed for either in situ or ex situ treatment of contaminated soil.

45. **Comment:** **<u>Section 2.3.2.7, Page 60</u>. The habitat mitigation described here is a reasonable attempt at in-kind, on-site mitigation. Several considerations are:**

- **The habitat quality of these sites, particularly the Stormwater Retention Pond, is marginal and may not provide enhanced habitat even following mitigation;**

- **MFA is an active airfield and probably discourages the enhancement of wildlife habitat, particularly for birds, within its operational zone because of airplane safety;**

- **There may be a potential for recontamination of the mitigation in the northwestern corner of the Stormwater Retention Pond from Stevens Creek.**

Based upon these considerations, it might be worthwhile looking at some off-site mitigation options. In any case, any mitigation will have to be closely coordinated with the appropriate natural resource agencies.

Response: Comment noted. Several logistical, political, and engineering hurdles remain for any mitigation alternative. Offsite mitigation options will be significantly more difficult because of the Navy's funding requirements. Actions under the base cleanup program must take place at the base.

46. **Comment:** **<u>Section 2.3.3.1, Page 64</u>. Under the No Action Alternative, natural attenuation is deemed unlikely to reduce organic contaminant concentrations to an acceptable level over the short term. It would be helpful for the FS to provide a slightly more thorough evaluation of natural attenuation. A simplified approach to predicting what the concentrations would be within a given timeframe (e.g., 10 or 20 years) would be adequate and would provide useful information for remedial decision making, especially in light of the recent studies on volatility of PCBs in sediment (see attachment).**

Response: Some additional sampling is being considered for support of the treatability studies at MFA. Such sampling may provide an estimate of PCB degradation rates in sediments at MFA. Some sediment samples collected 10 years ago were analyzed for PCBs. Comparison of new analytical results with these older results could be helpful in resolving the site-specific degradation rates.

47. **Comment:** **<u>Section 3.1, Page 75, 76</u>. The alternatives outlined here describe active remediation options for the Eastern Diked Marsh and Northern Channel. Previous discussions (e.g., Section 1.3.2.4, Section 2.1.4, Section 2.2.1.2) and Figures 15 through 22 also show areas of concern located in the Stormwater Retention Pond as well as in the Western Diked Marsh. It is unclear why remedial alternatives were not considered for the Stormwater Retention Pond and the Western Diked Marsh. Please provide rationale for this decision.**

Response: This section will be revised to include treatment of sediments in the Northern Channel that exceed an HQ of 1 for protection of benthic invertebrates. In the Eastern Diked Marsh and stormwater retention pond, alternatives will be proposed for those areas where HQ_3 is greater than 1 and HQ_4 greater than 1 for PCBs for avian and mammalian species.

The stormwater retention pond and Western Diked Marsh were considered in the alternatives presented in the revised draft final SWFS where each bullet mentions in situ biotreatment of the remaining areas.

48. **Comment:** **<u>Section 3.1, page 76</u>. This section should also include alternatives that consider biotreatment or removal of sediments that protect receptors in areas with various HQs greater than 1. The alternatives should present cleanups that will remove or biotreat sediments exceeding the HQ levels.**

In the previous version of this FS, the alternatives proposed different amounts of excavation, based on meeting different HQ requirements. In this version, excavation is always down to one foot. What is the rationale for excavating down to one foot? Can the Navy show that only acceptable contamination levels exist below one foot and that ecological receptors will be unimpacted? Provide references to back up any claims.

The depth of contamination in the sediment profile is not adequately discussed. There are a few statements concerning the depth of contamination (e.g., page 70, paragraph 2; page 70, Bullet for Alternative 3; Appendix D), but no analysis of the subject is provided. An analysis of the extent of contamination in terms of depth in the sediment profile is required for a proper evaluation of remediation alternatives.

As mentioned previously, the effectiveness of biotreatment using white rot fungus is not well documented, yet half of all of these alternatives depend on this technology. Alternatives should be developed that either provide for a contingency if the white rot fungus does not work or that do not rely so much on this unproven technology. One possibility is to propose alternatives that are similar to those presented before, that is, using various HQs, propose different amounts of acreage excavation followed by restoration. Then verify that the remaining sediment does not pose an unacceptable risk to receptors by back-calculating cleanup levels (from the HQs) and show through ecological monitoring that these contaminant levels do not exist.

Response: Section 3.1 will be revised to include alternatives that consider action in areas of the Northern Channel where the HQ is greater than 1 for benthic invertebrates due to exposure to PCBs. For the other areas, HQ_3 greater than 1 and HQ_4 greater than 1 for avian and mammalian receptors exposure to PCBs will be included.

Past sampling indicates that the PCB contamination is sediments at MFA is concentrated in the top 6 inches of sediment. The vertical distribution of PCBs will be investigated further during sampling to support the treatability studies.

An evaluation of the effectiveness of biotreatment with white rot fungus and other biotreatment alternatives is planned for summer and fall 1998. The backup remedy for ex situ soil treatment is thermal desorption, as shown in Table 9 of the draft final SWFS. In addition, PCB concentrations at various risk levels have been back calculated.

49. **Comment:** **<u>Section 4.1, Cost</u>. In several locations in this section, Table 11 is referenced. When compared to Table D-1 in Appendix D (also a cost table), they are not really consistent. Either provide a range of costs or a fixed cost in both cost tables.**

Response: Table D-1 will be revised to show a range of costs. The rationale for the cost ranges will be presented in Appendix D.

50. **Comment:** **<u>Table A-2</u>. Add California Water Quality Standards for Inland Bays, as discussed on pages 47-48 of text.**

Response: See response to comment 36.

51. **Comment:** **<u>Page C-1</u>. The "short-term monitoring" as described by the Navy is really validation sampling and should be called this. The Navy appears to recognize this in the third sentence in stating the objective of "short term monitoring."**

Response: Short-term monitoring will be changed to remedial action verification sampling in this paragraph.

