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MOFFETT FIELD
SSIC NO. 5090.3.A.

DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
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27 AUG 2007

Mr. John Chestnut
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street, SFD-8-1
San Francisco, CA 94105-3901

Dear Mr. Chestnut:

Enclosed are the Navy's responses to the U.S. Environmental Protection Agency's (EPA) comments of March 21, 2007, on the August 4, 2006, Draft Groundwater Monitoring Well Installation and Sampling Report for Orion Park Housing Area, Moffett Community Housing, Moffett Field, California.

Since 2000, the Navy has spent considerable time and resources in responding to EPA's concerns with potential on-site sources to groundwater contamination underlying Orion Park Housing, former Navy property transferred to the U.S. Air Force in 1996. The U.S. Air Force subsequently transferred the property in 2000 to the U.S. Army, the current Federal Facility Owner. Based on numerous investigations, including groundwater and soil sampling, supporting analyses, and technical reports, the Navy has concluded that the underlying groundwater contamination existing at Orion Park Housing is originating from off-site sources. The Army reached the same conclusion in independent studies it conducted in 2003 and 2006.

Further, both the EPA and the State of California have acknowledged existence of a known off-site, non-Navy source to the Orion Park groundwater contamination, which lies directly south and up-gradient of the housing property, but the Navy is not aware of any actions being taken by the responsible party to delineate the extent of contamination, undertake source control or source removal, or conduct any groundwater remediation. It was our understanding that the regulatory community was to have met in June 2007 to address these issues and associated concerns regarding regulatory oversight. The Navy is interested in hearing of any decisions that may have been made as a result of this meeting or other activities regarding this off-site and up-gradient source.

As detailed in our responses to comments, the Navy maintains its conclusions that there are off-site trichloroethene (TCE) sources impacting the groundwater beneath Orion Park Housing and that there are no on-site TCE sources. The Navy has provided multiple

lines of evidence that support these conclusions. Therefore, the Navy intends to finalize this report. Should you have questions, please contact me at (619) 532-0985.

Sincerely,

JOHN M. HILL
Base Closure Manager
By direction of the Director

Enclosure: 1. Response to Comments

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RESPONSE TO U.S. EPA COMMENTS ON DRAFT GROUNDWATER MONITORING WELL INSTALLATION AND SAMPLING REPORT FOR ORION PARK HOUSING AREA DATED AUGUST 4, 2006 MOFFETT COMMUNITY HOUSING MOFFETT FIELD, CALIFORNA

Comments dated: March 21, 2007

Comments by: Ms. Alana Lee,
Environmental Protection Agency (EPA) Project Manager

GENERAL COMMENTS

Comment 1: ***Conceptual Site Model.*** *The Navy's Conceptual Site Model presented in the Draft Report includes an instantaneous or short-term off-site release of TCE south of Orion Park that is responsible for the majority of the observed on-site groundwater contamination. The Draft Report also indicates that three off-site TCE sources are impacting the groundwater beneath the Orion Park Housing Area and that there are no on-site TCE sources. Insufficient and inconclusive data has been provided to support the Navy's Conceptual Site Model.*

EPA's alternate conceptual site model is that there are likely on-site source areas, offsite source areas, and co-mingled contamination from on-site and off-site sources. This conceptual site model considers all the observed VOC distribution patterns in the A1 and A2 Aquifer zones and is based on the local groundwater flow direction, hydrostratigraphic data, and stable isotope data.

Response 1: The Navy's geologic, hydrogeologic, and geochemical data (including stable isotopes) support the conceptual site model (CSM) proposed in the Draft Report by using multiple lines of evidence. EPA has not identified an alternative CSM, or provided details supported by multiple lines of evidence, as accomplished by the Navy CSM.

Comment 2: ***Insufficient and Inconclusive Data.*** *EPA disagrees with the Navy's conclusion presented in the Draft Report that there are no on-site sources. Insufficient supporting data has been provided to conclude that there are no potential on-site sources of VOC contamination and that all of the groundwater contamination at Orion Park is from offsite, upgradient sources.*

Response 2: Please see the Response to Comment 1. Stable isotope data, groundwater flow direction, and volatile organic compound (VOC) data have been collected from monitoring wells located on the

hydraulically upgradient boundary of Orion Park Housing Area (wells MCH-1UA, MCH-2LA, MCH-3UA, and MCH-4LA). These upgradient well locations were selected in conjunction and with the approval of the U.S. Environmental Protection Agency (EPA) and the California Regional Water Quality Control Board (Water Board), and agreed to by the National Aeronautics and Space Administration (NASA) during a site walk on April 6, 2005 (see Response to Comment 3). It is an accepted standard of practice and scientifically defensible that groundwater samples collected from hydraulically upgradient monitoring wells represent groundwater moving onto the site from upgradient sources (EPA, 1986 and 2001; Tetra Tech FW, Inc. [TtFW], 2004). Therefore, VOC contamination is migrating onto and through the Orion Park Housing Area from upgradient sources. In addition, it is Navy policy not to sample off site unless the impacts off site are related to/caused by site activities (Navy Environmental Restoration Program [NERP] Manual, 2006).

The EPA continues to identify minor variations in concentration of TCE as potential source areas. The Navy has provided multiple lines of evidence (including geology, hydrostratigraphy, potentiometric surface [flow direction], relative hydraulic conductivity, VOC chemistry, and stable isotope chemistry) to define a CSM that explains the variability in trichloroethene (TCE) concentration and shows that sources of TCE underlying Orion Park are located off-site.

An on site source has not been identified nor is one suggested when interpreting the composite data set.

NERP. 2006. *Department of the Navy Environmental Restoration Program Manual.* August.

EPA. 1986. *RCRA Ground-Water Monitoring Technical Enforcement Guidance Document.* OSWER-9950.1. September.

_____. 2001. *Introduction to: Groundwater Monitoring* in RCRA, Superfund & EPCRA Call Center training Module. EPA530-K-02-0101. October.

TtFW. 2004. *Final Technical Memorandum Site 1 Groundwater Evaluation Process.* April 8.

Comment 3:

Purpose of Monitoring Well Data. *The installation and quarterly sampling of the 11 monitoring wells at Orion Park were helpful to further assess groundwater flow conditions and to generally confirm contaminant distribution at Orion Park. However, these monitoring wells are not sufficient to identify and characterize potential source*

areas. These wells are limited spatially and, as stated in the Draft Report, were not installed with the objective of identifying potential source areas.

