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MOFFETT FIELD
SSIC NO. 5090.3

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

May 26, 1993

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

Re: Draft OU5 Remedial Investigation Report, dated April, 1993

Dear Mr. Chao,

The U.S. Environmental Protection Agency (EPA) has received and reviewed the subject document. The technical review of the non-Baseline Risk Assessment (BRA) portion of the report was performed by SAIC/TSC Geologist Richard Brown. The technical review of the BRA was performed by EPA Environmental Scientist Dan Stralka and SAIC/TSC Environmental Scientist Naomi Feger. EPA has three major issues with this report:

- The document tends to be confusing; only "selected" data are presented for certain wells. It is unclear which sampling rounds were used to determine the average concentrations in the risk assessment and the validation. Additionally, the discussion of background risk is missing and inappropriately applied background discussion is presented instead. The Navy should demand a Remedial Investigation (RI) for OU5 that is both sufficient for determining how to proceed with remedial action on this site and consistent with past RI documents. Many of the comments to follow were presented and discussed for OUs 2 and 4 during meetings in the summer and fall of last year.

- The analytical laboratory was often unable to attain the contract required quantitation limits (CRQLs), especially for metals at certain sites. This inability to attain CRQLs on many of the samples is not explained anywhere in the report. Furthermore, the listed CRQLs for several of the compounds are above the proposed or the existing EPA maximum contaminant levels (MCLs). The Navy should keep abreast of the most current applicable, or relevant and appropriate requirements (ARARs), both federal and state of California.

- Groundwater contamination from metals is discussed to some extent but then appears to be dismissed without presenting any logical interpretations or conclusions. The potential for these metals to migrate to the salt evaporation ponds and adjacent wetland areas on the north end of NAS Moffett Field, and eventually into San

Francisco Bay, should be addressed in Operable Unit 6. The potential adverse effects to environmental receptors, resulting from groundwater contamination due to metals, should also be discussed in the Nature and Extent of Contamination section. Furthermore, the contamination to groundwater and surface waters due to leachate from Sites 1 and 2 should be addressed in the Chemical Fate and Transport section of the report.

Attached are the comments in more detail. Please 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

Attachment

cc: Elizabeth Adams (RWQCB)
Fred Molloy (SAIC)
Jeff Pile (IT)
Cyrus Shabahari (DTSC)

TECHNICAL REVIEW OF
THE NON-BASELINE RISK ASSESSMENT ISSUES
DRAFT REMEDIAL INVESTIGATION REPORT
OPERABLE UNIT 5: EAST SIDE AQUIFERS
NAVAL AIR STATION, MOFFETT FIELD
MOUNTAIN VIEW, CALIFORNIA

GENERAL COMMENTS

1. According to the analytical data tabulated in Appendix B, the analytical laboratory was often unable to attain the contract required quantitation limits (CRQLs), especially for metals at Sites 1, 2 and 11. This inability to attain CRQLs on many of the samples is not explained anywhere in the report. Some discussion as to why the CRQLs were unattainable should be presented.

   Furthermore, the listed CRQLs for the following compounds are above the proposed (1/94) or the existing EPA maximum contaminant levels (MCLs): antimony (6.0 μg/L), benzo(a)pyrene and other polynuclear aromatic hydrocarbons (0.2 μg/L), beryllium (4.0 μg/L), bis(2-ethylhexyl) phthalate (6.0 μg/L), pentachlorophenol (1.0 μg/L), thallium (2.0 μg/L), and vinyl chloride (2.0 μg/L). MCLs and other applicable, or relevant and appropriate requirements (ARARs) must be considered for any groundwater investigations at NAS Moffett Field. Likewise, CRQLs for the following compounds (for ingestion only) exceed California's Proposition 65 regulatory levels: arsenic (5.0 μg/L), hexachlorobenzene (0.2 μg/L), lead (0.25 μg/L), 1,1,2,2-tetrachloroethane (1.5 μg/L), and vinyl chloride (1.5 μg/L).