52. **Comment:** **<u>Page C-1, Long-term Monitoring</u>. Monitoring is not performed to "verify that no additional adverse changes to the habitat are occurring," but rather to verify that the remedial actions taken are sufficient to protect the assessment endpoints identified for the site. This may be a subtle point, however, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and the ecological risk assessment guidance in particular identify the focus of the process to be the assessment endpoints, which is more comprehensive than focusing on just the habitat or the receptors. The statement of purpose should be clarified to include a more comprehensive goal rather than the limited target of the habitat.**

Response: Remedial action verification sampling will be conducted in the Northern Channel and the Eastern Diked Marsh following sediment removal, and additional sediment will be removed if the requirements are not met.

The Navy will present alternatives in the final SWFS for natural attenuation with monitoring for the stormwater retention ponds area at MFA. The Navy would like to discuss in greater detail with the regulatory agencies the methodology to be used for long term monitoring. The Navy will propose that the monitoring plan be prepared, with regulatory agency input, as a separate document prior to and during the remedial design phase of the project. The monitoring plan will incorporate the information, approaches, and discussions developed during the May 27, 1998 field visit with Dr. Keith Miles attended by the Navy and the regulatory agencies. Detailed discussion of the ecological monitoring (Appendix C) to be conducted at MFA would not be included in the final SWFS using this approach.

53. **Comment:** **<u>Page C-2, Chemical Monitoring</u>. The Navy should identify the contaminants of concern as identified from the baseline ecological risk assessment. The Navy does not identify the required "decision points" that will be used to determine if and when further sampling should be performed. A "significant increasing trend in concentration" is very vague and does not clearly state how the decision will be made to stop or to continue further monitoring.**

Response: See response to comment 52.

54. **Comment:** **<u>Page C-3, Proposed number of Samples</u>. EPA can't evaluate these sample numbers because there are no locations shown. Sample locations need to be identified on maps and justified with respect to the baseline results and the remedial actions proposed. The number of samples may or not be sufficient because of lack of information provided.**

Response: See response to comment 52.

55. **Comment:** **<u>Page C-2, Biological Monitoring</u>. The Navy should not change the type of bioassay from those used in the baseline assessment because there are no direct connections between the monitoring proposal described by the Navy in this document and the baseline results. Without an adequate description of this relationship, there will be a disconnect between the two efforts. The Navy does not describe the method proposed to complete this effort. The title presented is insufficient as the Navy is suggesting that bivalve larvae be substituted for amphipods in the 10-day Static Sediment Toxicity Test. What is the basis for this substitution? Where is the documentation to suggest that this substitution can be made?**

Response: See response to comment 52.

56. **Comment:** **<u>Page C-4, Reference Site</u>. The Navy's suggestion for the reference site at Hunters Point is inappropriate as it was inappropriate for Hunters Point. If a reference site is needed, then another location should be identified by the Navy.**

Response: See response to comment 52.

57. **Comment:** **<u>Page C-4, Random Sampling</u>. The use of random sampling is not justified as stated here. Why and on what basis should a random sampling approach be used for the monitoring effort?**

Response: See response to comment 52.

58. **Comment:** **<u>Page C-4, Tissue Sampling</u>. The Navy must provide a justification for no further plant sampling based on the results of the baseline data. EPA believes that plants may not have been sampled adequately which is the likely reason for no observed contaminants in plant tissue. This is an area for further discussion.**

Response: See response to comment 52.

59. **Comment:** **<u>Page C-4</u>. The Navy must identify what species and approach will be used for the bioaccumulation. The reference to the American Society for Testing and Materials (ASTM) standard guide is not specific enough.**

Response: See response to comment 52.

60. **Comment:** **<u>Page C-4, Biological Surveys</u>. EPA does not agree with the proposal as written. There is little if any detail provided that demonstrates a difference from what was done in the previous effort. The previous effort was not sufficient to show the presence or absence of organisms that birds might**

feed on. The Navy is strongly advised against, "a detailed cataloguing of the entire biological community at the various habitats." This is another area that needs further discussion. Lastly, if the survey is performed after the remedial action, what will be the benchmark to determine that the action was effective?

Response: See response to comment 52.

61. **Comment:** **<u>Table D-1</u>. Identical costs are shown for the alternatives that use biotreatment, yet different amounts of sediment are being biotreated. In addition, the cost of off-site sediment disposal is always estimated to be the same, even though different amounts of sediment will be hauled offsite. Please explain.**

Response: For ex situ biotreatment, the cost is the same for alternatives 3, 4, 5, and 6 because there is no change in the amount of excavated soil to be treated. This alternative envisions treatment of all soil excavated from the Northern Channel, Eastern Diked Marsh, and stormwater retention pond. For alternatives 5 and 6, there is no difference in the area to be biotreated. Therefore, the costs are the same. For alternatives 3, 4, 5, and 6, the amount of soil to be hauled is the same. The difference between these alternatives is the area to have in situ biotreatment.

2.3 EDITORIAL COMMENTS

62. **Comment:** **<u>Section 1.2.4.6, page 16, 17</u>. Please correct the spelling of Lindbergh Ave. ditch in this section (at least 4 instances).**

Response: These spelling errors have been corrected.

63. **Comment:** **<u>Section 1.2.4.6, Page 17, Paragraph 4</u>. The "SWEA" acronym needs to be corrected.**

Response: This typographical error has been corrected.

64. **Comment:** **<u>Appendix D</u>. The notation of "HQ" is incorrectly used in place of "HQ_3" at various spots in this appendix (e.g. page D-1 [Alt.3], Table D-1 [Alt. 4], page D-10 [title]. Please correct these errors.**

Response: The text of Appendix D will be revised to reflect the changes in the alternatives to be provided in the final SWFS.

