

## MEMORANDUM

**TO:** Steve Chao  
**FROM:** Peter Strauss, MHB Technical Associates  
**DATE:** 3/21/95  
**SUBJ:** Comments on OU5 Draft Final Feasibility Study and Upcoming Agenda for April RAB

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Enclosed are my comments, on behalf of the Silicon Valley Toxics Coalition that address the Navy's Draft OU5 Feasibility Study. Please note that I serve as Technical Advisor to the Silicon Valley Toxics Coalition (SVTC), recipient of a Technical Assistance Grant from the U.S. EPA.

This comment is divided into three sections:

- 1) Specific points which I recommend for discussion at the April RAB meeting;
- 2) Comments on Navy Responses to Previous MHB Comments;
- 3) General Comments; and,
- 4) Specific comments and/or questions

### RECOMMENDATIONS FOR TECHNICAL DISCUSSION AT APRIL 1995 RAB.

1. As part of the discussion concerning OU5, please be prepared to discuss the following topics:
  - a) the basis for the definition of the buried sand channels, including figures for each of the three layers showing the data points by which the channels were defined;
  - b) how well constrained the channels are, and what information is used to support any conclusions;
  - c) the extent that the channels are the primary contaminant pathways (provide a figure for each layer showing sand channels and concentrations of chemicals and discuss why it is the Navy's belief that these channels are the major pathways);
  - d) downgradient monitoring (from treatment arrays) that will be installed or used to verify that the treatment cell is working;

- e) what would be the contingency plan if the reaction cell technology does not work;
  - f) how total petroleum hydrocarbons will affect the arrays, and how they plan to be remediated;
  - g) any documentation, results, or other data that demonstrates the effectiveness of the proposed treatment system;
  - h) whether the Navy has considered using a dual system, whereby pump-and-treat is used for treating the highest concentrations of chemicals, and areas of low concentrations are treated by reaction cells technology (this may include piping contaminated water to the MEW regional treatment facility).
2. Please place on the agenda for each RAB meeting a technical update of information discussed at the monthly project managers meetings. This was agreed to at the Technical Review Committee, and it would be helpful for the discussions at the RAB. As was discussed during earlier TRC meetings, there are discussions, and decisions made during project managers meetings which are not shared with the public.
3. Please include a discussion of two topics that have recently been the subject of correspondence between MEW and EPA concerning contamination north of Highway 101: the first being the Navy's charge, and MEW's denial that there is DNAPL emanating from the MEW plume; the second being MEW's claim that it cannot design a remedial system for the regional system north of 101 until the Navy takes responsibility for contamination at expanded Site 9, and has properly characterized it. Please discuss the nature of these controversies, and what the implications are for clean up and the timing of clean up.

#### NAVY COMMENTS OF FEBRUARY 16, 1995

1. The Navy responds to MHB Comment 1 that "land and aquifer use evaluation was conducted in accordance with EPA recommendations." Has Region IX of EPA ever recommended the type of evaluation presented, and if yes, please provide copy of the Regional guidance. Additionally, does Region IX agree with the Navy concerning the land and aquifer use evaluation contained in the report. If yes, please provide a written confirmation.
2. In response to MHB Comment 3, the Navy replies that the Navy Channel and the Building 191 lift channel act as hydraulic control points for the OU5 plumes, and any discharge would pass through a permitted outfall. I have several questions regarding this comment.

First, it appears from maps that both the northern plume or the southern plume would discharge into the Navy Ditch. This would lead to the assumption that the discharge would pass through the Building 191 outfall, so long as the barrier separating the Navy Ditch from the Navy Channel

maintains its integrity, and the contaminated groundwater does not enter the Bay by a sand channel that is deeper than the Navy Ditch. Please describe maintenance activities which will ensure the integrity of the levee separating the Ditch from the Channel, and the depth of the plumes as opposed to the depth of the Ditch. Is there enough evidence to conclusively state that the northern plume or the southern plume would pass through the Building 191 outfall? This determination would involve the A1 and A2 aquifer. Please describe data used to reach this conclusion.

Second, is the non-point discharge to the Navy Ditch a permitted source? Please inform me of the type and nature of the permit, and specify the discharge requirements to the Navy Ditch, and the date of the NPDES permit.

Third, I am under the impression that the discharge requirements from Building 191 are the MCLs, based on the Building 191 Evaluation, Draft Technical Memorandum of November 8, 1994. Therefore, it would be logical to apply the same standard to any non-point discharge. Please respond as to the Navy's plans concerning these permits.

