DEPARTMENT OF TOXIC SUBSTANCES CONTROL
Region 4
245 West Broadway, Suite 350
Long Beach, CA 90802-4444

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MCAS EL TORO
SSIC # 5090.3

December 17, 1993

Mr. Andy Piszkin
BRAC Environmental Coordinator
Southwest Division
Naval Facilities Engineering Command
Code 1831.AP
1220 Pacific Highway
San Diego, California 92132-5181

Dear Mr. Piszkin:

COMMENTS ON ***MARINE CORPS AIR STATION [MCAS] EL TORO, EL TORO, CALIFORNIA, INSTALLATION RESTORATION PROGRAM, PHASE II REMEDIAL INVESTIGATION/FEASIBILITY STUDY DRAFT WORK PLAN***

The California Department of Toxic Substances Control (Region 4, hereafter DTSC) and the California Regional Water Quality Control Board (Santa Ana Region, hereafter RWQCB) of the California Environmental Protection Agency have completed a review of the subject ***Draft Work Plan***, Volumes I through III, including the Draft Sampling and Analysis Plan (SAP), the Draft Quality Assurance Project Plan and the Draft Health and Safety Plan, dated November 9, 1993. The document presents the scope of work for the Phase II Remedial Investigation (RI) at MCAS El Toro (Station).

DTSC does not approve the ***Draft Work Plan*** as currently written. DTSC's and the RWQCB's comments are attached.

If you have any questions concerning this matter, please contact me at (310) 590-4878.

Sincerely,

Joe J. Zarnoch

Joe J. Zarnoch
Base Closure Unit

Enclosures
cc: See next page.

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cc: Commanding General
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ATTACHMENT

DTSC COMMENTS
ON
MARINE CORPS AIR STATION [MCAS] EL TORO
EL TORO, CALIFORNIA
INSTALLATION RESTORATION PROGRAM
PHASE II REMEDIAL INVESTIGATION/FEASIBILITY STUDY
DRAFT WORK PLAN

The Draft Quality Assurance Project Plan was not reviewed by DTSC because it did not include the necessary quality control information for the proposed field screening methods.

The following comments consists of three sections: I) General Comments, II) Site-Specific Comments, and III) Other Specific Comments. In general, minor grammatical or typographical errors that do not affect interpretation have not been noted. However, these should be corrected in the final version of the ***Draft Work Plan*** *(document).*

Please submit a revised document or submit revisions to the document as replacement pages (marked revised with a revision date and include revised binder labels).

Please submit a master list of the revisions indicating the changes that were made from the draft edition based on comments received. The master list of revisions should clearly indicate the nature of each change and identify each change by section (or table or figure) and page number. Please submit, to DTSC, four sets of revised documents or four sets of the revisions (including revised binder labels) and the master list of the revisions; please contact DTSC prior to the submittal for specific mailing addresses.

DTSC's comments were prepared by: 1) Joe J. Zarnoch, Project Manager, 2) Sherrill Beard, Geologist, 3) John P. Christopher, Ph.D., Toxicologist, 4) Bart Simmons, Ph.D., Hazardous Materials Laboratory Manager for Technical and Scientific Support and 5) Rani S. Patole, Industrial Hygienist.

DTSC Comments
December 17, 1993

I. GENERAL COMMENTS:

1. Definition of Strata

We do not feel that the strata have been adequately defined for a stratified randomized sampling plan. Although an analysis of Phase I data is presented which purports to estimate the coefficient of variation of risk within strata, we do not think such an estimate is possible, given the very small number of samples collected within any stratum in Phase I. Without this coefficient of variation, values for the minimum detectable relative difference (MDRD) cannot be validly calculated and the statistical basis for the sampling plan for Phase II must be called into question.

Statistical methodology used for defining the number of samples to be taken in Phase II is questionable, possibly invalid.

2. Chemicals of Potential Concern (COPCs)

COPCs are only partially identified as of the preparation of the document. It is entirely possible that chemicals in an analytical class will be detected in Phase II which were not detected in Phase I. If this occurs, these newly detected chemicals also become COPCs.

The locations of the boundaries of the strata are highly questionable. A large number of areas which seem to represent contamination have not yet been sampled and it is not at all clear, in the document as written, that these areas will be sampled in Phase II. We do not feel that the Phase II work plan as written will be adequate to identify COPCs and estimate their concentrations.

3. Optimization of the Sampling Strategy

Step seven of the Data Quality Objective (DQO) development process requires the optimization of the sampling strategy, given the available resources. The proposed sampling strategy will not adequately characterize the nature and extent of contamination, primarily because field analysis is not fully integrated into the optimization process. In many cases, the document indicates that field analysis will be used only to define the boundaries of the strata.

Another cost-effective field analysis technique that we believe should be incorporated into the characterization

strategy is immunoassay methods, especially to enhance the initial screening of some sites. Apparently, immunoassays were not considered because some immunoassay detection limits are above risk-based concentrations (RBCs). This view does not consider the overall effect on false negatives and false positives, as required by the DQO process. A technique with detection limits above a RBC may still produce lower levels of false negatives if it allows the collection of more measurements. Despite the assumptions of the document, contamination is generally non-homogeneous. Techniques such as TD/GC/MS and immunoassays can produce lower levels of false negatives because they can produce more measurements than CLP protocols for the same resources.

For each site, include a rationale for the selection of field and laboratory methods based on specific information for that site.

4. Shallow/Subsurface Soil Boundary

The cutoff depth of 10 feet for sampling shallow soils is appropriate. However, for purposes of risk assessment, it must be remembered that some chemicals migrate only very slowly in soils and thus are found exclusively in the most surficial layers. PCBs and dioxins may be expected to behave in this manner in some shallow soils. DTSC feels it would be a waste of money to generate data in Phase II with a very large number of "non-detects". Therefore, we recommend that those situations be identified where inclusion of deeper samples will serve only to dilute estimates of exposure concentrations based on surface soils. For instance, if concentration data decrease by an order of magnitude with depth to 10 feet, it would be appropriate to use only the most surficial sample in estimating an exposure point concentration.

5. *Draft Work Plan* Characterization/Investigation Strategies

Explosive Ordnance Disposal (EOD) Range and Landfill Sites

The characterization/investigation strategies as proposed in the document will most likely result in land use/deed restrictions for some sites, e.g., Site 1 (EOD Range) and landfill sites. Capping of landfill sites may result in mitigation of potential soil exposure pathways, however, such sites may still be restricted from such reuses such as residential development, for example. While the use of

institutional controls such as land use/deed restrictions may be an appropriate approach due to such considerations as cost and feasibility and may be consistent with U.S. Environmental Protection Agency (USEPA) draft guidance (see *Presumptive Remedy for CERCLA Municipal Landfill Sites*, September 1993), the Navy should be cognizant of the implicit ramifications of agency approval of the "final" characterization/ investigation strategies as presented in the document.

Stratigraphic Investigations

The proposed boreholes and well logs will not define the vertical and horizontal characteristics of the unconsolidated material and soil types. Most sites have minimal existing stratigraphic information, and the document proposes very few additional soil borings at the intermediate depths of the vadose zone (between 10 feet below ground surface (bgs) and the water table). To estimate the future impact of contamination to groundwater from the vadose zone, the soil matrix (and gas phase) must be evaluated. Although some sites have good surface or near surface coverage, most do not have sufficient deep borings. Based on existing and proposed soil data, it is not possible at many sites to define the lateral and vertical stratigraphic relationships, extent of soil contamination, and the point of original waste discharge. Please reevaluate the need for additional deep soil borings advanced within the vicinity of the waste discharge areas. These data will lend to a better understanding of the contamination and therefore future impact to groundwater.

6. Correction for Wells with Constant Speed Pumps

The final work plan should include a correction for wells with constant speed pumps (see DTSC letter dated August 27, 1993); a proposal for the correction should be submitted to the El Toro Team for review and approval. All groundwater sampling should be performed with pumps capable of low flows.

7. Agua Chinon Wash

The work plan should include a proposal to characterize the extent of the petroleum hydrocarbon contamination at Agua Chinon Wash (see joint USEPA, DTSC and RWQCB letter dated

November 1, 1993) in preparation for the requested removal action, if additional characterization and/or a removal action is not implemented prior to the Phase II RI field effort.

8. Groundwater Flow Direction

Groundwater flow direction as indicated in site plan views of Appendix A of the ***Draft Work Plan*** is at times inconsistent with groundwater contaminant contouring presented in the ***Draft Work Plan*** and the ***Technical Memorandum***, dated May 7, 1993. For example, the groundwater flow directions in Appendix A of the ***Draft Work Plan*** for Sites 3/4, 13, 14 and 15 are inconsistent with the ***Draft Work Plan*** (e.g., see Figure 2-15) and ***Technical Memorandum*** contouring of the northern and southern benzene plumes. As another example, the groundwater flow direction for Site 16 as indicated in Appendix A is inconsistent with the proposed placement of new downgradient wells.

Please address this comment in Section 2.4.6.3 (Groundwater Flow) and in each applicable site-specific section in Appendix A, including reevaluation of groundwater monitoring and/or extraction well placement.

9. Field Screening

Section 4.13 (Statistical Basis for the Phase II Design), on page 4-120, states that "Following the field screening sampling, ... Level 3 samples will then be randomly allocated within the revised *[if the stratum is revised]* stratum boundaries".

The CLP samples should not be located randomly but used as confirmatory samples for the TD/GC/MS field screening samples, i.e., co-located. The CLP samples should be selected to confirm the range of results from the TD/GC/MS field screening, both detected and non-detected. Several potential CLP samples should be held pending the field screening results. The short "turn-around times" for field screening results should preclude the exceedance of the CLP sample holding times.

10. Field Screening Reports

DTSC proposes that to maximize the effectiveness of the field screening techniques with short result "turn-around times", El Toro Team meetings should be held on-base during

the Phase II RI field effort to discuss the field screening results after the initial characterization for each such site is completed. Using such an approach, consensus on whether a site is adequately characterized can be reached. This should not present a delay in the field effort since sampling teams would normally move onto the next site anyway, and if initial field screening results did indicate additional characterization to determine extent is necessary based on team consensus, the sampling team(s) could return to the affected site at a later date during the field effort.

11. Elimination of Redundancy

a) Information presented in the Phase II RI documents should appear only once. DTSC reviewers have noted significant redundancy, e.g., the "Introduction to DQOs" in Appendix A contains a significant reiteration of information provided in Volume 1. Section 4.0 (Rationale for Sampling Locations) of the Draft SAP and Section 1.0 (Project Description) of the Draft Quality Assurance Project Plan also reiterate information provided in Appendix A. Redundancy should be eliminated.

   Please note that some of the following DTSC comments, specific to a single issue, refer to several sections of the Phase II RI documents that require change or clarification due to the multiple appearance of the information. It is preferred that all redundancy be eliminated rather than making changes for a single issue more than once.

b) Please also note that the RBCs in Tables 4-3 through 4-7 in Volume 1 are inconsistent with those in Tables A-3a through A-3d in Appendix A; please delete the incorrect version.

c) In Appendix A, please combine the applicable sections under "Problem Definition" and "Phase II Remedial Investigation Design". These sections are often confusing, especially for sites with numerous strata, because incomplete information is presented under "Problem Definition" and then additional information is presented under "Phase II Remedial Investigation Design". The combined sections should remove redundancy resulting in a vast improvement.

12. Screening of Organic Laboratory Contaminants

It does not appear that trace detections of organics listed as COPCs have been screened against laboratory method or trip blank concentrations; please make all necessary changes, including changes to plan view diagrams.

Please describe how trace detections of organics will be screened against laboratory method or trip blank concentrations. The documents should indicate the approach used, e.g., an averaged blank concentration was subtracted from sample concentrations. Please specify which blanks were used (e.g., laboratory method and/or trip blanks) and why.

13. Compliance with Solid Waste Assessment Test (SWAT) Requirements

The document should include a new section discussing both federal and state guidelines/requirements for landfill sites. We are aware that there are some differences in approach between USEPA's framework for a presumptive remedy (see *Presumptive Remedy for CERCLA Municipal Landfill Sites*, September 1993) and state requirements.

This section should indicate the SWATs (apparently air only and not groundwater) that have been performed for each of the landfill sites at MCAS El Toro. Please also provide a summary of the results.

State law requires testing at all active and some inactive landfills for specified toxic contaminants in the landfill gas, the air immediately above the surface of the landfill, ambient air adjacent to the site, and underground gas migrating beyond the landfill perimeter. To comply with the requirements for air testing, the Air Resources Board and a committee of the California Air Pollution Control Officers Association-Technical Review Group (CAPCOA-TRG) developed gas testing guidelines for landfill sites. Air analysis is required for methane, oxygen, nitrogen, carbon dioxide, and ten specified contaminants: vinyl chloride, benzene, ethylene dibromide, ethylene dichloride, methylene chloride, tetrachloroethene (PCE), carbon tetrachloride, 1,1,1-trichloroethane (methyl chloroform), trichloroethene (TCE) and chloroform. Please also see the list of twenty two primary target compounds by the California Regional Water Quality Control Board (Los Angeles Region) in *Work Plan Requirements for Active Soil Gas Investigation, Well*

Investigation Program (WIP). Please consider these constituents for the soil gas survey.

The new section should discuss a review of applicable requirements, how the requirements will be satisfied, and if not, rationale for the alternative approach.

14. Aerial Ground Penetrating Radar (GPR)

Please consider the use of aerial GPR to assist in delineating landfill boundaries, when applicable.

15. Collection of Soil Samples for Volatile Organic Compound (VOC) Analysis

The document should evaluate and recommend techniques to minimize the loss of VOCs from soil samples.

There is evidence that preserving VOC soil samples by freezing with dry-ice is superior to preserving by cooling to 4°C.

There is also evidence that VOC soil samples preserved in methanol during the field sampling and cooled to 4°C is superior to simply preserving by cooling to 4°C. However, the methanol used for preservation must be absolutely pure in order to avoid introducing volatile contaminants. A field blank is also required (see *Environ. Sci. Technol.*, 1990, 24, 1387-1392).

16. Figures Indicating Chemicals of Potential Concern in Shallow Soil, Surface Water Runoff and Sediment

Each site-specific figure (plan view diagram) in Appendix A (e.g., Figure A1-2) should indicate all COPCs, including petroleum hydrocarbon COPCs (TFH-gasoline and TFH-diesel). COPCs for site upgradient areas and catch basins, if applicable, should also be indicated. Please indicate the sampling depths from Phase I, e.g., following the sample location identification in the boxes listing the COPCs, include the sampling depths (e.g., "(0, 2 & 4')" could be used to designate that samples were collected at 0, 2 and 4 feet bgs in Phase I). Also in the boxes listing the COPCs, separate organics from inorganics and indicate concentration units for each. Please thoroughly review each site in Appendix A and make all necessary changes.

17. Figures Indicating Chemicals of Potential Concern in Subsurface Soil and Groundwater

Each site-specific figure in Appendix A (e.g., Figure A1-3) should indicate all COPCs, including the following:

a) inorganic subsurface soil COPCs also detected in groundwater at concentrations exceeding Maximum Contaminant Levels (MCLs)

b) petroleum hydrocarbons in both subsurface soil and groundwater

c) detected organic constituents in subsurface soil and groundwater (footnote constituents in groundwater exceeding MCLs)

d) inorganic constituents as well as gross alpha/beta in groundwater exceeding either primary or secondary MCLs (use different footnotes to distinguish those constituents that exceed primary vs. secondary MCLs), and

e) general chemistry results exceeding applicable regulatory criteria.

18. Phase I Remedial Investigation (RI) Results

Each of these site-specific sections in Appendix A should indicate the sampling/analysis methods used in Phase I, e.g., indicate if samples were analyzed for VOCs, pesticides/PCBs, metals, etc.

19. Chemicals to be Investigated During Phase II

The following comments address sections entitled "Chemicals To Be Investigated During Phase II" in site-specific sections of Appendix A (e.g., Section A1.7).

a) **Statements Concerning Risks**

As a first paragraph to these sections, please include the following statement (in bold letters): "**The statements in both this section and subsequent sections (such as those entitled "Potential Remedial Actions and Associated Data Needs") concerning human health and ecological risks are estimates based on Phase I RI results**".

b) **Evaluation of Lead in Shallow Soil as a Chemical to be Investigated During Phase II**

In several instances, these sections fail to identify that lead exceeded human health RBCs. It appears that the constituent is listed in the appropriate tables indicating chemicals detected in Phase I that exceeded human health screening criteria (for shallow soil), however, the text does not always state so. Please thoroughly review each applicable site in Appendix A and make all necessary changes.

We note the USEPA's lead uptake and biokinetic (UBK) model was used in calculating the RBC for lead of 500 mg/kg in soil in a residential setting. This value is about twofold higher than the value that would have been produced using LEADSPREAD, the model recommended by DTSC. We find 500 mg/kg to be reasonably protective of health. However, the Navy will find that the UBK model is not useful for determining safe levels of exposure for adults in the occupational setting. We urge the Navy to use LEADSPREAD for estimating the adverse health effects of lead in adults.

c) **LUFT Regulatory Limits**

Please provide all necessary information, including actual values, to show whether detected TFH concentrations are below or above regulatory limits.

d) **Evaluation of Groundwater General Chemistry Results**

These sections should evaluate groundwater general chemistry results. Include an evaluation of general chemistry results exceeding regulatory criteria (e.g., chloride, sulfate, nitrate, total dissolved solids (TDS) or gross alpha/beta exceeding MCLs) and compare downgradient to upgradient concentrations.

