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MOFFETT FIELD
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23 JAN 1989

Mr. Glenn Kistner
Remedial Project Manager
U.S. Environmental Protection Agency
Region IX
215 Fremont Street (T-4-5)
San Francisco, CA 94105

Subj: COMMENTS ON THE MIDDLEFIELD-ELLIS-WHISMAN AREA FEASIBILITY STUDY

Dear Mr. Kistner:

Enclosure (1) provides the Navy's comments on the Middlefield-Ellis-Whisman (MEW) Area draft Feasibility Study (FS) prepared by Canonie Environmental dated November 1988.

In the remediation alternatives presented, several proposed recovery wells are located on Naval Air Station (NAS), Moffett Field. These recovery wells may impact existing conditions on our facility as well as potential remedial action(s) the Navy might undertake. Coordination with NAS Moffett Field regarding the placement of these wells has not taken place but is crucial to the implementation of the proposed remedial action.

Should you have any questions regarding this matter, the point of contact is Commander, Western Division, Naval Facilities Engineering Command (Attn: Ms. Kathy Nakazawa, Code 1811KN, (415) 877-7505).

Sincerely,

Original signed by:

Louise T. Lew
Head, NPL Section

Encl:
(1) Comments on MEW Feasibility Study

Blind copy to: 18, 18A, 181, 1811, 1811KN, 09C5, OOD, Admin Record
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COMMENTS ON MEW FEASIBILITY STUDY

GENERAL COMMENTS

1. Unlike other FS reports, this report does not present supporting engineering calculations on treatment sizing, pumping requirements, simulated drawdown cones, or construction materials and methods. As such, the document is generic in nature and essentially requires the reader to assume that the black box system is optimal.

2. The report does not present specific design information for water treatment, soils aeration, and several other alternatives discussed. Without this fundamental information, it is impossible to critique the authors conclusions.

3. A ground water model is not specified, and pumping specifics (e.g., rate, duration, equipment) are not provided.

4. Off site remediation is mentioned throughout the document in a cursory manner, yet a number of pumping wells are shown on NAS Moffett Field property and a treatment system is shown on NASA property. How was the information gathered in the NAS Moffett Field Remedial Investigation incorporated into the treatment designs and ground water extraction schemes?

5. The document does not present information as to the potential timing for installation of off site or on site remediation. Due to other investigations currently ongoing, extensive coordination is needed. To date, what coordination is proposed?

6. It was difficult to determine if the unsaturated zone model is accurate without supporting calculations. In addition, how is differentiation made between vapor phase transport and liquid phase transport?

EXECUTIVE SUMMARY

1. ES-1. Uncontrolled sources are cited as present and impacting potential remediation. These sources are not clearly defined in the text nor are their impacts.

2. ES-1. It is stated that the FS is designed to adequately address unknown or uncontrolled sources of pollution. No reference was found in the text that presents how uncontrolled sources are handled in the FS design process.

3. ES-2. Chemicals have been detected in all 5 aquifers. Was there any investigation as to the vertical distribution of chemicals in any of the aquifers, particularly the C aquifer?

4. ES-2. How was the total volume of TCE, TCA, etc. calculated? This was not described in the text.

5. ES-3. Shallow aquifers beneath the site are cited by the RWQCB as being a potential drinking water source. This argument appears unfounded since the general water quality is poor and the aquifers thin, discontinuous, and low yielding. How much potential does EPA or RWQCB see for the shallow aquifers being utilized as a drinking water source?

6. ES-5. The upper foot of soil is not considered for remediation based on health risk. Was potential leaching of these materials and subsequent conentrations in lower zones considered?

7. ES-7. Throughout the document, maintaining an inward and upward hydraulic gradient is discussed. However, calculations on how much water should be pumped to establish this gradient or exactly what minimum magnitude of the gradient is necessary but not presented.

CHAPTER 1

1. P12. Recent ground water extraction from within the slurry walls is presented. There does not appear to be any reference in the text as to the quantity of water being pumped or the quality of effluent. This type of information is critical in evaluating appropriate remedial alternatives. No reference is made as to the established NPDES levels to Stevens Creek or to the POTW. This information is vital in establishing cost effective disposal options.