Additionally, the original comment asked the Navy to provide:

the model results of PCE/TCE/DCE/DCA/vinyl chloride plume for the next five years [emphasis added]. Provide information concerning the transformation of these chemicals in this analysis. Little information is available to us on how rapidly these chemicals are broken down in this environment, and whether the attenuated TCE plume creates a larger problem because of its more toxic breakdown by-products. Please provide this information in table and figure format so that it is accessible to the public. This will help to understand what would occur under a treatability-delay scenario, and would help us to understand the effects from adopting Alternative 2, Alternative 3, and other remedial options.

Although the Navy has modelled the long-term transport of the TCE/DCE contamination with and without pump-and-treat, we seek information on what happens if the VOCs are not treated and flow into the Bay.

Additionally, as a general comment related to the modelling approach, the results, although useful to show approximate levels in 50 years, make assumptions to support the finding that a pump-and-treat method would not make a measurable difference. This includes the assumption that no chemical or biological degradation occurs during 50 years. Some results are counter-intuitive, such as some contamination being more concentrated after 50 years of pump-and-treat (see Specific Comments below).

3. In Response to MHB Comment 5, the Navy continues to take the position that because the OU2-East (soils) ROD adopted a no-action alternative, it is no longer important to consider the contribution from leaching and migration of contaminants in the soil. However, I note that Table 2 of the OU2-ROD provides examples of just why we should be concerned. For a

future residential scenario in which groundwater use is included, the risk assessment falls below EPA standards at Site 3 (ILCR of  $1.34 \times 10^{-3}$ ), and it falls just inside EPA's acceptable range (ILCR of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ ) at Sites 4, 7 and 10. I also note that the State of California's point of departure for an acceptable risk is set at an ILCR of  $1 \times 10^{-6}$ . Therefore, I believe that it is incumbent upon the Navy to factor in leaching and migration from soil overlying OU5. Also, I note that the OU5 RI, states that sources for TCE at OU5 include "soils at Site 4, soils near Site 7, and soils near Site 19" (p. 7-3).

4. MHB Comments 7 and 9, which suggest that any remediation strategy account for degradation products of the PCE-TCE chain, and that a remedial action objective (RAO) be included which minimizes the development of Vinyl Chloride due the presence of TPH. In response, to the Navy states that all remedial strategies account for the degradation of chlorinated VOCs, and that petroleum sites are being addressed separately. Further, the response adds that degradation of VOCs to vinyl chloride "may actually enhance groundwater remediation rates". This may be true to some extent, but the problem is that at this time the Navy has not alleviated the concerns over these by-products.

In order to make these statements, I believe the Navy needs to provide analysis of the fate and transport of the breakdown products. The transport model described by the Navy in Appendix E assumes no chemical or biological degradation, and does not include results for vinyl chloride. I also do not believe that the effects of TPH on the VOCs are modeled. Without such analysis, the Navy cannot address SVTC's concerns about vinyl chloride. Furthermore, unless it can be shown that vinyl chloride, which is a known carcinogen, will degrade quickly, or will be present in very small quantities, I still think that the Navy should include as a Remedial Action Objective (RAO) minimizing vinyl chloride development because of TPH.

5. In response to MHB Comment 13, the Navy implies that it cannot develop a strategy that addresses desorption because it would be expensive to implement and raise environmental concerns. The Navy needs to be more specific in its response. For instance, what technologies or strategies were looked at? What were the environmental and economic costs? Merely stating that a strategy would be too expensive is not a sufficient answer.

#### GENERAL COMMENTS

1. The Navy's response to EPA Comment 6 is unacceptable to the community. It has been made clear in previous discussions with the Navy that all parts of Moffett, except for the wetland areas, would be analyzed for future residential land use, and that this would be the standard used for the base. The Navy seems to be backing away from this position, by only analyzing an occupational scenario.

As I have mentioned in previous comments regarding this OU, the aquifer meets the definition of SWRCB Resolution 88-63, and it must be treated as if it were a potential drinking water source. As previously stated, land-use considerations should not be dependant on NASA's "Comprehensive Use

Plan", which only poses future "concepts" for using the facility, and recommends one that is "indicative of the type of activity that *could* be found at Moffett Field in the year 2010 [emphasis added]." This statement is very equivocal, and the document has no legal force. A good example is the proposed closure of Onizuka. This may increase the residential use potential of Moffett. Ultimately, the primary movers in determining the future use of Moffett should be members of the surrounding communities and local governmental institutions.

As Appendix C states, the level of acceptable risk is based on the concept of reasonable maximum exposure (RME), and is "highly dependent on the particular exposure scenario expected at the site...Risks based on residential exposures may be one or two orders of magnitude higher than RME risks estimated for occupational exposures...".