20. <u>Evaluation of Groundwater Remedial Technologies</u>

Each applicable site-specific groundwater remedial technologies section of Appendix A should evaluate whether constituents of concern would present remedial difficulties for the proposed Desalter Project. Moreover, based on site-specific groundwater contamination profiles (e.g., the depth of groundwater contamination), evaluate whether or not the Desalter Project, as proposed, would be effective in

remediating groundwater contamination. For example, consider the distance to and screened interval of the nearest Desalter Project extraction wells.

21. Tables Indicating a Summary of Samples and Analytical Parameters for Phase II RI

After changes have been finalized, please thoroughly review these tables for consistency with the text and figures. Discrepancies were noted in the draft document.

22. Clarification of Sample/Analysis Methods

For all sites in Appendix A, please clearly indicate the sample/analysis method. The numerous terms used in the document are confusing; these include "samples for further characterizing risk", "laboratory samples", "Level 3 laboratory samples", "laboratory analysis", "field-screening samples" and "survey-level samples". Please thoroughly review sections entitled "Problem Definition" and "Phase II Remedial Investigation Design" and make all necessary changes. We recommend using the term "CLP samples" for Level 3 or 4 samples and "TD/GC/MS field screening samples" when appropriate.

Please note that site maps showing locations for field screening, both in Appendix A and the Draft SAP, do not provide a key for the type of field screening to be performed at each location.

23. Analysis for Metals (Non-CLP Samples)

In each site-specific section of Appendix A when metals characterization (non-CLP) is specified, please clearly indicate the type of sampling/analysis method. Please thoroughly review each applicable section and make all necessary changes.

24. Protocols and Quality Control for Soil Gas, TD/GC/MS Field Screening, X-Ray Fluorescence and Dioxin/Furan Sampling/Analysis Methods

Please make all necessary changes to provide a complete description, including protocols and quality control in the Draft SAP and Draft Quality Assurance Project Plan, respectively, for soil gas, TD/GC/MS field screening and x-ray fluorescence sampling/analysis proposed in the document

as well as for dioxin/furan sampling/analysis as requested in these comments.

25. New Groundwater Monitoring/Extraction Wells

The document contains unsubstantiated technical statements and lacks the conceptual understanding of the hydrogeology, both regionally and site-specific, that is essential for a sound environmental assessment. At some sites it is nearly impossible to evaluate the proposed placement of additional monitoring wells because there is often not enough groundwater information to determine groundwater flow direction and rates. Well placement is often proposed either too far geographically from the source or in some cases cross-gradient when defined as a up-gradient or down-gradient monitoring well.

All technical statements must be substantiated with adequate supporting data. In the case of groundwater flow, at a minimum, the following information must be provided: well location, well logs, well construction data (see additional comments below), water levels, hydrographs, location of pumping wells, location of recharge and discharge areas, and locations of ground water barriers. Locations for upgradient and downgradient monitoring wells for a specific site can not be proposed until groundwater flow beneath that site is understood and documented with substantive technical data. We suggest using cost-efficient techniques such as Cone Penetrometer Testing (CPT) or HydroPunch® to collect groundwater samples (e.g., BAT® samples) for plume delineation, and/or perhaps the relatively simple installation of piezometers, to aid in the evaluation of the hydrology before the installation of costly monitoring and extraction wells that may be improperly located.

Without additional information, it is not appropriate to propose extraction well locations at this time of the investigation. The hydrology has not been properly evaluated, and in the case of Site 2, the VOC groundwater plume has not been laterally or vertically characterized. If extraction wells are improperly placed it is possible to spread the plume into uncontaminated areas. There simply is not enough direct evidence to properly place an extraction well.

If you still feel that the proposal of extraction wells at this time is justifiable, please note that efficient extraction wells usually have much longer screened intervals

than monitoring wells and sometimes are designed with a larger casing diameter. The document implies that monitoring wells and extraction wells will be designed identically. Indicate the similarities and differences between the two types of wells. Provide rationale if identical construction is proposed for both the monitoring and extraction wells.

In each site-specific section of Appendix A when new groundwater monitoring and/or extraction wells are proposed, please provide a table for well construction details, including drilling method, depth of well, casing diameter and material, screen diameter (with slot size) and material, screen interval, length of drop pipe, make and model of pump to be installed and purpose of well (e.g., monitoring or extraction or both). In addition, for each applicable site, indicate if downhole geophysics will be performed and used to determine well screen depths. In an appropriate section of the document, please also include a master table providing this information for all wells.

In the text of each site-specific section of Appendix A, please provide a rationale for the proposed drilling method.

26. <u>Soil Gas Investigation</u>

It is our understanding that the soil gas survey work plan will be available for regulatory review. The work plan at a minimum should include the following:

a) a Station-wide map showing boundaries of all areas included in the soil gas survey, as well as maps indicating the locations of the industrial waste sewer line and storm drain systems in the southwestern quadrant of the Station that discharge into Agua Chinon and Bee Canyon Washes;

b) site-specific maps showing proposed probe locations and depths, include proposed and existing monitoring wells and borings;

c) rationale for probe locations and depths at each site;

d) a list of constituents of concern for each site and rationale for their selection based on considerations such as site history and previously demonstrated soil and/or groundwater contamination;

e) a detailed explanation of probe installation;

f) a figure showing typical probe installation construction (include both borehole and driven probe installation);

g) a detailed explanation of the vapor sample collection protocol, include proposed holding times of the sample from collection to analysis;

h) a figure showing the system design for the collection of vapor samples;

i) a detailed explanation of on-site mobil laboratory analytical procedures;

j) a quality assurance/quality control package with detailed guidelines, including protocols for both in-the-field vapor sample collection and laboratory vapor sample analysis; and

k) a detailed explanation on how the data will be presented, such as site-specific concentration contour maps, station wide contour maps if applicable, complete original sampling results, and summary tables of selected constituents. (Please note that complete information must be reported so that conclusions can be evaluated).

Any identified areas at MCAS El Toro that may have potentially been impacted by chlorinated solvents and/or petroleum hydrocarbons should be subject to a soil gas survey. The survey should not be limited only to the southwestern quadrant of the station and landfills, nor should the soil gas data points be limited to a grid pattern with predetermined specified depths of 10 and 20 feet bgs (non-landfill areas). Probe locations should be concentrated in areas of waste discharge and demonstrated soil and groundwater contamination. Generally, grid density should be tighter in the "hot spots" and decrease as soil gas results decrease. In areas of potential contamination, with no apparent point source and with little or no confirmed soil contamination, a grid pattern is appropriate. Multi-depth sampling locations should be in areas with known soil contamination and where prior soil gas sampling efforts have detected relatively high levels of constituents of concern. On-site, real time analysis of vapor samples is

required to allow for field modification of the sampling plan based upon test results.

A comprehensive soil gas survey in conjunction with companion soil matrix samples will determine the variation and extent of soil contamination. Soil matrix samples generally cannot be used to confirm soil gas results. The combination of both sets of data will assist in characterizing the distribution of soil contamination.

When designing a soil gas survey, the objectives of the investigation are not only to identify areas of discharge but also to establish patterns of vapor distributions for the design of a possible vapor extraction system (VES). If, while conducting the soil gas survey, it is determined that an area can be adequately remediated using a VES, consider installing multi-depth, semi-permanent vapor probes. Note, the delineation of a vapor plume and the installation of a monitoring network can be completed during the same phase.

27. VLEACH Model

Although parameters such as vertical contaminant distribution and recharge are identified as being conservative in the document, preliminary estimates of the total contaminant mass within the vadose zone may be underestimated. Studies have shown that in geologic and climatic environments similar to the MCAS El Toro area, VOC mass tends to concentrate within the vapor phase. If a discrepancy exists between the contaminant mass estimate based on soil matrix samples and soil gas concentrations, it is likely the VLEACH model will underestimate the mass of contaminate leaching to groundwater. Therefore it is suggested that after the soil gas survey is completed, VLEACH is again applied using soil gas concentrations instead of soil matrix concentrations, if soil gas results are greater. Before choosing an input concentration value, evaluate all soil matrix and soil vapor data, and explain the rationale for input choice.

Consider using another model for inorganics.

28. Tentatively Identified Compounds (TICs)

For all applicable sites in Appendix A, please identify and discuss TICs; evaluate whether or not the identified TICs will affect the characterization strategies for Phase II.

29. Use of EPA Method 8310 for Polycyclic Aromatic Hydrocarbons (PAHs)

    If PAHs are identified or suspected as COPCs in a stratum, EPA Method 8310 should be used for analysis. Properly used, this method should have detection limits for carcinogenic PAHs lower than the defined RBC. If a broader spectrum of SVOCs is needed, then EPA Method 8270 would be the method of choice. In any case, please provide rationale for the choice of PAH/SVOC analytical techniques.

30. Analysis for Organolead at Petroleum Hydrocarbon Contaminated Sites

    Organolead compounds could be COPCs at sites where petroleum hydrocarbon contamination is identified or suspected. For each such site, include an analysis for organolead compounds or present adequate justification as to why it is not needed. Because of the difficulty and expense with the organolead method, a phased approach could be used to limit the number of organolead analyses needed.

31. Matrix Interferences

    All analytical results for each site should be reviewed and, when necessary, evaluated for matrix interferences in the site-specific sections of Appendix A. Our Site-Specific Comments indicate several instances where it appears petroleum hydrocarbon contamination interfered (elevating detection limits) with other results, such as those for PAHs. A failure to properly evaluate analytical interferences could result in an underestimation of human health and/or ecological risk.

32. Round Two Groundwater Data and Quarterly Groundwater Monitoring

    The document should integrate round two groundwater results.

    All existing monitoring wells should be sampled quarterly so that a statistically valid data set can be compiled and a better understanding of site specific and Station-wide water quality can be achieved. Also, water levels measurements should be collected monthly. An approach for a water quality sample and analysis program may be to collect water samples during the first week of February, June, August, and November, and submit the quarterly reports no later than six weeks after collection. Monthly water level measurements

should be included in the water quality reports. This monthly gauging should be done during the same week of each month for all monitoring wells. These data should be included together with past data as a running summary, in a tabular format, as well as reference point elevations, depths to water, water surface elevations and dates of collection. All future groundwater monitoring wells should be added into the monitoring program as they are installed. After one year of quarterly monitoring reports, data should be evaluated, and if appropriate, the sample schedule reduced.

33. Map of Above Ground Tanks and Underground Storage Tanks (USTs)

The document should include a map displaying the following: 1) an outline of MCAS EL Toro, 2) the location of all RI sites, 3) the location of all tank farms and tanks (both above ground and below ground) containing petroleum hydrocarbons, including fuels, 4) the location of monitoring wells and 5) contours of the groundwater plumes potentially associated with the USTs.

34. Holding Times

Please identify all Phase I sample results for which the holding times were exceeded.

35. Employee Interviews

Please make another attempt to schedule interviews with current and/or former MCAS EL Toro employees; the information from interviews may be useful in the determination of sampling strategies for Phase II.

II. SITE-SPECIFIC COMMENTS:

Please note that the following Site-Specific Comments refer to sections in Appendix A (Volumes II and III), however, Section 4.0 (Rationale For Sampling Locations) of the Draft SAP as well as other portions of the document are also affected. Please make applicable changes to the Draft SAP based on these comments, however, as stated previously, DTSC would prefer that the redundant information presented in Section 4.0 of the Draft SAP be eliminated.

Site 1 - Explosive Ordnance Disposal (EOD) Range

1. **A1.1.1 Setting and History**

   a) Describe how groundwater flow was determined with two wells present at the site.

   b) In the last sentence of the first paragraph, add fuels to the suspected contaminants. Burning was conducted in pits and/or trenches at the EOD Range and fuels were used for ignition purposes.

   c) Demilitarization of munitions is performed at Site 1. Currently, the "pink water" washout is not discharged to soil. Add a discussion of this issue and include both current and past demilitarization practices. "Pink water" is a waste containing degradation products of trinitrotoluene (TNT); TNT is an animal carcinogen, as are its byproducts.

2. **A1.1.2 Strata**

   a) Change the last sentence of the first paragraph to read "According to employee interviews, however, the FS smoke was apparently burned in the northern portion of the site in an area currently exhibiting stressed vegetation *[underline denotes change]*".

   b) Change the first sentence of the second paragraph to read "One statistical stratum was established for the entire EOD Range in the Phase I RI *[underlines denote changes]* because it was believed that surface soil samples collected randomly from any location within the EOD Range would have an equal probability of containing potential contamination, however, areas such as the FS smoke area or known detonation pits were not sampled in the Phase I RI."

   Make other necessary changes to the paragraph, but delete the last two sentences concerning the FS smoke. DTSC has visited this site a couple of times in the last few months. In a visit on November 8, 1993, DTSC observed an area of stressed vegetation just north of the current detonation pits; the EOD Range employee confirmed

that it was the location of the FS smoke disposal. Furthermore, the area is consistent with the FS smoke area identified in the ***Draft Site Sampling and Analysis Plan***, dated September 10, 1990. Therefore, DTSC strongly disputes that the precise location of the FS smoke area is unknown. Also, because of the stressed vegetation, DTSC believes the statement "In any case, over the years the FS smoke will have degraded through contact with water" may not be sufficiently substantiated. If chlorosulfonic acid is being dismissed as a COPC because it has a short half-life, please present supporting information.

3. **A1.4.2 SAIC Survey**

Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report,*** *dated August 2, 1993, and include 116, 254, 444 and 472]*".

4. **A1.6 Conceptual Site Model**

Later in Section A1.9.2 (Subsurface Soil), it is stated that explosive materials possibly present in subsurface soils pose a possible danger to receptors, yet this section and Figure A1-5 do not address this; please make all necessary changes.

5. **A1.9.1 and A1.10.1 Shallow Soil**

a) Under "Statement of Risk", change the second paragraph to read:

> "Site 1 is an active ordnance site where explosive devices continue to be detonated. There are undocumented, anecdotal reports that radioactive materials have been buried at the site. Limited Phase I RI soil sample locations were assigned randomly; based on aerial photograph results, samples were not in areas, including the FS smoke area, that may have a more likely probability of exhibiting contamination. Risks at the EOD

Range may also include unexploded ordnance buried at the site".

b) Under "Sampling Strategy", change the paragraph to read:

> "No further investigation is proposed for Phase II, however Phase I RI samples were located randomly and not within trenches, pits or stains identified in aerial photographs. Site 1 is recommended for additional investigation during MCAS El Toro base closure, once explosive ordnance activities have been discontinued, to further characterize human and ecological risks as well risks posed by the possible presence of explosive materials".

Any future investigation must include analysis for explosives and their degradation products. Additionally, geophysical methods, such as magnetometry, should be used to locate buried metal.

c) Under "Stratum 1", state that "No further investigation is proposed in the Phase II RI".

d) Under "Rationale", delete the first sentence "There are no human health or ecological risk criteria exceedances".

6. **A1.9.3 and A1.10.3 Groundwater**

a) Under "Sampling Strategy", please clarify how the sampling of existing downgradient wells for metals and general chemistry will support the characterization of background levels for groundwater at the station.

b) Under "Sampling Strategy", change the third sentence to read "Sample for VOCs to monitor the possible presence of toluene and other fuel constituents, which may indicate degradation of groundwater as a result of site activities".

c) Add explosives (EPA Method 8330A or comparable method), TFH-gasoline and TFH-diesel to groundwater analyses.

7. **A1.10.2 Subsurface Soil**

Change the first sentence to read "No further investigation is proposed in the Phase II RI".

Site 2 - Magazine Road Landfill

1. **A2.4.2 SAIC Survey**

Add the following sentence to the end of the paragraph: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the SAIC Report and include 219, 263 and 455]".* Please evaluate site 455 identified in a 1981 photograph.

2. **A2.5 Site and Stratum Boundaries for Phase II RI**

Include that the recommendation to expand Stratum 1 to include the southern portion of former Stratum 2 is also based on visual observation of landfilled material, i.e., as a result of former recent erosion, it was evident that this area was also used as a landfill.

3. **A2.7 Chemicals To Be Investigated During Phase II**

a) In the first paragraph, add the following statement: "Although TCE and gross alpha/beta were detected in upgradient groundwater, the concentrations did not exceed primary MCLs; however, TCE and gross alpha did exceed primary MCLs in downgradient groundwater".

b) Also in the first paragraph, add iron to the group of constituents that exceeded secondary MCLs. Also make the necessary change to Table A2-3b.

c) Change the last sentence of the fourth paragraph to read "No classes of compounds were judged to have the potential to reach the groundwater, however, Phase I results indicate that Site 2 is releasing VOCs to groundwater".

4. **A2.8.1 Shallow Soil**

Under "Remedial Technologies", please include rerouting and/or lining of washes.

5. **A2.8.2 Subsurface Soil**

a) After the first sentence of the first paragraph, change the rest of the paragraph to read:

> "Based on Phase I results, no contaminants were detected in subsurface soils at levels that pose a threat to groundwater; however, these results are taken from only one deep boring drilled at the site. No potential remedial technologies and associated data needs were evaluated for subsurface soil for Site 2, however these needs will be reevaluated after reviewing the results of the soil gas survey proposed for the site. Installation of a cap at Site 2 should mitigate the mobility of the MCPP".

b) Change the second and third sentences of the second paragraph to read:

> "This threat will be addressed by the soil gas survey proposed for Site 2 and by landfill closure designed to contain the wastes and limit or prevent percolation of water through the wastes. In-situ technologies to address subsurface landfill wastes will be reevaluated after reviewing the results of the soil gas survey".

6. **A2.8.5 Sediment**

This section should address the relatively significant detection of TRPH at 02_EF2 (4 feet bgs and at a concentration of 4,555 ppm).

7. **A2.9.1 and A2.10.2 Shallow Soil**

Stratum 2 (Stained Area)

a) Under "Sampling Strategy", please indicate that another possible option is to cap this section of Site 2; such a strategy would probably not require additional soil sampling.

b) Please provide an enlarged figure of Stratum 2 and indicate aerial photograph anomalies identified by USEPA (see Plate 4 of the ***Sampling and Analysis Plan (SAP) Amendment***, dated August 26, 1992) and SAIC (see ***SAIC Report***). Judgmental samples should be located within the identified anomalies or the anomalies should be designated as new strata. Please make all necessary changes to applicable subsequent sections.