2. Contamination from metals is discussed to some extent at Sites 1, 2, 11, and 19, but then appears to be dismissed without presenting any interpretations or logical conclusions. Leachate, groundwater, and surface water samples from Landfill Sites 1 and 2 are all contaminated with many metal components; these metals include--in approximate order of decreasing frequency of detection--antimony, manganese, vanadium, arsenic, lead, thallium, and cadmium. The potential for this contaminated leachate and for surface waters to be transported to the salt evaporation ponds and adjacent wetland areas on the north end of NAS Moffett Field, and eventually into San Francisco Bay, as well as to groundwater, should be addressed in the Chemical Fate and Transport and Nature and Extent of Contamination sections of the report. Monitoring wells downgradient from Sites 1, 2, 11 and 19 have detected these same compounds at elevated levels well above their respective background values.

3. Leachate and surface water samples from Sites 1 and 2 are contaminated with metals, some semivolatiles, and some volatile organic compounds (VOCs), as is demonstrated in Appendix B, although the samples are discussed very little in the body of the report. Is the issue of possible contamination from leachate and surface waters to be addressed in Operable Unit 6 (OU6)? If not, the text of this report should more fully characterize the leachate and surface waters.

SPECIFIC COMMENTS

1. **Executive Summary, Page xxvi, Paragraph 1**

The statement "inorganic contamination was not observed in the Moffett Field east side aquifers" is not consistent with the data presented. The Navy is not considering the inorganic contamination detected above background values at Sites 1, 2, 11, and 19.

2. **Executive Summary, Page xxvi, Last Paragraph**

Contamination to surface waters as well as to groundwater has been demonstrated through the leachate, surface water, and groundwater samples obtained near Sites 1 and 2. The inorganic compounds detected above their background values are the same for all media sampled. Please rephrase this paragraph.

3. **Section 4.2.2.3, Page 4-13, Third Paragraph**

The third sentence of this paragraph states that "some common metals on the TAL are typical constituents of brackish water, such as calcium, sodium, and potassium." Calcium, sodium, and potassium are not only typical constituents of brackish water, but of natural waters, in general. What makes water brackish is the amount of these elements relative to the amount of water.

The next to the last sentence suggests that because groundwater from Sites 1 and 2 exhibits higher levels of potassium, calcium, sodium, iron, and magnesium it is, therefore, more "brackish" than groundwater from beneath Sites 4, 5, 6, and 7. The likelihood exists that the brackishness of the groundwater and the higher metals content are due to infiltration of leachate from the landfills.

4. **Section 4.2.2.3, Pages 4-13 through 4-18**

Manganese and vanadium are both missing from the discussion in this section, even though both are major metal contaminants. It appears that the objective of identifying the extent of groundwater contamination in each of the aquifer zones has not been met. (See General Comment No. 2).

5. **Section 5.2, Pages 5-7 and 5-8**

The fate and transport of at least the most common of the metal contaminants from Sites 1, 2, 11, and 19 should be discussed in more detail. Adsorption coefficients (or a range of adsorption coefficients) should be supplied to estimate the rate at which metals would travel through the aquifers. (See General Comment No. 2).

6. <u>Section 7.0, Pages 7-2 through 7-5</u>

Groundwater beneath Sites 1, 2, 11, and 19 is contaminated with various metals including antimony, arsenic, manganese, and vanadium. Leachate and surface water runoff from Sites 1 and 2 are likewise contaminated with these same metals. Yet, no discussion appears in this section regarding the nature and extent, the contaminant fate and transport, and the associated risks of this metals contamination. (See General Comment No. 2).

TECHNICAL REVIEW OF
THE BASELINE RISK ASSESSMENT
DRAFT REMEDIAL INVESTIGATION REPORT
OPERABLE UNIT 5: EAST SIDE AQUIFERS
NAVAL AIR STATION MOFFETT FIELD
MOUNTAIN VIEW, CALIFORNIA

GENERAL COMMENTS

1. Previous groundwater sampling efforts at Moffett Field included only filtered water samples. There should be a discussion as to whether this is the case for this data set and which samples were filtered. This will have a significant impact on the level of VOCs detected. The statements that the levels of VOCs measured in the western aquifers are much greater are irrelevant and should be removed. There is a possibility that they are untrue because of different sampling techniques. This may be one explanation for the discrepancies between phase I and II data.

