UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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December 17, 1993

Mr. Andy Piszkin
BRAC Environmental Coordinator
Code 1811
Southwest Division
Naval Facilities Engineering Command
Code 1811
1220 Pacific Highway
San Diego, California 92132-5181

Subject: Review of *Marine Corps Air Station El Toro Installation Restoration Program Phase II Remedial Investigation/Feasibility Study Draft Work Plan* (Project Plans)

Dear Mr. Piszkin:

The United States Environmental Protection Agency (EPA) has completed the review of the subject draft Project Plans, Volumes I through III, including the Draft Sampling and Analysis Plan, the Draft Quality Assurance Project Plan, and the Draft Health and Safety Plan, dated November 9, 1993. General and specific comments are attached. Overall, EPA identified the following major deficiencies in the subject draft Project Plans:

1. A three month extension was granted to the Navy for the submittal of the Phase II draft project plans. The purpose of this extension was to allow for the incorporation of the Data Quality Objectives Process (DQO). The intended use of the DQOs process is to streamline the scope for the Phase II RI and to minimize the volume of comments on the draft Project Plans. As demonstrated by the volume of the enclosed comments, the DQO process did not attain its objective. A major flaw for the El Toro DQO process is that it failed to develop and to optimize the sampling and analysis design for the Phase II RI (DQO Step 7). Coupled with the Phase I RI, the El Toro DQO process did not generate a sampling and analysis plan that can be used to adequately characterize the nature and extent of contamination. During the course of the development of the El Toro DQO process, meetings between Remedial Project Managers were held to provide guidance for the use of the DQO process. Numerous verbal and written comments have been generated regarding the Phase I RI results and the use of the DQO process. The Phase II Project Plans do not completely address our comments.

2. EPA does not believe that the draft Project Plans will produce an investigation that will adequately characterize the nature and extent of contamination or provide adequate support for the subsequent remedial decisions. Because MCAS El Toro is scheduled for closure, the failure of the Phase II Project Plans will result in a failure to expedite reuse. With the use of the proposed approach presented in the draft Project Plans, EPA believes that an additional phase of characterization after Phase II RI will be required.

3. The statistically based sampling strategy is based on a critical assumption of equal probability of finding contaminants at any point within each stratum. The Navy has been requested by EPA to evaluate the validity of this assumption. However, to date, documentation to support this assumption has not been adequately provided. All of the evidence available to EPA to date suggests that this assumption may not be valid. This implies that the Phase II Project Plans may fail to adequately characterize the facility.

Therefore, EPA would not approve the Draft Project Plans for the Phase II RI for MCAS El Toro as currently written. EPA believes that the current workplan does not address the three major deficiencies identified above. Because MCAS El Toro is a Base Closure Base, we need to expedite and optimize the investigation. As a result of the limited time frames we are facing, EPA believes that a workplan that integrates and optimizes rapid site characterization through innovative field screening techniques would address the concerns we have raised. EPA believes that the results of the rapid site characterization, properly supported, would provide the additional documentation for a defensible field sampling plan that would adequately characterize the contamination without the need of a third lenghtly phase of investigation.

If you have any questions concerning this matter, please do not hesitate to contact me.

Sincerely,

John Hamill

John Hamill
Remedial Project Manager

Attachment

cc: Commanding General, USMC El Toro
Joe Zarnoch, DTSC
John Broderick, RWQCB
John Dolegowski, CH2MHILL

Final Review Comments
MCAS El Toro
Installation Restoration Program
Phase II Remedial Investigation/Feasibility Study
Draft Phase II Work Plan

Introduction

EPA has reviewed the report entitled *MCAS El Toro Installation Restoration Program Phase II Remedial Investigation/Feasibility Study Draft Phase II Work Plan,* dated November 9, 1993. The proposed work plan presents the scope of work for the Phase II Remedial Investigation (RI) at MCAS El Toro. The Phase II RI work plan was prepared on the basis of the results of the Phase I RI using the Data Quality Objectives (DQO) process. The comments are presented in three sections. The first section, "Major General Comments," presents the major, report-wide fatal flaws. The second section, "Other General Comments," presents other reportwide comments. The third and final section, "Specific Comments," presents specific comments on report.

Major General Comments

1. **Deficiency**: Very little evidence is presented to establish the validity of the established stratum boundaries.

   The strata are purportedly set up so that at any point within one, there is an equal chance of finding contamination. However, very little support is provided for this assumption. The report presents a limited discussion of the two aerial photographic surveys that have been performed, but that is the extent of the discussion. Very little mention is made about any discussions that might have occurred with current or past employees, and of the fate and transport mechanisms that might distribute contaminants unevenly within a stratum even if they were initially randomly placed. Also, what effect would differences in the time of placement have on current distributions?

   In addition, areas of concern (AOCs) from the RCRA Facility Assessment (RFA) are rolled into existing strata at several CAOCs (see specific comments). The text provides no discussion to justify this. Logic suggests that these areas were identified as AOCs because something unique has occurred there. This is contrary to the concept that it is equally likely to find contamination at any point within the stratum.

It is imperative that the validity of the strata definitions be presented thoroughly and completely, since everything else in the Work Plan depends on this assumption. If it is not valid, the entire sampling strategy fails.

Remedy: The report should provide a complete presentation of all the information that went into the strata border definition. This should include the aerial photos, employee interviews and the results of the Phase I sampling effort. A non-exhaustive list of criteria for the lateral stratification of the CAOCs could be:

- similarity of past activities,
- patterns of contamination,
- physical characteristics of the CAOC,
- weathering and run-off processes,
- expected variability of concentration levels,
- characteristics of the chemicals of potential concern (COPCs),
- expected hot spots,
- geology, etc., and
- the fate and transport of the COPCs.

Again, it needs to be stated that without, this documentation, the entire RI/FS process is in danger of falling apart.

2. **Deficiency**: The proposed work plan for the Phase II RI is insufficient to characterize the nature and extent of contamination. The Phase I RI sampling strategy was based on an assumption of equal probability of finding contaminants at any point within each stratum. Since the validity of this assumption has never been substantiated, the use of the same sampling strategy for the Phase II RI will not provide sufficient characterization of the nature and extent of contamination. With the use of the proposed approach in the draft work plan, an additional phase of characterization after Phase II RI will be required.

   Remedy: An alternative to the proposed approach in this work plan is the use of the field screening techniques to quickly delineate the nature and extent of contamination. This approach can be used in the early phases of RI/FS when the primary objective is to investigate if contamination occurs at each potentially problematic site or CAOC. Field screening techniques can provide information which streamlines data collection efforts by optimizing the use of soil sampling techniques and the number of samples sent to the laboratory for confirmation chemical analysis. The following is an example for the use of field screening techniques to delineate the nature and extent of contamination.

A suspect stratum is sampled using a grid system, and a three-tier analytical approach is designed for the field screening system. The first tier, field screening analysis, involves the use of onsite chemical analyses at a field mobile laboratory. Massive quantities of soil samples are collected from the grid system; three samples are collected from three different depths at each sampling point. The samples are analyzed onsite at a field mobile laboratory for full suites of classes of priority pollutants, including VOCs, semivolatile and nonvolatile organics, and metals. Real-time results of the analysis can be available for onsite decision-making and to guide concurrent field investigations. If no contaminants are detected in the samples from the suspect stratum in the first tier analysis, the DQO process is used to optimize a sampling and analysis design and a specific number of sampling locations needed to satisfy the statistical requirements (i.e., specified rates for Type I and II errors) is calculated.

A moderate number of samples is then collected randomly from the calculated number of sampling locations from three depths (i.e., three samples will be collected at each location). These samples are analyzed for full suites of chemicals using a second tier analysis, field quantitation analysis, equivalent to CLP quality at the field laboratory.