3.0 RESPONSES TO SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) COMMENTS

3.1 GENERAL COMMENTS

1. **Comment:** **For avian and mammalian receptors, the Hazard Quotients (HQ) derived from low toxicity reference values (i.e. HQ_3 and HQ_4) are the best indicators of possible adverse effects for most contaminants. HQ_3 and HQ_4 estimates less than one indicate there is low likelihood for adverse effects from the contaminant. When the HQ_3 and HQ_4 estimates are greater than one, then more evaluation is needed to refine the estimates through either toxicity testing, laboratory studies, and/or field investigations. With the existing site**

specific data, the Navy cannot successfully quantify or differentiate the potential impacts to the receptors between HQs>1, >10, or >100. It is difficult to explain why the modeled HQs <100 or HQs<10 will be protective, since HQ_3 and HQ_4 estimates greater than one indicate there is a possible adverse effect. Therefore, the Navy should use HQ_3 or HQ_4 >1 to establish cleanup goals.

Response: The Navy will use HQ_3 greater than 1 and HQ_4 greater than 1 in the alternatives to be presented in the final SWFS.

2. **Comment:** **Metals in sediments should remain as chemicals of concern (COCs) in this report. The Phase II Site-Wide Ecological Assessment (SWEA) report showed that lead, zinc, mercury and selenium contributed significant risks to avian and/or mammalian receptors in the wetland areas. The State recognizes that the spatial distribution of metal chemicals of potential ecological concern (COPECs) generally reflects the wetland drainage pattern, and that relatively high concentration of metals in clay-size particles were found. However, all the risk drivers should be evaluated in the SWFS, any early elimination of COPECs may cause underestimating the total risks and bias cleanup decisions.**

Response: Discussion of the risks to human and ecological receptors resulting from metals at MFA will be included in the final SWFS.

3.2 SPECIFIC COMMENTS

1. **Comment:** **<u>Section 1.3.2.2, Chemistry Results, Page 30</u>. Inorganic COPECs were identified in the SWEA and should be included in this section.**

Response: Discussions of the chemistry results for inorganic chemicals will be included in this section.

2. **Comment:** **<u>Section 1.3.2.2, Chemistry Results, Page 30, Third Paragraph</u>. The discussion of chemistry results for porewater has not included organochlorine pesticides. Page 34, item 2 identifies dieldrin and endosulfan II, as well as PCBs, as those COPECs that may pose the greatest potential to adversely effect benthic receptors.**

Response: The paragraph should have stated, "Based on the theoretical pore water HQ information, PCBs, dieldrin, and endosulfan II are the organic COPECs that may pose the greatest potential to adversely affect benthic receptors in contact with sediment pore water, such as burrowing fauna." The word theoretical was omitted from the paragraph. Theoretical risks were calculated for pore water receptors based on the concentrations of chemicals in the sediment and the distribution coefficients. Because these chemicals were not actually detected in pore water, they are not discussed in Section 1.3.2.2.

3. **Comment:** **<u>Section 1.3.2.2, Chemistry Results, Page 30, Fourth Paragraph</u>. In the paragraph discussing upland soils, the samples from Lindbergh Avenue stormdrain channel are included in the discussion indicates that the stormdrain sediments have been removed. This paragraph is confusing and should be rewritten. What is the relevance of discussing chemical results for sediment which is no longer at the site?**

Response: This paragraph will remain. One sentence "This removal action is discussed in detail in *Soil Removal Project, Storm Drain Channel, Area of Investigation 6 (AOI 6) Moffett Federal Airfield, California* (SAIC 1997)." has been added.

4. **Comment:** **<u>Section 1.3.2.2, Chemistry Results, Page 31</u>. The last sentence of the top paragraph should be deleted. Discussion of bioaccumulation factor for PCB congeners is not relevant in this section.**

Response: This sentence has been removed.

5. **Comment:** **<u>Benthic Survey, Page 31</u>. This paragraph indicates that locations where grabs were taken for qualitative benthic community analysis are on Figure 14, but the figure doesn't clearly indicate the locations where each benthic analysis was performed. The last sentence indicates that wet and dry cycles influence the benthic community, but this does not apply to the Northern Channel which always receives water from the site and from tidal influence. The last sentence should be rewritten to clarify this point.**

Response: The first sentence of the paragraph states that, "The benthic community (bottom-dwelling) in the aquatic habitat was qualitatively characterized." The second sentence states, "Sediment sample locations are depicted in Figure 14." These two sentences will be separated by a paragraph break to clarify that they are not referring to the same samples.

The last sentence will be revised to state, "The wet and dry cycles of the stormwater retention pond and Eastern Diked Marsh wetlands at MFA are a major factor influencing the benthic community." The Northern Channel is not tidally influenced because it has no direct connection to the Bay.

6. **Comment:** **<u>Measurement Endpoints, Page 32, Third Full Paragraph</u>. This paragraph cites the State Water Resources Control Board (SWRCB) Water Quality Control Plan for Inland Surface Waters of California; this document should not be cited. The SWRCB has currently developed new Inland Surface Waters and Bays and Estuaries plans which are expected to be adopted in June 1998. In the interim, Board staff have been relying on federal Ambient Water Quality Criteria.**

Response: This paragraph has been revised to remove the reference in question.

7. **Comment:** **<u>Benthic Survey, Page 32, Third Full Paragraph</u>. The last sentence cites Long and Morgan 1991 for sediment benchmarks. This citation should also include Long and McDonald 1995[1], which was an updated version of the Long and Morgan document for marine and estuarine sediment benchmarks. Both were used for screening for Moffett SWEA.**

Response: This reference has been included in the final SWFS.