Response 3:

Section 2.2 explains the rationale for each well location. Well locations were selected based on the results of previous investigations. The majority of the wells installed including MCH-1UA, MCH-2LA, MCH-5UA, MCH-6LA, MCH-7UA, MCH-8LA, MCH-9UA, MCH-10LA, and MCH-11UA were located to evaluate high on-site TCE concentrations (potential source areas) detected in previous investigations. The well locations were selected and approved by the EPA and the Water Board, and agreed to by NASA during a site walk on April 6, 2005. The Draft Report does not state that the wells "were not installed with the objective of identifying potential source areas." The objectives are stated in Section 1.3 of the Draft Report as follows:

- Install 11 groundwater monitoring wells
- Complete two rounds of groundwater gauging and sampling
- Evaluate groundwater flow directions (horizontal and vertical)
- Evaluate contaminant distribution in the upper and lower portions of the A aquifer
- Evaluate the potential for contaminants to migrate between the upper and lower portions of the A aquifer

Inherent in an evaluation of contaminant distribution is the identification and characterization of potential sources. The data collected are sufficient for this purpose.

Comment 4:

Focused Remedial Investigation Work Plan. *The Navy must submit a Work Plan for focused Remedial Investigation (RI) activities in specific areas of concern to determine whether the hot spot areas of concern are: isolated on-site source areas; co-mingled on-site and off-site source areas of groundwater contamination; or a result of off-site source areas of contamination. Additional VOC data, groundwater flow direction data, and field investigation work are needed. In addition, the focused RI activities of the areas of concern should also include, at a minimum, the following data collection:*

- *Soil gas and soil data in the vicinity of FW41A to assess elevated photoionization detector (PID) readings*
- *Cone Penetrometer Testing (CPT)/HydroPunch sampling data*
- *Based on CPT/HydroPunch data, additional monitoring wells may be necessary.*

- *Investigation of former Farmhouse area – septic tank system and discharge lines.*
- *Investigation in the vicinity of W89-06A1 and 97A, including whether buildings in the area, including daycare, are impacted from the potential vapor intrusion pathway*
- *If using stable isotope data analysis to support the claim that contamination is from off-site, then both on-site and off-site isotope data must be collected and compared.*
- *Sampling and water level measurements of all 11 Orion Park monitoring wells, monitoring wells 67B1, 86B1, 87B1, 97A, W89-6, W89-7, and nearby NASA monitoring wells.*

Response 4:

The evidence presented in the report indicates that the groundwater contamination underlying Orion Park Housing Area is from upgradient sources, and there is no indication of an on-site source. Please see the Response to General Comments 1 and 2.

Monitoring wells MCH-1UA and MCH-2LA were selected by the Navy, EPA, the Water Board, and NASA to address the elevated PID readings at FW41A. No source has been identified.

The Navy has completed more than 60 CPT/HydroPunch® sample locations at the Orion Park Housing Area. The lithologic and geochemical data from the CPT/HydroPunch® and temporary wells were used to locate the 11 Orion Park Area monitoring wells. The Navy has interpreted the composite data set (on- and off-site lithologic, hydrogeologic, and geochemical data) to develop a CSM that characterizes the site.

The former Farmhouse area has been investigated by CPT/HydroPunch® samples and Orion Park Housing Area monitoring wells MCH-10LA and MCH-11UA. The interpreted composite data set (lithologic, hydrogeologic, and geochemical data) and resulting CSM does not suggest the former Farmhouse area or any activities related to the former structures have contributed any VOC contamination to the Orion Park housing Area. Please see the Response to General Comment 5.

The report shows that contamination detected in samples collected from monitoring wells W89-6, W89-7, and 87B1 are not related to any activity that might have taken place at the Orion Park Housing Area; these wells are located cross gradient to the Orion Park Housing Area. The CSM indicates upgradient sources. Well 97A is also located cross gradient to the Orion Park Housing Area.

The report already incorporates 4 quarters of sampling and water level measurements of all 11 Orion Park Area monitoring wells, monitoring wells 87B1, W89-6, and W89-7, and data supplied by NASA from their nearby monitoring wells.

No further action will be taken.

Comment 5:

(a) ***Potential On-site Source Areas of Contamination.*** *The data presented in the Draft Report support the likelihood of on-site source areas, thus further investigation of the following potential source areas on Orion Park and Moffett Field is necessary as part of a focused RI:*

- *Area in the vicinity of MCH-9UA/FW35A (A1 Aquifer Zone)*
- *Area in the vicinity of W89-06A1 (A1 Aquifer Zone)*
- *Areas in the vicinity of MCH-11UA, MCH10LA and Former Farmhouse buildings (A1 and A2 Aquifer Zones)*

(b) Link Between Off-site and On-site Contamination. *While EPA continues to acknowledge that there is VOC groundwater contamination migrating onto the Orion Park Housing Area from upgradient, off-site areas, the data provided in the Draft Report does not support the Navy's conclusion that the contamination at Orion Park is solely from upgradient, off-site sources. To fully evaluate the Navy's hypothesis that all on-site contamination is a result of off-site contamination, at a minimum, stable isotope data, groundwater flow direction, and VOC data from upgradient, off-site locations must be collected, analyzed, and compared to on-site data.*

(c) Potential On-Site, Off-Site or Co-mingled Source Areas of Contamination. *EPA's review of the data provided in the Navy's Draft Report indicate that groundwater contamination found in the northern and central areas of Orion Park may be from the following separate, potential on-site source areas:*

- *Central Area in the vicinity of MCH-7UA, MCH-11UA (A1 Aquifer Zone)*
- *East Central Area in the vicinity of MCH-5UA/FW15B (A1 Aquifer Zone)*
- *Central Area in the vicinity of MCH-6LA, FW17B, FW20B, and connection to MCH-10LA (A2 Aquifer Zone)*

(d) Without sufficient data to link groundwater contamination in the A1 and A2 Aquifer zones in the southern portion of Orion Park to the central and northern portions of Orion Park, the current data set supports these separate on-site source areas.

While EPA agrees that some of the contamination found in the southern portion of Orion Park is likely from off-site, upgradient contamination, additional data is necessary to link on-site contamination to off-site contamination.

- *Southeastern Area in the vicinity and upgradient of FW08B, FW07A, and 87B1 (A2 Aquifer Zone)*
- *Southwestern Area in the vicinity of MCH-1UA, FW41A, GW-4, FW12B*

Response 5:

The EPA continues to identify minor variations in concentration of TCE as potential source areas. The Navy has provided multiple lines of evidence (including geology, hydrostratigraphy, potentiometric surface [flow direction], relative hydraulic conductivity, VOC chemistry, and stable isotope chemistry) to define a CSM that explains the variability in trichloroethene (TCE) concentration and shows that sources of TCE underlying Orion Park are located off-site.