The third tier, laboratory confirmation analysis, involves sending samples to an offsite laboratory for CLP level 4 analyses. If no contaminants are detected in the samples from the second tier analysis, a minimal number of sampling locations is selected randomly from the suspect stratum. Samples from three depths are collected for confirmation analyses of full suites of chemicals at an offsite laboratory with data quality equivalent to CLP level 4. If the confirmation results from the third tier analysis indicate no contaminants present, the suspect stratum is then classified as no further investigation for subsequent phases. The advantage of this three-tier approach is the reduction of massive quantities of "non-detects" typically found in the laboratory results for strata that are classified for no further investigation.

On the contrary, if contaminants are detected during the first tier, field screening analysis, the data are used to locate the "hot spots" and the areal extent of contamination within the stratum, and perhaps beyond the stratum boundary. Once contaminants are detected during field screening and chemical concentrations indicate that remediation may be required, the subsequent analyses are thus designed to characterize the nature of contamination and to delineate the volume of the contaminated media. The RI sampling and analysis program is also designed to collect the necessary data for the subsequent feasibility study and remedial decisions. Samples are collected from within the contaminated area for the second tier analysis to confirm the results of field screening. Real-time analytical results are used to provide guidance for the field investigation to define the contaminated volume. A minimal number of samples is then collected for the CLP level 4 confirmation analyses at an offsite laboratory to confirm the results obtained from field screening and field quantitation analyses. The information from the three-tier analysis is also used to guide groundwater investigations and to optimize the locations of ground-water monitoring wells. The approach will also reduce the number of "non-detects" and the contaminated area can be delineated within one phase.

The use of the approach, most importantly, can result in site characterization in a single phase and significant overall savings in time. The use of field screening and quantitation analyses with a field mobile laboratory can expedite field investigations and enable field teams to conduct sampling and obtain real-time data to guide field investigations. The approach can result in savings from reducing the unnecessarily high number of samples for CLP level 4 analyses, which typically most of them are "non-detects." Also, precious time will not be lost waiting for offsite laboratory analytical results. With this approach, the RI can be cost-effectively streamlined to collect only those data necessary to assess what remedial actions, if any, are needed at a particular stratum. For those strata that are classified for no further investigation, less questions will be raised because the entire stratum has been thoroughly investigated and the results are confirmed.

3. **Deficiency**: The DQO process is a series of planning steps and its structure provides a convenient way to organize the information available for planning activities for the Phase II RI data collection. The intended use of the DQO process at this point is to streamline the scope for the Phase II RI. The DQO process consists of seven steps. In most cases, each successive step derives information from previous ones; thus, each step should be completed in the order that it appear in the DQO guidance. The El Toro DQO process presented in the document submitted by the Navy does not follow the structured DQO process. Instead, the Navy provides a cross-reference table to show where the information of each step is presented throughout the document. Between steps, there is no apparent connection. However, the major flaw for the El Toro DQO process is that it failed to develop and to optimize the sampling and analysis design for the Phase II RI. The final step of the El Toro DQO process did not generate a sampling and analysis plan that can be used to adequately characterize the nature and extent of contamination at the facility.

Also, the DQO process allows for iteration to refine the outputs from previous steps. With the loose format presented in this document, it would not be very efficient to refine the DQO outputs by iteration.

It is also very difficult for a reviewer to follow the process through to insure that it has been performed properly. For example, it is difficult to find adequate information about what cutpoints were used for which chemicals, or a discussion of the uncertainty inherent in this process.

Remedy: The document should be revised to more closely follow the DQO process. The final outputs from the DQO process should generate an optimized sampling and analysis plan for the Phase II RI.

4. **Deficiency**: The document does not provide a response summary to indicate that the comments on the Phase I RI from the regulatory agencies have been addressed. It is very difficult to determine if the regulators' comments on MCAS El Toro submittals have been addressed in this document.

   Remedy: The Navy is requested to provide a response summary to indicate where in the document the comments from the regulatory agencies have been addressed.

5. **Deficiency**: VLEACH modeling

   On page 4-64, it is stated that the accuracy of vadose zone transport simulations are directly dependent on an accurate estimation of the initial vertical distribution of contaminant mass in the vadose zone. VOC concentrations detected in the soil matrix during the Phase I RI were used in the VLEACH modeling. On page 26, Section A.6.7, it is stated that the analysis of vadose zone transport of VOCs typically address three phases: contaminant dissolved in the liquid phase, contaminant existing as a vapor phase, and contaminant adsorbed to the organic carbon fraction of the vadose zone soil. Significant losses of VOCs from soil matrix samples are believed to be unavoidable because of the disturbance of the soil matrix during field sampling and laboratory handling. Therefore, the soil matrix VOC concentrations used as inputs to the VLEACH modeling may be much lower than the actual field conditions.

   In addition, the VLEACH modeling ignored the VOC mass in the vapor phase that may be significant for an arid CAOC like MCAS El Toro. The modeling does not account for the VOC mass in the vapor phase. EPA disagrees that the VLEACH modeling overestimates the contaminant mass in the subsurface leaching to groundwater (see pages 4-64 and 4-92, and page 29, Section A.6.7).

Remedy: In light of the problems with VOC concentration in the soil matrix samples, the Navy should try to conduct sampling and analysis of soil gas VOC concentrations and calculate the equilibrium total VOC mass in the vadose zone for the modeling inputs. The results thus obtained should then be compared to those obtained using the soil matrix VOC data.

6. **Deficiency**: On what basis were the metals in the subsurface soils screened for potential migration to groundwater?

   In the discussion of chemicals to be investigated during Phase II, it is routinely stated that no COPCs were judged to have the potential to reach the groundwater. On pages 4-52 and 4-55 of the report, it is stated that inorganics were not evaluated with the VLEACH model. Since metals are always listed as COPCs in the subsurface soils, this raises the question as to how this judgment was made.

   Remedy: Please provide information for each subappendix to explain how the metals in the subsurface soils were screened for potential migration to groundwater. The potential for metals to migrate through the vadose zone can be modeled using the SESOIL model. Please provide an evaluation on the potential for metal species to migrate through the vadose zone.

7. **Deficiency**: Risks are not discussed for groundwater.

   Chemical results are presented in each subappendix for groundwater, and many subappendixes have a table showing which chemicals in groundwater exceed the RBC. This implies that risks due to groundwater can be calculated for each CAOC. However, no presentation is made of risk summaries for the groundwater, or of the significance of these risks.

   Remedy: A discussion should be provided to each subappendixes on the risk due to groundwater.

8. **Deficiency**: The discussion of the use of findings of Phase I in support of the Phase II approach, is not adequate.

   Remedy: Specifically, uncertainties in the Phase I data should be presented and well understood before the data are used to draw any conclusions about their theoretical distributions, real means and standard deviations (and consequently CV's). Summary statistics for the Phase I data should be presented and discussed by stratum. The presentation should include the number of samples, mean, error estimates, and variability estimates for the COPCs. Power and confidence level tests should be performed on the Phase I data, and the results should be presented with a discussion on how these results affect the Phase II approach.

9. **Deficiency**: Metals and other naturally occurring constituents are included as COPCs for groundwater at most of the CAOCs, and groundwater samples are proposed for sampling and analysis for total metals. EPA understands that total metal concentration data are required when conducting risk assessments. The proposed sampling and analysis plan, however, should also consider other potential end uses for the data collected during RI. Metals can occur in many chemical forms in a soil-water environment, and knowing these forms or species is important to predicting the behavior of metals. The mobility, reactivity, biological availability, and toxicity of metals and other inorganics depend upon the speciation; knowing only the total concentration of a metal or inorganic compound is frequently of little use.