8. **Comment:** **<u>Measurement Endpoints, Pages 32-33</u>. With respect to magnitudes of hazard quotients and expected effects, it is not clear how the HQs>100,**

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[1] Long and McDonald 1995. Incidence of Adverse Biological Effects Within Ranges of Chemical concentrations in Marine and Estuarine Sediments, Environmental Management, vol. 19, No. 1.

between 10 and 100, and ≤10 were used to assess risk. Further, it is not clear in this document, nor has any basis been presented, as to the magnitude of the HQ and its associated level of acceptable risk.

Response: This paragraph has been removed from the final SWFS.

9. **Comment:** **<u>Hazard Quotients (HQs) and Hazard Indices (HIs) for Surface Water and Sediment Receptors, Page 34</u>. Total petroleum hydrocarbons (TPH) as diesel and motor oil were detected in surface water pond and channel samples. Although there are no standard criteria with which to develop an HQ, TPH should not be eliminated from this discussion.**

Response: As noted in the comment, TPH cannot be included in the risk calculations. Its presence at MFA has been noted in the final SWEA. Any required cleanup of TPH will be evaluated as part of the petroleum actions.

10. **Comment:** **<u>HQs and HIs for Surface Water and Sediment Receptors, Page 34, Items 1 and 2</u>. These paragraphs discuss which COPECs may pose the "greatest potential to adversely affect benthic receptors" but it is unclear what criteria were used to determine this. Is this based solely on the magnitude of the HQ value? If so, there may be other chemicals with lower HQs which may also cause significant toxicity. If these groups of chemicals are generally co-located, then the COPECs listed as the most significant for sediment and surface water in this section may be acceptable.**

Response: This text was summarized from the SWEA. This section of the SWEA will be reviewed again and these paragraphs will be revised for clarity.

11. **Comment:** **<u>Bioassay Results, Page 35, Third Paragraph</u>. More clarification is requested to explain why the results of porewater bioassay from Northern Channel are not valid.**

Response: The second sentence of this paragraph has been revised to state, "However, there was evidence that the effects were likely associated with the presence of the natural toxic compounds hydrogen sulfide and ammonia and not COPECs; therefore, the quantitative results are not considered valid for evaluating the toxicity of COPECs." Additional discussion of this interpretation can be found on page 8-18 of the final SWEA.

12. **Comment:** **<u>Combined Results of the HQs, HIs, and Bioassays for Surface Water and Benthic Receptors, Page 36, Top of Page</u>. The last sentence states that the surface water HQ data are based on total chemical concentrations rather than the dissolved fraction, which may overestimate potential risk. There are two issues with respect to this. First, the estimation of risk based on total concentrations may or may not be an overestimate of risk, depending upon the organism exposed and the mode of exposure. If an organism ingests the water, then total concentrations may be representative of what the organisms are exposed to. Secondly, the issue of total versus dissolved usually relates to metals in water. However, this FS has excluded discussion of metals as COPECs. This discrepancy should be corrected by including discussion of metals (see comment 1 above).**

Response: Discussion of risks posed by metals will be added to the final SWFS.

13. **Comment:** **<u>Section 1.3.2.3, Summary of Ecological Risk, Pages 40-42</u>. This section describes the level of risk for each of the media by using terms "low" to "moderate" to "high" likelihood of adverse effects. The Navy should describe how these qualifiers are used and what they mean.**

Response: This section is extracted from the final SWEA. The terms are discussed in the footnotes for Table ES-2 in the final SWEA. Briefly, low is HQ less than 10, moderate is HQ greater than 10 but less than 100, and high is HQ greater than 100. Also see Section 10.1.2 of the final SWEA.

14. **Comment:** **<u>Section 1.3.2.3, Summary of Ecological Risk, Pages 40-41</u>. Inorganic COPECs were identified in the Draft Final SWFS and should be included in this section.**

Response: The distribution of metals and the potential risks they present will be included in the final SWFS.

15. **Comment:** **<u>Section 1.3.2.4, Potential Risk Areas, Page 42</u>. Elevated concentrations of PCBs and other COPECs were found in the Navy Ditch, Marriage Road Ditch and Patrol Road Ditch. Should these areas also be considered as potential risk areas and subject to corrective actions?**

Response: Although PCBs were detected in these areas, the concentrations do not equate to risks of HQ greater than 1 for benthic receptors in Patrol Road Ditch. For the Navy Ditch, the cement lining and seasonal drying preclude it from being a benthic habitat. Marriage Road Ditch will be evaluated to determine whether it should be included in the SWFS.

16. **Comment:** **<u>Section 1.3.2.4, Potential Risk Areas, Pages 41-42</u>. The previous section describes the "moderate to high" likelihood of adverse effects for the kestrel and burrowing owl (middle of page 41); however, the Section 1.3.2.4 has excluded the upland soils for these receptors. It is unclear why these receptors and media have been excluded.**

An additional issue in this section is the delimiting of the risk area for the stormwater retention pond to just the pond inlet. There is no explanation for why the area of potential risk has been reduced when the previous sections did not discuss the inlet area, per se. The Navy should clarify and justify this modification.

Response: The discussion of risks to the American kestrel and burrowing owl caused by metals in soil will be included in the final SWFS. The paragraph on the stormwater pond will be revised to include the entire pond. PCB concentrations in sediments in the inlet area are significantly greater than in the rest of the pond.

17. **Comment:** **<u>Section 2.1.4, Allowable Exposure Levels (AEL) Based on Risk Assessments, Page 44, Last Paragraph</u>. The Navy has provided no rationale for setting the "allowable exposure level" for benthic invertebrates of bulk sediment at HQ of <100. Nor have they provided rationale for other alternatives discussed in this paragraph. This section needs significant modification and rationale in order to evaluate the alternatives. See also comment 8 above.**

Response: This paragraph will be rewritten to use an allowable exposure level of HQ less than 1 in bulk sediment for protection of benthic invertebrates in the Northern Channel. Allowable exposure limits of HQ_3 no greater than 1 or HQ_4 no greater than 1 will be used to develop remedial alternatives for the protection of avian and mammalian receptors in the Eastern Diked Marsh and stormwater retention pond.

