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Mr. Stephen Chao
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8 February 1993

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File: 2738.0300/3.11/2.1

Subject: NAS Moffett Field Remedial Investigation/Feasibility Study
Draft Final Phase I Site-Wide Ecological Assessment Work Plan

Dear Mr. Chao:

James M. Montgomery, Inc. has completed the responses to comments on the Draft Final Phase I Site-Wide Ecological Assessment (SWEA) Work Plan. Responses to recurring agency comments are presented in Attachment A and responses to specific comments are presented in Attachment B. A figure showing sampling locations to be included in the Phase I SWEA Workplan is in preparation and will be distributed prior to distributing the revised workplan.

Call us if you have any questions (510) 975-3400.

Sincerely,

James M. Montgomery, Inc.

Kimberly A.Walsh
Project Biologist

Joseph P. LeClaire, PhD
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cc:

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ATTACHMENT A

NAVAL AIR STATION MOFFETT FIELD

RESPONSE TO RECURRING COMMENTS ON DRAFT FINAL PHASE I SITE-WIDE ECOLOGICAL ASSESSMENT WORKPLAN

FEBRUARY 8, 1993

Recurring Comment 1: **The USEPA, RWQCB, DTSC, and NOAA each commented on sections 6.0, 7.0, 8.0, and 9.0 of the Phase I SWEA Work Plan. The USEPA commented that, with a few exceptions, the work in these sections should be conducted in Phase II after the development of a conceptual site model.**

JMM Response: An agreement was reached regarding the scope of Phase I work during the January 15, 1993 meeting. The Phase I SWEA Workplan will be modified to incorporate that agreement. Quantitative evaluation of data collected during Phase I will be deferred until Phase II. Therefore, work planned in Sections 6.0 (except 6.4 and 6.5), 7.0, 8.0, and 9.0 will be postponed until Phase II, and comments on these sections will not be incorporated in the revised work plan.

In an effort to be responsive to agency concerns, we have presented preliminary responses to comments on these sections. The actual approach to Phase II work may change somewhat depending on the results of Phase I. We believe it is useful to discuss the approach to Phase II work, although the actual work will be conducted after agency review and comment on the Phase I report.

Recurring Comment 2: **The USEPA, RWQCB, and NOAA each commented that the SWEA Workplan focused on OU-6 and OU-2. The agencies were concerned that SWEA as planned in the subject document was not a *site-wide* ecological assessment.**

JMM Response: The Phase I SWEA Work Plan will be revised to reflect the emphasis on a site-wide assessment. During Phase I, the entire site will be the focus of the reconnaissance habitat survey and receptor identification tasks. Sampling of environmental media will be focused on areas of the site (particularly some areas of OU 6) where no previous sampling has been conducted. The sampling locations for Phase I are those identified during the site

walk on January 26, 1993, including preliminary sampling of Steven's Creek. The goal of the Phase I SWEA is to develop a conceptual site model that can be used, along with a preliminary evaluation of the data, to focus Phase II work.

Recurring Comment 3: **The USEPA, RWQCB, DTSC and NOAA each commented that the USACE method for wetlands delineation is either inappropriate for the SWEA objectives or it is unclear how the information would be used to meet project objectives. There was concern that the Navy planned to use the USACE methods to facilitate plans to fill wetland areas.**

JMM Response: The Navy has no current plans to fill wetland areas at NAS Moffett Field. The USACE procedure was chosen because of its wide acceptance as a method for delineating wetlands. This method has been used for general habitat delineation other than strictly for compliance with Section 404 of the Clean Water Act. To address agency concerns regarding the use of the USACE method, the work plan will be revised to incorporate the use of the USFWS method for identification of functional wetlands, as was agreed during the January 15, 1993 meeting. The USFWS methods will be used to provide the broadest interpretation of wetland habitats.

Recurring Comment 4: **The USEPA, RWQCB, DTSC and NOAA each commented on the scope of Phase I sampling and analysis included in the work plan. The USEPA recommended the elimination of all Phase I sampling other than that planned in the Northern Channel, and an intensive Phase II effort. The RWQCB commented that the Phase I sampling should not be considered the extent of sampling required to assess ecological risk, that TPH should be included in the list of analytes, and that at least three samples should be taken in the Marriage Road Ditch. The DTSC commented that additional characterization should be done in areas receiving storm water runoff including Jagel and Devil's Sloughs. The NOAA commented that additional sampling should be conducted in Steven's Creek, Jagel Slough, and Devil's Slough.**

JMM Response: Phase I sampling is intended to provide preliminary chemical data for areas on or in the vicinity of the site that have not previously been investigated. TPH will be added to the list of analytes. The Phase I effort includes sampling of areas that, based on our current understanding of the site, may be impacted

by past site operations. The sampling locations were reviewed with the agencies during a site walk conducted on January 26, 1993.

Sampling locations will remain as designated on Figure 13 of the Draft SWEA Workplan with the following exceptions:

- Sampling locations that appear to be in the wetlands north of the Northern Channel will be taken in the Northern Channel.

- The sample northeast of the Navy Stormwater Retention Pond will be moved inside the pond southwest of the levee.

- Based on consideration of the topography of the NASA/Navy Storm Water Retention Pond, one sampling location within the pond will be moved to the lowest area of the pond adjacent to the drainage inflow.

- Three samples from sediments and three samples from surface water in Steven's Creek will be collected downgradient of the lift station.

- Three sediment samples and two water samples will be collected from Patrol Road Ditch as part of a separate confirmation study. The results from this sampling will be included in the Phase I SWEA report.

These revisions will be incorporated in Figure 13 of the Final Phase I SWEA Work Plan. Our current understanding of the site indicates that Jagel Slough and Devil's Slough do not receive stormwater runoff from the site or from Building 191 lift station. Therefore, there are no plans to sample these sloughs during the Phase I SWEA.

ATTACHMENT B

NAVAL AIR STATION MOFFETT FIELD

RESPONSE TO COMMENTS ON DRAFT FINAL PHASE I
SITE-WIDE ECOLOGICAL ASSESSMENT WORKPLAN

FEBRUARY 8, 1993

GENERAL COMMENTS
From Joseph Greenblott, USEPA

Comment No. 1:	**This draft final workplan is a vast improvement over the previous draft. The Navy and its contractors are to be commended for their efforts. The workplan, however, still does not address many critical issues discussed in previous comments and at agency meetings. While it is EPA's desire to begin work on this ecological assessment with due haste, we must also ensure that the approach is consistent with good science and makes the most efficient use of resources and data.**
JMM Response:	Comment noted.
Comment No. 2:	**The approach that EPA supports is an iterative, phased approach. The Phase I assessment involves summarizing and evaluating all available information on the site so that additional data gathering efforts will be highly productive. It is hoped that the detailed comments contained in this memorandum will help to improve understanding of EPA's approach to ecological assessments.**
JMM Response:	Comment noted.
Comment No. 3:	**The overall goal of the Phase I assessment should be to develop a site conceptual model by which a detailed and coordinated field investigation can be planned. That site model will be refined as more detailed information is collected and analyzed in subsequent phases. The rationale for this approach is that it will save time, money, and generate high quality data. Phase II field studies should be based on the conceptual model developed in the Phase I assessment, and incorporate sampling and analyses for both biotic and abiotic parameters, including contaminants. EPA**

considers this approach to hold the greatest promise for conducting a thorough yet efficient ecological assessment that addresses the concerns of all interested parties.

JMM Response: We concur with the comment that the overall goal of the Phase I SWEA should be the development of a conceptual site model and this goal will be reflected in the revised workplan. The scope of the Phase II SWEA will be proposed after review of the Phase I results.

Comment No. 4: **Although I do not recommend approval of this workplan at this time, I do recommend that some sections of this workplan be approved and that work begin as soon as possible, conditional on satisfactorily addressing the comments contained in this memorandum and those supplied by the other regulatory agencies and the various Natural Resource Trustees.**

JMM Response: Comment noted.

Comment No. 5: **The following activities are recommended for approval upon satisfactorily addressing relevant comments:**

Sections 3.0, 4.0 (with the exception of 4.4--Phase I sampling should be conducted only in Northern Channel: a detailed Field Sampling Plan should be prepared that includes handling, and analytical procedures; and data management and treatment), 5.0, 6.0 (excluding 6.3 and 6.6).

Comments relevant to these sections should be addressed in a technical memorandum that can be appended to this workplan to avoid any additional delays; however, the workplan should be rewritten as a Phase I workplan before being approved.

JMM Response: See Attachment A, Response to Comment 1. See also Attachment A, Response to Comment 4. The detailed field sampling methods will either be incorporated by reference to previously approved sampling methods or will be included in detail in the revised Phase I SWEA Workplan.

Comment No. 6: **Sections 7.0 and 8.0 should be excluded from the Phase I assessment and substituted with a section for developing a site conceptual model. Sections 9, 10 and 11 should be modified to address the specific work to be conducted under**

the Phase I assessment. An additional section should be added to identify and present data gaps and make recommendations for the Phase II assessment approach.

JMM Response: See Attachment A, Response to Comment 1. The suggestions presented in this comment will be incorporated in the revised Phase I SWEA Workplan.