   The Phase II RI needs to sample and analyze for dissolved metals in groundwater samples. Often, within a contaminant plume, concentrations of dissolved metals are often elevated because of changes in pH and redox potential (Eh) conditions. Microbial degradation of organic compounds often is accompanied by the decrease in Eh levels. Certain metals retained by iron and manganese oxides may be remobilized when iron and manganese oxides in the aquifer are reduced due to the lowering of Eh levels in the contaminant plume (Francis and Dodge, 1990; Hounslow, 1981). An increase in dissolved metals would facilitate the transport of metal species in groundwater.

   In addition, the proposed monitoring parameters at the landfill CAOCs were not designed to monitor the leachate-impacted groundwater. Ammonia is identified as a constituent that needs to be analyzed for at most of the CAOCs. Nitrogen occurs primarily as organic nitrogen and ammonia in landfill leachate. An important parameter, TKN, which measures the reduced forms of nitrogen including ammonia and organic nitrogen, may provide more information than ammonia alone. However, none of the CAOCs where ammonia was identified are proposed for TKN analysis.

   Remedy: Groundwater should be sampled and analyzed for total and dissolved metals, including iron and manganese, and parameters that are important for the fate and transport of metal species (i.e., dissolved oxygen (DO), Eh, pH, temperature, and electrical conductivity). This comment applies to all the CAOCs with groundwater monitoring wells within the contaminated groundwater plumes (i.e. the benzene plume, and the regional TCE plume,) and all the landfill CAOCs (i.e. CAOCs 2, 3, 5, and 17). To provide more information on the contaminant plume, dissolved metals and other parameters useful in identifying contaminant plumes from the landfills should also be analyzed for. These parameters include: TKN, COD, BOD, TOC, and TOX.

13. **Deficiency**: Strata in CAOCs 1, 2, 3/4, 5, 6, 7, 8, 9, 10, 15, 16, 17, 19, 20, 21, 22, and 25 were selected for no further investigation during the Phase II RI.

    The conclusions were made based on stratum risk ratios calculated from comparisons of maximum contaminant concentrations in soil matrix samples to the risk-based concentrations (RBC). Besides the issue of inadequate number of sampling points within each stratum, these conclusions seem questionable in that the VOC concentrations used to calculate the risk ratios are from soil matrix samples, and the validity of the soil matrix samples are highly questionable (see discussion and references below).

    The soil matrix VOC concentration data generally are increasingly being called into question because of (1) the potential for some VOCs to be lost during field sampling and laboratory handling, (2) the tendency for highly volatile VOCs to reside primarily in the vapor phase, especially in relatively dry soils and soils containing little natural organic matter, and (3) the spatial heterogeneity of soil textures (Forbes and others, 1993). Sampling of soil for laboratory VOC analyses is subject to numerous sources of random and systematic errors. Of the errors, negative bias (i.e., measured value less than true value) is perhaps the most significant and most difficult to delineate and control. This error is principally caused by volatilization losses during soil sampling collection, storage, and handling (Siegrist and Jenssen, 1990). Also, in a study presented at an EPA-sponsored symposium, it was shown that laboratory soil VOC data obtained from the EPA sample collection and handling protocol (SW-846) were one or more orders of magnitude lower than those obtained by a less disruptive, limited-exposure handling method (Hewitt, 1993). The spatial heterogeneity of soil textures, which results in similar heterogeneity in the distribution of VOCs within the soil matrix, makes it very difficult to obtain a representative sample for laboratory analysis (Forbes and others, 1993).

    Remedy: The Navy may have to conduct more investigations in some of these strata during the Phase II RI or use field screening techniques.

14. **Deficiency**: CAOCs 3, 5, and 12 Analysis of Total Phenols

Since herbicide MCPP was detected in the soils of CAOCs 3 and 5, total phenols should also be analyzed in the groundwater at the two CAOCs. Phenolic compounds can be derived from the degradation of MCPP (Agertved et al., 1992). Also, MCPP was detected at an upgradient groundwater monitoring well 12_UGMW31.

Remedy: If phenolic compounds are to be analyzed under the analytical method for SVOCs, this should be indicated in the discussion or table. Otherwise, total phenols should be analyzed for in the groundwater at CAOCs 3, 5, and 12.

Other General Comments

1. **Deficiency**: The LUFT regulatory limits are presented in the body of the report, but each section simply states whether or not they were exceeded.

   Remedy: A more thorough discussion is needed. Each CAOC should include a discussion of which category on Table 4-8 it falls into, and the reader should be shown, either in a table or in the text, that each of the values detected are below or above the indicated criteria.

2. **Deficiency**: The VLEACH model and its results are presented in the body of the report, but each section simply states whether or not the subsurface contaminants are predicted to appear in groundwater at a level higher or lower that the regulatory standard.

   Remedy: A more thorough discussion is needed. Table 4-13 should be expanded to include all COPCs detected at each CAOC, and the relevant section of the table should be presented in each subappendix.

3. **Deficiency**: It is very difficult to determine whether or not only the listed compounds exceed their RBCs, MCLs, etc. Also, limited data is presented to support the risk summary tables presented in the subappendixes. Since these tables form the basis of the sampling strategy for Phase II, they need to be clear and verifiable.

   Remedy: A more thorough discussion is needed. Table A_-3_ should be expanded to include all COPCs detected at each CAOC.

4. **Deficiency**: The report states that other chemical classes could be included for chemical analysis during Phase II of the RI/FS investigation for other reasons.

No explanation or discussion is presented to show how or why chemical classes were included for chemical analysis during Phase II of the RI/FS investigation for other reasons and why they were included.

Remedy: The paragraph at the end of Section A_.7 of each subappendix should be expanded to include a description of which chemical classes were included for chemical analysis during Phase II of the RI/FS investigation for other reasons, and what these reasons were.

5. **Deficiency**: The report does not include a bibliography or adequate references for the documents cited.

   For Example:

   Page 2-10, (TM, 1993) reference should be either (JEG_, 1993) or (TM-00_, JEG_, 1993).

   Page 2-25, a reference should be included for the May, 1992 and September, 1993 Reconnaissance Surveys.

   Pages 4-151 & 152, a reference should be included for the Spring, 1992 and September, 1993 Reconnaissance Surveys.

   Remedy: A bibliography section should be added to the report, all documents referenced should be included in it, and references cited by the text should be adequately referenced.

6. **Deficiency**: The report does not include a Table of Contents for each subappendix.

   Remedy: A Table of Contents should be included in each subappendix. This would increase the usability of the report by making it easier for find information.

7. **Deficiency**: Tables, Figures and text in all subappendixes are not consistent on their lists of COPCs.

   For example, Table A1-2a lists ammonia, nitrate-N and TKN as COPCs for the shallow soil at CAOC 1 whereas, on page A1-4, only nitrate-N is listed. This type of mistake appears throughout the subappendixes.

   Remedy: The text, Tables, and Figures should be revised to insure that all COPCs listed on Table A_-2a, b, and c are accurate, and are shown or listed in the text and on all Figures A_-2_ and on Figure A_-3.

8. **Deficiency**: No mention is made of how other aerial photographic anomalies noted by EPA and SAIC are being investigated.

   Remedy: The text, should include a description of how the other anomalies noted by EPA and SAIC during the aerial photo reviews are being investigated.

9. **Deficiency**: The figures in each subappendix that show the deep borings and wells (Figures A_-3) are not as helpful as they could be because the well and borings are evenly spaced horizontally across the figure, no indication is given to the reader of the horizontal distribution of chemicals at a given CAOC.

   Remedy: These figures should be to scale in both directions. That is to say, they should be presented as a crossectional view.

10. **Deficiency**: Fuel and petroleum hydrocarbons are not always shown on Figure A_-2_. This makes it more difficult to get a full picture of the nature and extent of contamination at each CAOC.