18. **Comment:** **<u>Section 2.1.5, Allowable Exposure Levels Based on Applicable or Relevant and Appropriate Requirements (ARARs), Page 44</u>. This section should include discussion of federal Ambient Water Quality Criteria. If sediment concentrations cause surface water concentrations to exceed AWQC, then action may be required.**

Response: The Navy will consider whether potential federal Ambient Water Quality Criteria (AWQC) will be included as a potential ARAR for surface water.

19. **Comment:** **<u>Section 2.1.6, Potential Federal and State Location-Specific ARARs, Page 45</u>. The Navy must include the Bay Conservation and Development Commission [BCDC] which has jurisdiction on any activity within 100 feet of the shoreline.**

The Navy must include the San Francisco Bay Region Water Quality Control Plan (Basin Plan) dated June 21, 1995 which specifies protection of beneficial uses. These include all water bodies, such as mudflats, wetlands, estuarine and wildlife habitats.

Response: The Navy will evaluate whether any BCDC regulations meet the criteria for listing as an ARAR. To facilitate this effort, the Navy requests that RWQCB provide a list of the specific statutes and regulations that it believes are ARARs. The Navy will also identify what, if any, portion of the Basin Plan is an ARAR.

20. **Comment:** **<u>Section 2.1.7, Potential Federal and State Action-Specific ARARs, Pages 46-47</u>. The Navy should include Chapter 15 (Title 23, California Code of Regulations (CCR) - discharges of wastes to land) if wastes are left in place. In addition, they must include the San Francisco Bay Region Basin Plan, the Porter-Cologne Water Quality Act (California Water Code, Division 7), State Board Resolution No. 68-16 (Policy on Maintaining High Quality Waters of the State), and State Board Resolution 92-49 (Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304).**

Response: Because the contaminated medium is not a hazardous waste, Chapter 15 does not apply. The Navy does not believe it is appropriate to list the Porter-Cologne Act as an ARAR as it contains no substantive requirements. If RWQCB disagrees, please provide the Navy with the specific sections that may be ARARs. Resolution 68-16 is not an ARAR because the Navy is not contemplating any discharges to higher quality waters as part of the cleanup.

21. **Comment:** **<u>Section 2.1.8, Development of Remedial Action Objectives, Page 48</u>. This section states that the objective is to reduce exposure of the environment to shallow sediments. As to the deeper sediments, if levels remain in place that exceed acceptable risk, they will have to be remediated. This issue is also**

present in Section 2.3.2.3, In Situ Treatment, page 56 and Section 3.1, Development of Alternatives, page 75.

Response: The Navy will demonstrate that the vast majority of PCB and pesticide contamination is located in the shallow sediments (depths of less than 2 feet below ground surface [bgs]).

22. **Comment:** **<u>Section 2.2.1.2, Areas of Attainment Based on the SWEA, Bottom Page 51-52</u>. It is unclear why the salt marsh harvest mouse has been left out of the discussion as a receptor of concern. Page 40 (Summary of Ecological Risk) discusses that "significant potential risks were identified for avian and mammalian receptors exposed to wetland sediment. . ."**

Additionally, for all these scenarios, there is no rationale presented for selecting the various hazard quotient values. The Navy should describe the benefits and limitations (or levels of protection) for each of these scenarios. See comment 17 above. This is also missing from Section 3.1, Development of Alternatives, pages 75-76.

Response: The risk to the salt marsh harvest mouse is due to selenium in stormwater retention pond sediments. It was not included as a receptor of concern because the selenium concentrations are naturally occurring. The risk to the salt marsh harvest mouse as a result of selenium concentrations will be included in the final SWFS.

23. **Comment:** **<u>Section 2.2.2, General Response Actions for Sediments, Mitigation, Page 54</u>. As a note of interest to the Navy, the Regional Board typically requires a three to one mitigation for destroyed wetlands.**

Response: Wetlands will not be destroyed during remedial actions. Therefore, the amount of wetlands to create to compensate for the potential impact of contaminants in the existing wetlands is not well constrained.

24. **Comment:** **<u>Section 2.3.2.7, Mitigation: Restoration of Eastern Diked Marsh, Page 61.</u> Please provide a map to describe the areas of contamination, areas to be excavated, and areas to be restored.**

Response: Additional maps will be provided in the final SWFS.

25. **Comment:** **<u>Section 2.3.2.7, Mitigation: Restoration of Saltwater Wetland in Stormwater Retention Pond, Page 61</u>. Again, a map overlying areas of contamination and areas to be restored would be useful. What is the acreage impacted by chemicals? What is the acreage to be restored?**

For either of the above proposals, the Navy should provide a conceptual plan for these wetland restoration projects prior to agency approval of these alternatives.

Response: Additional maps will be provided. The maps will show the areas with chemical concentrations of concern and the area to be restored. If this remedial alternative is selected, additional discussion and plans for the project will be provided.

26. **Comment:** **<u>Section 2.3.3.7, Evaluation of Process Options, Brackish Marsh Restoration, Page 72</u>. Regarding costs, the Navy should include the cost for long-term monitoring for performance criteria for a wetland creation and revegetation project.**

Response: Costs for long-term review of the effectiveness of the wetland will be estimated for this remedial alternative.

27. **Comment:** **<u>Section 2.3.3.7, Evaluation of Process Options, Saltwater Marsh Formation, Page 73</u>. Regarding effectiveness, the Navy indicates that the relative value of creating wetlands versus leaving some or all contaminants in place is uncertain. An alternative proposal would be to do both: create wetlands and remove contaminants.**

Regarding Implementability, the Navy indicates that there is potential for transferring contaminants from Stevens Creek to the created marsh. Has the Navy established that there is contamination coming from the marsh? And, if so, to what levels? Is it stormwater runoff or from some other source? Contaminants should not be assumed to come from the creek unless it has already been tested.

