N00296.001951
MOFFETT FIELD
SSIC NO. 5090.3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

November 10, 1993

Mr. Stephen Chao
Naval Facilities Engineering Command
Western Division
900 Commodore Way, Bldg. 101
San Bruno, CA. 94066

Re: Draft IRP Petroleum Sites (And Wastewater Tanks and Sumps)
Corrective Action Plan, dated October 1, 1993

Dear Mr. Chao,

The U.S. Environmental Protection Agency (EPA) has received the subject document and provides the following comments. The document was reviewed by Dan Stralka, EPA's Regional Toxicologist and Ken Eichstaedt of URS Consultants. Call me at 415-744-2383 if you have any questions.

Sincerely,

Michael D. Gill

Michael D. Gill
Remedial Project Manager
Federal and Technical Programs Branch

cc: Elizabeth Adams (RWQCB)
Ken Eichstaedt (URS)
Chip Gribble (DTSC)
Josh Marvil (PRC) (Fax)

Review Comments
Draft IRP Petroleum Sites (and Wastewater Tanks and Sumps) CAP (10/1/93)
Naval Air Station - Moffett Field

GENERAL COMMENTS

1. The Navy is to be commended for trying to find a solution to a difficult problem in risk assessment, namely calculating cleanup levels for TPH-contaminated soil and groundwater. This exercise is associated with substantial uncertainty, because TPH can contain a diverse range and unknown number of chemicals, while cleanup levels are typically calculated on a chemical-by-chemical basis. Hence, calculating one number to represent a safe level of TPH is difficult.

   The ideal solution to the TPH problem would be to collect chemical-specific data. This sampling could be focused only on certain petroleum-related indicator chemicals, such as BTEX, PAHs, and metals. This would eliminate the need to try to calculate health-based cleanup levels for TPH. Although additional sampling at the site(s) was not discussed in any detail (a data gap), it should be considered.

   The approach developed by the Navy is unproven and may not be, in all cases, health and environment protective. It is possible to imagine that unidentified hydrocarbons contained in the TPH may include chemicals of greater toxicity than those selected as representative by the person reviewing the chromatogram. It would be very useful for the Navy to compare cleanup levels developed using this new approach with those calculated by a more standard methodology. (For example, identify a dataset that has both TPH and chemical-specific data; calculate cleanup levels based on the TPH chromatogram and based on BTEX; then compare results.) This approach may not be sufficiently conservative.

2. One reoccurring problem throughout the document is that although objectives are routinely stated, the specific steps needed to reach these objectives are seldom defined in adequate detail. Hence, it is difficult to critique the approaches recommended in the document, since the necessary assumptions and essential steps are not present. Examples of this difficulty are presented in the specific comments section.

3. It is not clear that all potentially relevant guidance documents have been considered in this document. For example, there were no references to the EPA Region 9 or the Cal/EPA "Scientific and Technical Standards for Hazardous Waste Sites" documents. The Navy should consider these (and other) potential sources of information.

4. It is not clear which media are being considered for cleanup. While the Executive Summary discusses only cleanup levels for soil (pp. ES-1 and 2), Section 3.1.3 discusses

cleanup levels for both soil and groundwater. This document needs to be checked throughout for consistency. In addition, the criteria used to include or exclude a media from consideration need to be stated.

5. One of the stated goals of the document (Section 1.1, Purpose and Scope, and elsewhere) is to determine cleanup levels based on impacts to the environment. However, the remainder of the report never mentions how this will be accomplished. The only discussion of cleanup levels relates to human health. It is easy to imagine significant environmental impact from petroleum saturated soils, even if human health cleanup goals are not exceeded. The authors must explicitly state how their cleanup goals will address ecological concerns.

6. The Summer's Model is proposed to evaluate the potential for leaching of petroleum hydrocarbons and associated constituents into the groundwater. Because this model uses a number of simplified assumptions (i.e., homogeneous soil conditions, estimated values for K_{oc}, and organic carbon in the soil) to evaluate the fate and transport mechanisms, it is recommended that Preliminary Remediation Goals (PRGs) be developed using laboratory investigation of site specific soil leaching characteristics. The Summer's Model (a vadose zone model) may be appropriate to use to determine impact to ground water. But the situation at Moffet Field is such that the vadose zone is nonexistent or so small that it is of little significance in the attenuation of the contaminant fate and transport. Therefore, vadose zone modeling may not be applicable in this modeling effort. The treatment of the contaminant as a finite source may not be appropriate if the ground water contamination has not been well characterized. Each site needs to be evaluated individually to select the most appropriate modeling parameters for that site and the assumptions and rationale clearly stated.

   Soil samples should be analyzed for leachability using a California Waste Extraction Test Procedure (CALWET) or Toxicity Characteristic Leaching Procedure (TCLP) modified to simulate rainwater infiltration. This would allow comparison of the theoretical Summer's Model with actual field data.