CHAPTER 2

1. P-17. Three additional recovery wells were added in 1985. What was the rationale behind their installation? Where are they? Do they all couple into one treatment system? If so was the original system redesigned? Where is the treatment system?

2. P-17. Twenty-one (26?) recovery wells are apparently now operating. A schematic of the operating system(s) is essential along with design details and rationale. None of this information is provided making a good review of additional pump and treat scenarios difficult.

3. P18. Three stripping towers are said to treat some portion of the recovered water. What portion goes to the POTW and to Stevens Creek?

4. P22. The Raytheon slurry wall is said to partially penetrate the B2 aquifer. Why was the wall keyed into permeable materials?

5. P23. 1,300 lbs. and 230 lbs. of VOCs were removed from two plots. What percentage recovery of VOCs was achieved?

6. P24. In-situ tests apparently suggest an effective radius of influence of 40 feet for venting wells. The specifics of these tests were not presented. What were the physical soil properties? Soil moisture and temperature? Total concentration of chemicals in the soil? Generally, in the fine grained soils, vent wells are placed on 5 to 10 feet centers. Although it is not possible to check the authors' calculations, previous experience suggests that the vent system as given may not be adequate.

7. P26. The slurry wall around Fairchild building 9 appears to be built through a highly contaminated area. Why? (See figure 2-1.6)

8. P27. Metals have been detected in the ground water but are essentially discounted because of the statement: "Metals... are not very mobile in ground water ...". The presence of metals in the soils and ground water should be considered in the design of treatment alternatives. Metals present in the high ppb range may have adverse affects on potential treatment options such as biological reactors and promote scaling in air stripping towers.

9. P33. Chemical concentrations were detected in Stevens Creek. What were the concentrations of these chemicals? How were these chemicals addressed in NPDES permitting at the site?

10. P33. How were the synergistic and antagonistic effects of the various non target chemicals addressed when designing water treatment systems? For example, is fouling of the aeration tower packing material due to high levels of inorganics a potential problem at the MEW remediation area?

11. P34. Chemicals detected in samples below 10X or 5X associated field blanks are reported as non-detected. Which specific compounds other than the four chemicals listed fell under the 10X rule? On what basis was the 5X rule chosen?

12. P36. The mobility of metals is again mentioned yet there is no discussion on the redox potential, precipitation or exchange of these chemicals in the presence of soil components such as humic acids. Lead for example can be solubilized by some naturally occurring acids and some lead compounds produced are classified as soluble. If lead is able to come in contact with estuarine benthic microbes through surface water transport or shallow ground water flow, these microbes can methylate lead to form tetramethyl lead which is volatile and more toxic. Although situations like the one described are not common, a more comprehensive review of metals contamination should be considered.

CHAPTER 3

1. P54. In paragraph 2, soil remediation levels are left open, yet all remedial alternatives are based on 1 ppm and 0.5 ppm TCE cleanup levels. This apparent inconsistency needs clarification.

2. P57. The federal pre-treatment guidelines for toxics of 1.37 ppm from manufacturing facilities would be relevant only if the local treatment works would agree to use this guideline.

CHAPTER 5

1. P92/106. In-situ biological treatment is considered only to a very limited extent. Specifically, the authors address biodegradation in an undisturbed state. Further they discount this option quickly by citing a single study performed by Stanford University. No significant conclusions were drawn from this work.

   Aerobic biodegradation can be performed using an above grade landfarming technique. This technique is very successful with aromatic hydrocarbons and would augment soil aeration. The technique can be used with similar farm equipment employed by the aeration alternative. Although biodegradation alone is not a plausible solution, biodegradation using marine bacteria, sewage sludge or some strains of soil bacteria can enhance the removal of chlorinated alphatics sorbed to the soil matrix and should be considered.

2. P95. On site treatment options deal exclusively with volatile compounds. The extracted water stream will contain numerous other chemicals such as iron, magnesium, calcium carbonate, and heavy metals. These compounds must be treated prior to entry into an aeration tower to prevent fouling and to promote treatment to the limits set. Treatment units including precipitation tanks and mixers, in line filtration, and multimedia filtration should be addressed.

3. P101. The chemical characteristics listed are properties associated with volatilization and sorption. Characteristics such as pH, TDS, BOD and TSS need to be quantified prior to design of water treatment works.