Regarding costs, see comment 26.

Response: The issue of contamination migrating from Stevens Creek into the newly created marsh will be further explored if this remedial alternative continues to be of interest. Costs for long-term review of the effectiveness of the wetland will be estimated for this remedial alternative.

28. **Comment:** **<u>Section 3.1, Development of Alternatives, pages 75-76</u>: It is unclear why the Navy has focused the remediation of sediments to unsaturated areas only in Alternatives 4, 5 and 6. This needs to be clarified and a basis presented.**

Response: Biotreatment of sediments under water or below the water table will not be feasible because no treatments have been developed for this situation.

29. **Comment:** **<u>Figure 14</u>: The legend indicates "other sampling locations used for SWEA." The Navy should indicate what these "other" locations are.**

Response: These are sediment samples collected during previous investigations of these areas. All data are presented in the final SWEA. The legend will be revised to state "Sediment sample locations from previous investigations."

30. **Comment:** **<u>Figures 18 through 22</u>: The title indicates these represent avian and mammalian receptors. Are we to assume this represents salt marsh harvest mouse? There is a discrepancy here in that the salt marsh harvest mouse is not really discussed in the text as being a receptor of concern.**

Response: The salt marsh harvest mouse is not included on these figures because the risk to the mouse is due to selenium in sediments. The risk to the salt marsh harvest mouse will be discussed in the final SWFS. However, the risks due to selenium in sediments are not part of the presently proposed remedial alternatives. The map legend and title will be revised to show only avian receptors.

31. Comment: **<u>Appendix C, Proposed Approach for Ecological Monitoring</u>. While the RWQCB appreciates the Navy including a conceptual approach for long term monitoring, it may be difficult at this point to include too many specifics. The final monitoring plan will depend on, of course, the alternative selected. We do not believe this appendix should be considered final until the remediation work is complete.**

<u>Page C-3</u>. Regarding sampling grids only in areas where remediation has occurred, the Navy should consider other areas as well, depending upon the alternative selected. We may be concerned about migration of contaminants from areas that are not ultimately remediated.

<u>Page C-3</u>. It is premature to determine the number of samples required for each area. In addition, the ditches might need to be included in the long-term monitoring to track any contaminant migration.

<u>Page C-3 and C-4, Bioassays</u>. Agreed that we should re-evaluate the test organisms used for bioassays. Recently, the Regional Board has been using, with consistent success, a sediment-water interface test that theoretically is more representative of chemical fluxes between surficial sediments and overlying water. This is a test that can be considered. Regarding the test organisms of choice, there may be more appropriate and more sensitive organisms than bivalve larvae. In addition, the amphipod bulk sediment bioassay nor the FETAX should not be discounted. The RWQCB requests that these discussion remain open until the remediation is complete.

<u>Page C-4</u>. With respect to reference sites, we agree that the use of one of the Regional Board's reference sites for San Francisco Bay should be considered. The specific location should be open for further discussion.

<u>Page C-4. Tissue Sampling</u>: Again, this needs further discussion. The preferred methodology would be collecting and analyzing tissues from organisms at the site, rather than laboratory bioaccumulation tests because they reflect what is actually occurring in the field and what the organisms are exposed to. In addition, the specific tissues collected will depend upon concerns for any residual long-term exposure to receptors of concern. In other words, pickle-weed, insects, earthworms should not yet be discounted.

<u>Pages C-4, C-5, Biological Surveys</u>. We agree that these are useful, especially if done in wet and dry seasons. However, the surveys may need to be expanded beyond benthic populations and include plants and higher trophic level receptors. The number of years that the surveys should be conducted should be open for further discussion as to the species considered.

Response: The Navy agrees that the appendix may be finalized at the remedial design/remedial action phase of the project. The Navy is not certain that a long-term monitoring plan is required, given the remedial alternatives to be presented in the final SWFS. Please also see the response to EPA comment 52.

4.0 RESPONSES TO SILICON VALLEY TOXICS COALITION (SVTC) COMMENTS

4.1 GENERAL COMMENTS

1. **Comment:** **Typically PCBs have been used as an insulator or in other ways where they are heated. Heating has caused PCBs to sometimes breakdown into products such as dioxins and furans, while other PCB molecules have a similar molecular alignment to dioxin (i.e., co-planars). These conditions present far greater risks than the PCB congeners identified. For example, dioxins and furans are generally cleaned up to a 1 ppb [part per billion] level, and may be toxic at a 1 part per quadrillion. Have dioxins or furans been tested for at the site? Have the PCBs been tested to determine whether they contain co-planars? Without this information, it seems that the Navy is unable to set a cleanup standard or make a weight-of-evidence argument that is based on the sound scientific principles. SVTC recommends that the Navy test the presence of dioxin or dioxin-like compounds in the PCBs. This recommendation is similar to an issue raised by the California Department of Toxic Substances Control (DTSC) in its comments on the Draft Final Phase II Site-Wide Ecological Assessment.**

   Response: Some additional sampling is planned in conjunction with the treatability studies for the summer of 1998. At this time, some of the sediment samples collected for the analysis of PCBs can be analyzed for dioxin.

2. **Comment:** **The weight of evidence summary concerning the risk assessment for benthic receptors does not make a conclusion concerning food chain effects. Since the drivers in the wetlands are PCBs, pesticides and some PAHs, which are all known to work their way up through the food chain, what do you conclude from the HIs for benthic organisms concerning potential food-chain effects? PCBs in particular have been known to be more potent as they work themselves up the food chain, and exhibit some dioxin-like qualities when found in higher organisms.**

   Response: Food-chain effects are incorporated in the hazard quotient values for the various avian and mammalian species. See Figures 18 through 22 in the revised draft final SWFS. Additional figures showing hazard quotients for HQ_3 greater than 1 will be included in the final SWFS.