SPECIFIC COMMENTS

2.0 PURPOSE AND OBJECTIVES

Comment No. 1: **Page 2, Par. 2: The text states: "The purpose of the site-wide field investigation is to determine if contamination exists in the storm water retention ponds or wetlands in or adjacent to the facility and to assess whether there is risk posed to ecological receptors in those areas." As stated in my comments on the 3 July draft workplan for OU6, "Figure 7 of the draft work plan (Previous Soil and Sediment Sampling Locations with BNAs/PCBs/Pesticides Above Reporting Limits) and Figure 8 (Previous Soil and Sediment Sampling Locations with TPH Above Reporting Limits) [Figure 8 and 0 of the draft final workplan] clearly show sufficient numbers of contaminated samples in and around sensitive habitats to indicate a potential risk to ecological receptors..." because there are potentially complete exposure pathways. Since risk (defined as the chance of injury, damage, or loss) has already been established, one goal of the overall ecological assessment should be to "evaluate the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressor[1]." Objectives of the ecological assessment should include establishing remediation goals that are protective of the environment, and evaluating the efficacy of remedial options in meeting those goals.**

JMM Response: We concur that there are existing analytical data indicating a potential risk to ecological receptors. However, the site-wide nature and extent of contamination is not fully characterized. This is particularly true of OU-6. Thus, there are three objectives in conducting the SWEA. First, we will collect

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[1] Framework for Ecological Risk Assessment. February 1992. U.S. Environmental Protection Agency, Risk Assessment Forum. EPA/630/R-92/001, p. 2.

preliminary data to determine the presence or absence of contaminants in previously uninvestigated areas, and identify receptors and habitats for the purpose of developing a conceptual site model. Second, during Phase II, we will evaluate the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to chemical contamination originating at Moffett Field. Finally, during Phase II or a subsequent phase, we will propose remediation goals protective of the environment. The evaluation of the efficacy of remedial options in meeting those goals will be conducted during the feasibility study. The Phase I Workplan currently includes a statement of the first objective. The workplan will be revised to state that the eventual overall goal of the site-wide ecological assessment is to evaluate potential adverse ecological effects due to past and current onsite contamination, including establishing remediation goals that are protective of the environment.

Comment No. 2: **Page 3, Par. 1: The workplan states that it is a site-wide workplan, but then states that it addresses only OU6 and portions of OU2, because "...potential impacts from other OUs is much smaller, and therefore they are not addressed in this work plan." This is not consistent with EPA's definition of a site-wide ecological assessment. This reason is why EPA requested expansion of the workplan to include the entire site to evaluate all potential impacts on ecological receptors that result from on-site contamination. No OUs should be excluded from evaluation at this time. Groundwater may serve as a contaminant source to or a sink from sensitive habitats. In addition, treatment of groundwater can drastically impact wetlands and other surface waters by altering their hydrology. Upland contaminated soils, golf courses, and paved areas (OUs 1-3) may likewise be sources of contaminants to sensitive habitats through non-point source contributions and by contributing to groundwater contamination.**

JMM Response: See Attachment A, Response to Comment 2.

Comment No. 3: **Page 3, Par. 3: Change the second sentence to read "These conditions include the presence of chemical contaminant in soil and groundwater and the potential that some of these chemicals are reaching adjacent or on-site streams, wetlands, storm water retention basins, terrestrial, or marine environments."**

JMM Response: We concur with the suggested change. This change will be incorporated in the final SWEA Workplan.

Comment No. 4: **Page 4, Par. 1: While a "weight-of-evidence" can be a useful complement to a stressor-response-based risk assessment, EPA prefers to make decisions based on stressor-response relationships and prefers that uncertainty be quantified in a probabilistic manner. This approach offers much greater certainty in decision making than does planning an investigation based on a weight-of-evidence approach, which relies on professional judgment to a greater extent. A probabilistic risk assessment will report potential risk as a probability of some magnitude of impact to a receptor at a given exposure.**

JMM Response: The workplan will be revised to reflect the Phase I objective of a preliminary characterization of the nature and extent of contamination, and identifying receptors and habitats site wide. The final product of the Phase I report will be a conceptual site model. Phase II will incorporate the emphasis on probabilistic evaluation of the magnitude and likelihood of ecological effect, and quantifying uncertainty. Consideration of weight of evidence is a necessary interpretative step that will follow the probabilistic evaluation in Phase II.

Comment No. 5: **Page 4, Par. 2: Sections No. 1 (Background and Site Description) and 2 (Plan for Site Characterization) should be included in the Plan for Problem Formulation (Section 3). Problem formulation is similar in concept to developing the conceptual site model, and is a product that begins to be developed in the Phase I Assessment. It includes site description. For the Phase I assessment the site characterization, as described, should be based on available data and the results of the site reconnaissance survey. Additional field data should be collected, as necessary, during Phase II.**

JMM Response: We concur that the background and site description and plan for site characterization are integral parts of the plan for problem formulation. However, in the interest of clarity, we will present these sections of the workplan separately, acknowledging that they are related tasks. As agreed to in the meeting on January 15, 1993, Phase I will include limited preliminary sampling in areas with no existing data. Additional field data will be collected as needed in Phase II.

3.0 BACKGROUND AND SITE DESCRIPTION

Comment No. 6: **Page 5: Much of the information contained in this section, together with additional data to be gathered as part of the Phase I ecological assessment, will be useful in developing a conceptual site model for the Phase I assessment. This model should integrate what is known about the site (e.g., surface features, hydrological characteristics, habitats, biotic receptors, and both chemical and non-chemical stressors) and make qualitative predictions about contaminant fate and transport and exposure to ecological receptors. These predictions (hypotheses) should be used to focus and coordinate the field studies in Phase II.**

JMM Response: We concur that the information in Section 3.0 will be useful in developing the conceptual site model during Phase I. If field studies are indicated, Phase I information will be used to focus and coordinate the Phase II effort.

Comment No. 7: **Sec. 3.2, Page 9, Par. 1: While OUs other than OUs 6 and 2 may not support sensitive ecological receptors, they can contribute to impacts on sensitive habitats, as previously discussed in these comments.**

JMM Response: We concur. The Phase I SWEA Workplan is not intended to exclude OUs, but preliminary information does indicate areas of emphasis and deemphasis in the overall evaluation. The Phase I SWEA will include all areas of the site and rationale supporting focusing effort in Phase II will be presented in the Phase I report.

4.0 PLAN FOR SITE CHARACTERIZATION

Comment No. 8: **Sec. 4.1, Page 12: Change the second sentence to read, "The primary objectives of the Phase I site characterization are to":**

Change the third objective to read, "Evaluate, through direct observation and reported information, the general functional condition and boundaries of surface water bodies and wetlands on and around the site."

Change the fourth objective to read, "Evaluate potential exposure pathways of sensitive species and biological communities to contaminated environmental media."

JMM Response: We concur with the first two changes and will incorporate them in the Final Phase I SWEA Workplan. The fourth objective will read: "Evaluate the nature and extent of contamination of environmental media, in previously uninvestigated areas, with regard to potential exposure of species and biological communities." The fifth objective will read: "Evaluate potential exposure pathways of sensitive species and biological communities to contaminated environmental media."

Comment No. 9: **Sec. 4.2, Page 12: Since the text states that the objectives of the habitat survey include identifying the nature and composition of aquatic habitats, change the heading to read: "4.2 CHARACTERIZATION OF HABITATS."**

JMM Response: We concur with this comment and will incorporate this change in the Final Phase I SWEA Workplan.

Comment No. 10: **Page 12, Par. 3: Change the first sentence to read, "The objective of the Phase I habitat survey...." and**

Change the third bulleted activity to read, "Recommend species or groups of species...." Selection of sensitive species and other assessment endpoints should be done within the context of habitats and the larger landscape ecology. Screening out species is not appropriate for Phase I; however, the data supplied in Phase I should be used to focus future assessment efforts.

JMM Response: We concur with this comment and will incorporate this change in the Final Phase I SWEA Workplan.

Comment No. 11: **Sec. 4.2.3, Page 15, Par. 2: The text states the objective of the site survey "...is to provide an inventory of terrestrial fauna on site." A valid inventory of the terrestrial fauna at the site cannot be accomplished without conducting an extensive wildlife survey performed over several seasons. EPA does not consider an extensive wildlife survey to be necessary for the Phase I ecological assessment; rather, the Phase I assessment should include a reconnaissance survey (or surveys) which will identify habitats and record observations of wildlife as a secondary objective. This information should be compiled with previously reported information on wildlife expected to be present on or that utilize resources at the site, as well as areas potentially impacted by contaminants from the site or potentially**

impacted by remediation of contaminated media. Detailed wildlife surveys should be postponed until the Phase II ecological assessment and should focused on measurement endpoints selected on the basis of data from the Phase I assessment. Such field work should be coordinated with non-biological sampling and analysis to be most efficient and to provide the highest quality data.

JMM Response: We concur with the comment that a valid wildlife inventory should be performed over several seasons. We will revise the Final SWEA Workplan to state that the site survey is a reconnaissance survey that will focus on habitat identification. However, evaluation of Phase I information will be used to determine the need for field studies and to focus these efforts.