Judgmental samples will lead to biased statistical inferences, however, the bias will tend toward the upper portion of the distribution of concentrations. The bias is in the health-protective direction and is entirely acceptable. The approach will be based on the best available information (such as aerial photograph analyses) and sampling locations will be targeted in areas that have the highest probability of exhibiting contamination.

8. **A2.9.2 and A2.10.3 Subsurface Soil**

These sections only address subsurface soil for Stratum 1; please make all necessary changes.

9. **A2.10.1 Preliminary Investigation**

Include the soil gas survey grid spacing (in feet) based on a total of 72 samples.

10. **A2.10.4 Groundwater**

a) This section is confusing and can be improved by indicating the number of each new well in the text (please be consistent with the well numbering in Figure A2-6b).

b) Under "Rationale", change the last sentence to read "Because no VOCs were detected in upgradient wells *[underline denotes change]* in the second ground of groundwater sampling ...".

Site 3/4 - Original Landfill and Ferrocene Spill Area

1. **A3/4.1.1 Phase I RI Site 3**

a) The second paragraph states that Site 3 consisted of six separate pits and trenches. Please change this statement since it appears that the landfill actually consisted of more than six disposal areas.

At some point in this DQO section for Site 3/4, perhaps for a section discussing newly defined boundaries, provide an enlarged (drawn to scale) figure indicating the location of all pits, trenches and anomalies identified in aerial photographs, geophysical surveys, etc. The figure should include:

i) the two 1952 excavations east of Agua Chinon that were probably used as landfills and possible stained areas west of the wash (identified in a 1952 photograph; see Plate 5 of the ***SAP Amendment***);

ii) the two possible trenches in the southwestern portion of the site and west of the wash (observed in a 1963 photograph; see Plate 5 of the ***SAP Amendment***);

iii) the northwest-southeast oriented trench in the northern portion of the site that apparently contained liquid in its northern part and refuse in the southern part (observed in a 1946 photograph; see Section A3/4.4.2 (SAIC Survey) and 15 in the ***SAIC Report***);

iv) the 900 foot long east-west oriented trench in the eastern portion of the site that extended through and apparently beyond the boundaries of Site 4 (observed in a 1946 photograph; see Section A3/4.4.2 (SAIC Survey) and 18 in the ***SAIC Report***);

v) the trench observed in a 1958 photograph that apparently was located outside existing site boundaries (this trench should be evaluated even though landfill activities allegedly ceased in 1955); see Section A3/4.4.2 (SAIC Survey) and 89 in the ***SAIC Report***;

vi) the three former disposal pits as indicated by the geophysical survey in the northern portion of the site and west of the wash (see Plate 5 of the ***SAP Amendment***);

vii) the smaller former potential area of buried waste indicated by the geophysical survey in an area east of the wash (see the text of the ***SAP Amendment***, however, this area was not indicated in Plate 5 of the ***SAP Amendment***);

viii) stains in the northwestern portion of the site (observed in 1952 and 1970 photographs; see Plate 5 of the ***SAP Amendment***);

ix) disturbed ground with possible staining west of the wash observed in a 1980 photograph;

x) the locations of the buried wastes that were uncovered during the construction of Building 746 and a nearby parking/office area;

xi) the location of the two trenches in the area of Solid Waste Management Unit/Area of Concern (SWMU/AOC) 300 where digging was halted for a water supply line in October 1992 due to the presence of a strong petroleum odor;

xii) the piles of debris and mounded material that existed north of the Motor Pool area and heavy staining observed in the Motor Pool area west of the landfill area (see the ***SAP Amendment***); and

xiii) the mounded materials on the northeast and southeast sides of Tank Farm 5 (observed in a 1971 photograph; see 197 in the ***SAIC Report***).

The text should discuss the relationship of these areas with the original information in the ***Draft Final Sampling and Analysis Plan***, dated February 28, 1991, which indicated three trenches, two 1-acre disposal pits and a 4-acre disposal pit located in a slightly different configuration.

This information will be essential for delineating landfill boundaries and targeting the soil gas survey and trenching (if conducted).

b) Please indicate the location of abandoned well 24-4247 in figures. Also, please change the wording in paragraph 3 concerning this well-- it is not likely that an abandoned well could be sampled anyway.

c) Please indicate the locations of SWMUs/AOCs 194 and 300 in Figure A3-1a; indicate the location of SWMU/AOC 300 in Figures A3/4-6a and A3/4-6b.

d) As stated above, please indicate (in Figures A3-1b, A3/4-6a and A3/4-6b) the location of the two trenches in the area of SWMU/AOC 300 where digging was halted for a water supply line in October 1992 due to the presence of a strong petroleum odor.

e) Indicate how the location of SWMU/AOC 194 was identified.

2. **A3/4.1.2 Phase I RI Site 4**

a) In the first sentence of the first paragraph, change the reference to "Figure A-1" to "Figure A4-1".

b) Include the location of the (former?) 500-gallon ferrocene tank in all applicable figures.

3. **A3/4.3 Chemicals of Potential Concern**

Chloromethane is listed as a detected VOC in groundwater at Site 3 but does not appear in Figure A3-3; please make the necessary changes.

4. **A3/4.3.2 Subsurface Soil**

   Provide a figure showing the subsurface soil COPCs for SWMU/AOC 300.

5. **A3/4.4.2 SAIC Survey**

   Add the following statement to the end of this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the **SAIC Report** and include 15, 16, 18, 56, 89 and 197]*".

6. **A3/4.6 Conceptual Site Model**

   This section and Figure A3/4-4 should be changed to indicate potential infiltration of surface water runoff via the unlined section of Agua Chinon Wash running through Site 3/4. This recharge could potentially enhance the migration of subsurface contaminants in the landfill.

7. **A3/4.7 Chemicals To Be Investigated During Phase II**

   a) Add the following statement concerning the location of shallow soil samples for former Site 3 (if it is true based on the new figure which will indicate identified pits, trenches and other anomalies):

      > "However, surface soil samples located west of Agua Chinon Wash were not within identified pit or trench disposal areas. The two surface samples east of the wash were possibly located in fill material overlying landfill disposal areas (based on excavated areas observed in a 1952 photograph)".

   b) This section should indicate if chemicals detected in subsurface soils exceeded screening criteria; if so, please make all necessary changes, including the addition of tables. Evaluate the results for subsurface soil at SWMU/AOC 300.

c) This section should indicate if chemicals detected in dry wash sediment exceeded screening criteria; if so, please make all necessary changes, including the addition of a table.

d) This section should summarize the constituents or at least the chemical classes of the constituents that exceeded screening criteria. The results should be summarized for shallow soil, subsurface soil (VLEACH and petroleum hydrocarbon results), groundwater, surface water runoff and dry wash sediment. This information should <u>not</u> be presented in the following section, Section A3/4.8 (Potential Remedial Actions and Associated Data Needs). Please move the applicable information into this section, make all necessary changes and add all requested information.

e) This section should discuss that although gross alpha and beta were apparently detected in upgradient groundwater, the concentrations were not above regulatory criteria. In downgradient groundwater, gross alpha was detected above regulatory criteria.

8. **A3/4.8.1 Shallow Soil**

a) This section should be changed based on Comment 7d above.

b) Please indicate that the concentration of TFH-diesel at the surface of the Drainage Ditch was 16,400 ppm.

c) Under "Remedial Technologies", add diverting and/or lining Agua Chinon Wash in the vicinity of Site 3.

d) Under "Remedial Technologies", clarify the statement "Only one surface soil sample exceeded the screening criteria for two chemicals".

9. **A3/4.8.2 Subsurface Soil**

This section should be changed based on Comment 7d above. When the discussion of subsurface soil results is moved under Section A3/4.7 (Chemicals To Be Investigated During Phase II), indicate that for both

former Sites 3 and 4, only one deep boring was completed at each site and located in areas estimated to be outside of landfill disposal areas (if this is in fact true based on the new figure which will indicate identified pits, trenches and other anomalies). Include a discussion of the deep boring results for SWMU/AOC 300. As stated in Comment 7d above, also discuss VLEACH and petroleum hydrocarbon results for subsurface soil.

10. **A3/4.8.3 Groundwater**

a) This section should be changed based on Comment 7d above. When the discussion of groundwater results is moved under Section A3/4.7 (Chemicals To Be Investigated During Phase II), make all necessary changes based on the following comments.

b) Include that the MCL <u>for benzene</u> and antimony was exceeded (at Site 4).

c) <u>The evaluation of Phase I RI groundwater data is inadequate</u>. Evaluate the following:

i) the presence of benzene (3 ppb) in well 04_UGMW63;

ii) the presence of petroleum hydrocarbons, including TFH-gasoline (769 ppb) and TFH-diesel (78 ppb) in well 04_DBMW40;

iii) the presence of the following contaminants in cluster well 18_BGMW01 <u>which may be located downgradient of Site 3/4</u>:

- TFH-gasoline (1,080 ppb) in the well screened at 205-245 feet bgs
- TFH-diesel (1,840 ppb) in the same well screened at 205-245 feet bgs
- benzene (270 ppb) in the same well screened at 205-245 feet bgs
- cadmium in wells screened at 242-262 and 330-350 feet bgs

- TFH-diesel (2,260 ppb) in a well screened at 466-486 feet bgs.

Please evaluate the meaning of these results; consider if we see the same contaminant profiles in round two data. The evaluation should consider all possible source areas, including Site 3/4, as well as other potential sources such as Tank Farms 5 and 6. Please also see Comment 13e below.

In the evaluation, please also address the following two concerns:

- The water table may have been above the screen interval of well 04_UGMW63 during sampling (see Figure B4-2 in the ***Technical Memorandum***); the well pump is positioned near the bottom of the screen. Higher concentrations of benzene at the water table may be present.

- Is the petroleum hydrocarbon contamination in well 04_DBMW40 possibly related to Tank Farms 5 and/or 6 or is it possibly due to the handling of fuels/fuel wastes at or near Site 4? TFH-diesel was detected in a surface soil sample at Stratum 2 at a concentration of 16,400 mg/kg. In addition to discussing this concern in the text, include a discussion of all potential sources and groundwater flow direction.

  Please also indicate the locations of Fuel Farms 5 and 6 in figures showing site boundaries and well locations; the figure should indicate the number and location of the specific USTs within these two tank farms. In the text, provide the capacity and current as well as historic contents of each UST. Indicate if the USTs have been integrity tested, and if so, in what years(s) and the results.

11. **A3/4.9.1 and A3.10.2 [sic] Shallow Soil**

Stratum 2 (Drainage Ditch)

a) Phase I results indicate that the contamination at Stratum 2 is possibly confined to the upper 2 feet of soil; consider that samples could be initially collected at 0 and 2 feet bgs. Samples at deeper depths, such as 5 and 10 feet, may not be necessary unless significant contamination is identified at 2 feet. Immunoassay techniques can be used to initially screen the stratum for semivolatile organic compounds (SVOCs), pesticides and TFH-diesel.

   Indicate the proposed number of Phase II samples for this stratum.

b) Please make all necessary changes when Sections A3/4.9.1 and A3.10.2 [sic] are merged. Section A3.10.2 [sic] apparently implies that CLP samples will be collected and analyzed for SVOCs, pesticides/PCBs, TFH-gasoline and TFH-diesel. However, Section A3/4.9.1 implies that field screening samples will be collected for TFH-diesel and that samples would not be collected for TFH-gasoline. Due to these inconsistencies, we are unable to ascertain what sampling strategies are actually being proposed. Please make all necessary changes in the text and tables, such as the table providing a summary of samples and analytical parameters for the Phase II RI. Moreover, due to the inconsistencies in sampling proposals for Site 3/4, we reserve the right to make additional changes to the sampling approach at a later date (e.g., during review of a Phase II SAP Amendment) once the strategies are clarified.

SWMU/AOC 194 (Former Incinerator)

a) Under "Hypothesis", change the beginning of the paragraph to read:

   "Elevated levels of VOCs were found in the shallow soil at SWMU/AOC 194. In fact, this was one of the few locations in the Phase I RI where relatively significant

> concentrations of chlorinated VOCS were detected in soil; PCE was detected at a concentration of 130 ppb in a soil sample collected at 2 feet bgs *[underline denotes change]*".

b) Under "Sampling Strategy", indicate that samples will also be located based on soil gas survey results. Consider using field screening techniques to characterize extent away from the former incinerator location.

c) In this section within Section A3.10.2 [sic], please clarify the last sentence of the first paragraph which states "SVOCs will be analyzed for at this location only at depths of 0, 5 and 10 feet bgs". If this statement refers to the sampling strategy for the upper soil zone, it is not necessary because samples are to be collected only at 0, 5 and 10 feet bgs anyway. Or does this refer to the deep boring described in the previous sentence? If it does refer to the deep boring, prior corresponding Section A3/4.9.2 (Subsurface Soil) and the following section, Section A3/4.10.3 (Subsurface Soil) indicate analyses for only VOCs, herbicides and fuel hydrocarbons; please make all necessary changes.

12. **A3/4.9.2 Subsurface Soil**

a) The wording in this section needs improvement. Define the problem at Stratum 1 first (include the deep borings at former Site 3 and at the former Stratum 1 of former Site 4, then address subsurface soil at SWMU/AOC 300, followed by a discussion of SWMU/AOC 194.

b) Under "Sampling Strategy", add a statement that soil gas survey results will be used in determining the "most contaminated" area for the deep boring.

Indicate the number and depth of soil samples to be collected from the deep boring.

c) Under "Sampling Strategy", delete the statement "... drilling through landfill debris is hazardous

..."; this is really not the most appropriate reason for not completing a deep boring.

13. **A3/4.9.3 Groundwater**

a) Under "Statement of Problem", again, the evaluation of groundwater is inadequate; please see Comment 10c above.

b) Please consider the following for well placements at Site 3/4:

i) a cluster well placed near wells 04_DGMW66, 04_DBMW40 or 04_UGMW63 may be more appropriate. Please see General Comment 8 concerning groundwater flow direction inconsistencies. TFH-gasoline and TFH-diesel were detected in well 04_DBMW40 and benzene was detected in well 04_UGMW63; and

ii) whether the benzene found in 04_UGMW63 is from Tank Farm 5 or 6.

c) Indicate the number of each new well in the text and please be consistent with the well numbering in the figures.

d) Please indicate the location of well 04_DGMW66 in Figures A3/4-6a and A3/4-6b.

e) Please indicate if any of the proposed wells would also be groundwater extraction wells, and if not, please explain why. <u>Please consider and evaluate whether it would be feasible to design a groundwater monitoring/extraction strategy to monitor/remediate groundwater (contamination) from both Site 3/4 and other possible sources in the immediate area such as Tank Farms 5 and/or 6.</u>

14. **A3/4.10.1.1 Soil Gas**

<u>Stratum 1 (Landfill Area)</u>

a) Correct the statement "Collect soil gas samples for VOCs ..." since additional non-VOC constituents will also be analyzed.

b) The location of soil gas sampling points should also be contingent on the location of identified pits, trenches and other anomalies shown in a new figure (requested in an above comment).

SWMU/AOC 194 (Former Incinerator)

Indicate in the text the number of soil gas sampling points; in Figure A3/4-6c, the number proposed is six.

Site 5 - Perimeter Road Landfill

1. **A5.1.1 Setting and History**

This section should describe the current use of the site as a storage area for contaminated soil placed in "burritos"; please describe the type and origin of the contaminated soil.

2. **A5.4.2 SAIC Survey**

a) We do not necessarily agree with the conclusions in this section and the following section, Section A5.5 (Site and Stratum Boundaries for Phase II RI). We feel that the information presented in the ***SAIC Report*** warrants additional investigation of areas possibly related to the landfill. This section dismisses an impoundment surrounded by berms and containing open trenches as observed in a 1979 photograph as a possible construction site. However, we are unaware of any building or other similar such constructed unit being located at that area.

We recommend the use of geophysics, including possibly GPR or aerial GPR, in suspected disposal areas identified in the ***SAIC Report*** and the following areas identified in the ***SAP Amendment*** but excluded from investigation in Phase I:

i) a large tract of disturbed ground located southwest of the landfill observed in a 1980 aerial photograph;

ii) disturbed ground and a possible impoundment filled with an unidentified liquid located northwest of the landfill; and

iii) a possible impoundment, located west of the impoundment described in ii above, observed in 1986.

Please provide a figure, e.g., a plan view diagram showing the anomalies identified in the ***SAIC Report*** and those mentioned above.

b) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the **SAIC Report** and include 161, 413 and 416]*".

3. **A5.6 Conceptual Site Model**

This section and Figure A5-4 should address contaminated soil stored at the site. Figure A5-4 does indicate Phase I wastes, but please address the "burritos" if they were derived from another origin.

4. **A5.7 Chemicals To Be Investigated During Phase II**

a) Did aluminum actually exceed the secondary MCL? Our information indicates that the MCL for aluminum is 1,000 ppb; if this is correct, please make all necessary changes for this site and the entire document.

b) The second paragraph briefly discusses the source of detected TCE, PCE and benzene in groundwater. Please briefly discuss round two data and indicate if the results support an upgradient source.

c) The last sentence of the fourth paragraph states that "No classes of compounds were judged to have the potential to reach the groundwater". However, vadose zone samples were collected from only one deep boring which was located outside of the actual landfill boundary. The ***Initial Assessment Study (IAS)***, dated May 1986, indicates that supplies with an expired shelf life were disposed of at Site 5 from 1955 through the early 1970s; some of these supplies/wastes may have included liquid chemicals. Please add a statement that indicates landfill wastes may pose a threat to groundwater.

d) Please add a discussion of round one groundwater results from the cluster wells at 18_BGMW02; this well is located downgradient of the landfill. Also consider round two results, as well as all TDS results.