(a) First Bullet (Area in the vicinity of MCH-9UA/FW35A): The relative TCE concentration in well MCH-9UA is explained by the Navy's CSM. In addition, the samples collected from well MCH-9UA fit the stable isotope data for interpreted Source 1, evidence for which is also found at the hydraulic upgradient boundary of Orion Park Housing Area in well MCH-1UA, and thus, as discussed in Response 2, the TCE presence is considered to originate from off-site sources.

(a) Second Bullet (Area in the vicinity of W89-06A1 [W89-6 in report]): The area around well W89-06A1 is located neither on Orion Park property, nor hydraulically downgradient of Orion Park. Groundwater samples collected from well W89-06A1 are not impacted by historic activities at Orion Park.

(a) Third Bullet (Areas in the vicinity of MCH-11UA, MCH-10LA, and Former Farmhouse buildings): The relative TCE concentrations in wells MCH-11UA and MCH-10LA are explained by the Navy's CSM. Samples collected from wells MCH-11UA and MCH-10LA all fit the stable isotope data for interpreted Source 1, evidence for which is also found at the hydraulically upgradient boundary of Orion Park Housing Area in samples collected from well MCH-1UA, and thus the TCE concentrations are considered to originate from off-site sources.

(b) Please see the Response to General Comment 2. It is an accepted standard of practice and scientifically defensible that groundwater samples collected from hydraulically upgradient monitoring wells represent groundwater moving onto the site from upgradient sources (EPA, 1986 and 2001; TtFW, 2004). Therefore, VOC contamination is migrating onto and through the Orion Park Housing Area from

upgradient sources. In addition, it is Navy policy not to sample off site unless the impacts off site are related to/caused by site activities (NERP Manual, 2006).

(c) First Bullet (Central Area in the vicinity of MCH-7UA, MCH-11UA [Upper portion of the A Aquifer Zone]): The relative TCE concentrations in wells MCH-7UA and MCH-11UA are explained by the Navy's CSM. In addition, well MCH-1UA is a hydraulically upgradient monitoring well (see Previous Response), and is not located in the "Central Area" of Orion Park. The samples collected from well MCH-7UA and MCH-11UA fit the stable isotope data for interpreted Source 1, evidence for which is also found at the hydraulically upgradient boundary of Orion Park Housing Area in samples collected from well MCH-1UA, and thus the TCE concentrations are considered to originate from off-site sources.

(c) Second Bullet (East Central Area in the vicinity of MCH-5UA/FWI5B [Upper portion of the A Aquifer Zone]): The relative TCE concentration in well MCH-5UA is explained by the Navy's CSM. In addition, the samples collected from well MCH-5UA fit the stable isotope data for interpreted Source 2, evidence for which also is found east of Orion Park Housing Area in samples collected from well 87B1. Thus the TCE concentrations are considered to originate from off-site sources.

(c) Third Bullet (Central Area in the vicinity of MCH-6LA, FWI7B, FW20B, and connection to MCH-10LA [Lower portion of the A Aquifer Zone]): The relative TCE concentrations in wells MCH-6LA and MCH-10LA are explained by the Navy's CSM. In addition, the samples collected from well MCH-6LA and MCH-10LA fit the stable isotope data for interpreted Source 1, evidence for which is also found at the hydraulically upgradient boundary of Orion Park Housing Area in samples collected from well MCH-1UA, and thus the TCE concentrations are considered to originate from off-site sources.

(d) The hydrostratigraphy, groundwater flow direction, and the stable isotope data link groundwater contamination in the upper and lower portion of the A aquifer in the southern portion of Orion Park to the central and northern portions of Orion Park Area. These and other data are incorporated into a CSM that defines the sources of data as being off site. Please see the Response to General Comments 1 and 2.

Comment 6:

Use of Stable Isotope Data. *Isotope data can be a useful tool in combination with other lines of evidence when evaluating potential source areas. Here, because only on-site isotope data was analyzed and no data from off-site was collected, it is not possible to use isotope analysis to conclude that all sources of VOC contamination at Orion*

Park are from off-site sources or to distinguish whether "hot spot areas" are solely from off-site, upgradient sources. Additionally, for the isotope analyses, until appropriate standard operating procedures and quality assurance/quality control information are provided, EPA must consider the isotope data used in this analysis to be of unknown quality.

Response 6:

The standard operating procedures from the University of Waterloo will be included as an appendix to the final report. Although EPA may consider the isotope data used in this analysis to be of unknown quality, the fact remains that the isotope data corroborate other multiple lines of evidence presented in the report and the Navy's CSM.

Please see the Responses to General Comments 1, 2, and 7.

Comment 7:

Stable Isotope Regression and Cluster Analysis. *A regression was run on the stable isotope data for all of the well data, but further data analysis is needed. As shown in Figures 6-8 and 6-9, the A1 and A2 Aquifer data seem to plot in two groups on the regression lines. The isotope data from the A1 Aquifer do not correlate very well along the regression line. To better understand the difference in the detected TCE concentrations and to assess possible source areas in the A1 and A2 Aquifers, separate regression analysis should be run separately on only the A1 Aquifer data and only the A2 Aquifer data. Different conclusions may be drawn.*

In addition, Appendix F presents the cluster analysis with different groupings of wells as shown on the d13C vs. d37Cl data plots (Figures F-3 and F-4). However, the cluster analysis is not presented and discussed in Section 6.2 Stable Isotope Results. The cluster analysis results in a clustering of different possible TCE sources than shown on the d13C vs. TCE and d37Cl vs TCE plots (Figures F-5 and F-6). Section 6.2 of the Draft Report should be revised to include the cluster analysis.

Response 7:

The regression lines shown on Figures 6-8 and 6-9 define the Rayleigh Distillation Equation, which is the result of biodegradation exerting a classic kinetic isotope effect (isotopic enrichment as biodegradation proceeds) from a common source material for monitoring wells MCH-1UA, MCH-3UA, MCH-7UA, MCH-9UA, MCH-11UA, MCH-4LA, MCH-6LA, and MCH-10LA. Separate regression analysis on only the upper portion of the A aquifer data and/or only the lower portion of the A aquifer data is not appropriate, since: 1) biodegradational isotopic enrichment effects on <u>all</u> wells needed to be accessed <u>together</u> to determine if they originated from a common source material (exhibited a similar classic kinetic isotope effect); and 2) there is no indication in the data that biodegradation rates were different between the two

aquifer zones, as evident by all the isotopic values and hydrogeologic data, irrespective of aquifer portion, exhibiting a linear relationship. It would only be appropriate to segregate the upper and lower portion of the A aquifer if separate and distinct data groupings occurred that clearly exhibited two distinct and separate linear trends unique to each portion of the aquifer, however, this was not the case for the Orion Park data.