Comment No. 12: **Sec. 4.2.6, Page 16, Par. 1: Change the third bullet to read, "Recommendation of species or groups of species...."**

JMM Response: We concur with the comment and will incorporate this change in the Final SWEA Workplan.

Comment No. 13: **Sec. 4.2.6, Page 16, Par. 2: The final report should integrate all information on habitats, species, and contaminant exposure and toxicity into a conceptual site model site that can be used to focus the Phase II field investigation.**

JMM Response: We concur with this comment and will incorporate this change in the Final SWEA Workplan. The final report will integrate information on habitats, species, and contaminant exposure and toxicity into a conceptual site model that will be used to evaluate preliminary significance and focus possible future Phase II field investigations.

Comment No. 14: **Sec. 4.3, Page 17, Par. 2: What is the objective of the intensive effort in wetland delineation during the Phase I assessment? The U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual describes the criteria for application of Clean Water Act Section 404, and as such constitutes a regulatory-defined wetland. However, for the Phase I assessment we are interested in functionally defined habitats that may be impacted or sensitive to chemical stressors or adversely impacted by remediation. These are not necessarily included in USACE-defined wetlands. In addition, the State may have a regulatory definition that may**

be substantially different from the USACE definition. A more appropriate definition may be that used by U.S. Fish and Wildlife Service, which requires only one of the three criteria to be met for an area to be considered a wetland. A better approach for a Phase I habitat characterization would be to characterize each habitat according to ecological definitions, as agreed upon by the experts participating in the proposed field reconnaissance survey.

JMM Response: See Attachment A, Response to Comment 3.

Comment No. 15: **Sec. 4.3.2, Pages 18-19: It is recommended that activity 5 be amended to use the U.S. Fish and Wildlife wetland criteria or any State criteria that may exist, or any other means of "functionally" describing a habitat more ecologically applicable than the USACE regulatory criteria. The purpose of the Phase I ecological assessment is to develop a conceptual model that will support the planning of a more intensive sampling and analysis effort (if one is determined to be necessary) in the Phase II ecological assessment. To develop this model, it is important that the Phase I assessment be inclusive, and not exclude any habitats from consideration prior to agency evaluation. Phase I requires only a qualitative habitat characterization developed from available information and the reconnaissance survey. The intensive effort described in the workplan, beginning with activity number 3, should be postponed until the Phase II assessment (if it is necessary at all). To make the most effective use of resources and data, these activities should be coordinated with Phase II biotic and abiotic sampling and analyses in the wetlands. Such coordination will minimize the disturbance to sensitive habitats and provide better data than would be possible through separate investigations.**

JMM Response: See Attachment A, Response to Comment 3 and Response to Comment 2.

Comment No. 16: **Sec. 4.4, Page 22: While the revised workplan has addressed some of the concerns raised in the agency meeting of August 31, 1992 and in my written comments of August 17, 1992 regarding the adequacy of the proposed field investigation (see November 25, 1992 letter from James M. Montgomery, Inc. to Stephen Chao: NAS Moffett Field Remedial investigation/Feasibility Study Responses to Comments), other concerns have not been adequately addressed. In**

addition, sampling and field activities, other than a site reconnaissance survey for habitat characterization, were to be planned as part of the Phase II ecological assessment, as agreed to at the agency meeting of August 1992.

JMM Response: See Attachment A, Response to Comment 1 and Response to Comment 4.

Comment No. 17: **Sec. 4.4., Page 22: The specific data quality objectives for each aspect of the field investigation have not been negotiated. While some explanation has been provided for the location of sample stations, the rationale for the number of sampling locations also is not provided, and the number and location of sampling stations is relatively unchanged from those proposed in the previous draft of this workplan (with the exception of the addition of 4 sampling stations in OU6 on the dry land south of the Navy Storm Water Retention Pond and east of the NASA/Navy Storm Water Retention Pond). Is the sampling array statistically designed and based on know or estimated spatial variability? Will the results of the proposed field investigation satisfy the need for evaluation of the extent of contamination, given the large spatial variability observed during previous sampling of environmental media? Will negative results have sufficient statistical certainty to eliminate the need for further field activities, or will the results only provide a basis for disputes between agencies? The rationale for proceeding in a step-wise process is to insure (1) the acceptability of both data and data interpretation to all agencies, and (2) that the assessment proceeds without major procedural or administrative interruptions.**

JMM Response: See Attachment A, Response to Comment 4. Additional rationale for the sampling plan will be presented in the Final Phase I SWEA Workplan.

Comment No. 18: **Sec. 4.4, Page 22: As per my comments to the previous draft of this workplan, I recommend an intensive synaptic field investigation be conducted as part of the Phase II investigation. Because this will require more detailed planning and inter-agency cooperation, it is again recommended that the majority of this section be omitted from the Phase I workplan, with the following exception:**

Sec. 4.4.1, Page 22, Par. 5: Northern Channel. Because no data have previously been reported, EPA concurs with the need to conduct a preliminary evaluation of sediment, water, and biota contamination in the Northern Channel. The approach outlined in this section is adequate for this purpose.

JMM Response: See Attachment A, Response to Comment 4. The scope of the Phase II effort will be determined following evaluation of the Phase I information.

5.0 PLAN FOR PROBLEM FORMULATION

Comment No. 19: **Page 24: Problem formulation is not a stage--it is a process. It has its beginnings in the Preliminary Site Assessment and only begins to be refined during the development of the Phase I workplan, and continues as an iterative process throughout the ecological assessment. As such, the objectives and scope of the project will likely change significantly and become more specific as a result of new information.**

JMM Response: Comment noted.

Comment No. 20: **Sec. 5.1, Page 24: Identification of contaminants of concern should be inclusive during the Phase I assessment. Although this point was disputed in the response to my comments on the previous draft workplan, all contaminants should be considered during the Phase I ecological assessment as being *de facto* contaminants of concern when and where there are potentially complete exposure pathways. This should be part of the site conceptual model that should include a discussion of contaminants in relation to potential exposure to and impacts on ecological receptors, as well as contaminant concentrations relative to background levels. Recommendations for refinement of contaminants of concern should be based on this information; however, the final determination should be the result of discussion and agreement with the regulatory agencies and Federal and State Natural Resource Trustees. No chemical should be eliminated from consideration at this stage.**

JMM Response: During Phase I, all chemicals present above background levels that can reasonably be related to the operating history of the site will be considered chemicals of concern. As part of the conceptual site model, recommendations for focusing on

contaminants of concern will be presented for regulatory agency review.

Comment No. 21: **Sec. 5.2, Page 25: The list of ecological receptors should be inclusive for the Phase I assessment. It is not appropriate at this stage to eliminate any species or habitat from consideration. The Phase I assessment report should recommend assessment and measurement endpoints. Final selection of assessment and measurement endpoints should be made collectively by the regulatory agencies, DOD, and the other Natural Resource Trustees.**

JMM Response: We concur with the comment that the list of ecological receptors should be inclusive for the Phase I assessment. We will recommend assessment and measurement endpoints in the Phase I report. We will provide recommendations to focus effort for regulatory agency review.

6.0 PLAN FOR EXPOSURE ASSESSMENT

Comment No. 22: **Sec. 6.3, Page 27, Par. 3: Use of equilibrium partitioning models are only valid for non-polar organic compounds and some metals. In addition, since sediment ingestion may be an important exposure pathway for benthic and epibenthic fauna, pore-water equilibrium partitioning may significantly underestimate exposure. Bioassays and toxicity tests, as part of the Phase II investigation, should provide better empirical data than modeling.**

JMM Response: See Attachment A, Response to Comment 1. Equilibrium partitioning models will not be used during Phase I. We concur with the comment that the use of equilibrium partitioning models is only applicable to evaluation of certain contaminants. We also concur with the comment that sediment ingestion may be an important route of exposure for some species. Evaluation of Phase I data will be used to determine appropriate Phase II response and focus those efforts. If equilibrium models are used during Phase II, associated uncertainties will be discussed.

Comment No. 23: **Sec. 6.3.1, Page 28, Par. 3: The recommended use of the equilibrium partitioning model is based on the assumption that ingestion of sediment or soil is not a significant exposure pathway. There are insufficient data to either accept or refute this assumption. Sediment quality criteria should not**

be based on this model without further identification and evaluation of significant pathways of exposure.

JMM Response: See response to Comment No. 22.

Comment No. 24: **Sec. 6.4, Page 29, Par. 1: For the Phase I ecological assessment, it is important to consider all potential exposure pathways. Justification for exclusion of an exposure pathway should be made as a result of the Phase I assessment and subsequent assessment activities. Information provided in the Phase I report should be used to focus the assessment on significant exposure pathways.**

JMM Response: We concur with this comment and the Final Phase I SWEA Workplan will reflect this agreement.

Comment No. 25: **Sec. 6.4.1, Page 29, Par. 2: Bio-accumulation through the foodweb and transfer of contaminants between trophic levels often represents significant routes of exposure for higher trophic levels. Evaluation of these exposure pathways is absolutely essential. While a quantitative evaluation of these pathways is not possible as part of the Phase I assessment, a qualitative assessment based on a conceptual foodweb is required. An objective of subsequent field investigations may be to quantitatively evaluate these pathways.**

JMM Response: Depending on the contaminant, biomagnification may be a significant route of exposure for higher trophic levels. Clearly, this route of exposure is an important consideration where there is exposure to PCBs as well as DDT and DDE. Phase I information will be used to evaluate the significance of this pathway and focus appropriate Phase II efforts.