    Remedy: Figure A_-2_ should show levels for all COPCs including TFH-diesel, TFH-gasoline, and TRFH

11. **Deficiency**: Section A_.7 does not always contain a discussion of groundwater COPCs.

    Remedy: Section A_.7 should always include a discussion of groundwater COPCs.

12. **Deficiency**: The soil samples for background concentration determination were collected from locations that are apparently of minimal human impact. However, information of soil characteristic such as mineral composition and grain size distribution was not provided to determine the appropriateness of the soil samples. The capacity for a soil to retain metals is largely determined by its texture and mineral composition. A description of the mineral composition and a plot of the grain size distribution curves for the soil samples used for background determination would be useful to determine if the soil samples used for background determination are appropriate.

    Based on Figure 2-5, MCAS El Toro is located on alluvial fan deposits where it receives alluvial deposits from surrounding highlands (Santa Ana Mountains). The lithologies of the highlands consist of diversified rock types, including igneous and sedimentary rocks. The soil underlying MCAS El Toro consists of weathering products from these rock types. However, the background soil sampling locations are primarily located in the highlands northeast of the facility, which excludes many rock types in other directions. Therefore, the representativeness of background soil samples may be questionable.

Remedy: Please provide information on how these background data are comparable to published references for the region.

Specific Comments

1. Page 3-2, Paragraph 1, last sentence. The text states that, as more information is collected, COPCs will be added or deleted. Since at each phase of the RI process, classes of chemicals are being eliminated, how will additional COPCs be added? Also, when will a screening process be performed to determine COCs?

2. Page 4-18, Paragraph 1, last sentence. The report states "because the design of the Phase I RI provided statistical assurance that commonly occurring chemicals at any of the MCAS El Toro RI/FS CAOCs would have a high probability of being detected, chemicals that were not detected during the Phase I investigation may be deleted from the list of COPCs." To date, the Navy has yet to provide adequate documentation to establish that the Phase I sampling provided a high probability of detection. Until this documentation is provided, there is insufficient evidence to support the validity of this statement.

3. Page 4-25, Table 4-3. No Risk-Based Concentrations are listed in this table for TFH-diesel, TFH-gasoline, aluminum, cobalt, copper, gross alpha or gross beta. Every effort should be made to determine values for these chemicals. Also, it should be noted that the lack of risk-based concentrations is not a valid reason to ignore contamination by these chemicals.

4. Pages 4-52 & 55. Classes of chemicals that were detected during Phase I RI but were not evaluated using the VLEACH modeling are listed. However, very little information is provided as to why they were not evaluated using the VLEACH modeling. The report needs to provide rationale for each exclusion.

5. Pages 4-81 to 4-83, Table 4-13. This table is missing information on the detection limits for several compounds. Also the text on page 4-85 paragraph 1 does not match the numbers on the table for MCPA and MCPP. Also, the table shows high maximum concentrations for endosulfan sulfate and endrin ketone that are not mentioned in the text.

6. Page 4-102. The section on cutpoints should include a discussion of the range of uncertainty associated with the cutpoints.

7. Page 4-103 to 4-148, Section 4.13. It should be clearly stated in the text where the discussion is referring to the sample mean or population mean and where it is referring to the mean of the logarithms. Also, it should be clarified where the text is referring to the risk distribution and where to the distributions of the COPC concentration data, or their logarithms.

8. Page 4-104. The Work Plan states that *"because the number of samples collected from a stratum is relatively small, there is uncertainty associated with this estimate. In fact an alternate population distribution of values could have yielded a similar set of sample values".* There is uncertainty associated with both large and small samples. The point here should be that the Phase I samples are so small that the uncertainty in the data is very large. The similarities of the distributions should be discussed here. The discussion should explain in what way are the distribution similar.

9. Pages 4-104 & 4-109. The sentence "The relationship between . . ." that spans these two pages is unclear. It should be rewritten.

10. Pages 4-105, 4-107 & 4-111, Figures 4-6, 4-7 & 4-8. More background information is needed on the construction of the hypothesized and alternative distributions in these figures. If these distributions were taken from another source, then the proper reference should be given. Are these hypothetical cases based on hypothetical data given here just to clarify the concepts or are they based on actual CAOC data? Are Figures 4-6, 4-7, and 4-8 based on the same data set? It appears there are some inconsistencies between the figures. The Y axes of these Figures should be labeled. The discussion of the method is based on the assumption of lognormal distributions of risk. It is not made clear whether the analytical results from Phase I data support the assumption of lognormality or not. Were there normality and lognormality tests conducted for the different COPCs?

11. Page 4-110. It is not clear what degrees of freedom and why were used to select $t_{\alpha(1)}$ and $t_{\beta(1)}$. The values of these parameters, and consequently the number of samples, can vary considerably for the same probability depending on the degrees of freedom used to select these parameters. The degrees of freedom used and the actual values of $t_{\alpha(1)}$ and $t_{\beta(1)}$ should be given.

12. Page 4-113 & 4-117. The discussion of the analysis of the Phase I estimated risks is not very clear. In particular, it is not clear how the sample-specific risks were calculated. Clarification is needed on what contaminants are represented and what are the concentrations. Further discussion is needed about Figure 4-10 and Table 4-14. At least five different populations are present in Figure 4-9. An explanation of what causes this should be given in terms of real concentrations for the COPCs not just risk. Analysis of variance is an excellent approach for assessing variability. However, additional discussion of the implementation of the analysis of variance approach for this study should be provided. The discussion should explain what strata and what COPCs were used for this analysis.

13. Page 4-114. It is not clear what criteria were used to select the MDRD of 4.8 and 7.4. What does this translate to in terms of the MDRD of the actual mean of the concentration values of particular COPCs? What is the percent of MDRD for a specific COPC?

14. Page 4-114, paragraph 2, last line. The *"coefficient of variance"* should be changed to read *"coefficient of variation"*.

15. Page 4-119, Paragraph 3, Last Sentence. This sentence is unclear. How can the number of samples to be collected for non-carcinogenic risk be based on the carcinogenic risk?

16. Page 4-151, Section 4.14.2.2. Why are CAOCs 5, 10, 11, 15, 18, 19, 21, 22, 23, and 24 not discussed? Why are no results presented for CAOC 25?

17. Page 5-4. It is stated that soil gas samples will be analyzed for up to 10 chlorinated solvents, BTEX, and petroleum hydrocarbon fractions. What are the 10 chlorinated solvents that will be analyzed for? Will the measurements of fixed gases be included in the survey? In addition, analysis of vinyl chloride and methane, common landfill gas constituents, should be included in the soil gas surveys for all the landfill CAOCs.

18. Page 6-2, Paragraph 1. In this paragraph the Field Technical Manager is abbreviated as TM. However, in the rest of the report TM stands for Technical Memorandum. This confusion needs to be removed.

19. Page 6-5, Paragraph 2. This paragraph is unclear. FC is not previously defined in the text or shown on Figure 6-1, and it should be the Health and Safety Manager who reports to the Phase II Project Manager.

20. Page 4. In the step 2 of the DQO process (identify the decision) for the Phase II RI, the report lists potential remedial actions and stating actions to be taken at the substeps. This is incomplete. EPA believes that the major decision at this stage is "does the site pose a risk to human health and the environment?" The second subtask of this phase is to determine what actions need to be taken to answer this question. Among the other questions that need to be answered are: "what is the nature and extent of contamination at the site" and "what are the potential remedial actions available to mitigate risk at the site?". The potential remedial actions should only be used to identify the data needs at each CAOC. If risk exists, a feasibility study will be conducted to evaluate remedial responses. This should be stated very clearly in the DQO process.

21. Page 4. It is stated that DQOs were applied prior to the Phase I RI to specify the quality of data required during Phase I. Please provide a reference to indicate where the results of the Phase I DQO process were presented.