4. P103. The contention that additional surface capping would have a minimal influence on infiltration should be supported by calculations provided in the document.

5. P104. It is contended that excavation would require demolition of several buildings. Which buildings?

6. P105. Limited space available for stockpiling soils is given as a reason to discard excavation, yet landfarming soils for volatilization of organics is passed through for consideration. If space is limited, where would the above grade landfarming be accomplished?

7. P108. Aeration is described as not being effective on phenol. However, no treatment method is offered for phenol in lieu of aeration. Why?

8. P108. What constitutes successful dewatering? (para 4). If vapor extraction is to be successful, what is the maximum residual water content in sandy soils? cohesive soils?

9. P108. Adverse settling due to dewatering was encountered. What was the magnitude of this settlement? Why was this situation not reviewed in Chapter 9 with respect to the long term pumping scheme?

10. P108. It is stated that settling will not affect slurry wall integrity. Were calculations performed to support this contention?

11. P109. The report claims that in-situ aeration is applicable to soils beneath buildings. It is not clear from the supplied figures how soils beneath buildings are being remediated.

12. P109. What are the serious concerns about steam injections?

13. P109. What are the potential adverse effects of steam flushing? They are not presented in the discussion.

14. P112. The arguments that flushing may increase the boundaries of chemical-bearing ground water and that the flow injected water cannot be controlled are not valid. If injection wells are properly placed upgradient of the plume and extraction wells placed downgradient, a closed loop system can be maintained. Flushing increases the hydraulic gradient and can substantially reduce remediation time. Further, flow controllers connected to sensors in monitor wells can maintain a predetermined hydraulic head.

15. P112. It is stated that it is unlikely that enough water could be injected to alter the piezometric surface. This argument contradicts the previous statement regarding complex stratigraphy. The aquifers are low yielding, discontinuous and relatively thin bedded. All of these physical characteristics suggest an induced head could be applied. Were calculations performed or a flow model used to show the effects of water injection?

CHAPTER 7

1. P160. An 80 foot square grid would be required according to section 7.2.1.2. Earlier in the report, a 35 foot spacing was presented. Which is correct?

2. P160. In figures 7.2-1 a-c, extraction wells are shown but air inlet wells are not shown. The text describes inlet/extraction wells. Is this a pump in, pull out process or just vapor extraction?

CHAPTER 9

1. P260. Stevens Creek is proposed as the ultimate receptor for treated ground water although it is not specifically stated in this chapter. How will the added flow affect the stream channel?

2. P260. Have channel hydraulics been modelled using the HEC-1 or similar flood routing scheme to ensure that the added water will not create a local flooding problem?

3. P245. Seven tenths of a pound of TCE is considered to be de minimus. How is this value calculated (weight or volume basis)? What criteria is used for determining the volume or weight to test?

4. P245. How was the pumping scheme outside the slurry walls designed to ensure that an upward gradient is maintained inside the slurry walls? If the ground water surface is sufficiently suppressed outside the walls then inside pumping is negated.

5. P260. Why are only B1 and A aquifer wells proposed offsite in the downgradient direction?

6. P260. What is the rationale for placement of wells within NAS Moffett Field? Was flow modelling performed?

7. P260. Since chemical transport modelling was accomplished in only two dimensions, how were the effects of drawdown of chemicals through shallow aquitards considered?

8. P261. Air stripping and activated carbon filtration are listed as treatment components. Will these systems require continuous monitoring?

9. P261. What are the estimated carbon use rates and packing life spans? What other components comprise the treatment systems? How much area will be required?

10. P261. How will utilities be handled for the off site systems?

11. P266. What is the rationale for the placement of the three "C" aquifer wells? What are the proposed pumping rates? Will the higher volume pumped from the "C" aquifer have a tendency to dilute the waste stream from the lower yielding upper aquifer wells? If so, what is the expected average concentration of chemicals on the influent side of the air stripper?

12. P267. The Operation and Maintenance costs are not well defined in the appendices. How was the 2.9 million dollars of annual O & M derived for the off site remediation scheme? How many treatment systems are included in the off site program?

13. Figure 9.2-4. Some fairly extensive piping is shown on NAS Moffett Field property. How would this piping be installed? Have the numerous subgrade utilities on the facility been factored into the estimated cost?