The aquifer data plotting in two groups on the regression lines with the upper A aquifer exhibiting more enriched isotopic ratios shows: 1) the TCE in the upper A aquifer monitoring wells MCH-1UA, MCH-3UA, MCH-7UA, MCH-9UA, and MCH-11UA has undergone greater biodegradation than that in the lower A aquifer monitoring wells MCH-4LA, MCH-6LA, and MCH-10LA; 2) the TCE in the lower A aquifer monitoring wells MCH-4LA, MCH-6LA, and MCH-10LA is more similar to the original TCE source material, since it has undergone less biodegradation (as evident by their less-enriched isotopic ratios); and 3) further substantiates the Navy's CSM of an off-site TCE source that has migrated beneath Orion Park Housing (if the TCE originated from an on-site surficial source, the opposite pattern of TCE isotopic enrichment would be expected to occur).

The cluster analysis in Appendix F identifies groups of data that do not necessarily translate into potential sources. The appendix discussion only shows that there are multiple groups of data. Whether this result translates into potential multiple sources cannot be further resolved by cluster analysis. The conditions are not ideal for the cluster analysis because microbial reduction has affected the chloride (Cl) and carbon (C) ratios, confounding the ability to make a direct conclusion. Therefore, the analysis was explained and performed in Appendix F, but not used (other than by reference for more than one source) within the text. It would be inappropriate to use the cluster analysis in the text other than its current reference.

Comment 8:

Field Sampling Investigation. *It is EPA's understanding that the Army plans to demolish the existing buildings at Orion Park and to construct a Reserve Center there. Prior to construction of the new buildings, a field sampling investigation must be conducted to include:*

- *Investigation of agricultural wells 06S02W15G001 and 06S02W15G004 in the vicinity of the former farmhouse buildings and any other wells encountered during demolition;*
- *Investigation of septic tank system and discharge lines and properly decommission, as appropriate;*
- *Proper notification to EPA and the Water Board of any encountered contamination; and*

- *Report of Findings.*

Response 8: The agricultural well 06S02W15G001 has previously been reported to the EPA and Water Board to be properly destroyed on March 24, 1993 (Santa Clara Valley Water District records). No further action is appropriate. This information with supporting data was provided to the regulatory agencies previously.

The agricultural well 06S02W15G004 was identified and reported to the EPA and Water Board to be located near a former NASA farm site, north of Orion Park Housing Area. Requests for further investigation of this well should be directed to NASA. This information with supporting data was provided to the regulatory agencies previously.

Requests for Army data and additional investigation and/or remediation work by the Army should be directed to the Army.

Comment 9: ***Missing Groundwater Data.*** *The Navy collected water level data and VOC data in August 2005, December 2005, March 2006 and June 2006, but only the first two rounds of monitoring data are included and discussed in the Draft Report. In addition, during this monitoring period, NASA and the MEW Companies collected water level data and VOC data at nearby existing wells, but not all of this data is included in the Draft Report. The Draft Report should be revised and the isoconcentration maps and potentiometric surface maps should be updated to include all the available data.*

Response 9: As stated in the Work Plan, only two rounds of groundwater samples (August and December 2005) were planned. Pursuant to an EPA request, the Navy completed the last two rounds (see the Response to Specific Comment 8).

At the time the analysis and reporting began, the March 2006 data had been collected, but were not validated and available, and the June data had not been collected (standard turnaround for validated chemical data is approximately 60 days). With EPA's agreement, we issued this draft report recognizing that the final report would include all four rounds of groundwater sampling data and any available MEW, NASA, EPA and Army data.

Groundwater elevation data from the Navy, Middlefield-Ellis-Whisman (MEW), and NASA are included in the report for the November 2005 Black Thursday event on Figures 5-7 and 5-8. Chemical data including PCE, TCE, cis-1,2-DCE, and VC are included from the Navy, EPA, MEW, NASA, and the Army on Figures 6-5 through 6-10 and Figure 6-13. In all, the Navy used four rounds of Navy CPT/DPT/Hydropunch data and four rounds of Navy

groundwater monitoring well sampling data; NASA's CPT/DPT/Hydropunch data; NASA's groundwater monitoring well sampling data; Army CPT/DPT/Hydropunch data; EPA CPT/DPT/Hydropunch data; and groundwater monitoring well data collected from nearby MEW groundwater monitoring wells. Use of this data has allowed for a composite picture of the contaminant plumes in the upper and lower portions of the A Aquifer.

Comment 10:

VOC Analysis Using EPA Method 524.2. *EPA Region 9 used EPA Method 524.2 to analyze for VOCs in split groundwater samples collected at Orion Park in August 2005 and to analyze groundwater samples collected during EPA's groundwater investigation off-site of the Orion Park Housing Area (Highway 101 & Moffett Blvd Study Area). Throughout the Draft Report (Section 6.1.2.1 and other sections), the text states that:*

> *"EPA Method 524.2 is designed for samples with low matrix interference, is not typically used to evaluate contaminated groundwater, and is not appropriate for samples with high sediment content (such as samples collected using HydroPunch equipment) and high VOC concentrations (EPA, 2004a; 1995). The 440-ug/L TCE sample concentration at HP03 may not be representative of site-specific conditions. Because a different analytical method (EPA Method 524.2) and different laboratories were used to analyze EPA samples, results from the EPA investigation are not considered comparable with Army and Navy investigation results (EPA Method 8260B). Isoconcentration contours near EPA data points are presented as inferred on Figures 6-1 through 6-7."*

The Navy's description and conclusions about the comparability and usability of EPA's data using EPA Method 524.2 are misleading, inappropriate and unsubstantiated. EPA Region 9 has significant experience with the use of EPA Method 524.2 and EPA Method 8260B for the purpose of analyzing VOCs in groundwater at hazardous waste sites. EPA has found that these two analytical methods are comparable and that any differences in the results are not due to the analytical method itself.

The instrumentation of the two methods is similar and the quality control procedures have only slight differences. EPA Method 524.2 does not require matrix spike/matrix spike duplicates (MS/MSDs), however the EPA Region 9 laboratory performs a modification of the method by adding MS/MSDs and additional surrogate spike compounds to its 524.2 procedure in order to evaluate more thoroughly for potential matrix effects. The EPA Region 9 laboratory also uses additional internal standards.

