NAS MOFFETT FIELD

RESPONSE TO COMMENTS ON

DRAFT ADDITIONAL INVESTIGATION OF INFERRED SOURCES TECHNICAL MEMORANDUM

FEBRUARY 18, 1994

This report presents point-by-point responses to regulatory agency comments on the Draft Additional Investigation of Inferred Sources Technical Memorandum prepared November 22, 1993 by PRC Environmental Management, Inc. (PRC) for Naval Air Station (NAS) Moffett Field, California. Mr. Michael Gill of the U.S. Environmental Protection Agency (EPA) submitted comments in a letter dated December 17, 1993. Mr. Joseph Chou of the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) submitted comments in a letter dated January 13, 1994. Ms. Elizabeth Adams of the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) stated RWQCB did not have any comments in a telephone conversation with Mr. Timothy Mower of PRC on January 20, 1994.

Comments from Mr. Michael Gill, EPA

GENERAL COMMENTS

Comment Number 1. Section 2.2, Screening Results
Section 3.0 (inclusive of all subsections): Field Activities Summary
Section 4.0 (inclusive of all subsections): Results

The above sections reference investigation areas, buildings, and soil and groundwater sampling locations; however, there are no figures presented in these sections, nor are there references to figures presented in other sections that show information discussed in the text. Figures or figure references, such as in a grid, should be provided for clarity. Plate 1 presents locations of buildings and investigation areas; however, neither the regional volatile organic compound (VOC) groundwater plume nor the adjacent Middlefield-Ellis-Whisman (MEW) site boundaries are shown on Plate 1.

Response: *Sections 3.0 and 4.0 have been modified to include references to the figures in Section 5.0 that present the data discussed in the report. Plate 1 has been modified to include the regional groundwater plume and the MEW area. Plate 1 also has been modified to indicate the approximate coordinates of each building of interest to facilitate locating each building on the plate.*

Comment Number 2. Several sections of the report provide only general discussion of sample locations related to a specific investigation area (that is, Section 3.3.2, page 21, paragraph 1 states "After drilling and sampling, four of the soil borings were converted into A1 zone groundwater monitoring wells,," and Section 4.1.1, page 25, paragraph 2 states "Of the three soil borings at the transportation yard ...). The report should provide more concise descriptions of sample locations for clarity (that is "After drilling and sampling, soil borings SBSI-1 through 4 were converted into A1 zone groundwater monitoring wells," and "Of the three soil borings (SBSI-1 through 3) at the transportation yard ...").

Response: *Additional detailed descriptions have been added to the report to reduce the potential for misinterpretations. The paragraphs in Sections 3.3.2 and 4.1.1 have been modified as suggested.*

SPECIFIC COMMENTS

Comment Number 1. Table 1 - Site Screening Activities, Page 12. Building 341 is identified as used for Pest Control Storage and is slated to have been demolished. It is cross-referenced to Building 184 (Landscape Equipment Storage) but no investigative work is slated for either building. No basis for the lack of further investigative work is stated; the extent of any pesticide contamination of soil or potential for groundwater contamination is not mentioned. Further investigation is considered necessary in the area of the prior Building 341. Note: Appendix A, page A-9 states that Building 341 could not be located, and Building 184 was inspected instead, since it was within the transportation yard.

The boundaries of the yard should be clearly delineated on Figure A-11, and Table 1 should be amended to reflect that the area coinciding with the probable location of Building 341 will be addressed by sampling efforts conducted in the transportation yard.

Table 1 is intended to summarize the screening of the investigation sites. It identifies the potential for groundwater impact from the site by identifying the closest downgradient monitoring well. Table 1 should identify if a well is cross gradient and also how far downgradient the well is. It was noted that some monitoring wells were greater than 500 feet away from buildings under investigation (for example, Building 10, 500 ft.; Building 15, 700 ft.; Building 117, 750 ft.; Building 118, 600 ft.; Building 127, 600 ft.; Building 258, 700 ft.; Building 400, 400 ft.; and Building 438, 650 ft.). The effectiveness of these wells is questioned when the distances from a potential source is so great. It was also noted that some investigated buildings had wells located upgradient even though they were identified as downgradient (for example, Building 95, Building 96, and Building 161).