SPECIFIC COMMENTS

SECTION 1.0 - INTRODUCTION

1. p. 2, para. 1, lines 2-3. The criteria used to guide the work products developed for this project are identified as federal and California regulations, water quality control plans, and California guidance documents. However, the guidance documents identified in this paragraph are not comprehensive of the available California guidance documents that may be useful in evaluating the sites. Specifically, the California regulations identify the necessity to determine the potential for current and potential beneficial uses of groundwater with respect to compliance with applicable policies for water quality control (23 CCR 2721.c and 2725.g). One of the guidance documents not presented is the SWRCB Resolution 68-16 anti-degradation policy. Since this policy forms the basis for

cleanup levels in the regulations and RWQCB water quality plans, it should be addressed and evaluated for potential use in the determination of groundwater and soil cleanup levels.

Although the regulations and guidance documents are identified, the lack of local requirements, applicable to the remedial actions addressed in this document, is apparent. Local agencies have historically conducted remedial activities for USTs under the auspices of their respective RWQCBs. Since many of the local jurisdictions have developed local UST ordinances, air pollution control rules, and adopted local fire codes to address construction and remediation activities proposed by the Navy, the local jurisdiction should be contacted to identify requirements applicable to the actions proposed in the CAP. Since these remedial actions are not within the purview of CERCLA, the applicable administrative and substantive requirements would apply to the proposed remedial actions.

SECTION 2.0 - SUMMARY OF INVESTIGATIONS

2. p. 6. It would be very illustrative to include a summary table like Table 17 from the Petroleum Characterization Report, dated 10/1/93 (Summary of Recommendations).

3. p. 7, para. 5, line 3. The CAP identifies the field work plan for Site 5 will be prepared for regulatory agency review. The definition of a field work plan should be included in the text.

4. p. 9, para. 4, line 2. The regulatory requirements for tank closures are identified as being contained in the California and federal regulations, Titles 23 CCR Chap. 16 and 40 CFR 280 respectively. The California regulations identify the local agency as the approving jurisdiction in the tank removal and reuse process, soil sampling procedures, and preliminary investigation phase (23 CCR 2672). The text should be amended to reflect the requirements and involvement of the appropriate local agencies.

SECTION 3.0 - CLEANUP GOAL APPROACH

5. p. 13, para. 2. It appears that many items will be added to the Final CAP (next submittal). Because there is no draft final version of this document, EPA has a concern that the many changes may produce additional substantive comments. It is important for this CAP to be finalized in a useable form. EPA hopes the Navy will be willing to work towards that same goal.

6. p. 14, para. 3, line 3. Title 23 CCR Chaps. 15 and 16 are referenced as the requirements for the evaluation of impacts to groundwater quality. Title 23 CCR Chap. 15 was not referenced as a requirement on page 2, paragraph 1. The applicability of 23 CCR Chap. 15 should be included in the Section 1.0 Introduction as an applicable regulation.

7. p.16, Figure 3. The evaluation of the hazard based only on the TPH measurements (shown on the left branch of the decision tree in this figure) is not appropriate due to the

lack of information in such a determination. A better flow path would be to reevaluate the sampling information, locations and results. This would be a reevaluation of the conceptual site model and the current level of information. If sufficient information has been collected to determine that there is no risk based on the detected chemical constituents, then this conclusion can be used to support a decision. If not, then this reevaluation will define data gaps that need to be filled and the risk managers can decide how to fill these gaps.

8. p. 17, para. 2, line 3. Petroleum cleanup levels are described as being based on a risk management approach, indicating only risk-based remediation goals will be developed. Although, risk-based remediation goals are an integral part of the assessment and the determination of cleanup levels, they do not constitute the sole method in the determination of remediation goals. The protection of groundwater issue for potential future beneficial uses and the SWRCB Resolution 68-16 anti-degradation policy has not been recognized or addressed in this document. Additionally, compliance with the regulatory requirements of Title 23 CCR 2721.c have not been presented or identified in the preliminary remedial goal process. These issues should be resolved or addressed prior to instituting future field investigations.

9. p. 17, Section 3.1.2. This section does not adequately describe what class (or classes) of chemicals within petroleum-related compounds are of potential concern. It would be useful if the document identified both the classes of chemicals from which indicator chemicals would be selected (e.g., paraffins, PAHs, metals), as well as specific chemicals within each class that may be present in TPH at the site. As the section is currently written, it is impossible to tell which chemicals will be evaluated. A table listing the chemicals would be helpful.

   Also, this section contains no discussion of possible lead contamination that may be present as a result of its use in fuel products. EPA does not currently have a toxicity value for lead, and it must be evaluated using a computer model recommended by EPA or Cal/EPA.

10. p. 18, para. 1, 4th sentence. The authors state that "by addressing the most toxic and mobile constituents, the risks posed by other chemicals should be simultaneously addressed." This approach is not necessarily true, and should be reevaluated at this site. For example, certain chemicals, such as benzene, may migrate from a petroleum spill, while high lead concentrations may remain in the soil. If one were concerned with just the most toxic chemical, presumably benzene, it would be possible to overlook lead contamination in the soil.