Comment No. 26: **Sec. 6.4.2, Page 30, Par. 1: All terrestrial exposure pathways should be evaluated in Phase I.**

JMM Response: Comment noted.

Comment No. 27: **Sec. 6.5, Page 30, Par. 2: As stated previously in these comments, problem formulation is a process, not a discrete task. Receptor characterization should be inclusive for the Phase I ecological assessment. Assessment and measurement endpoints will be selected cooperatively by the regulatory agencies, DOD, and the other Natural Resource Trustees.**

This will be based, in part, on the information provided and recommendations made in the Phase I assessment report.

JMM Response: Comment noted. The Navy will recommend assessment and measurement endpoints to focus regulatory review efforts and for concurrence.

Comment No. 28: **Sec. 6.5, Page 30, Par. 3: Change the fourth bullet to read, "Benthic invertebrates within potentially impacted waterbodies, including the northern channel, golf course ponds, stormwater retention ponds, wetland and intertidal habitats."**

JMM Response: The fourth bullet will be changed to read: "Benthic invertebrates within potentially impacted waterbodies, including the northern channel, golf course ponds, stormwater retention ponds, and wetland habitats." Based on our current understanding of the site, intertidal benthos are not expected to be impacted. This understanding will be reevaluated as information from Phase I becomes available.

Comment No. 29: **Sec. 6.6, Page 31: When using exposure-point concentration as a tool to predict ecological impacts, consideration must be given to the fact that exposure point concentrations, as defined in this workplan, do not necessarily reflect bio-availability or behavioral factors that affect exposure and dose. With humans, these considerations are accounted for in referenced doses or slope factors; however, these dose-exposure relationships have not been established for most ecological receptors, nor should they be. Direct bio-assays and toxicity tests that account for these factors can and should be performed in the Phase II assessment.**

JMM Response: Comment noted. See Attachment A, Response to Comment 1. Quantitative analysis of Phase I data will be conducted during Phase II workplanning, after agency review of the conceptual site model is received. Phase I information will be evaluated and used to focus Phase II efforts.

Comment No. 30: **Sec. 6.6, Page 31, Par. 4: Change the first sentence to read "Predicted exposure point concentrations will be presented in tables...." This estimation should be based on data obtained in the Phase II field investigation that includes bioassays and toxicity tests. Currently, there is insufficient data to make reasonable quantitative predictions/estimates of exposure and**

impacts. This activity should be postponed until the end of the Phase II assessment.

JMM Response: See Attachment A, Response to Comment 1. As agreed during the 15 January 1993 meeting, quantitative assessment of Phase I data will be conducted during the Phase II work planning. Phase I information will be evaluated and used to focus Phase II efforts.

7.0 PLAN FOR ECOLOGICAL EFFECTS ASSESSMENT

Comment No. 31: **Page 32: This approach will not substitute for site-specific empirical data because of the impossibility of estimating the uncertainty of the data. Ecological effects will be quantitatively assessed from empirical data derived from the Phase II field and laboratory investigation.**

JMM Response: See Attachment A, Response to Comment 1. See response to Comment 30 above.

8.0 PLAN FOR RISK CHARACTERIZATION

Comment No. 32: **Page 33, Par. 4: Neither AWQCs or the sediment quality data were designed to be used to assess adverse ecological effects from Superfund sites. The AWQCs were developed as part of the NPDES program for end-of-pipe discharges, and the Long and Morgan sediment quality data were prepared from literature-reported data as part of the NOAA Status and Trends program. Neither can be applied as stressor-response estimates with any confidence to Superfund sites.**

JMM Response: See Attachment A, Response to Comment 1. We disagree with the conclusion that the AWQC and sediment quality data are not applicable to chemical input originating on Superfund sites. The AWQC are derived from acute and chronic toxicity data and are based on laboratory observed biological responses to chemically affected water. In general, AWQC denote concentrations of chemicals which, if not exceeded, are protective of aquatic ecosystems. Some of the factors that are considered during criteria formulation are food web dynamics, interspecies variation in response to a given toxicant, bioconcentration of toxicants, and the interrelationship between sediments and water quality constituents (USEPA, 1976). Similarly, the values reported in Long and Morgan's NOAA document (1990) were

assembled as informal guidelines for use in evaluating sediment data. It is a comparison of various approaches (laboratory, field, and theoretical calculations) used to develop sediment quality criteria based on concentrations and corresponding adverse biological effects. The program-specific development of these databases notwithstanding, both the AWQC and NOAA criteria represent toxicity and biological effects information. Eliminating these tools may result in lengthy and resource intensive investigations that are not necessarily warranted by site conditions. These criteria will not be applied to screen out media and pathways during Phase I. However, the criteria will be used, along with other tools for interpreting Phase I data, during Phase II.

Comment No. 33: **Sec. 8.1, Page 33, Par. 1: The assumption that exposure is continuous and equal to surface water contamination concentrations may be erroneous. Contaminant concentrations may fluctuate due to variations in precipitation and water levels. Exposure concentrations may also vary seasonally and diurnally, depending on species' life stages and behaviors. See above comments with regard to AWQCs, etc. Establishing SQCs should be a final product of the ecological assessment. SQCs should be recommended as one of the last activities of the ecological assessment, after completion of the field and laboratory investigations, and should be based on site-specific empirical data.**

JMM Response: See response to Comment 32. Phase I results will be used to evaluate the appropriate Phase II scope of work.

Comment No. 34: **Sec. 8.2, Page 34, Par. 2: Because "...the majority of available toxicity information for NAS Moffett Field-related chemicals is for species other than those expected at the facility..." literature-derived data is inappropriate. The ecological effects assessment should be based on site-specific field- and laboratory-derived empirical data obtained as part of the Phase II assessment.**

JMM Response: See Attachment A, Response to Comment 1. Literature data are toxicological data documenting biological effects resulting from exposure to a given toxicant. Literature data will be used as suggested in the Risk Assessment Guidance for Superfund (RAGS) Volume II (USEPA, March 1989), Framework for Ecological Risk Assessment (USEPA, February, 1992), and ECO Updates guidance. There are inherent difficulties in

interpreting ecological field studies, just as there are limitations to the application of toxicological literature. During the work planning for Phase II, these factors will be considered in recommending the appropriate Phase II scope of work.

Comment No. 35:

Sec. 8.4, Page 35, Par. 1: Change the last sentence to read "Modifications may include alterations of soil, sediment, groundwater, or freshwater flow environments, or alterations to the quality of these environments, as well as other alterations that would affect habitat quality.

JMM Response:

See Attachment A, Response to Comment 1. We will incorporate this comment as appropriate in the Final Phase II Workplan. The objective of this task is to attempt to distinguish between risks from chemical exposure and those resulting from physical alteration of habitats.

Comment No. 36:

Sec. 8.5, Page 35: The proposed method for assessing potential adverse effects, the hazard quotient method, can be useful in screening potential exposure pathways or in developing priorities from among several different sites. Its applicability for assessing the site-specific adverse effects are limited and may be considered at best a preliminary step in an ecological assessment that is useful in developing a workplan. Further, effect levels derived from the literature or laboratory studies designed for extrapolation to humans, because of the organisms and methodologies used and the inability to calculate realistic uncertainties, have little validity in ecological assessments. Because of the number of species involved, variable sensitivities of individual species and life stages to chemical stressors, sub-acute impacts that may have dramatic effects of populations, potential bio-accumulation, and the complexity of trophic level interactions, use of a hazardous quotient for anything other than a screening tool is unacceptable in ecological assessments. Even when used as a screening tool, hazard quotient models should be based on dose and toxicity data that are derived from or supported/verified by field sampling, laboratory analyses, bioassays, and toxicity tests.

JMM Response:

See Attachment A, Response to Comment 1. The quotient method is one way of comparing single effect and exposure values. Comparison of single effect and exposure values is one of three general methods of estimating risk that are presented in the EPA Framework for Ecological Risk Assessment (EPA,

February, 1992). The quotient method is commonly used, but is the least probabalistic of the methods discussed in the guidance (EPA, February, 1992). A second method discussed is comparing distributions of effects and exposures (ibid). This method is more probabalistic than comparison of single effect and exposure values, but requires significantly more data to model the actual distribution of values in the environment. Clearly, the greater the collection of data in sensitive habitats, the greater the likelihood of disruption due to sampling activities. The third method discussed is simulation modeling, an approach that is in its infancy and requires more research to be generally applicable. The Phase I SWEA will not require the use of any of these approaches, as quantitative data analysis will be conducted during Phase II. However, after Phase I, the quotient method will likely be one of the evaluation tools used to determine potential adverse affects and focus Phase II efforts.

Comment No. 37:

Sec. 8.6, Page 35: See above comments regarding use of published water and sediment quality criteria. EPA prefers that, when possible, risk be expressed as a stressor-response function, and that uncertainty be quantified and probabalistic.