Response:

As discussed in Appendix A, Building 184 was apparently misidentified as Building 341 in the Harding Lawson Associates (HLA) report (1992) describing potential inferred sources. Building 341 is listed in the building inventory on Navy map F-80091, but the building location is not shown on the map. It was assumed that Building 341 was demolished because the building does not currently exist at NAS Moffett Field. The subjective statement indicating that Building 341 has been demolished has been removed from Table 1. The extent of any potential pesticide contamination was not evaluated because, as discussed in Section 1.1, the focus of the additional inferred sources investigation is VOC contamination. Because the former location of Building 341 cannot be established, additional investigations into potential contamination could not be appropriately directed. Figure A-11 has been modified to include the boundaries of the transportation yard that are within the figure area.

Table 1 has been modified to include the distance each monitoring well is downgradient from the associated building of interest. The Navy maintains the position that the groundwater monitoring well distribution on the western side of NAS Moffett Field is sufficient to locate all major contaminant sources. The Navy does not believe that installing and sampling additional monitoring wells closer to buildings of interest would significantly improve the current understanding of the contaminant distribution in the west side aquifers. The selection of the areas to be investigated, and those for which no further action was required, was made during the July 23, 1993 meeting between EPA, RWQCB, and the Navy. This selection was reiterated in letters from EPA on July 26, 1993 (PA/SI Meeting Minutes), October 18, 1993 (Approval of Final Additional Investigation of Inferred Sources Field Work Plan), and December 17, 1993 (Inferred Navy Sources and West Side Aquifer Initial Well Placement and Responsibility).

Comment Number 2. Table 1 - Site Screening Activities, Page 13. It is stated in Section 2.2, page 8, paragraph 3 that Building 503 will still be undergoing further petroleum investigation. Even though this investigation is not related to the inferred sources issue, please clarify this in Table 1.

Response: *Footnote 6 in Table 1 explains that additional investigations at the Naval Exchange (NEX) service station are planned for February 1994.*

Comment Number 3. Section 3.0, Field Activities Summary, Pages 17 - 24. It is recommended that the report include a brief discussion of containment or disposal of remedial investigation (RI)-derived waste.

Response: *Section 3.3.2 has been modified to include a paragraph discussing investigation-derived waste.*

Comment Number 4. Section 3.2, Cone Penetrometer Testing and HydroPunch® Sampling, Page 18, Paragraph 1. The paragraph discusses the use of the HydroPunch® sampler and sample hole abandonment. The type of HydroPunch® sampler used, HydroPunch I® or HydroPunch II® should

be stated. The paragraph states that the samples were bailed from the probe suggesting that the HydroPunch II® was utilized in the 'hydrocarbon mode'. If that was the case, the sampling method is appropriate only for collection of groundwater samples for semivolatile hydrocarbon analyses due to potential volatilization of a sample which is bailed from the probe. If the HydroPunch II® was used in the 'groundwater mode', the probe itself becomes the sample chamber which would allow for the collection of volatile and semivolatile groundwater samples since any potential sample volatilization occurs when the sample is transferred from the probe to the sample vial. As described in the paragraph, the latter example may not be the case. This issue should be clarified.

Response: *Section 3.2 has been modified to indicate that the HydroPunch II® probe was used in hydrocarbon mode for sample collection. Although volatilization during bailing is a concern, bailing is an approved method for collection of samples for VOC analysis at NAS Moffett Field (PRC and JMM 1992a).*

Comment Number 5. Section 3.2.2, Sampling, Page 18. The average thickness of the A1 aquifer zone should be stated in this paragraph. Also, reference should be made to the type of analyses conducted for the HydroPunch® groundwater samples.

Response: *The cross sections in Figures 4 and 5 in Section 5.0 present the hydrogeological relations between sand thickness in the A1 aquifer zone and the HydroPunch II® sample depths. Section 3.2.2 has been modified to indicate that samples were analyzed for VOCs and total petroleum hydrocarbons (TPH) purgeable as gasoline.*

Comment Number 6. Section 3.3.1, Locations, Page 20. This section generally describes field activities, including sampling locations. The rationale for sample location selection should also describe the groundwater flow directions and investigation area of interest (that is, upgradient, crossgradient, downgradient), and the objective of each sample location.

The second sentence of the second paragraph should be edited to state that the sand thickness recorded in HSI-3 was the greatest of the three cone penetrometer test (CPT) locations discussed in the previous sentence (HSIs-1, 2, and 3). The sentence, as presented, does not distinguish the three CPT locations used as criteria for the selection of WSI-1 from any of the seven CPT locations completed during the investigation.