22. Page 7. One of the general objectives for the Phase II RI at OU-2 and OU-3 is to derive background concentrations of metals for subsurface soil, groundwater, and surface water. In a memorandum presented in August 1993, the Navy requested that background concentrations for metals in groundwater not be established due to the complexity of the geochemistry and the high variability of the data. On page 21, Section A.6.3.3, it is also stated that it was not possible to establish regional background concentrations for inorganics in groundwater during the DQO process due to the complexity of the geochemistry and the high variability of the data. Please clarify if this has been changed and the rationales.

23. Page 9. Operable Unit 1, OU-1 is defined as the groundwater on- and off-Station that is contaminated with constituents that have migrated from CAOCs at MCAS El Toro. The definition should be expanded to include the constituents that may become mobile triggered by the contamination from MCAS El Toro. In addition to VOCs, any naturally occurring constituents that may be remobilized by the condition changes in the contaminant plume should also be included as the COPCs for CAOC 18 and 24.

24. Page 18. It is described that the background soil samples for metals were collected at 11 locations randomly selected outside the Station boundaries. However, based on Figure A3-1, Locations of Off-Station Background Soil Samples, in the Phase I RI Technical Memorandum, the 11 locations are concentrated in the northeast direction from the Station. It does not appear that these locations were randomly selected. Please provide the information on how these locations were selected. The representativeness of the background soil samples for metals are crucial because the data generated are used for the statistical comparison. Also, please provide the typical metal concentrations in soil in the region from published references.

25. CAOC 1, General. The CAOC covers an area of approximately 40 acres. During Phase I RI, only three surface soil samples were collected from within the CAOC boundary. Unless the assumption of equal probability of finding contamination is demonstrated, inadequate information exits to conclude that no further investigation is required for the Phase II RI. In addition, during the Phase I RI the FS smoke area was not sampled. EPA disagrees that the surface soil sampling results from Phase I RI are representative of the CAOC 1 conditions. The Navy needs to propose more investigations for the Phase II RI.

26. CAOC 1, General. CAOC 1 has been used as an explosive ordnance disposal range, typical chemicals associated with munitions were not included in the COPC list. For example, 2,4,6-trinitrotoluene (TNT), hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetraazocine (HMX), which are commonly found in munition contaminated soil (Funk et al., 1993), do not appear to have been analyzed for. Also, degradation intermediates of munition chemicals, such as para-hydroxytoluene, 2,4,6-trihydroxytoluene (Funk et al., 1993) and others, should be identified. Also, the CAOC groundwater shows elevated nitrate concentrations, which may be caused by the degradation of munition-related chemicals from the CAOC. The Navy is requested to evaluate the need to include these chemicals as COPCs. Groundwater at this CAOC needs to be monitored for nitrate/nitrite and total Kjeldahl nitrogen (TKN).

27. Page A1-3, Section A1.1.2. If there is any way to determine where the FS smoke was disposed of, it should be investigated. The FS smoke disposal area should be broken out in to a separate stratum since the pH of the soil made be affected, which could change the mobility of COPCs in this area.

28. Page A1-13. In this section it is stated that metals and general chemistry parameters in the groundwater samples from the two downgradient wells will be used for evaluation of the MCAS El Toro background concentrations and geochemical facies. Similar statements also are seen in the discussion of sampling strategy for other CAOCs. Since groundwater beneath CAOC 1 appears to be contaminated with arsenic, nitrate, manganese, and nickel, it is not clear how the contaminated groundwater can be used for the Station background evaluation. In addition, in a memorandum entitled "MCAS El Toro RI/FS, Establishment of Cutpoints for Inorganics in Groundwater, Sediments, and Surface Water" issued by CH_2M Hill on August 6, 1993, it was stated that because of the complexity of the geochemistry and the high variability of the data, it does not appear to be feasible to establish regional background concentrations for inorganics in groundwater. Please clarify how the data of naturally occurring constituents in the groundwater will be used for the Station background determination and make necessary changes accordingly throughout the document.

29. Figure A1-1. How was the direction of groundwater flow determined for this CAOC, since only two closely spaced wells are shown on this figure? If other regional wells were used, they should be included.

30. Figure A1-1. Why is the "upgradient" soil sample (01_UGS) crossgradient of the CAOC?

31. Table A1-6. This table lists the treatability parameters to be analyzed for. Dissolved oxygen, nitrate, and sulfate should be added to the list.

32. Page A2-16, Section A2.9.1. This section proposes capping as a remedial approach. However, wouldn't capping the CAOC result in the destruction of habitat for the special-status species identified at this CAOC?

33. Page A2-18. Since no information is given about the depth of the landfill, soil gas samples should be collected at 5, 10 and 20 feet below ground surface for this stratum. This will greatly improve the information available for decision making at this CAOC

34. Page A3/4-10. Since SWMU/AOC 194 was once the location of a former incinerator, the proposed COPCs should include typical chemicals that are known to be associated with incinerators; such as dioxins, metals, PCBs, and dibenzofuran.

35. Page A3/4-28. Since no information is given about the depth of the landfill, soil gas samples should be collected at 5, 10 and maybe 20 feet below ground surface. This will greatly improve the information available for decision making at this CAOC

36. Page A3/4-7. Section states that nine shallow soil samples were collected, but only eight are listed.

37. Page 3/4-15. EPA disagrees with the way the strata were defined for this CAOC. Each of the AOCs defined in the RFA should be a separate stratum, and Stratum 1 from CAOC 4 should also be a separate stratum. Otherwise, the assumption that the chances of finding contamination at any point in a stratum are equal is obviously not valid since definably different activates took place in these areas.

38. Page 3/4-16, Section 3/4.6. This section states that no special-status species use this CAOC, yet Section 3/4.8.1 (page 3/4-18) states that the lining or diversion of Agua Chinon Creek will be coordinated with the U.S. Fish and Wildlife Service due to the presence of special-status species. Please resolve this contradiction.

39. Page 3/4-19. No data needs are listed for shallow soil. If this is indeed the case, the text should state that there are no data needs, and why. Otherwise, the data needs should be added.

40. Page 3/4-24, Paragraph 3. The cancer risk is **over** (greater that) 10^{-6}, not under (less than) 10^{-6}, as stated in the text.

41. Page 3/4-25. The discussion on sampling intervals should cross-reference the information provided on page 3/4-30

42. Page 3/4-27, Paragraph 1. The text states that 3 water sample locations will be sampled, whereas the figures and tables show 4 locations (03_AC01-03 and 03_ACX)

43. Page 3/4-30. Why complete the deep boring, and only sample at 0, 5, and 10 feet? It would be more statistically defensible to choose three random locations to sample at 0, 5, and 10 feet and then to locate the deep boring in the area of highest contamination. The deep boring would then be sampled at 10 foot intervals down to the top of the watertable.

44. Figure 3-2b. Where is the data for sample 03_ACX?

45. Table A3-2a. The table shows that certain metal concentration in shallow soil at SWMU/AOCs 194 and 300 are higher than background levels. Metals were not proposed to be sampled in shallow soil at these two AOCs during the Phase II RI. Please provide the rationales why metals will not be investigated.

46. Page A5-2. It is stated that almost any types of waste generated at MCAS El Toro may have been disposed of at the Perimeter Road Landfill. Please provide additional information to demonstrate that the proposed classes of chemicals to be analyzed for during the Phase II RI, as shown on page A5-15, will cover all the El Toro Station-specific COPCs. This comment also applies to other landfill CAOCs at the Station.

47. Page A5-8, Paragraph 3. The text states that antimony, arsenic, and nitrate concentrations exceed human health criteria, yet Figure A5-3 does not show any arsenic or nitrate. Also, aluminum and TDS concentrations exceeded Secondary MCLs, yet there is no aluminum or TDS shown on Figure A5-3. Finally, chloromethane is shown on Figure A5-3 and not mentioned in the text.