Furthermore, EPA's groundwater sample results are generally comparable with the Navy's, Army's and nearby MEW's groundwater results. The Draft Report should be revised to delete the discussion of the comparability and usability of EPA's groundwater data.

Response 10:

EPA's groundwater sample concentrations, which are generally comparable with the Navy's and MEW's groundwater results, have been based primarily on samples collected from groundwater monitoring wells, which have been developed and are generally not turbid (the samples were sediment free). The EPA samples collected south of Orion Park were HydroPunch® samples, which are typically very turbid.

The question regarding the comparability and usability of EPA's data for the HydroPunch® samples using EPA Method 524.2 relates primarily to the 440-micrograms per liter (µg/L) TCE sample concentration at HPO3 and the appropriateness and applicability of using a low concentration method at a site with mid to high TCE concentrations. EPA Method 524.2 is a low concentration method that typically exhibits and notes a method detection limit of 0.19 µg/L (wide-bore capillary column) or 0.02 µg/L (cryogenic trapping with a narrow-bore capillary column). The applicable concentration range of this method is primarily column and matrix dependent, and is approximately 0.02 to 200 µg/L when a wide-bore thick-film capillary column is used, whereas capacity limits for narrow-bore thin-film columns have a capacity that limits the range to 0.02 to 20 µg/L. To achieve these low limits, instrument sensitivities are maximized and calibration curves adjusted to lower concentration limits. As a consequence, samples with concentrations above the defined calibration curves must be diluted to put them within calibration range to determine the analytes' concentration, which can introduce transcription and/or calculation errors, particularly if the analyst inaccurately or inappropriately dilutes the sample and/or fails to or inaccurately reports the dilution(s) utilized. It is more appropriate to use a method such as EPA Method 8260B.

For the reasons stated above, the statements "TCE sample concentration at HPO3 may not be representative of off-site-specific conditions . . . and . . . Isoconcentration contours near EPA data points are presented as inferred on Figures 6-1 through 6-7" were added and a lower confidence level in the data reported was applied.

Comment 11:

Table 5-2 and A1 and A2 Aquifer Designations. *The Navy recently re-named the "A1" and "A2" Aquifer zones to the Upper A Aquifer and Lower A Aquifer, respectively. These aquifer zones are equivalent. EPA is continuing to use the "A1" and "A2" Aquifer zone*

designations as the change in nomenclature is unnecessary and confusing.

Response 11: Comments from the EPA, NASA, and the public have repeatedly questioned the hydraulic connection between the A1 and A2 aquifer zones, implying that these are independent hydrostratigraphic layers. The name has been changed by the Navy to the upper and lower portion of the A aquifer to reduce the apparent confusion. As detailed in the West-Side Aquifers Treatment System (WATS) Optimization Completion Report (Tetra Tec EC, Inc. [TtEC], 2005), the Navy used numerous hydrogeologic techniques including aquifer testing (background monitoring, step-drawdown tests, single-well pump tests, constant discharge pumping tests, slug tests), borehole geophysics, and modeling, as well as looking at historical boring logs and well data, to develop stratigraphic cross sections and evaluate the hydraulic connection between the A1 and A2 aquifer zones. Furthermore, work conducted as part of the Building 88 investigation and this MCH investigation support the interpretation.

The analysis determined that the A aquifer, although a complex hydrostratigraphic unit (see Response to Specific Comment 1[b]), is a single hydrostratigraphic unit. For characterization purposes, wells have been placed toward the top of the A aquifer (upper portion of the A aquifer) and toward the bottom of the A aquifer (lower portion of the A aquifer).

TtEC. 2005. *WATS Optimization Completion Report*. Former Naval Air Station Moffett Field, Moffett Field California. May.

SPECIFIC COMMENTS

Comment 1: ***Stable Isotope Data, MCH-5UA and 87B1.*** *Based on the stable isotope data, the Draft Report concludes that TCE concentrations detected at MCH-5UA are from a separate source in the A1 Aquifer. In addition, as shown in cross-section E-E' on Plate 5-2, the area of MCH- 5UA and FW15B seems isolated since it is not hydrogeologically connected to downgradient location FW18B. However, the Draft Report suggests that, based on the isotope data, there is a connection between MCH-5UA and A2 Aquifer well 87B1, located approximately 700 feet southeast of MCH-5UA. This is not a logical conclusion based on the detected VOC data (i.e., 84 micrograms per liter (µg/L) TCE at well 87B1 and 210 µg/L at FW15B). It is unlikely that TCE concentrations detected at A2 Aquifer well 87B1 are from the same source as detected TCE concentrations at MCH-5UA and FW15B in the A1 Aquifer.*

Response 1:

(a) Cross section E-E' (Plate 5-2) shows a hydrostratigraphic connection between boring FW15B, well MCH-5UA, boring FW18B, well MCH-10LA, and boring FW24B in the upper portion of the A aquifer at a depth of approximately 10 to 15 feet below ground surface (bgs) (the yellow colored silty sand).

(b) The report does not suggest a connection between MCH-5UA and lower A aquifer well 87B1. The following text explains why.

Regionally, the northwesterly trending Santa Clara Valley Basin contains interbedded alluvial fluvial, and estuarine deposits to a depth of as much as 1,500 feet (Iwamura, 1980). Locally, these sediments consist of varying combinations of clay, silt, sand, and gravel that represent the interfingering of estuarine and alluvial depositional environments during the late Pleistocene and Holocene epochs. The fluvial sediments were derived from the Santa Cruz highlands west of the basin and deposited on an alluvial plain bounded by alluvial fan deposits to the west and baylands to the northeast (Iwamura, 1980).

The heterogeneous nature of channel and interchannel sediments deposited in the fluvial depositional environment is evident in the many subsurface explorations that have been conducted at Moffett. These sediments most likely were deposited during the Holocene period when the worldwide sea level was rising toward its present elevation. In general, thicker intervals of sand and gravel and discontinuous intervals of clays and silt are found near the highlands and source of the alluvial fan deposits. The sand and gravel intervals are thinning and the clay and silt intervals are becoming thicker and laterally continuous at a distance from the source of the fan deposits.

Sediments within the Moffett area include channel, floodplain, and shallow marine and tidal deposits. Buried sand and gravel channel deposits are incised in floodplain and tidal deposits. There appears to be two relative scales of the sand and gravel channel deposits. The larger features have been interpreted as distributary stream deposits. Distributary channels are branches of a main channel that extend out onto the floodplain that forms an anastomosing network of relatively permeable material. The distributary channels beneath parts of Moffett are described by James M. Montgomery Consulting Engineers (JMM) (1992) to be as wide as 100 to 200 feet. Channels depicted by Tetra Tech EM, Inc. (TtEMI) (2001) are as narrow as approximately 60 feet. Smaller sand and gravel features are interpreted as splay and overbank deposits. Splay deposits form when a stream breaks through a levee and deposits its material onto the surrounding floodplain. These deposits generally are thin sheets that have only limited connection to the main channel. The channels generally trend northwest to southeast, and tend to be to the north of Highway 101. Thicker, more continuous

channels of sands and gravels trending northwest to southeast exist south of Highway 101, as discussed by Iwamura (1995).