Response: *Section 3.3.1 has been modified to more fully describe the objectives for the locations of the CPTs and HydroPunch® samples and their positions relative to the northerly groundwater flow direction.*

Section 3.3.1 has been modified to indicate that the sand thickness recorded at HSI-3 was the maximum from among the three CPTs (HSI-1, -2, and -3) recorded to locate well WSI-1.

Comment Number 7. Section 3.3.2, Field Activities, Page 21, First full sentence. The sentence indicates that photoionization detector (PID) screening was completed on soil cores. The sentence should also state that the results of the PID field screening appear on the individual soil boring logs included as an appendix.

Response: *Section 3.3.2 has been modified to indicate that, along with lithologic characteristics, the borehole logs included in Appendix C also contain the results of the PID field screening.*

Comment Number 8. Section 3.3.2, Field Activities, Page 21, Paragraph 1. The fourth sentence should indicate what type of bentonite seal was used (pellets, slurry, etc.)

Response: *This well construction discussion has been modified to indicate that bentonite pellets were used to create the seal above the well sand pack.*

Comment Number 9. Section 3.3.2, Field Activities, Page 21, Paragraph 2. The fifth sentence in this paragraph should be rewritten to read, "Each well was developed until at least three borehole volumes had been removed from the well and the monitored parameters stabilized."

Response: *The discussion of well development in Section 3.3.2 has been clarified as requested.*

Comment Number 10. Section 3.3.3, Sampling, Page 23. This section discusses sampling procedures but does not include references to the type of sample containers, the preservation methods, analytical methods, chain of custody procedures, or rationale for individual boring and sample locations. The report should either reference approved work plan/field sampling plan methods, or this information should be provided in this text.

Response: *Section 3.3.3 has been modified to indicate that samples were collected in accordance with the site-wide field sampling plan (FSP) and site-wide quality assurance project plan (QAPjP) (PRC and JMM 1992a and 1992b).*

Comment Number 11. Section 3.4.2, Sampling, Pages 23 and 24. This section describes groundwater sampling procedures but does not include references to sample containers, preservation methods, analytical methods, or chain of custody procedures. Additionally, performance standards for considering well parameters stabilized should be referenced.

Response: *Section 3.4.2 has been modified to indicate that samples were collected in accordance with the site-wide FSP and site-wide QAPjP (PRC and JMM 1992a and 1992b). Section 3.4.2 also has been expanded to indicate the performance standard used for well stabilization.*

Comment Number 12. Section 4.0, Results, Page 24, Paragraph 2. The description of EPA contract laboratory program (CLP) statements of work (SOWs) should include the SOW number and indicate whether the SOW is routine or special analytical services (RAS or SAS).

Response: *Section 4.0 has been modified to indicate that the organic analyses were conducted using CLP RAS under SOW OLM01.0 (EPA 1991).*

Comment Number 13. Section 4.1, Soil Sampling, Pages 24 and 25. Trichloroethene (TCE) results of less than 10 micrograms per liter (μg/L) are quoted and found to correspond to the following sample locations (Appendix D: SBSI-2, 7 μg/L; SBSI-4, 9 μg/L; SBSI-7, 8 μg/L). All of these results are flagged J in Appendix D, because they are below the method reporting limit (typically 12 μg/L) but above the instrument detection limit. These data are considered qualitative evidence only and should be qualified in the text on page 25.

No quality assurance and quality control (QA/QC) data are presented or discussed in either Section 4.1 or Appendix D.

Response: *Section 4.1.1 has been modified to indicate that the concentrations detected below 10 micrograms per kilogram (μg/kg) are estimated values. Appendices D and E have been modified to include sample QA/QC discussions.*

Comment Number 14. Table 4 - Soil Sample Results, Page 26. Sample results flagged J in Appendix D are not qualified in this table (see URS comments for Section 4.1). The table is footnoted stating that only the U qualifier is shown; however, the omission of the J qualifier is misleading.

Response: *Table 4 has been modified to present all the qualifiers that accompany the analytical data.*

Comment Number 15: Table 4 - Soil Sample Results, page 26. Please indicate in the footnotes when validated data will be available.

Response: *Table 4 has been modified to present validated data.*

Comment Number 16. Section 4.2.1.1, Chlorinated Volatile Organic Compounds, Page 28. There should be a discussion of QA/QC data in the groundwater section, as in the soil sampling section.