5. **A5.8 Potential Remedial Actions and Associated Data Needs**

One of the subsections should address remedial actions for contaminated soil stored at the site.

6. **A5.8.2 Subsurface Soil**

Change the last sentence to read: "In-situ technologies to address subsurface landfill wastes will be reevaluated after reviewing the results of the soil gas survey proposed for Site 5".

7. **A5.10 Phase II Remedial Investigation Design**

a) This section states that soil gas samples for VOCs [sic] will be collected at 10 and 20 feet bgs. Yet Table A5-6 indicates the sampling depths will be 5 feet bgs; please make all necessary changes.

b) This section indicates soil gas will be conducted at 13 locations, yet Figure A5-6 and Table A5-6 indicate 7 locations; please make all necessary changes.

c) Once again, due to inconsistencies in sampling proposals, we reserve the right to make additional changes to the sampling approach at a later date (e.g., during the review of the Phase II SAP Amendment) once the strategies are clarified.

d) We recommend the use of GPR or other geophysical techniques to further characterize the landfill boundaries, especially in areas identified as anomalies in the ***SAIC Report*** and ***SAP Amendment*** (see Comment 2a above). Instead of a one-row grid for the soil gas survey at Site 5, we recommend that additional soil gas sampling locations be contingent on the geophysical results.

e) Under "Rationale", please delete the last sentence. We disagree that the landfill

boundaries have been sufficiently delineated and that a one-row grid of soil gas samples is adequate.

Site 6 - Drop Tank Drainage Area No. 1

1. **A6.1.1 Setting and History**

   a) The ***SAP Amendment*** states that two vertical tanks were observed in a 1952 aerial photograph. Where were the tanks located and what were the contents? Please make all necessary changes, including changes to figures and possible changes to characterization strategies.

   b) We disagree with the conclusions concerning SWMU/AOC 204. The document states that the area will not be included in the Phase II RI because it is a curbed concrete pad and wash water was collected in a sump. However, we believe that fuel wash out potentially drained onto the grassy area west of the concrete pad. Evidence supporting this hypothesis can be found in the ***SAP Amendment*** (see Plate 10) which indicates that liquid was observed flowing from the concrete pad in aerial photographs from 1970 and 1980. Please note that the ***SAP Amendment*** indicates that the flows ended in a stained area that was persistent in 1970, 1980 and 1981 (see later comments concerning this stained area which was not sampled in the Phase I RI).

      Please add the area west of the concrete pad and towards Stratum 2 to Stratum 2 or create a new stratum. Please make all necessary changes, including figures. Immunoassay and/or the TD/GC/MS field screening techniques can be used to initially characterize this area (see later comments).

   c) Indicate the maximum TRPH concentration detected (4,582 ppm) at SWMU/AOC 204.

   d) Please review the ***SAP Amendment*** and include a discussion of the possible stained area, located approximately 250 feet west of Site 6, that was evident in a 1986 photograph. Is this the same area identified in the ***SAIC Report*** as potential

sites 125 and 183 (in photographs from 1961 and 1968, respectively) on the east side of the taxiway south of Site 6? Irrespective of whether the areas are the same, the areas identified as potential sites 125 and 183 in the ***SAIC Report*** should be, as recommended in the ***SAIC Report,*** added to the Phase II RI; a decision on the stained area identified in the ***SAP Amendment*** (if not the same area) is pending additional information.

Please add potential sites 125 and 183 in the ***SAIC Report*** to Stratum 3 or create a new stratum. Please indicate these areas in a figure(s) and make all necessary changes, including changes to strata and characterization strategies. Immunoassay and/or the TD/GC/MS field screening techniques can be used to initially characterize this area (see later comments).

e) Include the triangular-shaped impoundment-like area, located west of Site 6, in a stratum for Site 6 (possibly as a part of Stratum 3 or create a new stratum). This area was identified in a 1991 aerial photograph (see ***SAP Amendment***) and based on recent site visits appears to be a former fuel storage area, possibly for engine tests conducted in the area. Please obtain all available information about this area and make all necessary changes, including changes to figures, strata and characterization strategies. Immunoassay and/or the TD/GC/MS field screening techniques can be used to initially characterize this area (see later comments).

2. **A6.3 Chemicals of Potential Concern**

Provide a figure showing the COPCs for SWMU/AOC 204.

3. **A6.4.1 EPA Survey**

Please make all necessary changes based on Comment 1 above.

4. **A6.4.2 SAIC Survey**

a) Please make all necessary changes based on Comment 1 above.

b) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report*** and include 124, 125 and 183]".

5. **A6.5 Site and Stratum Boundaries**

Please make all necessary changes based on Comment 1 above.

6. **A6.7 Chemicals To Be Investigated During Phase II**

a) Change the second sentence of the first paragraph to read "Lead (at concentrations up to 1,410 ppm) exceeded RBCs in shallow soil at Stratum 3".

b) Discuss the detection of TRPH (at a concentration of 1,041 ppm) at the upgradient location; indicate potential sources for the result.

c) The ***Technical Memorandum*** indicated that phenol in groundwater at Site 6 also exceeded regulatory criteria. Yet the text in this section does not discuss results for phenol; please make all necessary changes, including Table A6-3b.

d) Also in the second paragraph, change the fourth sentence to read "Although no individual chemical exceeds 1 <u>for cancer risk</u> *[underlines denote change]*, the chemical class contributing most to the <u>cancer</u> risk is SVOCs".

e) We disagree with the statements made in paragraph 3. Shallow soils at Site 6 should be investigated for TFH-gasoline and TFH-diesel based on the site history. Please make all necessary changes, including Table A6-5.

7. **A6.9 Problem Definition**

<u>Stratum 2 (Drainage)</u>

We disagree with the proposal for no additional sampling because areas of possible disposal activity have not been investigated. In a figure(s), indicate the stained area that was persistent in 1970, 1980 and 1981 (see ***SAP Amendment***, including Plate 10).

Please propose a sampling strategy to include the flowing liquid area and other areas downgradient of the concrete pad at SWMU/AOC 204 and areas within the former Stratum 2, including the persistent stain area (which was not sampled in Phase I). Immunoassay and/or the TD/GC/MS field screening techniques can be used to analyze for TFH-gasoline, TFH-diesel and PAHs. Propose a field screening sampling/analysis method for metals at Stratum 2.

If proposed, initial immunoassay samples can be located at 0.1-0.5 feet bgs. If the immunoassay results are negative in the expanded areas (i.e., new areas not previously characterized in Phase I and added for Phase II), then no additional TD/GC/MS field screening sampling is required. If the immunoassay results are positive, use the TD/GC/MS field screening method to further characterize extent, if needed; TD/GC/MS analyses should include VOCs and PAHs.

To further characterize the human risk with Level 3 or 4 data and if needed, to confirm the TD/GC/MS results with Level 3 or 4 data, please propose at least one CLP sample location in each of the following areas: 1) the flowing liquid area of SWMU/AOC 204, 2) the persistent stain area, and 3) another location placed in Stratum 2. Consider collecting two CLP samples from each of the three locations, at 0.1 and 2 feet bgs, unless TD/GC/MS field screening results indicate that deeper samples are needed. Analyze CLP samples for TFH-gasoline, TFH-diesel, VOCs, SVOCs and metals.

Please make all necessary changes to the text as well as figures and tables. <u>Please note that Table A6-6 contains errors based on the sampling strategy that is proposed in the document.</u>

<u>Stratum 3 (Storage Area)</u>

Please revise Stratum 3 boundaries or create new strata based on Comments 1d and 1e above. In a figure(s) showing the revised or newly created stratum boundaries, indicate potential sites 125 and 183 recommended for further investigation in the ***SAIC Report*** and the triangular-shaped impoundment-like area. Also consider the stained area identified in the ***SAP Amendment*** from a 1986 photograph (see Comment 1d above).

Immunoassay and/or the TD/GC/MS field screening techniques can be used to analyze for TFH-gasoline, TFH-diesel and PAHs. Propose a field screening sampling/analysis method for metals at Stratum 3.

If proposed, initial immunoassay samples can be located at 0.1-0.5 feet bgs. If the immunoassay results are negative in the expanded areas (i.e., new areas not previously characterized in Phase I and added to Phase II), then no additional TD/GC/MS field screening sampling is required. If the immunoassay results are positive, use the TD/GC/MS field screening method to further characterize extent, if needed; TD/GC/MS analyses should include VOCs and PAHs.

To further characterize the human risk with Level 3 or 4 data and if needed, to confirm the TD/GC/MS results with Level 3 or 4 data, please propose at least two CLP sample locations in each of the following areas: 1) potential sites 125 and 183 (from the ***SAIC Report)***, 2) the triangular-shaped impoundment-like area, and 3) two locations placed in other areas of Stratum 3. Consider collecting two CLP samples from each of the three locations, at 0.1 and 2 feet bgs, unless deeper samples are needed. Analyze CLP samples for TFH-gasoline, TFH-diesel, VOCs, SVOCs and metals.

Please make all necessary changes to the text as well as figures and tables.

Site 7 - Drop Tank Drainage Area No. 2

1. **A7.1.1 Setting and History**

   a) In addition to Figure A7-1, please provide an expanded overview site map to include the location of well 07_DGMW91.

   b) Please describe the abandoned well to the north/northeast of Site 7. Describe its use and when and how it was abandoned; indicate the location of the well in a figure.

2. **A7.1.2 Strata**

   The document states that two hazardous waste storage areas, SWMUs/AOCs 71 and 72, are within Strata 1 and 2 and will be investigated as an integral part of these

strata. Please clarify this statement since Stratum 2 is not recommended for further investigation and the characterization strategies for Stratum 1 do not address these storage areas. Please make all necessary changes. Indicate the storage areas in figures, including Figure A7-6.

3. **A7.4.1 EPA Survey**

This section states that "On the 1970 photograph, nine *[underline added for emphasis]* probable vertical tanks ... are seen on the grassy area northeast of Building 295". Yet a review of the ***SAP Amendment*** indicates that " ... a *[underline added for emphasis] probable vertical tank ... " was situated on the grassy area northeast of Building 295.* Please make all necessary corrections.

Our comments on the ***Technical Memorandum*** questioned the contents of this tank, yet no additional information is provided in the document. Please discuss the contents of the tank, and if necessary, make changes to the characterization strategies. Indicate the location of the tank(s) in a figure(s).

4. **A7.4.2 SAIC Survey**

Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report*** *and include 49, 131, 138, 247, 406, 407 and 507]".*

Please indicate that areas identified with flowing liquids, especially the drainage ditch areas contributing to Agua Chinon Wash, will be investigated with the soil gas survey proposed for Site 24.

Please indicate that the storage areas identified in the ***SAIC Report*** that are outside of the Site 7 boundaries will be investigated in the ***Base Closure Plan***.

5. **A7.7 Chemicals To Be Investigated During Phase II**

a) This section states that lead in shallow soils at Stratum 5 exceeded ecological criteria, however, it appears that the text should also state that lead exceeded the RBC as well. Lead was detected

at the surface of 07_GN1 at a concentration of 931 ppm. This detection of lead is listed in Table A7-3a as exceeding human health screening criteria. Please make all necessary changes.

b) This section should discuss the TFH-diesel detected in well 07_DBMW70 at a concentration of 2,660 ppb.

c) This section should discuss the Phase I TRPH results:

Stratum 1

TRPH was detected at a concentration of 942 ppm at the surface of 07_ST1. TRPH was detected at a concentration of 3,329 ppm at the surface of 07_ST2. TRPH was detected at a concentration of 3,188 ppm at the surface of 07_ST3.

Stratum 5

TRPH was detected at concentrations of 32,091 and 1,007 ppm at the surface and 2 feet bgs, respectively, at 07_GN1. TRPH was detected at concentrations of 4,074 and 983 ppm at the surface and 2 feet bgs, respectively, at 07_GN2. TRPH was detected at a concentration of 2,222 ppm at the surface of 07_GN3.

d) This section should discuss that Site 7 is one of the few locations where TCE was actually found in subsurface soil. Please add the following to an applicable section of Site 24:

> "The 110 and 120 foot depth soil samples of well 07_DGMW 71 had TCE concentrations of 74 and 27 ppb, respectively. The 110 foot depth sample was 4 feet above the water table; these were the only two soil samples collected at this location".

An applicable section of Site 24 should also identify borings and depths (including concentrations) where TCE was found in this area

during the RCRA Facility Assessment (RFA) investigation.

6. **A7.8.2 Subsurface Soil**

This section should address the detection of TFH-diesel in groundwater at well 07_DBMW70 at a concentration of 2,660 ppb. It seems there is a potential upgradient subsurface soil source for this contamination. Could this be related to the probable former tank located to the northeast of Building 295?

7. **A7.9.1 Shallow Soil**

Stratum 1 (North Pavement Edge)

Phase I results indicate that the soil surficial contamination at Stratum 1 is possibly confined to the west end of the stratum. Contamination is apparently localized. Consider remediation without further investigation, however, TFH-diesel was detected in well 07_DBMW70 at a concentration of 2,660 ppb. Phase II sampling and analysis must identify the source of the hydrocarbons in groundwater.

If further surficial soil investigation is undertaken, then consider that samples could be initially collected at 0.1 and 2 feet bgs. Samples at deeper depths, such as 5 and 10 feet, may not be necessary unless significant contamination is identified at 2 feet.

Immunoassay techniques can be used to initially screen the stratum for PAHs; TD/GC/MS field screening samples can then be located in areas with a positive immunoassay result.

CLP samples collected at 5 and 10 feet may not be necessary; base the required sampling depths on the TD/GC/MS field screening results.

At a minimum some immunoassay, and preferably some TD/GC/MS field screening samples, should be located in the area of the former tank which was situated on the grassy area northeast of Building 295.

Please make all necessary changes to the text, figures and tables.

Stratum 3 (New East Pavement Edge)

a) Make all necessary changes based on the comments for Stratum 1 above.

b) Provide a figure of Stratum 3 indicating aerial photograph anomalies identified by USEPA (see Plate 11 of the ***SAP Amendment***). Locate at least one of the TD/GC/MS field screening samples within the identified anomalies, e.g., within the three empty bermed areas (probably used for fuel bladders); please note that these areas were not sampled in Phase I.

Stratum 5 (Open Dirt Area)

Explain why the TD/GC/MS field screening method was not proposed for this stratum. Additional sampling at depths deeper than 2 feet may not be required if significant contamination is not found at the 2 foot depth.

8. **A7.9.3 Groundwater**

Well 07_DBMW70 should also be analyzed for SVOCs, TFH-gasoline and TFH-diesel.

9. **A7.10 Phase II Remedial Investigation Design**

Revise this section based on the above comments.

Site 8 - DRMO Storage Yard

1. **A8.1.1 Setting and History**

a) For clarity, change the first sentence of the second paragraph to read: "As shown in Figure A8-1, the site has two primary areas of concern: the Old Salvage Yard (near Building 800) and the current storage yard consisting of both a west and east section".

b) For clarity, change the third paragraph to read:

> "In 1984, several gallons of PCB oil were spilled in the current Storage Yard ... Refuse piles in the west portion of the current Storage Yard and staining in both the current Storage Yard and the Old Storage Yard are evident in the site aerial photographs since 1952".

c) Provide an enlarged figure of the eastern portion of the current Storage Yard and indicate the area where soil was excavated. According to the ***IAS,*** several cubic yards (about 10,000 pounds) of PCB contaminated soil adjacent to ramp 633 was excavated. Please also indicate ramp 633 and Phase I sampling locations in the figure. Please explain how the excavated area was filled with soil. Was soil from Stratum 1 scraped into the excavated area? It appears from the Phase I results that Strata 1 and 4 can be combined into a single stratum.

2. **A8.1.2 Strata**

a) For clarity, change the second paragraph to read (note the first sentence has been deleted):

> "Heavy and continual staining was observed in the East Storage Yard throughout the photographic record. In the West Storage Yard, however, stains were ... No information was available regarding possible contaminant releases in either portion of the current Storage Yard (except for the PCB Spill Area which has been designated as a separate stratum). Therefore, it was decided to divide the current Storage Yard into two strata on the basis of the photographic record: East Storage Yard and West Storage Yard".

b) Indicate the three drum storage areas (SWMUs/AOCs 104, 105 and 106) in figures, including Figure A8-6.

> "In 1984, several gallons of PCB oil were spilled in the current Storage Yard ... Refuse piles in the west portion of the current Storage Yard and staining in both the current Storage Yard and the Old Storage Yard are evident in the site aerial photographs since 1952".

c) Provide an enlarged figure of the eastern portion of the current Storage Yard and indicate the area where soil was excavated. According to the ***IAS,*** several cubic yards (about 10,000 pounds) of PCB contaminated soil adjacent to ramp 633 was excavated. Please also indicate ramp 633 and Phase I sampling locations in the figure. Please explain how the excavated area was filled with soil. Was soil from Stratum 1 scraped into the excavated area? It appears from the Phase I results that Strata 1 and 4 can be combined into a single stratum.