While the Navy notes that the groundwater in the southern plume will be cleaned up to maximum contaminant levels (MCLs), they are not set solely on the basis of risk. Economic and political considerations influence how the MCLs are set. For example, if one were to use the PRGs developed by EPA as guidelines for acceptable levels to determine risk often have a different, and more stringent cleanup level. Since the Silicon Valley Toxics Coalition (SVTC) and its Community Advisory Board (CAB), and apparently EPA, believe that the residential exposure scenario should be used to estimate risks, I ask that the Navy revise this section of the report. It should be made clear, with no equivocation, that groundwater cleanup standards will meet residential standards. Thus all of OU5, except for that aquifer zone which does not meet the drinking water criteria established by the state, will meet residential standards. Elimination of Appendix C is suggested.

Lastly, in the discussion of potential land use, there is no mention of reasonable possibilities such as: the airfield stops operating, thereby not needing drains and pumps. This would lower salt water intrusion and TDS in the water, and would make the shallow aquifer more likely to meet potential state drinking water supply criteria. I request that the Navy include an analysis of this possibility.

2. The permeable cell and iron curtain technology which the Navy favors seems very dependent on accurate characterization of the contaminant plume and of the sand channels. I note that the proposed method Comparing Figures 1-6 and 1-7 with Figures 6-1 and 6-2, I can detect that some of the highest levels of TCE and DCE lie outside of the sand channels. Is it the Navy's opinion that the contaminants will necessarily flow towards the defined sand channels? As suggested for the RAB meeting agenda, I believe that Navy must address the following points:
  - a) provide the basis for the definition of the buried sand channels, including Figures for each of the three layers showing the data points by which the channels were defined;
  - b) Provide a discussion on how well constrained the channels are;

- c) Show the extent that the channels are the primary contaminant pathways. Provide a Figure for each layer showing sand channels and concentrations of chemicals. Please discuss why it is the Navy's belief that these channels are the major pathways;
  - d) Please describe downgradient (from treatment arrays) verification monitoring that will be installed.
3. The chemical reaction cell treats many areas where petroleum-related constituents are commingled with VOCs. The text states that "This technology will not reduce petroleum-related constituents" (p. 102). However, the final IRP Corrective Action Plan for petroleum sites states that "Groundwater under the eastern portion of Moffett ... is being addressed through the operable unit 5 (OU5) ....petroleum-related groundwater under the eastern portion will be addressed in this CAP, except in areas where commingling with other contaminants (such as VOCs) has occurred." (p. 4). Please explain how petroleum-related constituents commingled with VOCs will be treated under this FS.
4. It appears that a concept of "dual treatment" warrants a critical examination. I think this is warranted for several reasons, including that the reaction cell technology is unproven; that the sand channel definition appears to be uncertain; and that high concentration groundwater would be traveling through low concentration areas, thus potentially creating a larger problem than one that already exists. Dual treatment would mean extracting high concentration groundwater and treating it through traditional methods (such as air stripping), and treating the low concentrations by the reaction cell method. This could entail using the MEW regional plume treatment system, as NASA has proposed to do with groundwater extracted near Site 8.

#### SPECIFIC COMMENTS AND QUESTIONS

- 1. Regarding Figure 1-2, please add to the legend an explanation of the areas bounded by small x's. Also please add the location of Building 191 on Figure 1-2 and other maps which define the plume.
- 2. Referring to Appendix C, please explain medical terminology used in 1.2.6. Also define the following:
  - a. Carcinogenic Slope Factor (CSF), and the general types of assumptions that are used to derive this figure;
  - b. CNS;
  - c. General assumptions that differentiate California risk based concentrations and EPA RBCs.
- 3. On p. 24, the statement that because a no-action remedy was selected for OU2-East, the "unsaturated soils are not a source of OU5 contamination" was changed to read "unsaturated soils do not appear to be a source of OU5 contamination". Although this statement has been qualified, I still believe that the Navy cannot infer this from the OU2-East ROD. The ROD states

that OU2-East soils overlying OU5 are not in themselves a health risk. However, these soils could contribute contaminants to the groundwater (although if the models are correct, not at levels by themselves which would constitute a health risk). Sorption and desorption are key factors in determining the level of contamination in the groundwater. Sorbed VOCs in saturated zones, as well as those in unsaturated zones, could contribute to groundwater contamination, and both must be considered together as potential sources.

Additionally, no information is provided in the FS about the location of the sorbed VOCs relative to ground level. If there is information available, please include in the final FS.

4. The draft states that 1,1-DCA is a degradation product of TCE. Please identify any attributes which may enhance this transformation. Should the potential transformation be considered in any remediation strategy?
5. Referring to Appendix E, Figures E-15 and Figures E-18, please explain how some of the concentrations of TCE increase after 50 years of pump-and-treat, as opposed to no action.

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