Response: *Appendices D and E have been modified to include sample QA/QC discussions.*

Comment Number 17. Section 5.1, Page 37, Paragraphs 1, 2 and 3, and Figure 4. These paragraphs indicate that a minor release of VOCs may have occurred at the location of SBSI-3, but that TCE concentrations in monitoring well WSI-3 (390 μg/L) are consistent with upgradient TCE levels as detected in monitoring wells W60-2, WSI-1, and R32A. The report indicates that the closest monitoring well to WSI-3 (W60-1) has relatively low concentrations of TCE (38 μg/L), and indicates that this low level is due to dilution from being screened in the shallow A1 unit soils as well as the deeper portion of the A1 aquifer. It should be noted that the logs and screened intervals for W60-1 and WSI-3 are nearly identical, and that the increased TCE levels in WSI-3 may be partially due to the TCE soil contamination detected in SBSI-3. It seems that TCE soil contamination detected at SBSI-3 is a source of local increases in TCE concentrations in the A1 aquifer. Closer investigation of this area is necessary to attempt to conclude the origin of the TCE contamination.

Response: *The discussion regarding potential dilution at well W60-1 represents one interpretation to explain why concentrations observed in groundwater samples collected from well W60-1 are abnormally low compared to samples collected from the other wells in the transportation yard. The TCE concentration detected in the sample from well WSI-3 is not elevated with respect to concentrations detected in the regional VOC plume throughout the transportation yard (wells WSI-1 and W60-2) and at upgradient locations (well R32A). Rather, the TCE concentration detected in the sample from well WSI-3 is consistent with samples from the other transportation yard wells monitoring the regional VOC plume and it is the low concentration detected in the sample from well W60-1 that is anomalous.*

The subsurface lithology logged at the location of well W60-1 indicates two distinct sand units separated by a 3-foot thick clay layer while only

one sand is present at well WSI-3. Although dilution was proposed as a hypothesis, other mechanisms could (and probably do) contribute to the variations in TCE concentration observed throughout the transportation yard. Local variations in sorptive capacity or changes to the local groundwater flow pattern, perhaps related to the position of well W60-1 immediately downgradient from the former Sump 60 excavation, may also affect the chemical concentrations observed in the sample from this well.

In addition, only minor TCE concentrations (up to 260 µg/kg) were observed in soil samples collected from boring SBSI-3. The area around boring SBSI-3 would not require remediation based on the cleanup standard for TCE in soil of 500 µg/kg set in the MEW record of decision (ROD).

In summary, the Navy does not believe further investigation of the area near well WSI-3 is warranted because (1) the TCE concentration detected in the sample from this well is consistent with TCE concentrations measured in the regional VOC plume in this area, and (2) the TCE concentrations detected in soil samples from this location are already below the cleanup standard.

Comment Number 18. Figure 3 - Transportation Yard Investigation Locations, Page 33 Figure 6 - Site 8 Area Investigation Locations, Page 40. Groundwater flow directions as shown by approximate groundwater flow arrows vary by approximately 45° between figures, with the groundwater flow direction in Figure 3 shown as approximately due north, and the flow direction in Figure 6 shown as approximately N45°E. Additionally, the groundwater flow direction shown on Plate 1 is approximately due north. The report should discuss these differences in flow directions and support the interpretation with data. It is recommended that groundwater be represented with contours of equal elevation to clarify groundwater flow directions at each investigations area and to support the selection of sampling locations.

Response: *The A1 zone groundwater flow direction changes in the northern part of NAS Moffett Field because of the influence of pumping at the Building 191 lift station. Consequently, the groundwater flow directions indicated on Figures 3 and 6 were different. Plate 1 has been modified to indicate the approximate A1 zone groundwater flow direction at several locations to avoid potential misunderstandings. The northern runway area is underlain by a drain system to maintain the structural integrity of the runways which would be compromised by saturated conditions in the runway subbase. Continued groundwater removal from this area depresses the potentiometric surface and changes the groundwater flow direction in the A1 aquifer zone. The Navy monitors groundwater elevations quarterly at NAS Moffett Field and presents these data and potentiometric surface maps in quarterly reports to the regulatory agencies. The Draft May 1993 Quarterly Report (PRC and Montgomery 1994) contains the most current published data and maps related to the A1 zone potentiometric surface at NAS Moffett Field.*

Comment Number 19. Figure 4 - Transportation Yard Geologic Cross Section A-A', Page 34. The figure utilized information derived from previous investigations but does not include that information in the appendices (soil boring logs for 74A, W60-1, W60-2, and R32A). The depiction of the top of the filter pack interval for WSI-1 (22 feet) is incorrect according to the vertical scale included on the figure.