48. Page A5-10, Last Sentence. The text makes the generic statement that in-situ technologies were not considered appropriate. This statement needs to be explained to explain why in-situ technologies were not appropriate.

49. Page A5-15 & Figure A5-6. The new proposed well is not downgradient of the CAOC. The well is about 2,000 feet downgradient from the CAOC, which is too far away from the CAOC. Contaminants released from the CAOC can be significantly diluted to less than the method detection limits at the proposed location. Please provide rationale for the proposed location of the well, or relocate the well.

50. Table A5-3b. The gross alpha and gross beta values and MCLs reported are below the method detection limit. Also, no contract required detection limit, RBCs or risk ratios are shown. These discrepancies need to be addressed. This comment to all other Tables A_-3_ where gross alpha and/or gross beta were detected.

51. Table A5-6. This table indicates that the soil gas samples with be collected at 5 foot depths, but the text indicates that they will be collected at 10 and 20 feet. Which is correct? In general, collecting soil gas samples only at 5 feet in conditions such as are encountered at the facility may not be adequate to detect significant VOC concentrations. Collecting samples at 10 and 20 feet should be considered.

52. Page A6-2. It is indicated that SWMU/AOC 236 will not be included in the Phase II investigations because it is not related to drop tank drainage activities. Please provide information on how SWMU/AOC 236 will be investigated.

53. Page A6-7 & 8. The 1991 aerial photograph shows a triangular-shaped impoundment partially filled with liquid east of the site. Although the impoundment is probably not related to the drop-tank drainage activities at the CAOC, please provide information on how this impoundment will be investigated.

54 Page A6-8. If drums and stains were reportedly seen on the 1975 and 1976 aerial photographs, please provide references where the information was presented. Also, please indicate if it is possible to obtain these aerial photographs.

55. Figure A6-3 shows that the nickel concentration increases from 230 micrograms/liter at the upgradient well 06_UGMW28 to 866 micrograms/liter at the downgradient well 06_DGMW69. Please provide possible explanations for the increase in the nickel concentration.

56. Table A6-6. The first and fourth line under shallow soils are not clear. No discussion of grid sampling is presented in the text, grids are not shown on Figure A6-6, and no stratum 4 is defined. Also, the totals are incorrect.

57. Page A7-4, Paragraph 2. The report needs to identify AOCs 71 and 72 on Figure A7-1. Please provide rationales if they should also be broken out as separate strata, or if they will be investigated under a separate program.

58. Page A7-7 and A7-8. An open storage area has been identified in the EPA aerial photograph analysis. Please provide information on how the area is being investigated.

59. Page A7-16. The section states that the criteria are conservative, and, therefore, can be relaxed. This is not acceptable. The criteria are conservative to insure that they are protective of human health and the environment. Either the report needs to make a convincing argument that less conservative standards are sufficiently protective, or these standards must be used.

60. Page A7-17. The last paragraph is unclear. It implies that three additional sets of samples after the first may be collected. Everything else in the section indicated that only two additional sets, maximum will be collected. This paragraph should be clarified.

61. Figure A7-3. What are the water levels for 07_DGMW91 and 43?

62. Table A7-3b. The addition is incorrect for Noncancer Risk Ratio, Stratum 3. It should be 0.67, not 0.65.

63. Table A7-6. The number of location should be 20 - 37, not 21 - 28 as shown in the table. The number of samples for Stratum 5 should be 9, and the total should be 60 - 111.

64. Page A8-4, Paragraph 3. The report needs to identify AOCs 104, 105 and 106 on Figure A7-1. Also, please provide information on how these AOCs are to be investigated. Should they be broken out as separate strata?

65. Page A8-6, Section A8.3.2. The data should be listed by strata (e.g. East and West Storage Yards should be listed separately.)

66. Page A8-9, Paragraph 2. This paragraph says that the CAOC is used by birds and mammals. However, paragraph 3 says that it was not investigated because it provides no habitat. These statements are contradictory. If the CAOC is used by animals, ecological considerations must be used.

67. Page A8-15, Stratum 5. This section states that, because no soil samples were collected in the top 5 feet, there is no risk, and, therefore, no soil samples will be collected. This is circular logic. This is only valid if the Navy can document that the fill for Stratum 5 was clean soil. If this can not be documented, than it should be sampled.

68. Figure A8-6. The area shown should be moved further to the right so that well 08_DGMW74 is included on it since the well is part of the proposed monitoring network for CAOC 8.

69. Table A8-4. The Cancer Risk Ratio addition for Strata 1 and 3 are incorrect.

70. Table A8-5. Text and Table A8-6 say that the soil samples will be analyzed for Pest/PCBs and TFH-diesel (page A8-21). Table A8-5 only shows Pest/PCBs. Also, Table A8-6 shows that Strata 1, 3, & 4 and groundwater will be analyzed for "other (treatability parameters)." However, the text does not mention analyzing Strata 1, 3, & 4 and groundwater for "other (treatability parameters)" (page A8-19 through A8-22) or on Table A8-5.

71. Pages A9-2 and A9-3. If the operational history of pit 2 is unknown, there does not appear to be any basis for assuming that there is an equal chance of finding contamination at any spot in either pit. Pit 2 should be a separate stratum.

72. Page A9-3, Section A9.1.2. If the aerial photos showed liquid flowing from the pits, there are enough reasons to suspect that the area surrounding the pit may have been contaminated with the chemicals disposed of in the pits. Therefore, the area around them should be included in the stratum. Please provide the rationale(s) why the area is excluded from the pits.

73. Page A9-1. Downgradient monitoring well 09-DGMW75 is not downgradient of the CAOC. A new well should be installed north-northeast of the CAOC, before the taxiways. Otherwise, very little information exists to discuss the impact of this CAOC on groundwater. Also, since background levels for groundwater are being determined on a CAOC by CAOC basis, an upgradient well should be proposed.

74. Table A9-5. The text and Table A9-6 show analysis for "other (treatability parameters)." Table A9-5 does not. This discrepancy should be resolved.

75. Page A10-2. What is the condition of the concrete "cap?" If it is cracked or otherwise damaged, sampling should be conducted underneath it.

76. Page A10-6. Why is there no discussion of ecological exposure in the conceptual model?

77. Figure A10-1. Well 10_DGMW77 is not downgradient of the CAOC. EPA recommends that existing well 22_DBMW47, 09_DGMW75 and 09_DBMW45 be use as downgradient monitoring wells, and 07_DGMW71 and 18_TICO57 be used as upgradient monitoring wells.

78. Table A10-6. The total number of samples to be collected should be 9 rather than the 0 shown on the table.

79. Page A11-2. It is indicated that a tank and several drums were observed during a site visit in October 1993. Please provide information on the material stored in the tank and drums. Apparently, these tank and drums were discovered very recently. The Navy should re-evaluate the content of these containers and the analytical methods used during the Phase I RI to ensure that these chemicals are among the chemicals being analyzed.

80. Page A11-9. Why only two additional samples for Stratum 2? Table 4-15 indicates that, for cancer risks of 10^{-5} to 10^{-4}, three samples will be collected.

81. Page A13-17. The proposed groundwater monitoring parameters do not include dissolved metals. Within the contaminant plume with aromatic compounds (i.e., BTEX), microbial degradation of aromatic compounds may result in elevated dissolved metals in the contaminated groundwater. Please make changes in relevant sections to include the sampling and analysis of total and dissolved metals.

82. Page A16-20. It is stated that there is a possibility that CAOC 16 may be a contamination source for the contaminated groundwater at CAOC 13. Based on the information presented in this document, it does not appear that CAOC 16 is a likely source for the benzene in the groundwater of CAOC 13. The contaminated groundwater beneath CAOC 13 contains high levels of benzene and other aromatic compounds of lower levels, however, the groundwater beneath CAOC 16 does not contain BTEX. A proposed upgradient monitoring well located between CAOCs 13 and 16 may be too far away from both CAOCs, which may not generate useful groundwater samples to reach conclusions.