JMM Response:

See Attachment A, Response to Comment 1. See Response to Comment 32. Stressor-response, in the context of a Superfund investigation of chemical discharges, can be termed dose-response when referring to chemical stressors. (EPA, February 1992, p. 3). Criteria derived through extensive review and interpretation of the toxicological literature provide valuable insight into the range of responses that might be expected at a given chemical dose. There are limitations and uncertainties in applying the criteria, just as there are limitations inherent to ecological field studies and bioassays. We concur with the comment that uncertainty should be quantified, to the extent practical. We believe that environmental criteria that have been used as ARARs in the Superfund program are appropriate for use in this ecological assessment.

9.0 UNCERTAINTIES

Comment No. 38:

Page 36: When possible, uncertainty should be treated statistically, and minimized through a consistent DQO process and statistically designed and interpreted field and analytical investigations.

JMM Response: See Attachment A, Response to Comment 1. See response to Comment 37.

10.0 DATA QUALITY OBJECTIVES

Comment No. 39: **Page 37: The discussion of DQOs will necessarily continue and evolve throughout the assessment. Confidence levels will need to be negotiated prior to Phase II to statistically design field studies.**

JMM Response: Comment noted. See response to Comment No. 30.

11.0 SAMPLING METHODOLOGIES

Comment No. 40: **Pages 38-39: There is no discussion of biotic sampling and analysis methodologies. All discussion of sampling and analytical methodologies should be included in an independent Field Sampling Plan for each field/laboratory study conducted as part of the ecological assessment. This will be necessary prior to initiating any Phase I or Phase II field work.**

JMM Response: Comment noted. Detailed field sampling methods not previously submitted will be presented in appendices to the revised Phase I SWEA Workplan. We recommend that the field methods be reviewed in a meeting with the agencies, prior to submittal of the Final Phase I SWEA Workplan, then be immediately implemented. We propose this be done to expedite the review process, and ensure that Phase I field work is conducted during late winter or early spring as planned.

GENERAL COMMENTS

From Elizabeth Adams, Regional Water Quality Control Board

Comment No. 1: **The purpose of this document is to outline the Phase I activities for a site-wide ecological assessment. Throughout the document the term "site" should refer to the entire site and not the former areas of OU6 and adjacent OU2 areas where there are obvious wildlife habitats. This workplan tends to address only the storm water retention ponds and wetlands on site, making a foregone conclusion that there are no other potential impacts to ecological habitats on the base. The Phase I data collection and evaluation of the site need to be completed before areas on site can be excluded from further ecological assessment. It is inappropriate to scale down the workplan to address only specific areas. The whole site needs to be evaluated.**

JMM Response: See Attachment A, Response to Comment 2.

Comment No. 2: **This workplan includes some of the activities that should be part of the Phase II portion of the ecological assessment. Phase I includes the compilation of data from literature review, site inspections, former field investigations and any pertinent data which can be utilized for the qualitative evaluation of the site. Phase I data can be used for a semi-quantitative evaluation of the chemical nature and extent of contamination on site, but not for evaluating impact or risk. Proposed contaminants of concern may be presented for purposes of discussion, but all contaminants should be included, even those considered to be at "background" concentrations. At the Phase I stage, determining total risk, rather than incremental risk, is the appropriate approach.**

JMM Response: Comment noted. See Attachment A, Response to Comment 1. The SWEA approach presented in the January 15, 1993 meeting will be followed, and the sampling reviewed during the site walk on January 26, 1993 will be implemented. The objectives of the Phase I effort are to obtain data for areas of OU-6 not previously investigated, to conduct a preliminary investigation of habitats and ecological receptors, and to develop a conceptual site model. Quantitative evaluation of Phase I information will be deferred until Phase II, after the agencies have an opportunity to review the conceptual site model.

Comment No. 3: **Candidates for representative "target" ecological receptors for future assessment may be presented within the context of the larger universe of potential receptors to be identified. The qualitative nature of the Phase I ecological assessment makes screening out receptors at this stage premature.**

JMM Response: We concur. On the basis of the Phase I qualitative study we will recommend that additional effort be expended on evaluating exposure to receptors of concern. We will not screen out certain receptors based on Phase I results.

Comment No. 4: **The field sampling proposed for Phase I should not be considered to be the extent of the sampling necessary to complete the ecological assessment. These sampling locations can be used to obtain additional data to aid in determining the nature and extent of the contamination in the areas where there is limited chemical data present. However, the data from these sampling points should not be used to assess ecological impact. The data collected in Phase I will be used to guide the specific sampling investigation to be conducted in Phase II. The field investigations during Phase II will address specific questions regarding toxicity. A sampling and analysis plan will be required for the specific Phase II investigations warranted by the information gathered in Phase I.**

JMM Response: Comment noted. Phase I information will be used to evaluate the site, develop a conceptual site model, and determine appropriate Phase II efforts.

Comment No. 5: **Plants as potential receptors need to be carried through all the stages of the ecological assessment. They seem to be forgotten during some of the stages of this evaluation.**

JMM Response: We concur with the comment that plants need to be carried through all stages of the ecological assessment and the Final Phase I Work Plan will reflect this concurrence.

Comment No. 6: **The use of field screening assessments such as screening for invertebrates in soil and sediment is highly supported.**

JMM Response: Comment noted.

SPECIFIC COMMENTS

Comment No. 1: **Sec. 2.0, Page 2: The purpose of the site-wide investigation should be to evaluate the entire site for possible ecological impact.**

JMM Response: See Attachment A, Response to Comment 2. The Phase I SWEA Workplan will be revised to reflect that the ecological assessment is site wide. The final workplan will read "The purpose of the site-wide Phase I field investigation is to evaluate the extent of contamination throughout the site and to assess whether there is risk posed to ecological receptors on and in the immediate vicinity of the site. This investigation will involve review of existing chemical and biological data and field sampling. The Phase I field sampling of soil, sediment, and surface water to assess the presence or absence of contaminants will be conducted in areas where little or no data is currently available (e.g., the storm water retention ponds and wetlands)."

Comment No. 2: **Pages 4-5: The description of this ecological plan incorporates sections, such as the exposure assessment and the ecological effects assessment which should not be included in the Phase I activities. These evaluations are part of Phase II.**

JMM Response: See Attachment A, Response to Comment 1. As agreed in the January 15, 1993 meeting, the Phase I evaluation will include only qualitative interpretation of Phase I results culminating in a conceptual site model for agency review. Quantitative data evaluation will be conducted during Phase II.

Comment No. 3: **Sec. 3.2, Page 9: These conclusions as to where the "significant" ecological receptors reside is premature. This evaluation needs to occur during the Phase I investigation. All potential ecological habitats need to be documented. Areas such as Site 10 and Patrol Road ditch are other potential areas of ecological habitats. The base's characteristics should be documented during the site walk.**

JMM Response: See Attachment A, Response to Comment 2. The habitats present on site and in OU-6 areas will be surveyed in a reconnaissance walk through by a biologist experienced in terrestrial and wetland habitat review. The reconnaissance will be site wide.

Comment No. 4: **Sec. 4.2, Page 12: The selection of "species or groups of species for evaluation of potential risks or impacts" should be done in the larger context of the description of habitat types and their respective locations. The Phase I qualitative assessment is not the appropriate stage to be screening out potential receptors.**

JMM Response: We concur with the comment that the Phase I SWEA is not the appropriate stage to be screening out potential receptors. Receptors of concern and indicator species of interest will be recommended based on the results of the Phase I effort.

Comment No. 5: **Page 14, Par. 1: The site reconnaissance can focus on certain areas but the entire site must be part of the reconnaissance investigation.**

JMM Response: We concur with this comment.

Comment No. 6: **Page 16, Par. 1: The Northern channel should also be included in the habitat survey.**

JMM Response: We concur with this comment. The Northern Channel will be included in the qualitative habitat assessment.

Comment No. 7: **Sec. 4.3, Page 17: What is the intention of delineating the wetland using regulatory guidelines when the habitats are being assessed? The U.S. Army Corps of Engineers' definition of wetlands is used to delineate wetland areas for regulatory purposes, primarily for the 404 permit process for dredging and filling activities which may alter a wetland. Since the purpose of this ecological assessment is to evaluate and document the habitats on site, a more useful definition of wetlands would be the one used by the Fish and Wildlife Service (FWS). The FWS definition does not require all three characteristics of a wetland to be present but states that wetlands must have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes, 2) the substrate is predominately undrained hydric soil, and 3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year (Classification of Wetlands and Deepwater Habitats of the United States, FWS U.S. Dept. of the Interior, 1979). The Corps' criteria for delineating a wetland could potentially exclude various types**

of wetland habitats such as mudflats, salt flats, and diked wetland habitats which possess various soil types.

JMM Response: See Attachment A, Response to Comment 3. The intention of the habitat identification effort in the SWEA is to identify functional habitats rather than habitats that meet a strict regulatory criteria. Therefore, the USFWS method for wetland identification is appropriate and will be used.

Comment No. 8: **Sec. 4.4.1, Page 22: TPH should be included in the analysis of the samples as stated on Page 39 of the work plan. The Northern channel is potentially an area where contaminated sediments reside due to the contaminated outfall from Building 191. As stated in our comments on the draft document, there need to be more sampling locations than proposed in the Northern channel, at least in the areas adjacent to and downstream of Building 191's potential impact. Whether or not the ponds contain water at the time of sampling, surface sediment samples should be taken in addition to the proposed water samples.**

JMM Response: As stated on page 22 of the workplan, the northern channel will be sampled for both sediment chemistry and water chemistry. TPH will be included in the list of analytes. Sampling locations will be those designated during the January 26, 1993 site walk.