3. **Comment:** **Clearly, the largest difficulty that Silicon Valley Toxics Coalition has with the <u>Site Wide Feasibility Study</u> (SWFS) is the use of high and arbitrary risk values for ecological receptors. While we realize that there is uncertainty over ecological risks, in our opinion, risk values and subsequent risk management decisions should be based on conservative assumptions. This means that when a risk level reaches a threshold that indicates harm, it should be the goal of remedy to alleviate that harm. The risk threshold used by risk assessors and risk managers is an HQ>1. Deviation from that standard must be reasonably justified. In our view, the Navy has not set forth a reasonable justification. Deviation from this standard cannot be justified merely on the basis that the risk model used to derive risk levels requires more cleanup than was expected.**

Referring to the HQs and HIs for avian and mammalian receptors, it is unclear why risk ranges (i.e., HQ>1, >10, and >100) were used. The goal of the risk assessment should be to identify all areas with risks above 1, and thereby develop a remediation strategy. This is the same position put forth by the DTSC in its comments on the Draft Final Phase II Site-Wide Ecological Assessment. For example, comment 7 states that "DTSC believes that HQ_3 and HQ_4 risk estimates greater than one are indicative of likely adverse impacts on the SMHM [Salt Marsh Harvest Mouse] from primarily PCBs and lead..".

EPA had similar comments on the Draft-Final SWFS. For example, comment 3 states "To reiterate, alternatives should also be developed to mitigate human health risks in the range of 10^{-4} to 10^{-6} and ecological risks when HQ>1." This statement is unambiguous. The Navy's response that Alternatives 5 and 6 address ecological risks exceeding HQ>10 for benthic organisms does not meet this standard, and avoids the question. Comment 26 also notes that interpretations by Menzie et al regarding the probability of risk for categories of HQ>1, HQ>10, and HQ>100 is not widely accepted and is based on a study without any technical basis. (Although the Navy responds that the comment is noted, it has continued to use this categorization of risk in the Revised Draft-Final SWFS.)

We understand that four different scenarios (HQ_1-HQ_4) were developed representing a range of reference doses and assumed daily doses for avian and mammalian receptors. (HQ_1 represents a high reference dose and an average daily dose; HQ_2 represents a high reference dose and a high daily dose; HQ_3 represents a low reference dose and an average daily dose; and HQ_4 represents a high reference dose and a high daily dose.) It was DTSC's comments that only HQ_3 and HQ_4 should be used. We support this, and we do not understand why another layer of risk range was added (i.e. >10, >100), as HQ_1-HQ_4 should embody the range of uncertainty. Based on our conversations at the Restoration Advisory Board (RAB) meeting in January 1998, it appears that the Navy could not accept HQ_4, and could only accept an HQ_3>100 because it is more like HQ_2. This apparently was what the Navy had originally thought it would clean up to.

It is equally unclear what the line of reasoning is in using an HQ>10 for benthic organisms, rather than an HQ>1.

This comment is made within the larger context of the "Precautionary Principle" for conducting actions that may be harmful to human health and the environment. In part, this principle states:

> **"We believe existing environmental regulations and other decisions, particularly those based on risk assessment, have failed to protect adequately human health and the environment.... We believe there is compelling evidence that damage to humans and the worldwide environment is of such magnitude and seriousness that new principles for conducting human activities are necessary.**
>
> **"While we realize that human activities may involve hazards, people must proceed more carefully than has been the case in recent history. Corporations, government entities, organizations,**

communities, scientists and other individuals must adopt a precautionary approach to all human endeavors.

"<u>When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof</u>."

We do not believe that the Navy has borne its burden of proof in this context.

Response: The final SWFS will use HQ greater than 1 for protection of benthic receptors as the risk threshold for the sediments of the Northern Channel. For the stormwater retention ponds and Eastern Diked Marsh, the final SWFS will present remedial alternatives showing areas with sediment concentrations exceeding the threshold of HQ_3 greater than 1 and HQ_4 greater than 1 for protection of avian and mammalian species.

4. **Comment:** **As the California Department of Fish and Game (DFG) explained in its comments on the SWEA (i.e., comment 1), the principal result of a remedy or remedial action is 'to prevent or minimize the release of hazardous substances so that they do not migrate or cause substantial danger...to the environment' <u>and</u> 'protect and restore (natural) trust resources'. DFG recommends that the remedial action be designed to restore natural resources to "conditions that would have been expected at the area had the discharge or release of the hazardous material not occurred." This latter overarching goal explains why the HQs derived from low toxicity reference values (TRVs) should be used to establish risk or the likelihood of adverse effects. SVTC concurs with this view.**

In the Navy's response, it states that "[T]he SWEA has been approved by the regulatory agencies..", that "various HQs are presented in the revised draft final SWFS as they were in the final SWEA", and "the range of HQs is presented in the SWFS to assist risk managers in making cleanup decisions for MFA." We are disappointed with this response for several reasons. First, all information concerning each HQ scenario is not presented in the SWFS. For example, cost estimates are only presented for the six alternatives. No cost information is provided for achieving $HQ_3>1$, or a benthic HQ>1. While there are three figures that show how much area would be remediated for $HQ_4>1$, $HQ_4>10$ and $HQ_4>100$, there is only one Figure for $HQ_3>100$, and one for $HQ_1>100$. Clearly, not all of the information needed to make risk management decisions is provided in the revised draft final document. Second, because effects to the wetland ecosystem drive the remediation strategy, the DFG should have a large say in risk management decisions. It is not clear to SVTC that the DFG has the resources to be involved in this decision-making process, and merely stating that the range of risk values is presented, without responding to the substance of DFG's comment begs the questions of what risk value is appropriate for MFA, or what should be the goal of the risk management decision.