2. **A8.1.2 Strata**

a) For clarity, change the second paragraph to read (note the first sentence has been deleted):

> "Heavy and continual staining was observed in the East Storage Yard throughout the photographic record. In the West Storage Yard, however, stains were ... No information was available regarding possible contaminant releases in either portion of the current Storage Yard (except for the PCB Spill Area which has been designated as a separate stratum). Therefore, it was decided to divide the current Storage Yard into two strata on the basis of the photographic record: East Storage Yard and West Storage Yard".

b) Indicate the three drum storage areas (SWMUs/AOCs 104, 105 and 106) in figures, including Figure A8-6.

d) Please review site 180 in the ***SAIC Report***. In figures, please indicate the location of the two upgradient stained areas. Make all necessary changes, including changes to characterization strategies. Was the upgradient Phase I sampling location (08_UGS) with a detected concentration of 512 ppm TRPH within one of these stained areas?

e) Please identify the locations of Buildings 1749 and 748 in figures. Site 461 in the ***SAIC Report*** indicates a stain adjacent to these buildings; the photograph is not provided in the ***SAIC Report.***

f) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report*** *and include 50, 132, 137, 180 and 461]*".

Please make all necessary changes to this section based on the above comments. Please clearly indicate the correct stratum in the text.

6. **A8.5 Site and Stratum Boundaries for Phase II RI**

Please make all necessary changes based on Comment 5 above.

7. **A8.7 Chemicals To Be Investigated During Phase II**

a) Lead also exceeded RBCs in Stratum 1; please make the necessary change in the text.

b) Lead also exceeded RBCs in Stratum 3; please make the necessary change in the text.

c) This section should discuss the Phase I TRPH results:

<u>Upgradient</u>

TRPH was detected at a concentration of 512 ppm at the surface of 08_UGS.

<u>Stratum 1</u>

TRPH was detected at a concentration of 665 ppm at the surface of 08_ST1. TRPH was detected at a

concentration of 7,730 ppm at the surface of 08_ST3. TRPH was detected at a concentration of 2,144 ppm at the surface of 08_STDB; deeper samples at this location were not collected in Phase I.

Stratum 2

TRPH was detected at concentrations of 678, 907 and 1,698 ppm at the surface of 08_GN1, 08_GN2 and 08_GN3, respectively.

Stratum 3

TRPH was detected at concentrations of 1,661 and 891 ppm at the surface and at 2 feet bgs, respectively, at 08_RE1. TRPH was detected at concentrations of 1,806 and 1,314 ppm at the surface of 08_RE2 and 08_RE3, respectively.

Stratum 4

TRPH was detected at a concentration of 6,001 ppm at the surface of 08_PCB1. TRPH was detected at a concentration of 5,094 ppm at the surface of 08_PCB2. TRPH was detected at a concentration of 1,299 ppm at the surface of 08_PCB3.

8. **A8.8.2 Subsurface Soil**

This section states no contaminants were found in subsurface soils at concentrations and depths that threaten migration to groundwater; yet earlier in Section A8.7 (Chemicals To Be Investigated During Phase II) it is stated that based on LUFT guidelines, TFH-diesel in shallow soils at Stratum 4 may pose a threat to groundwater. Please clarify this apparent discrepancy and make all necessary changes.

9. **A8.9.1 Shallow Soil**

Stratum 1 (East Storage Yard)

Phase I results indicate that the contamination at Stratum 1 is possibly confined to the upper soil layers; consider that samples could be initially collected at 0.1 and 2 feet bgs. Samples at deeper depths, such as 5 and 10 feet, may not be

necessary unless significant contamination is identified at 2 feet. Immunoassay techniques can be used to initially screen the stratum for PCBs; TC/GC/MS field screening samples can then be located in areas with a positive immunoassay result.

Please indicate the field screening method that will be used to analyze for lead. Characterization of lead should include delineating the extent of contamination at 08_ST3.

CLP samples collected at 5 and 10 feet may not be necessary; base the required sampling depths on the TD/GC/MS field screening results.

Stratum 2 (West Storage Yard)

Provide a figure of Stratum 2 indicating aerial photograph anomalies identified by USEPA (see Plate 12 of the ***SAP Amendment***).

Immunoassay techniques could be used to analyze for PCBs in the identified anomalous areas (please note that these anomalous areas were not sampled in Phase I) at 0.1-0.5 feet bgs. If the immunoassay results are negative, then no additional TD/GC/MS field screening sampling is required for the anomalous areas. If the immunoassay results are positive, use the TD/GC/MS field screening method to further characterize extent, if needed; TD/GC/MS analyses should include PAHs and PCBs.

Propose a field screening sampling/analysis method for metals.

To further characterize the human risk with Level 3 or 4 data and if needed, to confirm the TD/GC/MS results with Level 3 or 4 data, please propose at least three CLP sample locations in the anomalous areas of Stratum 2. Collect two samples from each of the three locations, at 0.1 and 2 feet bgs, unless deeper samples are needed. Analyze for SVOCs, pesticides/PCBs and metals.

Stratum 3 (Refuse Pile)

Stratum 3 is contaminated. Field screening methods should be used to delineate the extent of contamination, i.e., the volume of soil to be remediated.

Stratum 4 (PCB Spill Area)

Indicate the proposed sampling locations for this Stratum in the figure requested in Comment 1c above, i.e., an enlarged figure of the eastern portion of the current Storage Yard indicating the area where soil was excavated.

The sampling strategy should indicate the extent and depth of the excavation so that proposed samples are not located in fill material.

Indicate the depths of the TD/GC/MS field screening methods.

Add SVOCs and metals to the analyses for the CLP samples. Phase I results indicate that the contamination at Stratum 4 is possibly confined to the upper soil layers to about 2 to possibly 4 feet bgs; please review the proposed CLP sample depths, but consider the former excavation depth.

Stratum 5

Provide a figure of Stratum 5 indicating aerial photograph anomalies identified by USEPA (see Plate 12 of the ***SAP Amendment***) and SAIC (see site 132 identified in the ***SAIC Report***). Discuss the results of the three deep borings in this stratum, e.g., which borings were located within identified anomalies? Other questions that should be addressed include when was the Old Storage Yard covered with fill material and was storage conducted after it was covered with fill material? This information is important in making an informed decision for this stratum. The Phase I investigation for this stratum consisted of three deep borings with samples collected at 5, 10, 15, 20 and 25 feet, but surface soil samples were not collected in Phase I. The contamination at other strata in Site 8 appears to be limited to the

upper soil layers. Please propose a strategy based on the above comments to characterize surficial soils for PCBs and metals.

Please make all necessary changes to the text as well as figures and tables.

Site 9 - Crash Crew Pit No. 1

1. **A9.4.2 SAIC Survey**

   a) Please review site 248 in the ***SAIC Report***-- it indicates that seven possible vertical tanks were located near the west and south sides of Building 435 (Crash Crew). Is it possible that these tanks may have held waste fuels, oils, solvents and fire fighting foam for the burn pit? Or were the flammable liquids delivered to the burn pit by another method, e.g., by trucks?

   b) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report*** *and include 167, 182, 204, 248 and 486]*".

2. **A9.9.1 Shallow Soil**

   The document concludes that no further investigation of shallow soils is needed. However, this conclusion is questionable because it is based on three surface only samples which may have been located in fill material (see Section A9.1.2). It is true that one 25-foot boring was completed in the east pit (which included samples at 5 and 10 feet bgs) and a deep boring was completed in the west pit (which included samples at 5 and 10 feet). The dioxin sample at 20 feet bgs was targeted too deep. Moreover, none of the Phase I soil samples were located in the areas where liquids were reportedly flowing, i.e., near the northern edge of the pits. Propose a sampling strategy for shallow soil at Site 9 addressing these concerns (include analysis for dioxins/furans in surficial soils).

3. **A9.9.2 Subsurface Soil**

   Please add that the soil gas investigation for Site 24 will also include Site 9.

4. **A9.9.3 Groundwater**

   Consider changing the hypothesis to "Site 9 does not appear to be contributing to groundwater contamination; the actual source may be upgradient".

Site 10 - Petroleum Disposal Area

1. **A10.1.1 Setting and History**

   a) Embellish the description of Site 10 with the following information (in a later section, we are requesting that Site 10 be expanded based on this information):

   - Near Site 10, the former Heavy Duty Maintenance Shop was located in Building 1589 *[indicate Building 1589 in a figure(s)]*. Apparently two portable 500-gallon tanks were stored in Building 1589 and used to collect waste oils and solvents. When the portable tanks were filled, they were lifted onto a truck, a spray bar was attached, and the tank contents were sprayed onto the ground for dust control. This disposal occurred over a period of approximately 13 years with an estimated maximum volume of 52,000 gallons (Brown and Caldwell, 1986).

   - Various cleaning solvents were used in parts dip tanks in the former Heavy Duty Maintenance Shop. From 1952 through the mid-1960s, this solvent was used to wash the cement decks once per week and the lube racks daily; these solvent volumes are estimated, respectively, at 144 and 240 gallons per year (Brown and Caldwell, 1986). The solvents were then washed into storm drains *[please provide an expanded figure to indicate the location of the cement decks and lube racks]*.

   - The former Heavy Duty Maintenance Shop also contained a waterfall paint booth; sludges from the paint booth were drained onto the ground (Brown and Caldwell, 1986)*[please indicate the location of the paint booth area in a figure(s)]*.

b) Please describe the abandoned well at Site 10. Describe its use and when and how it was abandoned; indicate the location of the well in a figure.

2. **A10.4.1 EPA Survey**

a) Discuss the trenches that were observed in the western portion of the site in a 1952 aerial photograph; indicate the locations of the trenches in a figure(s). What types of wastes were likely disposed of in the trenches? Is it likely that paint wastes from the former Heavy Duty Maintenance Building were disposed of in the trenches?

b) Locate the dark material area identified in 1965 and 1970 (see Plate 7 of the ***SAP Amendment***) in a figure(s) of Stratum 1.

3. **A10.4.2 SAIC Survey**

a) Please review site 142 in the ***SAIC Report***. Extremely dark stains are visible in the southern portion of Site 10; the stain areas extend south of the current Site 10 boundaries. Consider extending the boundaries of Stratum 2 to the south.

b) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report*** *and include 42, 44 and 248]*".

4. **A10.5 Site and Stratum Boundaries for Phase II RI**

Expand Site 10 to include the former Heavy Duty Maintenance Shop at Building 1589. Rationale for this request includes that this location was the source of waste oils and solvents applied at Site 10 for dust control. Moreover, the solvent fraction of the liquids applied for dust control as well as the part dip tank solvents used for washing cement surfaces may have contributed to groundwater contamination at the site; identified as such, the soil gas investigation conducted for Site 24 can include this area, including possible sample points along storm drains that may have

carried solvents from cement washing operations at the former Heavy Duty Maintenance Building.

5. **A10.9 Problem Definition and A10.10 Phase II Remedial Investigation Design**

Stratum 1 (Aircraft Matting Area)

Immunoassays and/or the TD/GC/MS field screening method can be used to screen the stratum for PAHs. If immunoassays are proposed, locate several immunoassay samples within the dark material area identified in 1965 and 1970 (see Plate 7 of the ***SAP Amendment***) at 0.1-0.5 feet bgs. Locate CLP samples in areas with a positive immunoassay result. If the immunoassay results are negative, locate the CLP sample locations randomly, except locate at least one of the CLP sample locations in the dark material area and at least one near 10_GN1. Consider locating the CLP samples at 0 and 2 feet bgs, unless deeper samples are needed.

Make all necessary changes, including figures and tables.

Site 11 - Transformer Storage Area

1. **A11.1.1 Setting and History**

a) A UST is located at Site 11 just outside the east fenceline. The UST may have been used to store PCB fluids. Please add a description of the UST to this section and indicate its location in a figure(s).

Moreover, during the Phase II RI fieldwork, collect a sample (wipe sample, if necessary) from the UST and analyze for PCBs. If the results indicate that PCB fluids were stored in the UST, please remove the UST as part of the Phase II RI fieldwork in accordance with all applicable requirements, including collecting soil samples below the UST. Please make all necessary changes.

b) Add a description of the PCB spill (approximately 50 gallons) that occurred on September 29, 1982 when a transformer fell off a truck between Buildings 369 and 335 (please indicate the location of this spill and Building 335 in a

figure(s)). Describe the spill clean-up procedures; indicate if confirmation sampling was performed. Describe other PCB spills in the vicinity of Site 11. Make all necessary changes.

c) Looking at the storage yard from the east (near the UST), it appears that fill material and several layers of asphalt may exist below the current storage yard gravel surface. Please address this concern in this section, consider how this might affect sampling strategies (if true), and make all necessary changes.

2. **A11.1.2 Strata**

This section states that "Transformer oil ... was believed to have migrated to the edge of the *[concrete]* pad, and discharged onto the unlined surface of the storage yard ... it was believed that surface soil samples collected at any location on the pad perimeter would have an equal chance of containing PCBs". Based on observations made during a site visit, the sample locations were cored through the pad concrete. Preferably, the samples should have been located off the edge of the concrete pad.

3. **A11.4.1 EPA Survey**

a) Indicate the location of the possible vertical tank in a figure(s); please note that apparently the same tank was identified by the SAIC survey. Please identify the contents of the former tank and make all necessary changes to characterization strategies, including analytical parameters.

b) In a figure(s), indicate the location of the stained area observed at the center of Site 11 in a 1965 aerial photograph.

c) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the **SAIC Report** and include 506 and 550]*".

4. **A11.9 Problem Definition and A11.10 Phase II Remedial Investigation Design**

Stratum 1 (Concrete Pad and Surrounding Area)

Move the four sample locations through the concrete pad to the immediate area adjacent to the pad (off the edge of the pad). Use the TD/GC/MS field screening method at these four locations as well as the filled-in circle locations as shown in Figure A11-6.

Consider eliminating the hollow circle sample locations as shown in Figure A11-6. The sampling strategy as proposed in the document assumes PCB contamination migrated away from the concrete pad; this is an important consideration. Another approach would be to assume that PCB releases could have occurred anywhere in the storage yard, i.e., units containing PCB fluids were stored throughout the storage yard and not limited to the concrete pad. Moreover, releases could have occurred from the vertical tank and there may also be a more likely probability in detecting contamination in the stained area (identified in the 1965 aerial photograph). We prefer a combination of the these approaches. Therefore, consider using immunoassays to initially screen the rest of the storage yard for PCBs and PAHs; locate some of the immunoassay samples within the area of the possible vertical tank and the stained area. The TD/GC/MS field screening method can be used to further characterize extent, if needed, in areas with a positive immunoassay result.

If proposed, locate immunoassay samples at 0.1-0.5 feet bgs; locate TD/GC/MS and CLP samples at 0.1, 2 and 4 feet bgs, but consider the possible several layers of fill at the site.

Stratum 2 (Drainage Ditch)

Change the field screening sampling depths to 0.1, 2, and 5 feet bgs. CLP samples should be located based on the TD/GC/MS field screening results; it does not appear that samples at 10 foot bgs will be necessary.

Site 12 - Sludge Drying Beds

1. **A12.1.1 Setting and History**

   a) The document dismisses the two former impoundments located southeast of Stratum 2 (East Sludge Drying Beds); these units were apparently identified in aerial photographs from 1945, 1965 and 1970 (see Plate 13 of the ***SAP Amendment***). This is within the same area that the ***SAIC Report*** identified an impoundment and six vertical tanks. Please provide a history of the tank contents. All available information, e.g., aerial photographs and MCAS El Toro records/plans, should be reviewed; there appears to be sufficient evidence to warrant adding this area to an existing or new stratum. Please make all necessary changes.

   b) Please provide construction details for the sludge drying beds, including depth. This type of information may be obtained from reviewing MCAS El Toro records/plans.

   c) PCBs were detected in Stratum 3 (Drainage Ditch). The document should include a discussion of SWMU/AOC 7 (PCB Transformer Storage Area) and the location of this area should be identified on a site map(s). Is it possible that PCB releases from SWMU/AOC 7 contributed to the presence of PCBs in the Drainage Ditch? DTSC's comments concerning SWMU/AOC 7 in the ***Draft RFA Report*** are repeated below:

      > "The Preliminary Review/Visual Site Inspection (PR/VSI) Report states that one transformer, located near the center of the storage area, leaked oil from a valve onto the unpaved soil. The boring location as indicated in Figure 5 of Appendix B, while located near or within a stain area, is apparently not near the center of the storage area. Was the release from the transformer valve investigated? What is the origin of the stain indicated in Figure 5? Please indicate the extent of the stain in

Figure 5 and the location and extent of the leaked oil near the center of the storage area".

DTSC finds the response to these comments in the ***Final RFA Report*** to be unsatisfactory. The issue of whether SWMU/AOC 7 possibly contributed to the PCB contamination of the Drainage Ditch should be addressed. Please make all necessary changes.

2. **A12.2 Phase I Remedial Investigation (RI) and RFA Results**

Please review the description of RFA activities at SWMU/AOC 90 and make all necessary changes.

3. **A12.3 Chemicals of Potential Concern**

a) Provide figures indicating the locations and concentrations of COPCs for SWMU/AOC 90 (shallow soil) and Boring 265B1 (shallow soil and subsurface soil).

b) It appears that the PCB COPC results for 12_DDX are missing in Figure A12-2c; please make all necessary changes.

c) Apparently TFH-diesel was found at SWMU/AOC 90 up to 830 ppm; please make the necessary changes to the COPCs under SWMU/AOC 90 in Section A12.3.1 (Shallow Soil).

4. **A12.4.2 SAIC Survey**

Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report*** *and include 85, 90 and 129]*".

5. **A12.7 Chemicals To Be Investigated During Phase II**

a) Add analyses for metals and cyanide for all strata and areas of investigation at Site 12; make all necessary changes in all applicable sections of the text and tables.

b) This section does not discuss the chemical classes that will be investigated at SWMU/AOC 90; please make the necessary changes.

c) This section should discuss the significant Phase I TRPH results, including the following:

Upgradient Area

TRPH was detected at a concentration of 6,770 ppm at the surface of 12_UGS.

Stratum 3

TRPH was detected at a concentration of 42,529 ppm at 12_DDX.

Please provide possible explanations for these results and evaluate potential impacts on further characterization strategies.