In this depositional environment, streams may cut down through existing floodplain or channel deposits at one geologic time period and at other times bury the earlier sediments. During other geologic episodes, a combination of land subsidence and rises in sea level result in the deposition of fine-grained tidal and shallow marine sediments. The overall result is a complex network of coarser-grained sand and gravel surrounded by fine-grained floodplain and marine silt and clay. Continuity of individual sand and gravel units in this fluvial-dominated depositional environmental setting is variable.

Since well 87B1 is at least 350 feet to the east of cross section E-E', given the above depositional environment description, a visible permeable layer connecting the upper and lower portions of the A aquifer would not be anticipated.

(c) The report does not suggest a connection between MCH-5UA and lower A aquifer well 87B1. The correlation based on stable isotope analysis only states that both of these wells are affected by a similar source.

Monitoring well 87B1 is a 4-inch diameter well screened from 45 to 55 feet bgs. The 210 µg/L TCE concentration sample collected from FW15B was a HydroPunch® type sample collected from 16 to 17 feet bgs (a 1-foot interval). Although there is a reasonable correlation between shallow HydroPunch® samples and upper A aquifer monitoring well samples (see Table 6-1), there is a somewhat lesser correlation between deep HydroPunch® samples and lower A aquifer monitoring well samples (see Table 6-2). No correlation has been made between deep HydroPunch® samples and upper A aquifer monitoring well samples.

Monitoring well 87B1 is not along the same flow line as the location of FW15B, and appears to be generally cross-gradient. Since the TCE isoconcentrations generally follow the north-south channeling (see Figures 6-1 and 6-2), since these two sample locations are located nearly 350 feet apart (east-west), and since groundwater flow is generally north to northeast in this area (see Figure 5-10), based on the description of the channeling in Response to Specific Comment 1(b), it is reasonable to consider a large difference in TCE concentration. An example of this condition can be observed between lower A aquifer wells W9-21 and W9-20 in the WATS area, where the December 2005 TCE concentration in a sample collected from well W9-20 was 3,300 µg/L, while the TCE concentration in a sample collected from well W9-21 (located about 250 feet to the east and cross-gradient) was

3 µg/L. The correlation based on the stable isotope analysis only states that both of these wells are affected by a similar source.

Iwamura, Thomas I. 1980. Saltwater Intrusion Investigation in the Santa Clara County Baylands Area, California. Unpublished Report. Santa Clara Valley Water District.

JMM. 1992. *Geology and Hydrogeology Technical Memorandum.*

TTEMI. 2001. *Draft Final Interim Remedial Action Report, West-Side Aquifers Treatment System (WATS), Moffett Federal Airfield, California.* April.

TtFW. 2005. *Final West-Side Aquifers Treatment System Optimization Work Plan Addendum 1.* Former Naval Air Station Moffett Field, Moffett Field, California. March 17.

Comment 2:

Separate Hot Spot Areas. *The Draft Report concludes, based on the stable isotope data, that there is a separate source for VOCs detected around MCH-2LA and FW41A in the A2 Aquifer. This conclusion is reasonable, and is supported by the TCE, cis-1,2-DCE, and vinyl chloride concentration data which show that a source for VOC concentrations detected near FW41A could be located in the vicinity of off-site location SIG19.*

However, it is unclear whether the TCE contamination that likely migrates onto Orion Park in the A2 Aquifer around MCH-2LA is responsible for the TCE hot spot areas detected downgradient. As shown in Plate 5-1, cross-section B-B', there is no hydrogeologic connection between wells MCH-1UA/MCH-2LA, downgradient well MCH-6LA and downgradient well pair MCH-7UA/MCH-8LA. This indicates that the TCE detected in these downgradient areas does not originate from the area in the vicinity of MCH-2LA and FW41A. Therefore, separate hot spot areas around MCH-6LA/FW17B and MCH-10LA are not connected to the hot spot area around MCH-2LA/FW41A.

Response 2:

The Draft Report's conclusion (based on the isotope data) is that there is a separate source for the TCE detected around well MCH-2LA. There is no discussion about the source of the TCE detected around FW41A based on isotope data, since isotope data were not collected from this boring. The EPA appears to be making interpretations based solely on concentrations of TCE and daughter products. The Navy's interpretation, as provided in the CSM for Orion Park, uses multiple lines of evidence, including the geology, hydrostratigraphy, groundwater flow, and geochemistry (TCE and daughter products, and the stable isotopes of TCE).

Cross section B-B' (Plate 5-1) shows that there was no recovery of soils from the boring for well MCH-2LA between the screen intervals of wells MCH-1UA and MCH-2LA. Generally, no recovery is typical of a loose sand, not of clays. Therefore, it is possible that there is some hydraulic communication between MCH-1UA and MCH-2LA. The water elevation was 0.23 feet higher in MCH-1UA than in MCH-2LA in March 2006. The difference in water levels indicates minimal potential for upward groundwater movement from the lower A aquifer to the upper A aquifer at MCH-1UA/2LA during the dry season. During the dry season, the vertical gradients range from 0.001 ft/ft to 0.006 ft/ft upward (assuming a distance from the bottom of the screen at MCH-1UA to the top of the screen at MCH-2LA). During the wet season there is a downward potential (vertical gradient of 0.03 ft/ft downward). The seasonal change from upward to downward potential minimizes any actual migration of water from the upper to the lower portion of the A aquifer or from the lower to the upper portion of the A aquifer.

Monitoring well MCH-6LA is completed solely within the lower portion of the A aquifer (not across the upper and lower portion of the A aquifer). Cross section B-B' (Plate 5-1) shows no single higher permeability layer (silty sand, sand, or gravels) that connects monitoring well MCH-2LA and MCH-6LA along the B-B' section line. However, based on the depositional environment (see Response to Specific Comment 1[b]), there could be a hydraulic connection off the B-B' section line. Nonetheless, a groundwater flow line drawn through well MCH-2LA does not appear to go through downgradient well MCH-6LA. The CSM presented in the Draft Report describes a different source for the TCE found in samples from monitoring well MCH-2LA and MCH-6LA.