Comment No. 9: **Page 23: Marriage Road Drainage Ditch: Three sample locations are shown in Figure 13 compared to two samples discussed in the text. At least three samples of sediment should be taken.**

JMM Response: The Final Phase I SWEA will read "Samples will be taken from three depositional locations along the Marriage Road drainage ditch, which supports bordering wetlands, provides aquatic habitat, and receives runoff from the paved roads and golf course. This ditch is part of OU-2."

Comment No. 10: **Sec. 4.4.3, Page 24: Water samples from Patrol Road ditch should be included in this investigation during the period when there is standing water in the ditch. The surface water samples should also be analyzed for conductivity and turbidity.**

JMM Response: See Attachment A, Response to Comment 4. These data will be collected during Phase I.

Comment No. 11: **Page 24: Identification of Contaminants of Concern: The development of a list of candidate contaminants of concern should take place within the context of a larger discussion of all contaminants, including those at "background" concentrations.**

JMM Response: We concur with this comment. The Phase I effort will include consideration of all chemical present at detectable levels that can reasonably be related to past or present operations of the site. Phase I information will be evaluated and recommendations will be provided to focus the Phase II effort.

Comment No. 12: **Page 25: Identification of Ecological Receptors: The development of a list of candidate ecological receptors for future evaluation should take place within the context of a larger discussion of all ecological receptors. The qualitative Phase I assessment is not the appropriate stage of analysis to finalize a list of ecological receptors and no potential receptors should be screened out at this stage.**

JMM Response: We concur with this comment. The Phase I SWEA will be inclusive culminating in recommendations to focus Phase II effort.

Comment No. 13: **Page 27: Quantification of Release, Migration, and Fate: The use of equilibrium partitioning models must be balanced with the understanding that such an approach may only be valid for non-polar organic compounds. In addition, the fact that ingestion of contaminated sediments may be as, or more important, a pathway for transport, by comparison to the pore-water exposure pathway that equilibrium partitioning models, must be taken into account.**

JMM Response: See Attachment A, Response to Comment 1. Equilibrium partitioning models will not be used during Phase I. We concur with the comment that the use of equilibrium partitioning models is only applicable to evaluation of certain contaminants. We also concur with the comment that sediment ingestion may be an important route of exposure for some species. Evaluation of Phase I data will be used to determine appropriate Phase II response and focus those efforts. If equilibrium models are used during Phase II, associated uncertainties will be discussed.

Comment No. 14: **Page 28: Estimating Exposure in Wetland Soils/Sediment from Organic Contaminants: Equilibrium Partitioning: The**

assumption that "ingestion of soil is not a significant route of exposure" is not a valid assumption if the potential environmental impact is the result of consumption of contaminated prey which consume or process contaminated sediments.

JMM Response: See Attachment A, Response to Comment 1. This concern will be addressed in Phase II by separate consideration of bioaccumulation and bioconcentration of contaminants.

Comment No. 15: **Page 29: Identification of Exposure Pathways: All exposure pathways should be considered at the qualitative Phase I stage. Justification for exclusion of such pathways in the Phase II investigation should be presented. The elimination of food chain considerations as a pathway for contamination transport is not permitted, particularly when surrogate tests, such as bioaccumulation by molluscs and worms are well established.**

JMM Response: All exposure pathways will be considered at the qualitative Phase I stage. Rationale for the focus of Phase II work will be presented.

Comment No. 16: **Page 29: Aquatic Exposure Pathways: The SFBRWQCB may have sediment quality criteria (SQCs) for San Francisco Bay by the time the study reaches the stage of comparative analysis. Those SQCs should be included in the analysis.**

JMM Response: We concur. If the SFBRWQCB has SQCs ready by the time the study is at the stage of comparative analysis, the SQCs will be included.

Comment No. 17: **Page 29: Terrestrial Exposure Pathways: No consideration was given to direct contact by plants to contaminated soil and groundwater despite the fact that the field survey was to include a "stressed vegetation" survey.**

JMM Response: Direct contact by plants to contaminated media will be considered in the Phase I SWEA. The workplan will be revised to reflect this.

Comment No. 18: **Page 30: Characterization of Receptors: Wetlands vegetation should be included in the "categories of receptors."**

JMM Response: We concur. This change will be incorporated in the Final Phase I SWEA Workplan.

Comment No. 19: **Page 31: Estimation of Exposure Point Concentrations: The qualitative Phase I stage is too early in the assessment to have made decisions about the final exposure point concentrations. The choices of whether a mean or a maximum value for surface or groundwater should be indicated in the sampling plan so that regulatory approval may be made.**

JMM Response: See Attachment A, Response to Comment 1. Comment noted.

Comment No. 20: **Page 33: Plan for Risk Characterization: How will the "exposure dose" for various receptors be determined?**

JMM Response: See Attachment A, Response to Comment 1. The approach to evaluating exposure dose for various receptors will be detailed in the Phase II SWEA Workplan.

Comment No. 21: **Page 34: Terrestrial Ecological Effects Characterization: The database PHYTOTOX contains many toxicity references for terrestrial plants.**

JMM Response: Comment noted.

Comment No. 22: **Sec. 8.6, Page 35: There are State standards for sediment and water quality that may be more stringent than the EPA published criteria and will need to be addressed in the evaluation process. The California RWQCB Compilation of Water Quality Goals and the San Francisco Bay Basin Plan limits will be applicable. The toxicity quotient approach or hazard quotient approach is not to be used to screen out chemical contaminants or ecological receptors at the qualitative Phase I stage. This approach may be used within the context of a larger discussion of contaminants, receptors, and pathways, but is not appropriate for narrowing the discussion of the Phase I data.**

JMM Response: See Attachment A, Response to Comment 1. Comment noted. State standards will be considered during the quantitative evaluation in Phase II.

Comment No. 23: **Table 2: Where is the list of federal and California rare and endangered species which have been sighted and documented**

to be on Moffett Field? These species need to be included in the text and on this table. These species include the salt marsh harvest mouse, California clapper rail and black rail, least terns, and the San Francisco forktail damselfly.

JMM Response: The species list included in the draft workplan will be reviewed and revised as appropriate. Additional refinement of the species list will also result from Phase I data review.

Comment No. 24: **Figure 9: The HAZWRAP samples located along the sloughs are labeled but have no TPH concentration associated with them. Was TPH detected in these sample locations and, if so, at what concentration?**

JMM Response: Figure 9 will be reviewed and revised, if appropriate, for the Final Phase I SWEA Workplan.

GENERAL COMMENTS
From Laura Valoppi, DTSC

Comment No. 1: **It was agreed in the agency meeting of August 31, 1992 that recommendations for sampling and field investigation was to be part of Phase II. The reason for this is that a more comprehensive report of habitat, and the nature and extent of contamination in relation to important habitat, must first be compiled to provide a framework for a sampling plan. Therefore Sections 4.4, 6.3, 6.6, 7.0, 8.0, 10.0, 11.0, and 12.0 should be omitted from Phase I.**

JMM Response; See Attachment A, Response to Comment 1.

Comment No. 2: **Areas on the base, or off-site, which received stormwater runoff from the Building 191 Lift Station may need further characterization in terms of habitat, as well as extent of contamination. For example, the workplan states Guadalupe Slough received stormwater runoff diverted through the lift station. At the mouth of Guadalupe Slough, clapper rails were observed (Orton-Palmer and Takekawa, 1992), and the presence of the saltmarsh harvest mouse in the slough cannot be ruled out, since trapping surveys in that slough are limited (Haas, 1991). Potential transport of stormwater runoff via Jagel and Devil's sloughs should also be assessed in the Phase I report.**

JMM Response; See Attachment A, Response to Comment 4. Based on our current understanding of the site, Jagel and Devil's sloughs do not receive stormwater runoff from the site.

Comment No. 3: **The significance of the hydrogeology described on pages 6 and 7, in relation to the potential discharge of contaminated groundwater to surface waters, now or in the future, should be described in the Phase I report. In addition, the potential for burrowing animals (e.g., burrowing owls) to come into contact with contaminated soil vapors emitted from contaminated groundwater should also be assessed.**

JMM Response: We concur. The Final SWEA Workplan will be modified to reflect this concurrence.

Comment No. 4: **Section 4.3 contains a detailed procedure for formal delineation of wetlands per Army Corps of Engineers (ACE) protocol. What is the purpose of such an intensive effort? Is**

the Naval Air Station proposing to dredge or fill the wetlands on the base? The state may consider wetland habitat, such as mudflats, as important habitat, even though such habitat may not be considered wetland under the ACE protocol.

JMM Response: See Attachment A, Response to Comment 3.

Comment No. 5: **Page 16 states that the location of habitat and nesting sites for state and federally-listed threatened and endangered species will be mapped. In addition, the habitat and nesting areas of California Species of Special Concern should also be mapped.**

JMM Response: We concur. The Final SWEA Workplan will be modified to reflect this concurrence.