Response: *Although it may be convenient to reproduce all referenced information in every report, this is not an economical or time-effective practice. The reports containing the borehole logs of interest are listed below.*

Well Number	*Report*
W60-1	*Tank and Sump Removal Summary Report (PRC 1991)*
W60-2	*Additional Tank and Sump Field Investigation Technical Memorandum (PRC 1993b)*

	74A, R32A	*Remedial Investigation Report, MEW Study Area (HLA 1987)*

Figure 4 has been modified to indicate the correct depth to the filter pack in well WSI-1.

Comment Number 20. Figure 4 - Transportation Yard Geologic Cross Section A-A', Page 34
Figure 5 - Transportation Yard Geologic Cross Section B-B', Page 35.
These figures should present water levels at each well location.

Response: *Figures 4 and 5 have been modified to indicate the water level in each well shown on the cross sections.*

Comment Number 21. Figure 5 - Transportation Yard Geologic Cross Section B-B', Page 35.
This figure also utilized information derived from previous investigations but does not include that information in the appendices (soil boring logs for HSIs 1 through 7, 64A, and CPT log for CPTU4-2). HSIs 5 and 3 are mislabeled as HS1-5 and HS1-3.

Response: *Although it may be convenient to reproduce all referenced information in every report, this is not an economical or time-effective practice. The reports containing the borehole or CPT logs of interest are listed below.*

Well or CPT Number	*Report*
CPTU4-2	*Draft West Side Aquifers Field Investigation Technical Memorandum (PRC 1993a)*
64A	*Remedial Investigation Report, MEW Study Area (HLA 1987)*

Figure 5 has been modified to indicate the correct designations for HydroPunch® locations HSI-3 and HSI-5.

Comment Number 22. Section 5.1, Transportation Yard

Groundwater TCE Concentrations at the Transportation Yard, Page 38. Data for wells W14-2, W14-3, W14-4, W14-10, W14-11, and W14-12 are not presented in Appendix E. Therefore, it is unknown whether any of the data are J qualified, or otherwise problematic.

Response: *Analytical results for the samples collected from these wells are presented in the August 1992 Quarterly Report (PRC and Montgomery 1993). All the values listed for the samples from these Site 14 monitoring wells are qualified with a U, indicating that TCE was not detected at or above the listed concentration. Figure 3 also has been modified to include the U qualifier.*

Comment Number 23. Section 5.2, Pages 39 and 40. This section describes the results and interpretation of the investigation at Site 8 but does not include a discussion of upgradient and downgradient regional VOC concentrations in the wells presented on Figure 6 for comparison. It is recommended that this discussion be incorporated into the report, including discussion of groundwater sample results at all monitoring wells shown on Figure 6.

Paragraph 2 indicates soil boring SBSI-5 soil samples detected significant concentrations of VOCs and that these concentrations may be related to VOCs detected in the soil boring at NASA's monitoring well location 11M04A; however, the report does not present data for 11M04A soil sample results. The report indicates that this contamination may be related to activities inside the Site 8 storage area or may be related to contamination at the location of 11M04A on NASA property. Additionally, the report indicates that TCE concentrations detected in monitoring well WSI-4 (96 μg/L) may be related to activities in the western portion of Site 8 or dispersion from high concentrations detected in 11M04A; however, the report does not present data for monitoring well 11M04A. Furthermore, the report indicates that seven HydroPunch® groundwater samples were collected during a previous investigation, and that these HydroPunch® samples did not detect TCE at concentrations greater than 25 micrograms per liter. However, these HydroPunch® locations are not shown on Figure 6.

Based on a review of the presented data, there appears to be a clear source of VOC groundwater contamination near Site 8. In order to fully understand the implications of the results of the Site 8 investigation and determine the extent of impact to the soil and groundwater, it is recommended the report address the above issues. Additionally, the use of geologic cross sections should be considered for Site 8.

Response: *Section 5.2 has been expanded to discuss the Site 8 area in greater detail. Plate 5 presents two geologic cross sections through Site 8.*

Comment Number 24. Appendix C - Soil Boring Logs and Well Completion Records. The logs do not include an indication (signature) that they were reviewed by a registered professional (RG, CEG, or PE). The graphic logs do not include a graphic symbol for the assigned Unified Soil Classification System (USCS) designation. The logs do not include information regarding the type of drilling equipment used to complete the boreholes and monitoring wells. In some cases, density/consistency values appear in sample descriptions when blow count data are not provided, and in some instances, blow count data are presented without an assignment of the appropriate density or consistency classification.