Cross section B-B' (Plate 5-1) shows no single higher permeability layer (silty sand, sand, or gravels) that connects monitoring wells MCH-1UA and MCH-7UA or MCH-2LA and MCH-8LA along the (B-B') section line. However, based on the depositional environment (see Response to Specific Comment 1[b]), there could be a hydraulic connection between MCH-1UA and MCH-7UA or MCH-2LA and MCH-8LA off the B-B' section line. Cross section A-A' (Plate 5-1) shows a high permeability layer connecting MCH-1UA and MCH-7LA. The apparent lack of hydraulic connection between MCH-2LA and MCH-8LA may explain the lack of VOC contamination found in samples collected in well MCH-8LA.

A groundwater flow line drawn through wells MCH-1UA or MCH-2LA does not appear to go through downgradient wells MCH-7UA or MCH-8LA, respectively. The CSM presented in the Draft Report describes a different source for the TCE found in samples from

monitoring well MCH-2LA than in monitoring wells MCH-1UA and MCH-7UA, but a similar source for monitoring wells MCH-1UA and MCH-7UA. The apparent lack of hydraulic connection between MCH-2LA and MCH-8LA may explain the lack of VOC contamination found in samples collected in well MCH-8LA.

Comment 3:

Support for Two Separate On-site Hot Spot Areas. *There are no data points between the two A2 Aquifer Zone hot spot areas around MCH-6LA/FW17B/MCH-10LA and MCH-4LA. When the stable isotope data are plotted as d13C vs. d37Cl (Figures F-3 and F-4), the isotope clusters suggest that MCH-4LA and MCH-10LA have different sources. Only low TCE concentrations were found at FW15A, FW14B, FW24A, and FW09B, which supports the depiction of two separate on-site hot spot areas. The conclusion that the source of TCE detected in the area around MCH-6LA, FW17B, and MCH-10LA is from the southeast offsite should be confirmed by the collection of actual data.*

Also, based on cross-section E-E', there does not appear to be hydrogeologic communication between the A2 Aquifer Zone area of FW07/FW08/FW06 and the downgradient hot spot area around FW18B/MCH-10LA.

Response 3:

There are several data points located between mid-site monitoring wells MCH-6LA/MCH-10LA and upgradient monitoring well MCH-4LA, as shown on Figure 6-2 (including, but not limited to FW13B, FW14B, FW08B, and FW09B).

As stated in the Appendix F text, the "isotope clusters" on Figures F-3 and F-4 are groupings of data exhibiting similarities that only identify groups of data that do not necessarily translate into potential sources (see Response to General Comment 7). The isotope data on Figures 6-8 and 6-9 show three sources of TCE: 1) samples from monitoring well MCH-2LA; 2) samples from monitoring wells MCH-5UA and 87B1; and 3) samples from monitoring wells MCH-1UA, MCH-3UA, MCH-7UA, MCH-9UA, MCH-11UA, MCH-4LA, MCH-6LA, and MCH-10LA exhibiting a classic kinetic isotope effect due to biodegradation defined by the Rayleigh Distillation Equation (regression line shown) from a common source material.

Samples collected from FW15B at the depths of 16 to 17 and 19 to 21 feet bgs had TCE concentrations of 210 and 170 µg/L, respectively. The sample collected from FW09B at the depth of 18 to 20 feet bgs had a TCE concentration of 260 µg/L. These are not considered low concentrations. On the other hand, groundwater samples were only collected at two depths (first encountered groundwater and at the estimated depth of the top of the lower portion of the A aquifer) in HydroPunch® borings FW15A and FW24A. Samples collected from

HydroPunch® boring FW09A show that although some HydroPunch® sample intervals (generally one- to two-foot-thick intervals) have relatively high TCE concentrations (such as 260 µg/L at a depth interval of 18 to 20 feet bgs), adjacent beds have relatively low concentrations of TCE (such as an estimated value of 8.1 µg/L at a depth interval of 21 to 22.5 feet bgs). It is possible that other sample intervals at locations FW14B and FW24A may have relatively high TCE concentrations.

The TCE isoconcentrations (as shown on Figures 6-1 and 6-2) honor all of the TCE data and consider the hydrostratigraphy and the groundwater flow directions. The multiple lines of evidence based on the geologic, hydrogeologic, and geochemical data support the CSM as presented in the Draft Report.

Comment 4: ***Insufficient Data to Support Off-site Single TCE Slug Release.*** *The Draft Report concludes that there is an off-site TCE source in the A1 Aquifer and one slug release of TCE has caused the observed hot spot areas around MCH-1UA, MCH-3UA, MCH-7UA, MCH-11UA, and Building 703 (located near the northeastern Orion Park property boundary). However, a one-time release of VOCs as one single slug is unlikely to have created the TCE plume as observed; rather, several on-going slug releases would have had to occur to create the observed hot spot configuration. In addition, for these hot spots to be connected, a groundwater flow direction to the north-northeast would have to be assumed; however, the groundwater flow direction is to the north-northwest.*

Response 4: The EPA has concurred that there is an off-site TCE source contributing to the contamination underlying Orion Park Housing (see General Comment 5[b]).

The Draft Report does not specify that there was only "one" slug release. The CSM describes an "instantaneous" release mechanism and the resulting downgradient transport and fate of a "slug" of TCE. It is possible that one or more historic instantaneous releases from upgradient source(s) have occurred. One or more historic instantaneous releases of TCE from an upgradient source(s) would explain the current contamination underlying Orion Park Housing, as detailed in the CSM. It has been observed in the WATS area (located to the east of Orion Park Housing) and shown in numerical modeling of the Moffett aquifers (TtFW, 2004), that contaminant migration can occur cross-gradient controlled by high permeability channels (see Response to Specific Comment 1[b]). In addition, there is a north-northeast component of groundwater flow in areas of the eastern and western portions of Orion Park Housing in both the upper and lower portions of the A aquifer (see Figures 5-5 through 5-10).

TtFW. 2004. *Technical Memorandum for Conceptual Model for Groundwater Flow and Chemical Fate & Transport Simulations*. July 2.

Comment 5:

Fine-grained Material and Hot Spot Areas. *The Draft Report (pages 6-11 and 6-14) states that hot spots appear across Orion Park only because of encountering fine-grained material at the hot spot sampling locations and the slow desorption of contaminants from fine-grained material. However, this statement cannot be confirmed by the hydrogeology shown in Plates 5-1 and 5-2.*

For example, at MCH-6LA where 820 µg/L of TCE was detected, the sample was collected from a mostly silty sand layer; at MCH-9UA where 610 µg/L of TCE was detected, the sample was collected from a gravel with sand and silt layer; and at MCH-10LA, where 1,200 µg/L of TCE was detected, the sample was collected from a mostly gravel with sand and silt or a silty sand layer. Additional information to support the statement that hot spot sampling locations were encountered in fine-grained material should be provided or the statement revised.