6. **A12.8.2 Subsurface Soil**

This section states no contaminants were found in subsurface soils at concentrations and depths that threaten migration to groundwater; yet earlier in Section A12.7 (Chemicals To Be Investigated During Phase II) it is stated that based on LUFT guidelines, petroleum hydrocarbons in Stratum 3 may pose a threat to groundwater. Please clarify this apparent discrepancy and make all necessary changes.

7. **A12.9.1 and A12.10.1 Shallow Soil**

Stratum 3 (Drainage Ditch)

Consider using immunoassays to initially screen the Drainage Ditch rather than the proposed approach; PAHs, PCBs and/or pesticides could be used as indicator compounds. If proposed, locate immunoassay samples at 0.1-0.5 feet bgs. The TD/GC/MS field screening method can be used to further characterize extent, if needed, in areas with a positive immunoassay result. Phase I results indicate that the contamination at Stratum 3 is possibly confined to the upper 4 feet of soil; TD/GC/MS field screening or CLP samples at deeper depths may not be necessary unless significant contamination is identified at 4 feet.

Indicate the percentage of the estimated risk ratio for metals that is due to lead.

8. **A12.9.3 and A12.10.3 Groundwater**

Compared to the semi-upgradient well 12_UGMW31 and well 18_PS1, well 12_DBMW48 near the center of Stratum 1 does exhibit slightly higher concentrations of PCE in the same permeable zone (based on both round one and two results except for 18_PS1 which was not sampled in round one). TCE does not exhibit the same trend. With the additional information from round two results, it does not seem likely that Site 12 is a contributor to the chlorinated VOC plume.

We recommend that additional well installations at Site 12 be on a contingent basis, i.e., justification of additional wells should be supported by other needs or information such as monitoring requirements, soil gas survey results or Phase II investigation results. For example, the James M. Montgomery (JMM) Report ***MCAS El Toro Off-Station Remedial Investigation Final Work Plan***, dated March 1990, suggests that, based on a soil gas investigation, shallow PCE soil contamination may exist east of and immediately adjacent to Bee Canyon Wash. New soil gas survey results may indicate the need for a true downgradient well at Site 12.

Please note that the proposed new upgradient well is apparently not indicated in figures.

Site 13 - Oil Change Area

1. **A13.1.1 Setting and History**

a) The second paragraph states "Underground storage tanks (USTs) at Tank Farm No. 2 may *[underline added for emphasis]* contain waste oil and JP5 fuel". Definitive information on the contents of these tanks, both past and present, should be available and should be indicated in the document.

Please note that later in Section A13.9.3 (Groundwater) the document states that No. 2 fuel oil is also stored at the tank farm. Please make all necessary changes, including those for consistency.

Please indicate if all the USTs at Tank Farm 2 were leak tested in 1990 and include all test results. Indicate the capacity of each UST.

b) In figures (including Figure A13-6a), please indicate the locations of SWMUs/AOCs 67, 217 and 218.

2. **A13.4.2 SAIC Survey**

a) In Figures (including Figure A13-6a), please indicate the locations of Buildings 1505 and 244 and the possible vertical tank (near the northwestern corner of Building 1505) noted in the 1971 aerial photograph.

The document should indicate the contents of the former vertical tank. The ***SAIC Report*** indicates that there was a stain on the northerly side of the tank area. Make all necessary changes to characterization strategies.

b) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report*** *and include 170, 205 and 462]*".

3. **A13.7 Chemicals To Be Investigated During Phase II**

a) Please evaluate the Phase I elevated detection limits (20,000 ppb) for PAHs in the surface soil sample at 13_SA2.

b) Please evaluate the Phase I elevated detection limit (276) ppm for arsenic in the 2 foot soil sample at 13_SA3. The evaluation should consider whether arsenic may actually be present in Stratum 1 at concentrations exceeding the RBC or the 99th percentile of the distribution of background values; this could affect whether analysis for metals should be added (note that only analysis for SVOCs is proposed). Please make all necessary changes.

c) This section should discuss the significant Phase I TRPH results, including the following:

Upgradient Area

TRPH was detected at a concentration of 936 ppm at the surface of 13_UGS.

Stratum 1

TRPH was detected at a concentration of 1,605 ppm at 5 feet bgs at 13_DBMW49.

4. **A13.9.1 and A13.10.1 Shallow Soil**

Stratum 1 (Area Southeast of Tank Farm)

Instead of using randomly located samples, please consider at least one judgmental sample located in the area of the vertical tank and perhaps another located near SWMUs/AOCs 217 and 218.

Stratum 2 (Area Southwest of Tank Farm)

Based on Plate 14 of the ***SAP Amendment***, apparently only one stained area in Stratum 2 was sampled in Phase I. Instead of using randomly located samples, please consider using judgmental samples located in stained areas. Please indicate the stained areas in Stratum 2 in Figure A13-6a.

5. **A13.9.3 and A13.10.3 Groundwater**

a) Please update the combined section to indicate that apparently an 8,000 gallon UST (UST 240-A) containing aviation gasoline existed near Building 240 (Aero Club); it was abandoned or replaced in 1985 with a 10,000 gallon UST (UST 797). Please provide as much information about these two USTs as is possible, for example: 1) indicate if the two USTs were leak tested and if so, in what years, 2) if ancillary piping for the USTs was also leak tested, 3) the reason for abandonment or replacement of UST 240-A, and 4) indicate if UST 240-A was removed, and if so, in what year, the observed condition of both the UST and soil beneath it, and soil analyis results if available. Indicate the location of the two USTs in a figure(s). Discuss any additional USTs located in the area of Site 13 that may

potentially impact groundwater with benzene, TFH-gasoline and/or TFH-diesel if a release occurred.

It is likely that the benzene (730 ppb) and TFH-gasoline (1,690 ppb) observed in upgradient or cross-gradient well 13_UGMW32 is attributed to UST 240-A, especially if information corroborates that this UST may have had a release. However, please note that well 13_DGMW78, located downgradient or semi-downgradient from Tank Farm 2 also had benzene (110 ppb) as well as TFH-diesel (436 ppb). Please evaluate the likelihood that Tank Farm 2 may also have contributed to the petroleum hydrocarbons in groundwater, especially if No. 2 fuel oil or JP-4 was stored at the tank farm.

Near Site 14, please note that well 18_DW350, with a screened interval of 310-350 feet bgs, also indicated TFH-diesel contamination (943 ppb). Please note that moving away from Tank Farm 2, the closer shallower well 13_DGMW78 and the farther deeper well 18_DW350 are in a straight line from the tank farm.

Reconsider the necessity and placement of wells for this site based on this and additional new information. Note that newly proposed wells 3 and 4 may not be downgradient of UST-240 A or Tank Farm 2; however, new well 1 or a well just to the north of new well 1 should be installed to help evaluate the source of the groundwater contamination.

b) Please evaluate if metals (aluminum, cadmium and manganese) detected in downgradient well 13_DGMW78 are indicative of a release(s) from Tank Farm 2 and/or Site 13. Manganese, used in the manufacture of alloys (including of aluminum), was detected in all three wells at Site 13, but at approximately an eighteenfold concentration in downgradient well 13_DGMW78.

<u>Site 14 - Battery Acid Disposal Area</u>

1. **A14.1.1 Setting and History**

This section states that "In a 1970 aerial photograph, an unidentified liquid appears to have ponded around

Building 243, located north of the site, and flowed past the western portion of the site". Could this have been a likely disposal area? The current Site 14 is located behind the former heavy equipment maintenance shop. The shop doors are located on the Building 243 side of Building 245. Is it likely that all or most wastes were carried behind the building rather than just dumped directly outside the shop doors, perhaps in an unpaved area towards Building 243? Or is it possible that surface runoff from Building 245 drained towards Building 243? Please note that the ***SAIC Report*** identified a possible stain on the northwesterly side of Building 243 (see site 481 in the ***SAIC Report***).

2. **A14.4.2 SAIC Survey**

   a) In a figure(s), indicate the location of former Building 246 (use dashed lines).

   b) Please review sites 143, 169 and 505 in the ***SAIC Report.*** Probable excavations are indicated near Site 14; a possible expansion of the site is recommended to include these areas. Evaluate these sites in the text; please make all necessary changes.

   c) Please review site 481 in the ***SAIC Report*** (see Comment 1 above).

   d) Please review site 526 in the ***SAIC Report***. Evaluate this site in the text; please make all necessary changes.

   e) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the **SAIC Report** and include 31, 80, 143, 169, 275, 481, 505 and 526]*".

3. **A14.7 Chemicals To Be Investigated During Phase II**

   a) It appears that lead also exceeded RBCs for shallow soil in Stratum 1; please make all necessary changes, including the text and Tables 14-3a and A14-4.

   b) Please check that the Total Metals Stratum Noncancer Risk Ratio in Table A14-4 for Stratum 2 includes lead; make all necessary changes.

c) The third paragraph states that "Metals will also be investigated in Stratum 2 [sic]"; Stratum 1 was intended, however, please add analysis for metals to both strata.

d) This section should discuss the Phase I TRPH results:

Stratum 1

TRPH was detected at a concentration of 1,367 ppm at the surface of 14_GN5.

Stratum 2

TRPH was detected at a concentration of 960 ppm at the surface of 14_DD6.

Catch Basin

TRPH was detected at a concentration of 7,364 ppm.

4. **A14.9.1 and A14.10.1 Shallow Soil**

a) Add analysis for soil pH at both strata.

b) Phase I results indicate that the contamination at Strata 1 and 2 is possibly confined to the upper soil layers. Phase I results for PAHs and metals in shallow soils suggest Strata 1 and 2 might be combined.

Consider that the TD/GC/MS samples could be initially collected at 0.1 and 2 feet bgs. Samples at deeper depths, such as 5 and 10 feet, may not be necessary unless significant contamination is identified at 2 feet. CLP samples collected at 5 and 10 feet may not be necessary; base the required sampling depths on the TD/GC/MS field screening results.

5. **A14.9.3 and A14.10.3 Groundwater**

a) Site 14 could be a potential contributor to the carbon tetrachloride detected in groundwater up to 19 ppb (up to 26 ppb based on round two results); the round one result was apparently the highest detection for carbon tetrachloride on the Station.

Other evidence that indicates that Site 14 could be a potential contributor to the carbon tetrachloride detected in groundwater includes:

- wells semi-upgradient to Site 14 at Site 13 did not exhibit the presence of carbon tetrachloride, at least not above regulatory levels;
- the concentration of carbon tetrachloride is similar or slightly decreased in semi-downgradient well 18_DW135; and
- methylene chloride and other solvents associated with paints are potential contaminants. The disposal of paint wastes in the area of Site 14 indicates that painting occurred in the vicinity and likely degreasing activities occurred prior to painting. Solvents were likely used at Building 245 at Site 14 since it was the heavy duty maintenance shop. Carbon tetrachloride would be a potential contaminant at Site 14.

Site 14 also has petroleum hydrocarbon contamination in groundwater-- downgradient or semi-downgradient well 18_DW350 with a screened interval of 310-350 feet bgs did exhibit 943 ppb TFH-diesel (430 ppb based on round two results).

We do not necessarily agree with the conclusions for groundwater at Site 14.

b) Evaluate whether the screen length of irrigation well 18_TIC055 near Site 14 could actually provide a conduit for deeper aquifer contamination.

<u>Site 15 - Suspended Fuel Tanks</u>

1. **A15.1.1 Setting and History**

Indicate the location of SWMU/AOC 31 in figures.

2. **A15.4.2 SAIC Survey**

   a) Include a discussion of the 1973 aerial photograph relevant to Site 15 (see site 232 in the ***SAIC Report***).

   b) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report*** *and include 26, 27, 28, 32, 77, 232, 273, 274 and 548]*".

3. **A15.5 Site and Stratum Boundaries for Phase II RI**

   Substantial evidence indicates that the currently defined boundaries for Site 15 do not adequately address potential petroleum hydrocarbon contamination in the area of Buildings 27, 29 and 31.

   A heavy duty maintenance shop was located in Building 31 prior to moving to Building 245 at Site 14 in 1977. The ***IAS*** states that waste oil was drained onto the ground behind Building 31 until 1983. The ***SAIC Report*** identifies open storage areas with possible drums and stains in the area of Site 15; the ***SAIC Report*** also recommends an expansion of Site 15 to include some of these areas.

   Please evaluate the results of the three borings completed at SWMU/AOC 273 and indicate if they were located in the waste oil disposal area. While soil samples from the three borings were analyzed for TRPH and VOCs, analyses for TFH, SVOCs, PCBs and metals were not performed.

   Please make all necessary changes to the site boundaries and characterization strategies.

4. **A15.7 Chemicals To Be Investigated During Phase II**

   a) Please evaluate probable hydrocarbon interference that resulted in high detection limits for PAHs in at least one sample.

b) This section should discuss the significant Phase I TRPH results, including the following:

Upgradient Area

TRPH was detected at a concentration of 3,751 ppm at the surface of 15_UGS.

Stratum 1

TRPH was detected at a concentration of 1,233 ppm at the surface of 15_GN1. The ***SAP Amendment*** states that a 1991 photograph indicates the presence of debris and stains north of Building 29. Was this upgradient boring located within the stain areas? Provide an explanation for the elevated TRPH level.

TRPH was detected at a concentration of 2,694 ppm at the surface of 15_GN3.

TRPH was detected at a concentration of 23,034 ppm at the surface of 15_DBS.

TRPH was detected at a concentration of 1,377 ppm at 5 feet bgs at 15_DBMW51.

5. **A15.9.2 and A15.10.2 Subsurface Soil and A15.9.3 and A15.10.3 Groundwater**

We do not necessarily agree with the conclusions for subsurface soil and groundwater at Site 15.

The conclusions for subsurface soil are based on only one boring sampled at depths greater than 5 feet.

The document hypothesizes that Site 15 is not contributing to groundwater contamination. However, 120 ppb benzene and 3,370 ppb TFH-diesel were detected in well 15_DBMW51. The concentration of TFH-diesel detected in an upgradient well to Site 15, i.e., well 13_DGMW78, was considerably less (436 ppb). Please note that the concentrations of benzene detected in the two wells are similar, i.e., the concentration of benzene detected in 13_DGMW78 was 110 ppb. The work plan, as written, will not identify the source of the TFH-diesel in well 15_DBMW51.

Site 16 - Crash Crew Pit No. 2

1. **A16.1.1 Setting and History**

   a) Figures, including Figures A16-6a and A16-6b, should indicate the locations of the former secondary pit, the drain line from the main pit to the secondary pit, the former fire extinguisher training pit, the current burn pits and SWMUs/AOCs 288, 289 and 290.

   b) Describe how fuel was/is supplied to the former and current burn pits; describe and indicate the location of all former and current tanks, both above ground and underground, used to store fuel for both the former and current burn pits.

   c) Indicate that the current burn pits will potentially be investigated under the ***Base Closure Plan***.

2. **A16.4.2 SAIC Survey**

   a) Please evaluate sites 71 and 87 in the ***SAIC Report.***

   b) Please see sites 171, 259, 276 and 418 in the ***SAIC Report***. What were the contents of all the identified vertical tanks?

   c) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the **SAIC Report** and include 71, 87, 171, 259, 276, 318 and 418]*".

3. **A16.7 Chemicals To Be Investigated During Phase II**

   Generally discuss and evaluate the Phase I TFH-gasoline and TFH-diesel results, including the results for deep boring 16_AB213. This section should include and discuss the significance of the Phase I TRPH results, including the following:

   Stratum 1

   TRPH was detected at a concentration of 17,486 ppm at the surface of 18_GN3.

Stratum 2

TRPH was detected at concentrations of 8,404, 6,956 and 17,190 ppm at 0, 2 & 4 feet bgs, respectively, at 16_PT1.

TRPH was detected at 7,636, 28,859 and 18,933 ppm at 0, 2 & 4 feet bgs, respectively, at 16_PT2.

TRPH was detected at 2,844, 23,766 and 39,101 ppm at 0, 2 & 4 feet bgs at 16_PT3.

4. **A16.9.1 and A16.10.1 Shallow Soil**

   Add analysis for dioxins/furans in surficial soils at Strata 1 and 2-- locate samples in the secondary pit and the fire-extinguisher training pit below fill.

5. **A16.9.2 and A16.10.2 Subsurface Soil**

   a) Are the proposed samples CLP samples? Please make the necessary changes.

   b) Please indicate that the secondary pit can also be located by the drain line.

6. **A16.9.3 and A16.10.3 Groundwater**

   Please indicate that a former and/or current aviation gasoline UST(s) located near the Aero Club could also be contributing to the benzene contamination.

   One of the two newly proposed wells may not be necessary.

Site 17 - Communication Station Landfill

1. **A17.4.2 SAIC Survey**

   Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report*** *and include 192, 315 and 398]*".

2. **A17.7 Chemicals To Be Investigated During Phase II**

   Indicate that TRPH was detected at a concentration of 1,831 ppm at the surface of 17_SA1.

3. **A17.9.1 and A17.10.2 Shallow Soil and A17.9.2 and A17.10.3 Subsurface Soil**

   Stratum 2 (Stained Area)

   Please note that other figures delineating Stratum 2 are inconsistent with Figure A17-6; apparently Figure A17-6 is the correct figure. Please make all necessary changes.

   Consider that it may be unnecessary to collect soil samples or drill a deep boring if Stratum 2 will be capped in addition to the landfill proper under a containment approach as the presumptive remedy (see *Presumptive Remedy for CERCLA Municipal Landfill Sites*, USEPA, September 1993).

4. **A17.9.3 and A17.10.4 Groundwater**

   The installation of new well 3 should be contingent on the analysis results for the other three downgradient wells at this site.