Response: See response to comment 3.

4.2 SPECIFIC COMMENTS AND QUESTIONS

1. **Comment:** **<u>EPA's comment on the Draft Final SWFS regarding Section 1.3.1.1, Page 15</u>. Residential scenario (comment 21) seems to have been dismissed and not elaborated upon in the Revised Draft Final SWFS. We think that areas with carcinogenic risks higher than 10^{-6} should be identified. If there is a reasonable justification for not remediating those areas, then that should be explained. However, the revised draft final document does not even explain the fuzzy logic that was given in response to EPA's comments (i.e., risks exceeding 10^{-6} were found in sediments in Marriage Road Ditch and Patrol Road Ditch, but these areas would be filled before residences could be built, thereby mitigating the risks.) In our opinion, if residences were to be built in the area, it is not probable that they would be built on top of drainage channels. Rather, a residential area could be located in close proximity to the ditches. If those ditches are not remediated, they could pose a threat to human health.**

   Response: All risks, including those posed by sediments in the ditches and due to metals, will be discussed in this section of the final SWFS.

2. **Comment:** **The document does not clearly describe the definitions of the various HQs and how we can interpret the various risk ranges. Although the hazard matrix on p. 33 is relatively straight forward, it is not easily understood in the context of the various risk ranges that are presented on the same page (i.e., HQ>1, >10, >100). There was also an error in the matrix that was identified at the January 1998 RAB meeting.**

   Response: The error in this table has been corrected. Additional discussion of the hazard quotients will be added to this section of the SWFS.

3. **Comment:** **<u>Please explain in detail Tables 9-10, which provides alternatives for HQ_3>100 and HQ>10</u>. How can we compare these endpoints? Please explain the differences, not only by the area that would be affected, but how much contamination would remain. It is not clear from the text what the contaminant specific levels are for any of the alternatives. We suggest that for each alternative, the Navy provide a table indicating the quantity of the chemicals of concern that exist in each area and how much will be left after remediation. As stated in the general comments, SVTC believes that an endpoint of an HQ no greater than one should be the goal of the remediation strategy.**

   Response: Tables 9 and 10 will be revised to present the remedial alternatives involving the removal of the sediments posing risk as described in the response to general comment 3 above. The concentrations of chemicals that result in an HQ greater than 1 for the protection of benthic receptors and an HQ_3 or HQ_4 greater than 1 for avian and mammalian receptors will be back calculated and presented in the final SWFS.

4. **Comment:** **<u>Please provide more detail on Alternative 6, wetland mitigation</u>. This involves the creation of a saltwater marsh in the northwest corner of the stormwater retention pond. A drawing showing where and how flow would be increased would be helpful.**

Response: A map of the area that may be turned into a saltwater wetland will be provided.

5. **Comment:** **When designing the wetland options, was consideration given to using the treated water from the Middlefield, Ellis, Whisman (MEW) Regional Groundwater Treatment System? The system is expected to treat 955,000 gallons per day (gpd) of groundwater, with approximately two-thirds available for re-use. If this was not considered, please explain why. If it was considered, please explain why it was ruled out.**

Response: Fresh water from the MEW Regional Groundwater Treatment System was not considered for the revised draft final SWFS. It will be considered for use in this remedial alternative in the final SWFS.

6. **Comment:** **Please provide a description of a contingency plan for remediation of sediments if white rot fungus does not achieve its goals. The latest Federal Remediation Technologies Roundtable report states that "white rot fungus has the potential to degrade and mineralize other recalcitrant materials, such as DDT, PAH, PCB..". Most white rot fungus applications have been able to break down unexploded ordnance (UXO) compounds such as TNT. At Letterkenny AD in Pennsylvania, a pilot-scale demo achieved 30 percent removal of PCBs. Please describe the research or treatability study that would be needed prior to approving white rot fungus treatment for PCBs.**

Response: Treatability studies using the white rot fungus and other microbial organisms to degrade PCBs will be initiated in the summer of 1998. These studies will be briefly described in the final SWFS. As stated in the revised draft final SWFS, the backup alternative for ex situ treatment of PCB-contaminated soil is thermal desorption.

7. **Comment:** **<u>Referring to Page 31</u>. Please explain what is meant by the congener-specific bioaccumulation factor (BAF) of less than one.**

Response: This sentence has been removed from the final SWFS.

8. **Comment:** **<u>Referring to Page 32</u>. Please explain the statement following mean "an HQ of 20 does not represent a proportionally higher probability of effects than an HQ of 2."**

Response: The risk for an HQ of 2 is not 10 times the risk for an HQ of 20. Additional text will be added in this section to clarify this point.

9. **Comment:** **<u>Referring to Pages 35-36</u>. It states that HIs are not a good predictor of biological response for the bioassays. It is not clear from the text what is a better predictor, or if a predictor exists. It also states that the observation is based on a limited data set. Was the data set statistically significant? Please explain in detail.**

Response: A sentence referring to the section of the SWEA where this subject is discussed in greater detail will be added to the final SWFS.

10. **Comment:** **<u>Referring to Page 60</u>. Where is the off-site disposal area that is being considered?**

Response: The nearest commercial landfill licensed to accept MFA sediments will most likely be the off-site disposal area used. No specific vendor has been selected.

5.0 REFERENCES

Science Applications International Corporation (SAIC). 1997. Soil Removal Project, Storm Drain Channel, Area of Investigation 6 (AOI6) Moffett Federal Airfield, California. Mach.

PRC Environmental Management, Inc. (PRC) and International Technology Corporation (IT). 1994. Final Statistical Analysis of the Occurrence of Beryllium in Soils Technical Report, Naval Air Station Moffett Field, California. January.