SPECIFIC COMMENTS

From Denise Klimas, U.S. Dept. of Commerce, NOAA

Comment No. 1: **Sec. 2: The stated purpose of this workplan is to address site-wide ecological concerns at NAS Moffett Field. Why are only OU6 and OU2 addressed in this work plan? If indeed there is minimal risk to ecological receptors at OU1 and OU3, then the Phase I investigation will show no need for further evaluation. It is inappropriate to eliminate these OUs from the site-wide phase I investigation without some support for this decision.**

JMM Response: See Attachment A, Response to Comment 2.

Comment No. 2: **Sec. 4.2.3: The workplan proposes to conduct a site reconnaissance to qualitatively describe major habitat types, wildlife, and vegetation patterns. During the survey, the presence or absence of soil invertebrates is to be conducted. The survey should also include the presence or absence of sediment invertebrates in the various ditches and sloughs. This information is necessary to provide site-specific diversity of benthic species for use in the selection of ecological receptors for the overall ecological assessment.**

It is also recommended that potential pathways from source areas (ditches, streams, etc.) and aquatic receptors (wetlands) be identified and documented. Depositional areas of fine grained sediments should be documented as potential sites for future sampling. Obtaining this information during the site reconnaissance will likely insure the efficient placement of sampling stations to maximize the amount of useful data in a cost effective manner.

JMM Response: We concur. The Final SWEA Workplan will be modified to reflect this concurrence.

Comment No. 3: **Sec. 4.2.5: The workplan proposed to assess freshwater systems (golf course and stormwater ponds) during the Terrestrial Characterization by use of seines and dipnets to collect fish and invertebrate samples (Page 16). Kick nets and ponar grab samples will be obtained and sieved to determine the general composition of benthic invertebrates. These samples are proposed to be evaluated using "rapid benthic assessment methodology." To my knowledge there is not a qualitative bioassessment procedure for use in**

freshwater lakes and ponds. If the authors are referring to the rapid bioassessment protocols and methodologies outlined by U.S. EPA (1989), these protocols would not be an appropriate methodology to use in this situation. These protocols are for use in rivers and streams, not the ponds proposed in the workplan. It is unlikely that useful information can be gained by a qualitative evaluation of benthic and fish communities in the freshwater ponds of the study area. It would probably be more useful to conduct additional sediment and surface water chemistry in the ponds and streams that eventually discharge to nearshore areas of the south bay.

JMM Response:

It is correct that the EPA document (U.S. EPA, 1989), which outlines the rapid benthic assessment methodology, is for use in wadeable streams and rivers. However, this methodology has been applied to numerous wadeable ponds at other Navy clean sites and NPL sites across the country. Our objective is to gather qualitative information with regard to abundance and diversity of the macroinvertebrate communities in the site ponds. This qualitative analysis of invertebrates will be conducted by grab sampling and rapidly sorting and counting invertebrates in the field. The detailed methods which will represent an adaptation of the EPA protocol will be presented in the revised workplan. The objectives of this effort are to (1) determine the presence or absence of invertebrates, (2) determine the presence or absence of opportunistic species, and (3) qualitatively evaluate benthic diversity. This is an appropriate level of information gathering for a Phase 1 assessment. It is similar to the sampling of previously unsampled areas at the site for nature and extent information or to the site walkover for receptor/habitat identification and description.

Comment No. 4:

Sec. 4.2.6: According to the workplan, the data gathered during the habitat survey will be used to select species or groups of species for evaluation of potential risks or impacts. The wetland and field assessment barely mentions qualitatively assessing the aquatic habitat present in the sloughs in and adjacent to OU6. On Page 1 benthic organisms and fish have been left out of the mentioned groups of biota from which species will be selected for risk evaluation. The assessment is not only to inventory terrestrial fauna and diversity in OU6 and OU2 but to also inventory aquatic species and habitat. This workplan should

include specific mention of assessing aquatic biota in the sloughs in and adjacent to OU6.

JMM Response: The Phase I SWEA Workplan will be revised to include specific mention of assessing aquatic biota in the sloughs in and adjacent to OU-6.

Comment No. 5: **Sec. 4.3.3: Although the workplan states that the wetlands delineation and functional assessment report will "substantiate the wetland values in term of...aquatic diversity and abundance...sediment or toxicant retention..." it is unclear from the methods mentioned in the workplan how this assessment will take place. it is also unclear at this point in the ecological assessment why a functional value is to be assigned to the wetlands at NAS Moffett Field? How will this information be used in phase II of the ecological assessment?**

JMM Response: See Attachment A, Response to Comment 3.

Comment No. 6: **Sec. 4.4.1: The workplan proposes to sample environmental media (Page 22) including surface water and sediments in wetlands, stormwater retention ponds, northern channel, and Marriage Road Drainage Ditch. Samples will be analyzed for VOCs, BNAs, PCBs, pesticides and trace elements. In addition to the proposed sampling, Stevens Creek, and Jagel and Devil's Slough, which flow along the western and northern boundaries of the site, should be sampled for the same analytes. Previous sampling has identified several PAHs and BNAs in sediments of these waterbodies. For Stevens Creek, sampling stations should be located downstream of the stations shown in Figure 8 of the workplan, preferably where the unnamed slough joins Stevens Creek. If Stevens Creek and the two sloughs are non-tidal flowing freshwater streams, then benthic sampling using Rapid Bioassessment Protocols should be considered in these waterbodies. Also, none of the figures label the "northern channel." This should be clarified in the figures.**

The workplan calls for chemical analysis to be conducted on filets, if the fish are large enough. Since this is an ecological assessment, it is unnecessary to analyze filets. The biological receptors potentially feeding on the fish are not known to "filet" their prey prior to eating. Fish should also be

collected and analyzed from Stevens Creek, Devil's Slough, and Jagel Slough.

JMM Response: See Attachment A, Response to Comment 4. The figures will be clarified in the Final Phase I SWEA Workplan. Chemical analysis of fish will be conducted in Phase II, as appropriate. We concur with the comment that biological receptors are exposed to chemical concentrations in whole fish rather than in filets.

Comment No. 7: **Sec. 4.4.2: The workplan calls for granular sediments in shallow streams that are to be analyzed for chemical constituents to be collected using a hand trowel or shovel. This is an inappropriate technique for collecting a surface sample for chemical analysis. A grab sampler or coring tube must be used to collect all sediment samples for chemical analysis.**

JMM Response: Dry surface soil and sediment can be appropriately sampled using a clean hand trowel or shovel. A grab sampler or coring tube will used to collect wet sediment as appropriate.

Comment No. 8: **Sec. 6.4.1: the workplan states that "Exposure and potential impacts to biota associated with sediments will be estimated by comparing these concentrations to sediment quality criteria established for the contaminants of concern." Exposure and impact should not rely solely on comparison to derived sediment quality criteria but should also take into consideration the results of toxicity and bioaccumulation data.**

JMM Response: See Attachment A, Response to Comment 1. We agree that toxicity and bioaccumulation data should be considered in assessing impact.

Comment No. 9: **Sec. 8.1: For the aquatic effects characterization the workplan reports that exposure concentrations will be compared to AWQC citing U.S. EPA (1986) and potential regulatory criteria for sediments such as Effects Range-Low and Effects Range-High values (Page 34). The author cited Long (1991, 1992) as the source of "Effects Range-High" values (they are not in the reference section, however). Effects Range-High values have not been defined by any of Ed Long's sediment effects work and the much used Long and Morgan (1990) establishes ER-L values and ER-M**

(Effects Range-Medium) values. This needs to be clarified in the workplan. For the full protection of NOAA trust resources in nearby estuarine habitats, it is recommended that ER-L values be used in the characterization of ecological risk.

JMM Response: Comment noted. See Attachment A, Response to Comment 1. The Phase I SWEA Workplan will be clarified with respect to the use of the Long and Morgan data.

Comment No. 10: **Sec. 9.1: In addition to the listed uncertainties for the ecological assessment for the aquatic environment, the following uncertainty should be added: "The use of single species and single chemical evaluations when many species and chemicals are simultaneously present at NAS Moffett Field."**

JMM Response: See Attachment A, Response to Comment 1.

SPECIFIC COMMENTS
From Don Chuck, NASMF

Comment No. 1: **Page 3, Par. 1: The paragraph notes that this work plan includes portions of OUs that may impact ecological receptors and includes OU-6 and portions of OU-2. Should not other areas be included such as OU-5, Bldg. 191 effluent, and the horizontal conduit study? These are other mechanisms that can introduce contaminants into the environment.**

JMM Response: See Attachment A, Response to Comment 1.

Comment No. 2: **Page 5, Par. 1, 6th Sent.: The open ditch parallel to Lindbergh Avenue is no longer used to carry storm water for the west side of the base and NASA. It has been replaced by a pipeline which carries storm water to a settling basin which then discharges water to the wetlands. The ditch is still in place and may carry small amounts of water during storms.**

JMM Response: Comment noted. The Phase I SWEA Workplan will be revised to incorporate this comment.