Response 5:

The 820 µg/L of TCE detected in the sample collected from monitoring well MCH-6LA is likely from the gravel with silt and sand layers at a depth of about 18 to 21 feet bgs. There is also likely some contribution from the silty sand layers both between and above the gravel layers. However, as shown on cross section C-C' (Plate 5-2), these permeable layers abruptly end at a clay layer immediately downgradient of the monitoring well. This condition fits the proposed CSM exactly, with the TCE "slug" bound up in and dammed by the downgradient clays and leaching to the higher permeable layer.

The 610 µg/L of TCE detected in the sample collected from monitoring well MCH-9UA is likely from a sand layer at a depth of approximately 19 to 24 feet bgs. There is also likely some contribution from the silty sand layer beneath the sand layer. However, as shown on cross section B-B' (Plate 5-1), the continuity of this permeable sand layer is to the east toward boring FW12B – this is cross-gradient to groundwater flow (see Figure 5-5). Downgradient of monitoring well MCH-9UA is shown as silty sands and eventually clays (see Figure 5-2). This condition again fits the proposed CSM, with the TCE "slug" bound up in and dammed by the downgradient fine-grained soils and leaching into the higher permeable layer.

The 1,200 µg/L of TCE detected in the sample collected from monitoring well MCH-10LA is likely from the gravel with sand and silt layers at a depth of about 35 to 45 feet bgs. However, as shown on cross section E-E' (Plate 5-2), the continuity of these permeable layers

ends at a silt, clayey silt, and sandy silt layer immediately downgradient of the monitoring well. This condition again fits the proposed CSM, with the TCE "slug" bound up in and dammed by the downgradient fine-grained soils and leaching into the higher permeable layer.

Each of the examples questioned supports the CSM as presented in the Draft Report.

Comment 6: ***TCE Isoconcentration Maps.*** *Figure 6-1 shows TCE isoconcentrations in the A1 Aquifer zone. The 300 µg/L TCE contour line is misrepresented at FW31A as only 57 µg/L of TCE was detected. Also, it is unclear why the 300 µg/L TCE contour does not extend south of Highway 101 in the interchange area. The figure should be revised to address these points.*

Response 6: The TCE isoconcentrations shown on Figure 6-1 will be corrected.

The alternative depiction of the TCE plume, as described above by the EPA, is the depiction shown on Figure 6-1, assuming that all of the data are honored. Since monitoring wells MCH-1UA and MCH-3UA are on the upgradient boundary of Orion Park, the contamination found in samples collected from these wells represents underflow from upgradient/off-site sources (as observed in samples collected from off-site upgradient locations SIG5, SIG6, SIG7 SIG8, and HPO3), and thus the TCE isoconcentration lines would be open to the south, as shown on Figure 6-1.

Comment 7: ***Area Downgradient of MCH-1UA.*** *The Army sample location SIG1, located west of Stevens Creek, is in hydrogeologic communication with the A1 Aquifer at MCH-1UA (as shown in Plate 5-2, cross-section D-D'). Since the groundwater flow direction at Orion Park is north-northwest and TCE was detected at a concentration of 210 µg/L at upgradient well MCH-1UA, plume migration and the downgradient impact to the west of Stevens Creek should be further investigated.*

In addition, to better understand the hydrogeology downgradient of the area around MCH- 1UA, a cross-section of MCH-1UA and downgradient sample locations SIG2 and SIG3, located west of Stevens Creek, should be included in the Report. In addition, boring logs for FW11B, FW32A, and FW31A should be included in the existing cross-section A-A' between MCH-1UA, FW33A, FW14B, and FW16B to better understand the hydrogeology in that area.

Response 7: (a) The hydraulic gradient west of Stevens Creek can only be hypothesized, since there are no wells completed west of Stevens Creek. Reviewing cross section D-D' (Plate 5-2), it would be

hypothesized that Stevens Creek (at the time the water levels were collected) was a gaining stream in the area of monitoring well MCH-1UA and HydroPunch® boring S1G1 (water levels in the aquifer are shown higher than in the stream). Under this condition, the equipotential lines would "V" upstream, as appears to be the condition shown in the area of monitoring well MCH-1UA and HydroPunch® location S1G1 (Figure 5-8). However, actual hydraulic heads in the aquifer underlying the Stevens Creek have not been measured. As shown in cross section D-D' (Plate 5-2), there is a clay, silty clay layer potentially isolating the stream from the upper portion of the A aquifer. It is possible that there is no hydrologic connection between the stream and the aquifer.

(b_1) A new cross section has been developed. The new cross section is located on the west side of Stevens Creek, incorporating CPT locations SG1, SG2, SG3, and SG4.

(b_2) Borings FW31A and FW32A were drilled to first encountered groundwater at the depths of 13 and 17 feet bgs, respectively. Since each of these borings was first hand augered to 5 feet bgs, each would only provide lithology for 8 and 12 feet, respectively. Adding the logs for these borings to cross section A-A' will not provide additional useful information. No change in cross section A-A' is proposed.

Boring FW11B is already on section D-D', which is drawn generally orthogonally to groundwater flow. The current orientation of cross section A-A' has two tie points for cross sections B-B' and D-D'. There does not appear to be any reason to change the orientation of cross section A-A'. No change in cross section A-A' is proposed.

Comment 8: ***Deviations from the Work Plan.*** *A section discussing "Deviations from the Work Plan" should be added to the Draft Report. This section would aid in the comparison and evaluation of the project objectives and conclusions.*

Response 8: The Navy uses internal Field Change Requests (FCRs) for variances to Work Plans. There were two variances to the Work Plan: Navy Field Change Requests FCR-MCH-79-029 and FCR-MCH-79-036. FCR-MCH-79-029, dated August 11, 2005, was a change in the dimensions of the concrete pad for the surface completion of each well. The Work Plan had incorrectly listed the dimensions of the concrete pad as 4' x 4', it was corrected to 2' x 2'.

FCR-MCH-79-036, dated March 27, 2006, added two additional rounds of groundwater sampling. Sample results from the last two rounds of groundwater sampling were unavailable and could not be

included in the Draft Report (see the Response to General Comment 9), but will be included in the Final Report.

TETRA TECH EC, INC.

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CTO: 0079
LOCATION: Moffett Field, CA

FROM: A. N. Bolt

A. N. Bolt, Program Manager

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