Site 19 - Aircraft Expeditionary Refueling (ACER) Site

1. **A19.1.1 Setting and History**

   a) This section should describe the fuel farm (Tank Farm 101?) located at Site 19. Indicate the number of USTs, the capacity of each UST, and the current as well as historic contents. Indicate if the USTs have been integrity tested, and if so, in what years(s) and the results. Indicate the location of the tank farm (and individual tanks) in figures.

   b) SWMU/AOC 20 is dismissed based on a recommendation of No Further Action in the ***Draft RFA Report***. However, in our comments on the ***Draft RFA Report***, we indicated that SWMU/AOC 20 could be potentially contaminated with petroleum hydrocarbons; TFH-diesel was found at a concentration of 463 ppm at 5 feet bgs, but deeper samples were not collected. Please make all necessary changes. Indicate the locations of SWMUs/AOCs 20 and 107 in figures.

2. **A19.3 Chemicals of Potential Concern**

   a) In Figure A19-2c, the COPCs for 19_AB218 are shown for 19_2FB1. The COPCs for 19_2FB1 are not shown. Please make all necessary changes.

   b) Add well 19_DGMW86 to Figure A19-3. It appears that manganese, selenium and aluminum are missing as COPCs in groundwater for some of the wells in Figure A19-3; please make all necessary changes.

3. **A19.4.1 EPA Survey**

   In figures, indicate the locations of Buildings 404 and 414.

4. **A19.4.2 SAIC Survey**

   a) Identify the contents of the vertical tank observed in the 1967 and 1973 aerial photographs. This section indicates that the tank is Building 608; please explain. Indicate the location of the tank in figures and make all necessary changes, including changes to characterization strategies.

   b) Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the **SAIC Report** and include 166, 184, 200, 253, 328, 365, 489 and 533]*".

5. **A19.9.1 and A19.10.1 Shallow Soil**

   Stratum 1

   In figures, indicate the locations of all fuel bladder revetments, including those identified in 1965 and 1970 aerial photographs.

   Immunoassay and/or the TD/GC/MS field screening techniques can be used to analyze for PAHs. If proposed, initial immunoassay samples can be located at 0.1-0.5 feet bgs. If the immunoassay results are negative, then TD/GC/MS field screening is not necessary. If the immunoassay results are positive, use the TD/GC/MS field screening method to further characterize extent, if needed; TD/GC/MS analyses should include PAHs.

To further characterize the human risk with Level 3 or 4 data and if needed, to confirm the TD/GC/MS results with Level 3 or 4 data, please propose the CLP samples in former fuel bladder revetment areas. Most of the Phase I surface/near surface soil samples were collected at 0 and 2 feet bgs. CLP samples at 10 feet bgs may not be necessary, however, Phase I results do indicate PAH contamination at a depth to at least 2 feet.

Site 20 - Hobby Shop

1. **A20.1.1 Setting and History**

   In figures, indicate the locations of the following: 1) the 600 gallon waste oil UST (SWMU/AOC 156) and the three oil/water separators, 2) areas "stained black with oil" (perhaps use shading) and 3) SWMUs/AOCs 157, 158 and 159. Please also indicate paved vs. unpaved areas.

2. **A20.3 Chemicals of Potential Concern**

   a) Provide a figure indicating the COPCs for the four SWMUs/AOCs.

   b) It appears that manganese is missing as a COPC in groundwater for some of the wells in Figure A20-3; please make all necessary changes.

3. **A20.4.2 SAIC Survey**

   Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the **SAIC Report**]*".

4. **A20.7 Chemicals To Be Investigated During Phase II**

   Indicate that lead did exceed the RBC at Stratum 4; please make all necessary changes, including tables.

5. **A20.9.1 and A20.10.1 Shallow Soil**

   Stratum 2

   The document should evaluate the reason for the elevated detection limits (up to 22,000 ppb) for PAHs

in the surface soil samples at 20_DD5 and 20_DD6. The interference was probably due to high concentrations of petroleum hydrocarbons; please discuss the TRPH detected in surface soil samples at 20_DD5 (7,046 ppm) and 20_DD6 (84,590 ppm). The risk estimates, as presented for Stratum 2, are probably not truly representative. Consider remediation rather than additional characterization for Stratum 2.

Stratum 3

Stratum 3 is contaminated. Rather than further defining risk, propose a sampling strategy that will delineate the extent of the contamination or if the extent can be determined, consider remediation. Please note that TRPH, most likely indicating oil contamination in this case, was detected at 20_SA1 at concentrations of 12,572, 2,861 and 2,963 ppm at 0, 2 and 4 feet bgs, respectively.

The current waste oil collection system at the Hobby Shop should be evaluated and redesigned, if necessary, to preclude further releases. The waste oil UST should be removed, if necessary.

Stratum 4

The sampling strategy for this stratum fails to consider the detection of lead up to 900 ppm. Samples should be analyzed for metals and SVOCs.

Site 21 - Materials Management Group, Building 320

1. **A21.1.1 Setting and History**

   The ***IAS*** indicates that chemical supply drums were also stored next to a parking lot across the street from Building 320. Consider adding this area as a stratum.

2. **A21.4.2 SAIC Survey**

   Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report****]*".

3. **A21.7 Chemicals To Be Investigated During Phase II**

   Evaluate the detection of TRPH at a concentration of 2,556 ppm in the Phase I upgradient surface soil sample at 21_UGS.

4. **A21.9.2 Subsurface Soil**

   Please evaluate the Phase I boring log for 21_DGMW90; visible contamination was noted at 30 and 80 feet bgs. Apparently the 30 foot depth sample was not analyzed.

Site 22 - Tactical Air Fuel Dispensing System

1. **A22.1 Setting and History**

   Include the following information as well as information on other fuel spills in the area of Site 22; make all necessary changes to strata definition and characterization strategies:

   - On April 18, 1978, approximately 2,700 to 4,000 gallons of JP-5 was released from a ruptured fuel bladder east of Building 369. The fuel flowed across a fuel truck unloading area, across a parking lot on the east side of Building 369 and into the storm drain located at the southeast corner of Building 369. The fuel on the parking lot was washed into the storm drain that leads to Bee Canyon Wash.

   - On March 23, 1979, an unspecified volume of JP-5 was released from a ruptured fuel bladder and in transferring fuel from one bladder to another, a valve was inadvertently left open resulting in an additional release of fuel. Fuel on the parking area next to Building 369 was washed into the storm drain leading to Bee Canyon Wash.

   - On April 13, 1979, approximately one to several thousand gallons of JP-5 spilled out of a TAFDS fuel bladder and "liquified" the asphalt in the parking lot by Building 369. The JP-5 also entered the storm drain at Building 369 and flowed into Bee Canyon Wash.

2. **A22.4 Surveys of Historical Aerial Photographs**

   Indicate that the trenches observed in the 1952 aerial photograph will be evaluated as part of Site 10.

3. **A22.4.2 SAIC Survey**

   Add the following statement to this section: "Sites of potential concern identified in the ***SAIC Report*** include *[list the site numbers as identified in the* ***SAIC Report****]*".

4. **A22.9.2 Subsurface Soil**

   The conclusions presented in this section apparently failed to consider the results from 22_2FB3. TFH-gasoline, TFH-diesel and TRPH concentrations increase with depth; SVOCs appear to indicate a similar trend. This is a good example of needing TFH-gasoline and TFH-diesel COPCs in figures for evaluation purposes. Please make all necessary changes. The soil gas survey should investigate the area of 22_2FB3.

5. **A22.10 Phase II Remedial Investigation Design**

   Strata 1 and 2

   Generally, Phase I soil samples were not located in stained areas identified in aerial photographs nor in former fuel bladder revetment areas. In addition, Phase I soil samples were apparently not located along the former road, east of Stratum 2, observed with stains from a 1952 aerial photograph. Conclusions drawn from limited Phase I information is questionable. Immunoassay and/or TD/GC/MS methods with CLP confirmation could be used to further characterize both strata.

Site 24 - Potential VOC Source Area and Site 25 - Major Drainages

These sites will be evaluated in the soil gas survey work plan.

III. OTHER SPECIFIC COMMENTS:

Volume 1

1. Section 2.2.3.1 Previous Site Investigations

State that the interim groundwater pump and treat system installed at the Station boundary is not currently operating. Please also make the necessary change on page 2-2 of the Draft SAP.

2. Section 2.2.3.3 CERCLA Activities

Change the first complete paragraph on page 2-10 to read:

> "In October 1990, EPA, the California Department of Toxic Substances Control Program, now known as the California Department of Toxic Substances Control (DTSC), the RWQCB, and the Department of Navy signed a Federal Facilities Agreement (FFA) to conduct an RI/FS for MCAS El Toro following the NCP and EPA Guidance. Under the FFA, the Department of Navy is the lead agency; EPA and the California Environmental Protection Agency, which includes both DTSC and the RWQCB, perform oversight roles."

Please also make this change on page 2-3 of the Draft SAP.

3. Section 2.2.3.4 RCRA Activities

Change the first paragraph to read:

> "MCAS El Toro is currently a permitted hazardous waste storage facility (at Building 673T) under RCRA. The permit was issued in 1993 by DTSC under authority granted by EPA to implement the RCRA program for the state of California."

Delete all other statements in the first paragraph. Please also make this change on page 2-4 of the Draft SAP.

4. Section 2.4.6.3 Groundwater Flow

Under "Horizontal Flow", please change the statement "In the alluvial basin, groundwater is first encountered at a depth

greater than 240 feet on the northeastern edge of the Station along Irvine Boulevard (near Sites 3, 4, and 5)...". The depth to groundwater, e.g., at Site 5 is considerably less than 240 feet bgs.

5. Section 2.4.6.6 Groundwater Pumpage

As previously indicated in comments for this section of the ***Technical Memorandum*** that were not addressed in this section of the ***Draft Work Plan***, DTSC believes there are a number of deficiencies in the description of regional wells. Please address the following:

a) Please include a table with the following information:

i) each irrigation supply, production, municipal supply and industrial well (include the interim groundwater pump and treat system wells and all new wells installed or proposed for the Desalter Project). Wells that should be in the table include (but are not limited to): 18_ET1, 118_TIC047, 18_TIC056?, 18_TIC078, 18_TIC107, 18_TIC108, 18_TIC111, 18_TIC113, 18_W3526, 18_TIC025, TIC082, 18_W3462, 18_IDM1, 18_TIC041, 18_TIC039, 18_MCAS07, 18_WOODINL, 18_W4660, 18_WOODISL, 18_W3733, 18_W3723, 18_TIC010, 18_TIC037, 18_TIC064, 18_TIC110, 18_MCAS01, 18_TIC035, 18_MCAS02, 18_TIC061, 18_W4653, 18_TIC056, 18_TIC117, 18_TIC074, 18_MCAS03, 18_TIC068, 18_W3400, 18_W3398, 18_W3403?, 18_W3411, 18_W3413, 18_W3415, 18_W3428 and 18_W3435;

ii) the screen interval for each well in feet bgs;

iii) indicate the status of each well (e.g., continuously active, non-active, intermittent use (if intermittent, indicate pumping periods));

iv) indicate the specific use of groundwater pumped from each well;

v) indicate if pumped groundwater is treated prior to use, and if so, indicate the type(s) of treatment; and

vi) for each abandoned well, indicate the type of abandonment.

b) Please identify and indicate the location of the interim groundwater pump and treat system wells in a figure, e.g., Figure 2-16.

c) Again, as stated in prior DTSC comments, some wells in Figure 2-16 are indicated with a square surrounding a dot, yet this designation does not appear in the legend; please make all necessary changes. Please note that the following wells were not given a legend designation in Figure 2-16: 18_TIC039 and 18_W4660; please make the necessary correction.

d) Indicate the nearest drinking water production wells, especially downgradient of the Station. If these are well numbers 26 and 77, please so indicate. Indicate the distance of these wells from the Station proper and the regional groundwater plume.

e) Of particular importance to DTSC is irrigation well 18_TIC055; this well is located in the carbon tetrachloride plume. The text of this section should evaluate whether the screen length of this well could actually provide a conduit for deeper aquifer contamination. All other such wells with similar potentials should also be evaluated in the text.

6. <u>Section 4.9.2.4 Phase I Data Review</u>

a) Please show how the Maximum Allowable TFH Levels (both diesel and gasoline) in Table 4-9 were derived, i.e., show how points were assigned for each of the sites in the table.

b) Please update this section to indicate that the USEPA, DTSC and RWQCB have requested a removal action for the area of Agua Chinon Wash that is significantly contaminated with petroleum hydrocarbons (see joint letter from USEPA, DTSC and RWQCB dated November 1, 1993).

7. <u>Section 4.11.2 Subsurface Soil (below 10 feet)</u>

Under "Inorganic Chemicals", please clarify the statement "If the inorganic chemical in question exceeds background and RBCs in surface soil at that location and if it also exceeds Maximum Contaminant Levels (MCLs) or Action Levels in groundwater at the site, then it will be investigated during Phase II". Earlier, Section 4.6.1 (Surface Soil)

states that "Metals detected in subsurface soil... were not *[underline added for emphasis]* compared to background metal concentrations because of concern that a comparison of metals in subsurface soils to metals collected in surface soils would be statistically invalid."

Please also make all necessary changes to Sections A.6.3.2 (Subsurface Soil) and A.6.8.2 (Subsurface Soil (below 10 feet)) in Appendix A.

8. Section 4.11.5 Groundwater

This section states that groundwater constituents will be compared to RBCs and that "[Groundwater] Chemicals that fail to be selected through comparison to RBCs will be further compared to MCLs or Action Levels." Please change this to a comparison of both RBCs and MCLs; please make all necessary changes.

Please also make the necessary change to Section A.6.8.5 (Groundwater) in Appendix A.

9. Section 4.13 Statistical Basis for the Phase II Design

a) The Navy has chosen to use stratified random sampling. The utility of this method rests on whether waste disposal practices were uniform within a stratum. If they were, then any contaminant has an equal probability of occurring at any concentration anywhere in the stratum. Samples located randomly within such a stratum would then adequately characterize contamination and consequent risk.

The last sentence on page 4-104 has either extra words or words missing. In the very next sentence, at the top of page 4-109, the term S_e appears twice, but this does not seem to be correct. These two sentences are very confusing; please clarify.

The definition of MDD_{log} which appears in the middle of page 4-110 seems to conflict with the definitions of MDD and MDRD which appear on p-109. If the MDRD is a single value, as defined on page 4-109, how can it have a mean and a log of that mean, as indicated on page 4-110? We do not understand the derivation of the equation on page 4-110. It is not clear how the original scale has been converted to log space.

Table 4-14 on page 4-113 is not clear. The stratified random sampling would have called for a 2-factor or mixed model. Where is the 2-way analysis of variance (ANOVA)? Where are the data and calculations? Please present these in a table or appendix.

The discussion on page 4-113 refers to estimating the variability of sample-specific risk <u>within a stratum</u>. We question how such variability can be estimated using ANOVA (or any other technique), when so few data are available for each stratum. If, in fact, ANOVA is not appropriate for this estimation, then the derivation of the constant value for the coefficient of variation of risk within strata is equally inappropriate. This topic requires additional treatment, at the very least, and possibly a different approach.

Page 4-114 of this section states that "... as the risk calculated on Phase I samples becomes smaller, the number of samples required for Phase II becomes larger.... Additional random samples will be used to confirm the risk." Yet page 4-120 states that "... a total of seven locations to be sampled will be identified for each strata with indications of potential risk". Please clarify this apparent discrepancy.

On page 4-119 the authors state that the number of samples selected in strata where non-carcinogenic risk is the apparent driver is "calculated on the carcinogenic risk". We do not understand this statement. What will you do when, for instance, lead drives remediation at a stratum?

On page 4-120, 5×10^{-5} is equal to 5 in 100,000, not one in 1 in 500,000.

Please make the necessary changes to Section A.6.10 (Statistical Basis for the Phase II Design) in Appendix A.

b) This section should incorporate the explanation for the different levels of data quality found on page 38 of Appendix A since it is introduced in this section without sufficient description.

10. Section 4.14 Ecological Issues

Please place Tables 4-16A through 4-16C after the text of this section, rather than before it. Pages 5 through 9 of Table 4-16A seem to be a repeat of pages 1 through 4. Draft guidance on ecological risk assessment from DTSC recommends that toxicity criteria for ecological screening be based on the no-observed-effect-level (NOEL) rather than on a lowest-observed-effect-level (LOEL). If the action taken as a result of passing the screen is no further investigation, then it is most appropriate to screen against a level expected to produce no toxicity. If the literature yields only a LOEL, we recommend lowering this value by one order of magnitude to produce an estimate of the NOEL. This is similar to USEPA's practices in producing reference doses (RfD) and reference concentrations (RfC). The equation in footnote (c) to Table 4-16A should altered to show the introduction of an uncertainty factor for this correction. Alignment of the equation in this footnote can also be improved.

Regarding sediments in the catch basins (see page 4-159), it is our understanding that these materials are mobilized during storm events and move eventually into the washes. If this is true, then they represent potential terrestrial habitat *in situ* and aquatic or estuarine habitat *in extremis*. Therefore, select for each COPC the lower of the criteria for terrestrial or aquatic receptors and use this value for screening in both media.

11. Section 5.2 Task 2-Community Relations

Please change the former Technical Review Committee (TRC) meetings to Restoration Advisory Board (RAB) meetings.

12. Section 5.3.5 Surface Water Sampling

This section states that samples will be collected from up to 15 locations, however, Section 5.3.3 (Phase II Field Investigation) and Table 5-6 indicate 19 additional surface water samples; please make the necessary change or clarification.

13. Section 5.6 Task 6 - Risk Assessment

Please consult with DTSC before developing selection criteria to reduce further the number of COPC. Few if any identified sites have such an unmanageable number of COPC

that reduction in numbers is necessary. In general, DTSC feels that spreadsheet software makes it convenient to eliminate fewer rather than more COPC.