83. CAOC 17. The proposed groundwater monitoring parameters do not include total Kjeldahl nitrogen (TKN), chemical oxygen demand (COD), and dissolved metals. These are useful parameters to demonstrate groundwater contamination by landfill leachate. Groundwater contaminated by landfill leachate often contains elevated levels of these constituents and parameters. They should be sampled and analyzed for in groundwater samples from both upgradient and downgradient wells. The field-measured parameters should include dissolved oxygen, pH, Eh, temperature, and electrical conductivity. This comment also applies to other landfill CAOCs.

84. Pages A17-2 and A17-17. It is stated that almost any types of waste generated at MCAS El Toro may have been disposed of at this landfill. Please provide additional information to demonstrate that the proposed classes of chemicals to be analyzed for during the Phase II RI will cover all the El Toro Station-specific COPCs. This comment also applies to other landfill CAOCs at the Station.

A soil gas survey will be conducted at CAOC 17. What are the VOCs that will be analyzed for in the soil gas samples? The analytes of the soil gas samples have to include the typical landfill gas constituents.

Based on the subsurface soil sampling and analysis results, the groundwater samples need to be analyzed for total phenols because of the presence of MCPP in the subsurface soil. Please clarify if the phenolic compounds will be analyzed under the analytical method for semivolatile organic compounds.

85. CAOC 24. A total of eight groundwater monitoring wells is proposed to be installed within the boundaries of CAOC 24 to characterize the vertical distribution of the contaminants. Based on the TCE concentration contour maps shown on Figures 2-8 and 2-10, the TCE plume from MCAS El Toro shows the characteristics that DNAPLs may occur or might have occurred. If the TCE source is located near CAOC 9, apparently the plume has migrated upgradient from the source. This often is one of the characteristics of the DNAPLs. A well cluster is proposed to be installed at depths of approximately 250, 350, and 400 feet near well 09_DBMW45 because this well is located near the center of a suspect DNAPL pool. EPA concurs with this approach. The document, however, does not provide a discussion on how to minimize the potential for promoting downward DNAPL migration when conducting drilling and well installation in the vicinity of this area. Please provide an evaluation for the potential presence of DNAPLs using the available soil and groundwater data.

Based on the information presented on the two figures, CAOC 8 also is a suspect source for the TCE plume. However, only one new well is proposed for CAOC 8. The Navy's current proposal for the Phase II investigation in the vicinity of CAOC 8 does not seem adequate. Prior to the well installation, a soil gas survey will be conducted at this CAOC to identify the locations to install the proposed monitoring wells. Dependent on the soil gas survey results, EPA may request that more monitoring wells be installed.

86.

CAOC 24. The COPCs for CAOC 24 are limited to VOCs detected in soil and groundwater (see page A24-12). The COPCs for the groundwater are shown on Table A24-2c. It appears that the COPCs for CAOC 24 consists of all VOCs detected in groundwater at CAOCs 7, 8, 9, 10, 12, 18, 21, and 22. Major VOCs of concern include chlorinated and aromatic VOCs. However, certain VOCs that are known to be derived from degradation of PCE and TCE are not included on the list of COPCs. For example, 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethene (1,2-DCE), and vinyl chloride are not included in the COPC list. These compounds need to be included in the COPC lists for the soil and groundwater at CAOC 24.

87. Page A24-23. It is stated that mud rotary drilling will be used to drill the borehole for the deepest well of the proposed well cluster. The well will be used for groundwater quality monitoring purposes. Please provide additional information on how the other two wells will be installed.

References

Agertved, J. K. Rugge, and J.F. Barker, 1992, Transformation of Herbicides MCPP and Atrazine under Natural Aquifer Conditions, *Groundwater*, Vol. 30, No. 4, p. 500-506.

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Final Review Comments
MCAS El Toro
Installation Restoration Program
Phase II Remedial Investigation/Feasibility Study
Draft Quality Assurance Project Plan

General Comments

The use of the "Data Quality Objectives Process for Environmental Decisions" which should be the driving force of the RI/FS for MCAS El Toro, is given a very minimalistic treatment within this Quality Assurance Project Plan (QAPjP). The impact of the use of this process on the routine QAPjP components is not clear.

The organization and basic components of this QAPjP are consistent with current EPA guidance (U.S. EPA Region 9 Guidance for Preparing Quality Assurance Project Plans for Superfund Remedial Projects, 9QA-03-89, September 1989).

Specific Comments

1. Section 2.0, page 2-1

In subsequent editions of this QAPjP, the newly issued EPA document "Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objectives Process" (EPA QA/G-4, Interim Final) should be cited. Also, EPA guidance documents EPA-540/G-87/003 and EPA-540/G-87/004 are <u>replaced</u> by the new guidance document.

2. Section 2.0, Table 2-1a

To facilitate use of this table, footnotes or other references should be included to alert and direct the reader to the compounds included in each grouping (volatiles, semivolatiles, etc.). A note within the table would direct the reader to Tables 2-1b and 2-1c for a listing of individual parameters as well as alerting the reader that the list of parameters is not all inclusive (i.e., not the complete CLP list of organics, metals, etc.).

3. Section 2.0, Tables 2-1b and 2-1c

To facilitate comparison of these tables with Tables presented in Volume 1, the listing of individual chemicals should be presented in the same order in both documents. It is difficult to confirm that all parameters selected by the Data Quality Objectives Process have been included and that no additional parameters have been added.

4. Section 4.1, Sample Selection Points, Page 4-1

This section should be expanded to incorporate aspects of the Data Quality Objectives Process. The quality control aspects of spatial boundaries such as the following should be addressed:

- Specify the physical dimensions of each stratum, for example a soil stratum is limited to the top "x" inches of soil.

- Specify that the samples from each stratum are intended to be homogeneous. What action should be taken to assure this QA goal?

- Specify when or if the stratum has a temporal boundary. For example, all groundwater samples for a given stratum must be collected within a period of "x" hours, days, etc.

- Specify the duration between routine monitoring events if any. For example, if quarterly monitoring is planned, specify that sampling must be conducted at equally spaced intervals throughout the program.

5. Section 7.1, page 7-1

Be more specific on use of qualified data. If the validation qualifier "J" is applied, what are the limited purposes for which it is usable? Can J-qualified data be used for calculating statistical parameters. Will U-qualified data be used in statistical calculations? If so, what value will be used (zero?, the detection limit?, some fraction of the detection limit?).

6. Section 7.0

This section should be expanded to incorporate aspects of the Data Quality Objectives Process. The quality control aspects of the decision rule should be addressed such as:

- Identify the "parameter of interest" such as mean, median, proportion.

- Address the impact of qualified data on this "parameter of interest".

- Address the impact of rejected samples or uncollected samples which result in less than 90 percent completeness on the "parameter of interest".

The quality control aspects of the limits on decision errors should be addressed such as:

- The three data assessment criteria (accuracy, precision, and completeness) are presented as independent criterion. Will the combination of the three be considered?
- What is an acceptable level of combined measurement error?
- If all three parameters are marginally within the measurement criteria, does this have an impact on data quality? For example, is a sulfate value with a 124% accuracy, 24% precision, and 89% completeness acceptable data?

Final Review Comments
MCAS El Toro
Installation Restoration Program
PHASE II Remedial Investigation/Feasibility Study
Draft Sampling and Analysis Plan

Introduction

The scope of this review is limited to an assessment of acceptable procedures and techniques for performing the field work described. Deviations from and omissions of standard Sampling and Analysis Plan (SAP) components are identified; however, it is assumed that the decisions made in the DQO process (rationale) to select sample size and locations are valid and justifiable.