Comment No. 3: **Page 6, Par. 3, Bullet 3: The A2 and B1 aquifer zones are listed as equivalents. While this has been the practice during the several investigations carried out here, has there been any detailed study to show that these zones are geologically equivalent?**

JMM Response: JMM hydrogeologists have investigated this issue in some detail in support of layer designation for the groundwater flow model. Lithologic correlations were made by constructing cross sections connecting the MEW area to the south with NAS Moffett Field to the north. These cross sections showed that the B1 aquifer zone identified by HLA (HLA, 1988) in the MEW area is stratigraphically identical to the A2 aquifer zone identified by IT Corporation (IT Corp. 1991) at NAS Moffett Field. These cross sections also showed that the A2/B1 aquifer zone thins and becomes more shallow toward the north. These cross sections have not been published in PRC/JMM documents to the Navy.

Comment No. 4: **Page 7, Par. 2: The paragraph should also note that pumping tests performed by IT also showed that there is hydraulic communication between the A1 and A2 zones.**

JMM Response: This paragraph has been modified to include the following:

"These tests of the A1 aquifer zone indicate a horizontal hydraulic conductivity range of between 13.4 and 461 feet/day. Two of the aquifer tests included piezometers in the A1/A2 aquitard for the determination of vertical hydraulic conductivities. These tests indicate a vertical hydraulic conductivity of 0.20 and 0.26 feet/day. Leakage between the A1/A2 aquitard is known to exist since pumping in one aquifer zone affected the hydraulic head in the other zone during each of the Site 9 aquifer tests (IT Corp., 1992)."

Comment No. 5: **Page 11, Par. 3, 2nd Sent.: The sentence refers to Sump 53. The designation should be changed to Tank 53.**

JMM Response: Comment noted. The Phase I SWEA Workplan will be revised to incorporate this comment.

Comment No. 6: **Page 14, Par. 4, 2nd Sent.: The sentence states that a coarse classification of sediment and soil will be made during the walkover. What will be the basis used in classification of the soil? Will the Unified Soils Classification System (USCS) be used? It is important to define classifications to ensure good correlation between the various investigators.**

JMM Response: The following sentence will be added to the end of this paragraph:

" The Unified Soil Classification System (USCS) will be used to describe sediment grainsize and organic content since this has been used to describe lithology in past environmental investigations on base."

Comment No. 7: **Page 15, Par. 2: It is stated that the survey should take place during the rainy season. What will be the effect on this investigation if the drought continues and there is no rainy season? How will the weather affect the timely completion of the report?**

JMM Response: The continuation of drought conditions or weather changes are not expected to affect the timely completion of the Phase I SWEA. The field work was planned during the rainy season to maximize the presence of plants on site. The field work is still planned for late winter or early spring and the objective will still be met.

Comment No. 8: **Page 15, Last Par., 1st Sent.: A stream is described as crossing the golf course. Are you referring to Marriage Road Ditch? If so, it should be named to avoid confusion. Also, it should be noted that Marriage Road Ditch provides drainage for areas around Hangars 2 and 3.**

JMM Response: The Phase I SWEA Workplan will be revised to name Marriage Road Ditch. Future documents will name ditches to avoid confusion.

Comment No. 9: **Page 17, Par. 3, Last Sent.: How will soil and hydrological data be collected? Will this be done using soil borings?**

JMM Response: The Final Phase I Workplan has been modified to explain that wetlands delineation will follow U.S. Fish and Wildlife Service protocol. Soil and hydrological data will be examined through visual observations by a certified professional, as described in Section 4.3.2 of the Final Workplan.

Comment No. 10: **Page 20, Act. 6, Bullet 2: How will the degree of soil saturation be measured? Will this be a subjective judgment? What criteria will be used to decide the degree of saturation? Please specify or refer to an operating procedure.**

JMM Response: The list of 12 field activities associated with wetlands delineation following U.S. Army Corps of Engineers methodology has been removed from the Final work plan (see Comment 9).

Comment No. 11: **Page 21, Par. 3, 1st Sent.: The bracket after program in this sentence needs to be reversed.**

JMM Response: Comment noted. The workplan will be revised.

Comment No. 12: **Page 22, Par. 3, 4th Sent.: In addition to the compounds given, samples should also be analyzed for Total Petroleum Hydrocarbons (TPH). Note that Figure 9 shows several sampling locations where TPH is above the reporting limits. TPH is also reported at several locations on the east side of the base.**

JMM Response: Comment noted. TPH will be included in the list of analytes in the revised workplan.

Comment No. 13: **Page 23, Par. 1, 1st Sent.: The sentence states that the northern channel likely sustains fish populations. Has the**

northern channel been traced to its termination to see if it is connected to Guadalupe Slough physically or by a lift station? Does any other entity (such as Lockheed) discharge to the northern channel?

JMM Response: PRC/JMM has not physically traced the northern channel to its end nor do we have documentation on potential dischargers into the channel. Aerial photography of the area indicates that the channel flows into Guadalupe Slough without the aid of a lift station. The water treatment plant for the City of Sunnyvale is located near the confluence of the northern channel with Guadalupe Slough and we suspect that they are discharging into the northern channel.

Comment No. 14: **Sec. 4.4.1: In addition to the sampling locations listed, consideration should also be given to sample the water (and maybe soils) in the industrial waste water flux ponds. These ponds may also have an impact on ecological receptors, especially water fowl and small mammals.**

JMM Response: Two sediment samples and one surface water sample will be collected during Phase I of the investigation. In addition, this area will be included for Habitat Characterization. The need for additional sampling will be addressed after analyzing the data from the first round of sampling. This change will be reflected in the text, figures, and tables of the Final Phase I Workplan.

Comment No. 15: **Page 24, Par. 2: In addition to the analytes mentioned, TPH should be included. This is especially true in the northern channel which receives discharge from the storm water lift station at Bldg. 191. One of the storm water lines that feeds the lift station drain the high speed fueling area. The dikes surrounding the drains in this area have been damaged and fuel has the possibility of leaking into those drains, especially if a spill occurs.**

JMM Response: We concur. The Phase I SWEA Workplan will be revised to incorporate this comment.

Comment No. 16: **Page 25, Par. 1, Last Sent.: In addition to the contaminants of concern listed, should TPH also be included? Please refer to Figure 9.**

JMM Response: Yes, TPH should be included. The Phase I SWEA Workplan will be revised to incorporate this comment.

Comment No. 17: **Page 27, Par. 3, 1st Sent.: The EPA suggests the use of fate and transport to assess future contaminant levels or predict the movement of contaminants from a source or between media. The models to be used should be provided and the inputs needed for these models should be listed. From this list, the required data may then be obtained during this investigation. The work plan should include any and all sampling necessary to provide site-specific parameters for the models used. A discussion should also include the applicability of the models for the intended use and how well these models worked in other investigations. Any evaluation on the selected model's (or models') performance should also be noted.**

JMM Response: The data collected to date in the OU 6 area suggest that the distribution of contaminants is spatially variable. The behavior of surface and subsurface flow in the wetlands is also unknown and likely to be extremely heterogeneous. Because of these difficulties, a fate and transport model cannot be used *a priori* as a predictive tool in Phase I. Empirical data will be collected in Phase I which will be more useful in assessing any impact to receptors from contamination. These data, along with field observations (i.e., surface flow paths, topography), may be used in conjunction with simple analytical fate and transport models in the preparation of the workplan for Phase II.

Comment No. 18: **Page 37, Par. 3 "State Problem," 1st Sent.: TPH is listed as one of the contaminants found in samples from the wetlands and storm water retention ponds. Testing for TPH is not included in this work plan, however. Why is this so?**

JMM Response: TPH will be included in the Phase I list of analytes. The Phase I SWEA Workplan will be revised to reflect this change.

Comment No. 19: **Page 37, Par. 3 "State Problem," 2nd Sent.: It is stated that the nature and extent of contamination has not been fully characterized. Will this be done as part of the work for OU-6? When will this work be done?**

JMM Response: One of the purposes for collecting soil and sediment samples for this investigation is to define the nature and extent of contamination. Quarterly monitoring of groundwater will provide definition of the nature and extent of contamination in groundwater at the site.

Comment No. 20: **Page 37, Par. 5 "Identify inputs affecting decision," Last Sent.: Carghill [sic] is spelled incorrectly. The correct spelling is Cargill.**

JMM Response: Comment noted. The Phase I SWEA Workplan will be revised to reflect this change.

Comment No. 21: **Page 39, 1st sentence at top of page: Reference is made to SOP13 of the Field Sampling Plan (FSP) as the basis for characterizing soil samples. However, SOP13, as provided in my copy of the FSP, Rev. 0, 1 Jul. 92, deals with the field measurement of the specific conductance for water. Please provide the correct SOP number.**

JMM Response: The correct SOP is number 028, which is entitled Visual Classification of Soils. This change has been made to the text of the final work plan.

Comment No. 22: **Page 39, 2nd Sent. at top of page: Reference is made to SOP14 of the FSP for the collection of surface water samples. According to the FSP, SOP14 is concerned with the collection of static water level, total depth, and immiscible layer measurements. Please provide the correct SOP number.**

JMM Response: The correct SOP is number 009 entitled Sampling Surface Water. This change has been made to the text of the final work plan.

REFERENCES

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International Technology Corporation (IT Corp.), 1991. Phase I Characterization Report, Naval Air Station, Moffett Field, Vols. 1-5. April 1991.

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