The RBCs in the document were developed without using cancer potency factors developed by Cal/EPA. Negotiations are ongoing between the Navy and DTSC to clarify how and when Cal/EPA toxicity criteria ought to be used in risk assessment at Navy installations. The Navy's consultants for MCAS El Toro have shown to our satisfaction that screening the individual sites using RBCs based on Cal/EPA toxicity criteria would have yielded the exact same COPC for each of the sites. With the additional data to be provided in Phase II, this might not be the case any longer.

14. Section 6.0 Project Management

Please correct the spelling of Mr. Joe Zarnoch's name at the bottom of page 6-1.

Appendix A (Volumes II & III)

1. Acronyms

Add MCPP and MCPA to the list of acronyms.

2. Section A1.1 Background

USEPA DQO guidance is available: ***Interim Final Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objectives Process***, USEPA QA/G-4, U.S. EPA QAMS; please make the necessary changes.

3. Section A.6.3.1

The fourth paragraph beginning at the bottom of page 18 is confusing; it should state that if a sample's metal concentration is greater than the 99th percentile, there is a 99% confidence that it is contaminated.

4. Section A.6.10 Statistical Basis for the Phase II Design

On page 39, the field screening tests should be specified for each suspected type of contamination. The cutpoints for the field screening tests should be specified, as well as the acceptable levels of false positives and false negatives.

DTSC Comments
December 17, 1993

Draft Sampling and Analysis Plan

The Draft SAP contains information that is not referred to in the rest of the document, inferring that the Draft SAP was not completely tailored for this particular work plan. Any information included in the Draft SAP that is not applicable to the rest of the document should be omitted. There are numerous sections that have no relevance to the proposed investigation; these include but are not limited to, sections on packer installation, video logging, and procedures for multiple-port well installation. The Draft SAP and the rest of the document must be reconciled so that they are consistent with one another.

1. Section 4.3 Quality Control

   For groundwater samples, we recommend the use of field blanks as a check on ambient airborne contamination for those wells located at or near tarmacs with significant jet traffic during sampling. Field blanks should consist of purified water that is taken into the field (during sampling and at the specific well location) and transferred from the water container to the individual sample vial(s).

2. Section 4.3.1 Field Duplicate Samples

   a) Please explain the second sentence "For soil samples, duplicate samples will be collected by splitting samples, provided that sufficient sample volume can be collected". See comments below.

   b) It does not appear that a bailer will be used to collect water samples in Phase II, however, it is included in the discussion . If used, please indicate that volatile organic analysis (VOA) bottles will be filled with water from the same bailer volume.

3. Section 4.3.2 Rinsates and Equipment Blanks

   Please indicate that all preservatives used in the field will be included in the rinsate and equipment blanks.

4. 4.3.3 Trip Blanks

   A trip blank should be included in each cooler shipped to the laboratory to account for any contamination which may occur from handling.

5. Table 5-0 Sample Containers, Preservatives, and Holding Times

   a) Indicate that water samples for ammonia will be cooled to 4°C and that the holding time is < 28 days. Indicate that water samples for nitrate/nitrite will be cooled to 4°C and that the holding time is < 48 hours.

   b) Indicate that polyethylene containers will be provided with polypropylene closures. Indicate that glass containers (except VOA vials) will be provided with Teflon-lined closures.

6. Section 6.0 Field Methods and Procedures

   a) In an appropriate section, please indicate that: 1) regulatory representatives will be notified at least two weeks in advance of the date for the initiation of fieldwork and 2) base passes will be issued in advance to regulatory representatives for the duration of the fieldwork.

   b) In an appropriate section, indicate that soil samples will be discrete samples and not composite samples, except for immunoassay samples. If immunoassay techniques are used, collect composite samples for immunoassay analysis from 0.1 to 0.5 feet bgs.

7. Section 6.2.4.3 Procedure - Downhole Geophysical and Video Logging

   Please indicate that at a minimum, the following borehole geophysical methods shall be used: spontaneous potential, guard resistivity, natural gamma and caliper.

8. 6.2.5 Surface-Water Quality Sampling

   a) It is stated that surface water samples will be collected when there is adequate stream flow. Explain the definition of "adequate stream flow". How much water must be flowing before a sample is collected? Indicate that sampling will occur during a "first storm" event, if possible.

   b) Although it is understood that ephemeral and intermittent streams require special consideration because of rapid changing stage, discharge, concentration and loads, samples should, if possible,

be collected using a standard multi-vertical, depth-integrated method to obtain the most representative sample. Single-vertical, dip, and other types of point sampling methods are not recommended except during extreme flow conditions.

c) It is recommended that a churn splitter be used to subsample a composite sample. Organic samples should not be composited in a plastic churn splitter because of possible contamination from or adsorption to the plastic. Although it may not be possible to decontaminate collection containers in the field because of adverse weather conditions it is still possible to thoroughly rinse containers with sample water or use disposable containers or the actual sample container.

d) This section states that "Dedicated supplies will be stored at the field administration office and will not be used for other sampling efforts". Does this include field instruments such as pH and specific conductance meters? If not, will these meters be readily available and will there be sufficient personnel to calibrate all field meters at the sampling site?

9. <u>Section 6.3 Soil Sampling and Drilling and Subsections</u>

a) Use a decontaminated shovel to clear the surface soil sample location to 0.1 feet bgs and instead of using a trowel to collect the sample, use a coring sampler with a non-plastic liner to collect an undisturbed soil sample. This method can be used for all surface soil sample types, including VOCs. A plastic liner may be used if the sample is not analyzed for organics. Describe how the liner will be sealed for sample storage and transport. If recovery is a problem, use the proposed method. After the surface soil sample has been collected, a trowel can be used to collect enough soil within or below the coring sampler depth for a field determination of headspace vapor. Please make all necessary changes in Section 6.3.4.3 (Procedure - Sampling with a Hand Auger).

b) Although it is acceptable to collect soil samples at predetermined depths, in addition, surface/subsurface samples should also be collected where VOC field monitoring devises register possible contamination and

subsurface samples should be collected at changes in lithology.

c) The Draft SAP states that the modified California or split-spoon sampler will be fitted with up to six individual sleeves. Indicate the length of the sampler that will be used as well as the diameter of the sleeves.

Please indicate that at least a 2 foot sampler (with four sleeves) will be used to collect soil samples when hollow-stem auger, air-assisted or mud rotary drilling methods are used (please make the necessary changes to Section 6.3.6.3 (Procedure - Mud-Rotary). Indicate that the next-to-the-deepest sleeve will be used for VOC analysis, when applicable.

d) The document proposes mud rotary drilling for the installation of monitoring wells. The problems associated with mud rotary drilled boreholes for the purpose of environmental groundwater monitoring can often outweigh the benefits. If elevated concentrations of contamination are encountered, the drilling fluid may become contaminated. If this occurs, contamination can be transported throughout the entire section of the borehole, in addition, large amounts of drilling fluids would have to be properly disposed. Monitoring wells constructed in mud rotary drilled boreholes can also be difficult to develop properly. If a monitoring well is converted into an extraction well, proper well development can be a significant factor to the efficiency of an extraction well.

In addition, it is often not possible to identify depth to groundwater using a mud rotary rig while drilling the borehole. It is recommended to implement either hollow-stem auger or air drilling techniques for as many monitoring wells as possible. The Draft SAP indicates that hollow-stem augers have been used for holes as deep as 180 feet bgs. Although it is acknowledged that depth to groundwater can be depicted using borehole geophysical logs, it is preferred to continuously core the borehole using one of the above recommended drilling methods. If collecting continuous cores is not feasible, then it is strongly recommended to collect drive samples at a minimum of every ten feet, at obvious lithology changes, and at least one at

the screened interval. Collecting soil samples will supplement the limited stratigraphic data, aid in later modeling efforts, and provide valuable information to evaluate the hydrogeology beneath the Station.

e) A screen slot size of 0.02 inch and #3 Monterey sand may not always be the appropriate choice for a monitoring well filter pack. An on-site sieve analysis should be preformed prior to well installation and before choosing a slot/filter pack size.

f) Provide detailed figures showing the construction of a typical auger, air drilled, and mud rotary drilled monitoring well.

g) Provide a figure showing all methods that may be used for surface completing of well heads.

h) The proposal for well annular concrete grout seals (with an optional 5 percent bentonite additive) from the top of the bentonite transition seal to land surface is not acceptable. It is strongly recommended to use a pure bentonite grout for the entire seal (top of filter pack to land surface). Concrete seals have a tenancy to shrink and crack, possibly creating a conduit to the water table.

10. <u>Section 6.4.11.3 Procedure - Field Filtration of Groundwater Samples</u>

Groundwater should be sampled and analyzed for total (unfiltered) and dissolved (filtered) metals.

For filtered samples, indicate that the manufacturer's guidelines for the discard volume for the type of filter to be used will be followed. Indicate that if manufacturer's guidelines are not available, the filter will be pre-washed with distilled water and a volume of groundwater equal to two times the capacity of the filtering device must be passed through the filter and discarded before samples are collected.

For unfiltered samples, indicate that extra precautions will be taken to minimize sample turbidity, including the use of very low-flow pumps for purging and sampling. Turbidity should be carefully monitored and reported along with the sample results. If necessary, filtered particles can then be analyzed by electron microscopy and/or x-ray spectroscopy

to further aid in the evaluation of whether or not the particles are actually mobile in the aquifer.

Draft Health and Safety Plan (HSP)

1. DTSC has reviewed the Draft HASP for compliance with Title 8, California Code of Regulations (8 CCR), Section 5192 (Health and Safety for Hazardous Waste Operations and Emergency Response) as well as other appropriate State and Federal Occupational Health and Safety Regulations. Please note that in addition to the requirements of 8 CCR, Section 5192, the employer is responsible for the implementation of an effective Accident, Illness and Injury Prevention program required by CCR, Sections 1509 and 3203; these requirements have not been addressed here.

2. Please add decontamination protocols for all sites (see 8 CCR, Section 5192(k)).

3. In Section 1.3.19, please indicate the rationale for Level C personal protection equipment; please note that the HSP states work will begin in Level D at other sites.

4. In Section 2.4, please provide details of the medical surveillance and training program (see 8 CCR, Section 5192(f)(1)(2)).

5. In Section 5.0, please specify who will conduct site monitoring; also specify calibration and documentation procedures (see 8 CCR, Section 5192(h)(1)).

6. In Section 7.1, please add emergency alerting and response procedures (see 8 CCR, Section 5192(8)(A)(I)).

7. In Section 7.6.1, please update the contacts for the Navy, i.e, Lt. Cdr. Larry Serafini is not currently stationed at MCAS El Toro.

8. An Industrial Hygienist from DTSC may perform a field audit in order to confirm the implementation of the HSP.

   DTSC is unable to foresee all potential health and safety hazards in the work-place by the review of the submitted HSP. Continuous surveillance of the work-site and creation of an effective health and safety program will reduce injuries and liability.

Our review of the HSP is not a guarantee that it will be properly and safely implemented. Our review is limited to indicating whether or not all the required elements of a HSP are present.

State of California

Memorandum

To: Mr. Joe J. Zarnoch
Department of Toxic Substances
Control, Base Closure Branch
245 West Broadway, Suite 425
Long Beach, California

Date: November 29, 1993

From: CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - SANTA ANA REGION
2010 IOWA AVENUE, SUITE 100, RIVERSIDE, CALIFORNIA 92507-2409
Telephone: CALNET 632-4130 Public (909) 782-4130

Subject: Marine Corps Air Station, El Toro, Comments on the Draft Phase II Remedial Investigation Work Plans

We have completed our review of the Draft Phase II Remedial Investigation Work Plan Volume I-III, Sampling and Analysis Plan, and Quality Assurance Project Plan dated November 9, 1993, which we received November 9, 1993. We are requesting that the following comments be forwarded with your comments to the Marine Corps/Navy on the Draft Work Plan and Sampling and Analysis Plan. We have no significant comment to forward on the Draft Quality Assurance Project Plan or Appendix A Data Quality Objectives.

General comment:

The work plans are designed to take the results of the Phase I investigation and apply the resultant risk (or appropriate factor) to determine the level and media for Phase II effort at individual sites. Our problem with application of a health based risk approach at this site is that the principle demonstrated threat is to an environmental receptor; groundwater. If you apply the Phase I data using the Marine Corps/Navy's modeling (or approach), it will not predict or explain the groundwater VOC plume as presently defined. Therefore, sources of the plume and possible other significant soil contamination, at depth associated with various sites are yet undiscovered. We are not certain and do not basically agree with the application that the resultant risk and Phase I data should be such integral factors in determining sampling locations (or depth) for the Phase II investigation.

Draft Work Plan
Specific Comments:

4.9.2.3 <u>Considerations on Physical tests and Vadose Zone Modeling</u>

Model boundary parameter sensitivity requires extensive known

data/information to base engineering/modeling assumptions on to predict site characteristics through modeling. This normally requires an extensive data gathering effort in order to input proper model boundary parameters. The Phase I Remedial Investigation data was collected prior to the proposal of using vadose zone modeling to predict site conditions. Phase II does not propose to collect data for modeling specifically necessary for the establishment of proper model boundary parameters.

4.10.2.3 Boundary Conditions
Gas Exchange Between the Lowest Cell and the Groundwater

We disagree with your assumption that the water table is impervious to gaseous diffusion. It is commonly held the opposite is true, VOCs move from groundwater into the unsaturated soils and/or from the unsaturated soils into the groundwater. As an example we understand that a groundwater VOC plume has been mapped at a Superfund site in Arizona using this phenomenon and near surface gas collection sampling.

4.10.2.4 VLEACH Assumptions
Preferred Pathways to Flow

It is known that preferred flow pathways exist in soils and that under MCAS El Toro soils in the unsaturated zone are not homogeneous; therefore, assuming these facts are not true, would not appear to us to be a reasonable approach.

Presence of Free Product

We strongly disagree with the assumption that no free product exists. Based on the compounds of interest, the size of the groundwater contaminant plume, and the fact that the Phase I drilling failed to identified the source of the groundwater plume (except Site 2), we can not agree with the assumption or the statement of Phase I supporting your assumption that no free product exists.

4.10.2.5 Input Parameters
reference: 4.10.4.5 Surface Recharge

The surface recharge rate appears to us as perhaps the most critical input parameter. In your limited discussion on the estimation of this value, which you vary from site to site, only annual rainfall is identified as the source of recharge. We believe that depending on where you are on the station, surface recharge is affected by other sources in addition to annual rainfall, such as: watering grasses and plants to

maintain landscaping, watering for dust suppression, irrigation to support agricultural operations (on and off base), and proximity to intermittent streams which often contain surface flows not resulting form rainfall which provide recharge. If this input parameter is one of the most sensitive, then reasonable data input is necessary, not an estimated recharge based only on one possible component; annual rainfall.

Draft Sampling and Analysis Plan (SAP)
Specific Comments:

4.2 Sampling and Analysis Plan by Site

The Remedial Project Manages (RPM) agreed when the Phase I work plans were approved that the first phase of investigation was not sufficient to determine no further action at any site. Therefore, we expected the Phase I investigation would be used as a guide for the Phase II investigation in economic and strategic placement of additional sampling. Later modification of the rationale determined including the RPMs into a site by site development of the work plan using data quality objectives to have consensus as the plans were developed. In fact, we have had several lengthy meetings in which various issues were settled, except only 2 sites were actually discussed for Phase II sampling. Although this SAP contains various components we believe are reasonable objectives and approaches, it also contains numerous sites in which strata will not have further investigation because you believe the Phase I investigation provided sufficient characterization. We are not convinced that sufficient borings or other appropriate investigative techniques have been completed at all sites for remedial design or to characterized the nature and extent of contamination, especially for deeper soils at numerous of the sites (example Site 6), which have no further sampling proposed in this SAP. Therefore, we can not concur that the SAP will complete the investigation necessary to support remedial decisions and complete characterize the nature and extent of contamination.

Procedurally we are surprised that site maps are not located within each site discussion. Additionally, we believe that maps which summarize the previous investigations data, followed by maps showing locations for proposed work would be useful within site discussions in visualizing the approach and whether completion of objectives will be achieved.

4.2.24.2 Phase II Remedial Investigation Design Groundwater

No borings are proposed for stratigraphic investigation or for enhancement of your understanding of the aquifer and relationships of water bearing zones to one another. Is your understanding of this system sufficient to warrant no additional investigation?

6.4.8 Pump and Packer Installation

If submersible electric motor driven pumps are installed as dedicated or used for purging only, we prefer the use of variable speed pump so that moderate low purging rates and very low sampling rates can be used when sampling for parameters which are sensitive to purging rates.

6.4.10.3 Procedure - Groundwater Sampling

No discussion of purging rates is included. We feel this is appropriate and should be an important component of the sampling plan. Several parameters commonly tested for are sensitive to purging rates and sampling rates. Rates must be considered to enable you to collect representative samples for the parameters which are sensitive.

John Broderick
Special Projects Section

State of California
MEMORANDUM

To: John Broderick
Associate WRCE
Santa Ana Regional Board
Riverside, Calif.

December 3, 1993

From: Cynthia Paulo, Industrial Hygienist C. Paulo
State Water Resources Control Board, DAS
(909) 782-4382 or (8) 632-4382

Subject: Review of Draft Health and Safety Plan for Marine Corps Air Station El Toro IRP Phase II RI/FS, El Toro, California

I have reviewed the above listed draft health and safety plan and the following are areas that should have additional comment or documentation (the reference regulation will be Title 8 Calif Code of Regulations, Section 5192). There may be items in this plan that do not comply with the referenced regulation. This review is not intended to substitute for a Cal OSHA inspection, and an inspection of this type may find and cite non-compliant issues.

There were no items found in this draft plan after the review that need additional comment or documentation.