General Comments

The Field Methods and Procedures section of this document is well written, detailed, and very comprehensive. Few comments were noted. In contrast however, Section 4, Rationale for Sampling Locations was inconsistent and incomplete. In many cases, rationale for sample numbers or locations, or rationale for the "No Further Investigation" decision is simply not provided. When rationale is provided, it is often incomplete and does not support the proposed sampling design. This section should either incorporate summaries of the results of the Data Quality Objective (DQO) process to support the decisions; or, at the very least, make reference to relevant and corresponding sections in Appendix A.

Specific Comments

1. Section 4.2.1.2, Stratum 1, page 4-19

There should be a reference to Appendix A or summary of the DQO process to support the statement: "There are no human health or ecological risk exceedances." This comment applies to throughout most of Section 4.

2. Section 4.2.1.2, Subsurface Soil, page 4-19

There should be a reference to Appendix A or summary of the DQO process to support the statement: "Subsurface soil concentrations do not appear to be a potential threat to groundwater." This comment applies to throughout most of Section 4.

3. Section 4.2.2

Stratum 2 was drawn to encompass numerous areas of site activity (i.e., debris, trenching, liquid, mounded material, and stains identified on historical aerial photographs). It was concluded that shallow soil samples collected anywhere within Stratum 2 would have an equal probability of containing contaminants. This is true for the generalized term of "contamination." However, if individual areas of different activities and various chemical use are combined into a single stratum, it is improbable that random samples will contain the same contaminant constituents. In other words, unless Stratum 2 is considered homogeneous, such samples would not have an equal chance of containing the same contaminants; and randomly placed samples will not adequately evaluate human health and ecological risks.

4. Section 4.2.2.2, Preliminary Investigation, page 4-22

The depth of the soil gas samples is not clear. The text states that 2 landfill gas survey samples will be taken at depths of 5 feet bgs (below ground surface). However, Figures 3-2a and 3-2b refer to depths of "5 or 10 & 20 feet bgs." Considering Site 2 is a landfill, samples should be taken from the greater depth range (10 and 20 feet) to ensure that actual landfill contents are being sampled, instead of the graded soil cover.

5. Section 4.2.2.2, Subsurface Soil, page 4-23

Although it is stated that the landfill will be capped and closed, any contaminants that already remain within reach of the water table's fluctuation will present a continuous contaminant source to the groundwater aquifer. Therefore, further investigation is warranted if the landfill is considered a groundwater contamination source.

6. Section 4.2.2.2, Sediment, page 4-25

In general, same comment as No. 1.

7. Section 4.2.3, Site 3 Phase I RI, page 4-26

Abandoned oil well 24-4247 is considered part of Stratum 1. Besides geographical location, what similarities does this well share with the rest of Stratum 1? A separate investigation of well 24-4247 should be conducted to determine if the well was properly sealed and is not acting as a conduit to groundwater.

8. Section 4.2.3.2, Soil Gas, page 4-29

How can the soil gas data evaluate if the landfill is a possible threat to the ground water, if the sample may have not even been taken near the landfill contents? In order to increase the likelihood of penetrating the soil cover and obtaining a more representative sample, soil gas samples should be taken at depths greater than 5 feet.

9. Section 4.2.5.2, Subsurface Soil, page 4-35

In general, same comment as No. 5.

10. Section 4.2.6.2, Shallow Soil, page 4-38

In general, same comment as No. 1.

11. Section 4.2.6.2, Subsurface Soil, page 4-38

In general, same comment as No. 2.

12. Section 4.2.7.2, Stratum 1, page 4-41

Rationale should be provided for not sampling other previously detected contaminants (i.e., pesticides and TPH).

13. Section 4.2.7.2, Stratum 3, page 4-42

Unless supporting data exists, a minimum of 10% of the field samples should be submitted for laboratory confirmation analysis.

14. Section 4.2.7.2, Stratum 4, page 4-43

Provide rationale for the "No Further Investigation" decision.

15. Section 4.2.8.2, Stratum 1, page 4-45

In general, same comment as No. 13.

16. Section 4.2.8.2, Stratum 2, page 4-45

In general, same comment as No. 1.

17. Section 4.2.8.2, Stratum 3, page 4-46

How will two additional samples from Phase II better define Stratum 3 to support remediation? A contingency sampling strategy should be proposed to allow for collecting and analyzing additional samples if needed while personnel are still mobilized for Phase II field work.

18. Section 4.2.8.2, Subsurface Soil, page 4-47

In general, same comment as No. 14.

19. Section 4.2.9.2, Shallow Soil, page 4-48

In general, same comment as No. 1.

20. Section 4.2.10.2, Subsurface Soil, page 4-52

While semivolatile organic compounds (SVOCs) were detected in shallow soil, they are not being investigated in the subsurface soil. Provide justification.

21. Section 4.2.12.2, Stratum 3, page 4-59

In general, same comment as No. 13.

22. Section 4.2.12.2, Subsurface Soil, page 4-60

In general, same comment as No. 2.

23. Section 4.2.13.2, Stratum 1, page 4-62

Although the storage area is paved with concrete, the unpaved section adjacent to this area should be sampled for contamination from possible runoff during operations.

24. Section 4.2.14, Site 14 (Battery Acid Disposal Area), page 4-65

Additionally, the area around Building 243 which reportedly contained ponded unidentified liquid should be sampled.

25. Section 4.2.14, Shallow Soil, page 4-66

If the purpose of sampling at this location is to evaluate the extent of shallow soil contamination at Strata 1 and 2, provisions for additional samples should be made in case initial samples still exhibit signs of contamination. At a minimum, an additional row of samples extending outward from each strata should be taken during Phase II. These outermost samples may be archived at the laboratory until results of the initial samples are known, thereby preventing unnecessary analytical costs.

26. Section 4.2.15.2, Shallow Soil, page 4-69

In general, same comment as No. 1.

27. Section 4.2.16.2, Stratum 3, page 4-72

In general, same comment as No. 1.

28. Section 4.2.19.2, Stratum 1, page 4-80

Provide rationale for analyzing only for SVOCs and sampling at a maximum depth of 10 feet.

29. Section 4.2.16.2, Stratum 2, page 4-80

In general, same comment as No. 1.

30. Section 4.2.19.2, Stratum 3, page 4-80

In general, same comment as No. 1.

31. Section 4.2.20.2, Stratum 1, page 4-82

In general, same comment as No. 1.

32. Section 4.2.20.2, Stratum 4, page 4-83

Provide documentation or references to support the statement: "Although there are ecological risk exceedences for several metals, the risk is minimal because of the lack of habitat."

33. Section 4.2.20.3, Subsurface Soil, page 4-83

In general, same comment as No. 2.

34. Section 4.2.21.2, Stratum 1, page 4-85

In general, same comment as No. 1.

35. Section 4.2.22.2, Stratum 2, page 4-87

In general, same comment as No. 1.

36. Section 6.3

In order to prevent introduction of any sampling bias from the field, provide a detailed procedure for determining the coordinates of a random sample.

37. Section 6.4.10.3, Procedure - Groundwater Sampling, page 6-74

From the text, it is unclear of the evacuation procedure for wells not capable of being continuously pumped. Are these wells to be pumped dry three times, allowed to recharge each time and prior to sampling? What quantitative recharge criteria (i.e., 80%) will be used?

38. Section 6.5, Decontamination

To prevent cross contamination of samples from sampling equipment, the decontamination procedures for soil, surface water, and groundwater sampling equipment should include provisions for additional chemical rinses depending upon the type of analysis. For example. EPA Region 9 recommends a 0.1N nitric acid rinse where metal contamination is of concern and a pesticide grade solvent rinse where semivolatile and non-volatile organic contamination may be present.