Monitoring Well Completion Diagrams: The diagram depictions should be to scale and depict the silt trap with stainless steel centralizers.

Response: *Graphic symbols for USCS soil type were not included to simplify presentation of the lithological data. The heading information of each borehole log describes the type of drilling equipment used at each boring. Blow count data are indicated only for those intervals collected using split-spoon samplers. Sample collection with a Central Mine Equipment (CME) core barrel does not require use of a standard penetration hammer. Consequently, no blow count information is indicated for intervals collected using CME core barrels.*

No centralizers or silt traps were used during the construction of monitoring wells WSI-1 through -4. Therefore, these fields are blank on the well completion diagrams.

Comment Number 25. Appendix D - Soil Sample Analytical Data. The tables should be modified to include data qualifier descriptions.

Response: *Appendices D and E have been modified to include a listing of laboratory and validation qualifiers.*

Comments from Mr. Joseph Chou, DTSC

GENERAL COMMENTS

Comment Number 1. The objective of the inferred sources investigation was to evaluate whether activities at any of the 54 buildings on the western side of NAS Moffett Field have caused contamination to the shallow aquifer. At the end of the report, it was concluded that neither transportation yard area nor Site 8 were considered as TCE sources. However, as indicated in the specific comments, the data gaps and incomplete interpretations made the investigation results inconclusive. Therefore, the DTSC cannot concur with the conclusion. Further investigation and recompilation of the existing information will be needed.

Response: *The report has been expanded to more completely describe the data and interpretations supporting the conclusion that no contaminant sources exist at the transportation yard. The report presents an expanded interpretation of the Site 8 area and concludes that a minor source may exist in the western portion of Site 8 or that the groundwater contaminant concentrations observed at well WSI-4 may be caused by the source in the area of NASA well 11M04A. The Navy is coordinating with NASA to incorporate the groundwater in the vicinity of well WSI-4 in NASA's design of an A1 zone groundwater extraction system to address the groundwater TCE concentrations observed in the northern Site 8 area. Please refer to the responses to the specific comments for additional discussion of the transportation yard and Site 8.*

Comment Number 2. Numerous analytical results from previous investigations were included in this report to draw the cross sections (Figure 4 and 5) or to determine the contamination sources. It was noted that original lithologic logs, soil or groundwater analytical data were not associated with these results. In order to compare or combine with newly derived results and to support any conclusions made, more detail information should be provided by the Navy.

Response: *Although it may be convenient to reproduce all referenced information in every report, this is not an economical or time-effective practice. The reports containing the borehole and CPT logs of interest are listed below.*

Well or CPT Number	*Report*
W60-1	*Tank and Sump Removal Summary Report (PRC 1991)*
W60-2	*Additional Tank and Sump Field Investigation Technical Memorandum (PRC 1993b)*
CPTU4-2	*Draft West Side Aquifers Field Investigation Technical Memorandum (PRC 1993a)*
64A, 74A R32A	*Remedial Investigation Report, MEW Study Area (HLA 1987)*

SPECIFIC COMMENTS

Comment Number 1. Page 2, 4th Paragraph. Please clarify the sentence "a very small percentage of contamination is attributable to unidentified Navy sources, if they exist." If the source(s) is not identified yet, then how to determine the percentage of contamination from the unknown sources?

Response: *The Navy has consistently expressed the opinion that potential sources at NAS Moffett Field are adequately characterized. No specific percentage*

contribution from unidentified sources is implied. However, considering the density of monitoring wells at NAS Moffett Field, the effect on groundwater of any unidentified source would be likely to be very small.

Comment Number 2.

Page 3, 1st Paragraph. It was stated that the Navy will not be responsible for continuously evaluating the alleged existence of additional sources when the data do not indicate their presence. In fact, if the data do not indicate the presence of additional sources then it may imply no additional sources exits; or it could be the result of data gaps or other reasons. Therefore, the Navy needs to provide sufficient evidence to prove there is no data gap and the investigation has been conducted appropriately.