11. p. 18, para. 1, last sentence. This sentence states that petroleum cleanup levels "will be based on an individual constituent basis when possible..." It is not stated, however, which individual chemicals will be evaluated. It is certainly possible that analytic results of petroleum residues could turn up a large number of individual constituents, yet the calculation of it is unlikely that cleanup levels would be developed for all of those potentially present and identifiable. The Navy should be more explicit about which chemicals they intend to target as analytes and to calculate cleanup levels for. All

detected chemical constituents should be included in the risk evaluation which will not increase the length of the analysis appreciably but will present a complete representation of the site.

12. p. 18, para. 2 and 3. The text discusses how degradation will reduce the concentration of petroleum constituents at the site. However, it is not clear how the concept of degradation will be used in evaluating site contamination and developing cleanup levels. Will future sampling include evaluating possible TPH metabolites? Will cleanup goals be developed for degradative metabolites? The report should explicitly state how degradation will be incorporated into cleanup goals for the site.

13. pp. 18-20. As noted, it is difficult to develop cleanup standards for a mixture such as TPH. The authors have suggested using an approach based on the number of carbon atoms for the predominant chemicals present on a chromatogram. An alternative approach worth considering is to use the provisional toxicity factors developed by EPA for several different petroleum mixtures. In March, 1992, EPA published a memo presenting provisional RfDs for gasoline, JP-4, JP-5, and diesel fuel, as well as a cancer slope factor for gasoline.[1] If the original source of environmental TPH is known (e.g., a leaking JP-4 tank), it may be appropriate to use the provisional toxicity value developed for JP-4.

14. p. 20, para. 2. The distinction between PRGs and RBCs is unclear. It is important to clearly define each term, since for some chemicals the PRG and the RBC will be the same, while for other chemicals they may differ. For example, the RBC may differ from the PRG when the RBC is below background levels or the limits of detection. It would also be useful to identify what criteria will be used in determining when the RBC will be the same as the PRG and when they will differ.

15. p. 20, para. 3. The acceptable risk levels used to calculate the PRGs must be explicitly defined in this section. Although "acceptable risk levels of 1×10^{-4} to 1×10^{-6} will be considered", a more specific target risk level should be stated. As recommended by EPA, acceptable risk levels are 10^{-6} for carcinogens and a hazard index of 1 for noncarcinogens. In addition, if both a carcinogenic and a noncarcinogenic risk-based PRG are calculated for a particular chemical, then the lower of the two values is considered to be the appropriate risk-based PRG for any given contaminant. A discussion of these criteria should be included in the text.

16. p. 20, para. 3. This section needs to be much more explicit in describing what PRG equations and exposure assumptions will be used in calculating cleanup levels. The report indicates that "Risk-based PRGs and RBCs ... will be calculated using equations presented in RAGS (EPA 1991)," and that "exposure parameters will be consistent with the results of the land use study." Since at the most two media (soil and groundwater)

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[1]. Letter from Ms. Joan S. Dollarhide, Associate Director of the Superfund Health Risk Technical Support Center, to Ms. Carol Sweeney, EPA Region X; Oral Reference Doses and Oral Slope Factors for JP-4, JP-5, diesel fuel, and gasoline; dated March 24, 1992.

and only two populations (residential and occupational) are discussed, it should be possible to identify what equations and exposure assumptions will be used. EPA has developed numerous standard default exposure parameters that are recommended for risk-based cleanup goals. Lacking this information makes it impossible to adequately review the approaches presented in the report.

17. pp. 20-21. Various possible land use scenarios for future users of the site are discussed with the suggestion that an occupational scenario may be used to develop cleanup levels for portions of the site, depending on the results of the land use study. As done in the RI's, EPA requires that the future residential scenario be evaluated unless specific criteria, such as deed restrictions, make this option unlikely. It is not clear from the text what decision points will be used to justify future occupational use of the land. The Navy should evaluate future residential and future occupational land use scenarios, so that both evaluations can be used to assist in risk management decisions.

18. p. 21, para. 1. The text states that the PRGs will be compared to soil saturation values. It would be useful to define what a soil saturation value is and how it is used in this application. It is doubtful that a PRG of 100,000 ppm (10%) will be defensible, even if risk-based calculations indicate it is acceptable from a human health standpoint. Other criteria, such as ecological risk, should be considered in cases where chemicals present relatively low human health risks.

19. p. 24, "Step 1", line 4. The statement "... and will follow state guidance (such as those in Title 23 CCR Chapter 16)." is incorrect. This is a California regulation and not guidance. Recommend replacing the word "guidance" with regulation.

SECTION 4.0 - FEASIBILITY STUDY

20. p. 26, para. 2. Establishment of petroleum cleanup levels based on SWRCB Resolution 68-16 is not considered. Although the resolution presents narrative goals, the policy establishes the basis for the numerical cleanup levels or water quality standards in the RWQCB water quality control plan for the basin and Title 23 CCR Chap. 15. These issues should be addressed and resolved prior to future field investigations.

21. p. 28, para. 2, line 8. The issue of RCRA hazardous waste classification and disposal to a RCRA landfill is presented. The discussion should be expanded to include California hazardous waste classification and the landfill disposal options.

EDITORIAL COMMENTS

1. p. 7, Section 2.1, para. 1. Plate 1 does not appear in this report.