Response:

As mentioned in the response to general comment 2, the Navy believes that potential sources at NAS Moffett Field are adequately characterized. The Navy does not believe that installing and sampling additional monitoring wells closer to buildings of interest would significantly improve the current understanding of the contaminant distribution in the west side aquifers. The selection of the areas to be investigated, and those for which no further action was required, was made during the July 23, 1993 meeting between EPA, RWQCB, and the Navy. The selection was reiterated in letters from EPA on July 26, 1993 (PA/SI Meeting Minutes), October 18, 1993 (Approval of Final Additional Investigation of Inferred Sources Field Work Plan), and December 17, 1993 (Inferred Navy Sources and West Side Aquifer Initial Well Placement and Responsibility). The Navy concurs with the concept of filling identified data gaps. However, as in any geologic environment, uncertainty in subsurface stratigraphy and groundwater contaminant concentrations cannot be eliminated. The Navy believes sufficient data exist to proceed with the remediation of the west side aquifers at NAS Moffett Field.

Comment Number 3.

Page 10, 11, Table 1. Building 44 and 503 should not be listed as no further action sites. In page 8, it was mentioned that Building 503 will be studied under contract task order (CTO) 0235 and Building 44 will be evaluated by horizontal conduit studies (page A-4).

Response: *Footnotes 5 and 6 in Table 1 explain that additional investigations are planned that are related to Buildings 44 and 503.*

Comment Number 4. Page 12, Table 1. In column 7, the groundwater sampling results were used to summarize the impacts by any potential sources to downgradient groundwater wells. It was noted that many wells selected are either far away, more than 500 feet, from the investigated area or not located downgradient. Therefore, even no impacts were found in those wells yet it is still questionable whether the data can represent the true situation of potential sites or not.

Response: *Table 1 has been modified to include the distance each monitoring well is downgradient from the associated building of interest. The Navy maintains the position that the groundwater monitoring well distribution on the western side of NAS Moffett Field is sufficient to locate all major contaminant sources. The Navy does not believe that installing and sampling additional monitoring wells closer to buildings of interest would significantly improve the current understanding of the contaminant distribution in the west side aquifers. As discussed in the response to specific comment 2, the selection of the areas to be investigated, and those for which no further action was required, was made during the July 23, 1993 meeting between EPA, RWQCB, and the Navy. This selection was reiterated in subsequent letters from EPA.*

Comment Number 5. Page 33, Figure 3. Please clarify the relationship between the 100 parts per billion (ppb) TCE contour lines and the regional TCE plume boundary. More contour lines with different concentrations will be needed in determining if any potential sources in the transportation yard area.

Response: *The 100 µg/L TCE concentration was presented on Figure 3 to illustrate the approximate position of the segment of the regional VOC plume present at the transportation yard. The 100 µg/L value has no intrinsic significance; concentrations of 50 or 200 µg/L would also adequately*

show the position of the plume. The boundary of the regional plume is related to the cleanup level specified for each aquifer zone in the MEW ROD. For the A1 aquifer zone, this TCE concentration is 5 µg/L.

Presentation of additional contours using a smaller contour interval on Figure 3 would not significantly improve the interpretation because of the inherent variation in groundwater concentrations. Only changes in concentration of approximately an order of magnitude are significant, smaller variations are not. The fact that TCE concentrations measured in groundwater samples collected from wells at the transportation yard are within an order of magnitude of concentrations measured in the upgradient portion of the regional plume is a key observation supporting the statement that no contaminant sources exist at the transportation yard.

Comment Number 6.

Page 34 and 35, Figure 4 and 5. In Figure 4 and 5, soils were classified as 1) sand and gravel; 2) silt and clay. The DTSC suggests adding a third unit that includes silty sand, clayey sand, sandy silt, and clayey silt into these cross-sections to describe the underground lithology in the investigated area.

Response:

The intent of the geologic cross sections presented in Figures 4 and 5 was to indicate the principal grain size changes observed in the sediments at the transportation yard. The geologic hypothesis underlying this interpretation is that the major sand bodies represent deposits from stream channels. These channels are expected to act as preferential contaminant migration pathways. Clearly, the subsurface geology at NAS Moffett Field represents a highly complex and heterogeneous system. Many additional lithologic zones could be chosen and much more complicated cross section could be created. However, Figures 4 and 5 present only the major sand bodies to simplify the subsurface stratigraphy and focus on the dominant groundwater flow zones.

Comment Number 7. Page 34, Figure 4. Please explain the drastic lithology changes between the neighboring wells W60-1 and W60-2.

Response: *The highly complex and heterogeneous nature of the subsurface geology at NAS Moffett Field often results in abrupt lithologic changes. As mentioned in the response to specific comment 6, the geologic hypothesis underlying the interpretation of the subsurface stratigraphy is that the sediments represent fluvial deposits from stream channels. This type of geologic environment of deposition is characterized by rapid changes in sediment thickness and type.*

Comment Number 8. Page 35, Figure 5. According to Figure 3, the Hydropunch test hole HSI-5 and groundwater monitoring well WSI-2 were drilled at the same location. Please explain the different stratigraphy shown at the east and west side of the same borehole from the depths of 17 to 20 feet.

Response: *Figure 5 has been modified to correct the error on the cross section at well WSI-2. The cross section now more clearly indicates that the silty interval found between 17 and 20 feet below land surface (BLS) pinches out toward HydroPunch® location HSI-4. The borehole log from well WSI-2 and the CPT log from HSI-5 indicate approximately the same lithologic sequence.*

Comment Number 9. Page 35, Figure 5. The total depth of HSI-2 is 65.3 feet below land surface and should be indicated in Figure 5. Additionally, based on CPT data in Appendix B, a sand or sandy gravel unit should be identified in cross section B-B' at 35 feet BLS.

Response: *CPT total depths indicated on Figure 5 are rounded to the nearest foot. The sand identified at approximately 35 feet BLS on CPT log HSI-2 is below the bottom of the cross section. Deeper sand intervals were not shown on the cross sections to focus attention on the shallow aquifer zones that would most likely be affected by potential surface contaminant sources.*

Comment Number 10. Page 39. It was mentioned in Section 5.2 that the TCE concentration observed from well WSI-4 may be affected by the high concentration observed from NASA well 11M04A. However, the information given in this section is too brief to reach any conclusion. For example, no TCE or other detected VOCs concentrations from monitoring wells were shown in Figure 6; the relationship between groundwater flow direction and the spatial distribution of VOCs concentration was not discussed; the locations of seven Hydropunch samples were not marked; the source of high concentration TCE from well 11M04A should also be included.

Response: *Section 5.2 has been expanded to discuss the Site 8 in greater detail.*

Comment Number 11. Page 40, Figure 6. The groundwater flow direction shown here is about N45°E which is different from the groundwater flow shown in Plate 1, and Figure 3. Please clarify the variation of groundwater flow directions at different investigation areas.

Response: *The A1 zone groundwater flow direction changes in the northern part of NAS Moffett Field because of the influence of pumping at the Building 191 lift station. Consequently, the groundwater flow directions indicated on Figures 3 and 6 were different. Plate 1 has been modified to indicate the approximate A1 zone groundwater flow direction at several locations to avoid potential misunderstandings. The northern runway area is underlain by a drain system to maintain the structural integrity of the runways which would be compromised by saturated conditions in the runway subbase. Continued groundwater removal from this area depresses the potentiometric surface and changes the groundwater flow direction in the A1 aquifer zone. The Navy monitors groundwater elevations quarterly at NAS Moffett Field and presents these data and potentiometric surface maps in quarterly reports to the regulatory agencies. The Draft May 1993 Quarterly Report (PRC and Montgomery 1994) contains the most current published data and maps related to the A1 zone potentiometric surface at NAS Moffett Field.*

REFERENCES

Harding Lawson Associates (HLA). 1987. Remedial Investigation Report, Remedial Investigation/Feasibility Study, Middlefield-Ellis-Whisman Study Area, Mountain View, California. July 1.

HLA. 1992. Review of Potential Sources, NAS Moffett Field MEW Study Area, Mountain View, California. August 24.

PRC Environmental Management, Inc. (PRC) 1991. Tank and Sump Removal Summary Report, Naval Air Station Moffett Field, California. July 15.

PRC 1993a. Draft West Side Aquifers Field Investigation Technical Memorandum, Naval Air Station Moffett Field, California. March 16.

PRC 1993b. Additional Tank and Sump Field Investigation Technical Memorandum, Naval Air Station Moffett Field, California. March 22.

PRC and James M. Montgomery, Consulting Engineers, Inc. (JMM). 1992a. Field Sampling Plan, Naval Air Station, Moffett Field, Mountain View, California. June 17.

PRC and JMM. 1992b. Quality Assurance Project Plan, Naval Air Station, Moffett Field, Mountain View, California. July.

PRC and Montgomery Watson (Montgomery). 1993. August 1992 Final Quarterly Report, Naval Air Station, Moffett Field, California. June 9.

PRC and Montgomery. 1994. May 1993 Draft Final Quarterly Report, Naval Air Station, Moffett Field, California. January 31.

U.S. Environmental Protection Agency (EPA). 1991. Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration. Document OLM01.0 and revisions through OLM01.8. August.