2. The use of a frequency of detection screen is not necessary for the limited number of contaminants measured in this OU. Whereas this may not be of significant difference in the outcome, the exclusion of class A carcinogens is contrary to EPA Region 9 policy and a frequency of detection screen without the spatial verification step is deceiving with the separation of so many sites that impact the same aquifer.

3. Human exposure routes are lacking. For current exposure routes, there appears to be a possible surface water route but no data was presented in this report to substantiate this route. The time spent in fabricating the wild game pathway appears to be a waste of time. Such an unusual exposure route

should have been discussed prior to submittal with the regulators and the models and factors agreed upon. In this document, this pathway should be eliminated and a discussion including any surface data presented to substantiate the exposure route.

4. The obvious pathways for groundwater contaminated with VOCs were not used. The scenario is for residential use of the water and volatilization should be taken into account as was done in the OU2 and OU4 risk assessments.

5. Sites 1, 2, and 11 are not evaluated due to the high TDS levels. Whereas this may be appropriate for human health from a groundwater consumption scenario, these three sites are close to the Bay and it is assumed that a direct ecological effect of the contaminants surfacing will be evaluated in the site wide ecological assessment. This should be mentioned.

6. It is understood that a site wide ecological assessment is to be done. As the document reads now, there is a completed exposure route to humans by a wild duck consumption pathway, but no ecological exposure. How can this be? The ecological assessment should be referenced and a limited discussion of possible complete pathways presented and uncertainties discussed. The analysis can be delayed until the ecological assessment is done.

7. The risk management comments presented in the discussion and the summary should be removed. The summary should present the results of the risk assessment in a concise manner without projecting conclusions about possible remediation decisions.

8. The discussion of background risk is inconsistent with the discussions which took place on OUs 2 and 4. Due to the limited sampling sites for background and the apparent differences in salt water intrusion, it would be more efficient to address the source of any elevated risk. This will eliminate any questions of the relevance of the reference wells and limit the need for extensive background determinations. Section 6.2.2 mentions where information regarding the selection of background wells can be found in a different section of the report. A background level is provided in Tables 6.2-1 to 6.2-10; however, no information is provided regarding how much sampling these values are based on. Nor does the writer state whether the background samples were collected from appropriate areas for use in this assessment.

9. Please provide a better explanation of the delineation of contamination between OUs 5 and 6 and how this affects the risk assessment analysis. The distinction between OU5 and OU6 is not clearly made in this assessment. The definition of OU5 should include a discussion of what potential pathways are not included in the assessment. This should be identified early in the BRA document. A better delineation of the two OUs could explain why the

current exposure pathway for duck consumption is considered part of OU5 but not OU6.

10. No conceptual evaluation model is provided as suggested in Part A of EPA's *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual.* (EPA, 1989)

11. Any models used to identify potential exposure concentrations of contaminants should be supported by a rationale indicating why that model was chosen. No rationale is provided for the selection of the volatilization models or the vegetable concentration model. No model is provided to explain the duck tissue concentration levels.

12. In general, the tables are not integrated well with the text, nor explained well in the text. For example, Table 6.5-2 provides the potential risks associated with chemicals present in the groundwater at their contract required detection limit (CRDL). No explanation of the inclusion criteria is presented. Some of these chemicals were detected at greater than detection limits and were carried through the risk characterization calculations. No statement is provided regarding why only one pathway, ingestion of drinking water, was considered. Each site should have a table presenting the contaminants detected segregated by aquifer and clearly showing the number of samples, detection limits, range of detections including J qualified or estimated data, the average and 95% UCL of the mean.

SPECIFIC COMMENTS

1. <u>Page 6-8, Section 6.1.3, Paragraph 1</u>

It should be made clear here that groundwater contributing to surface water and any resulting exposure pathways will be evaluated as part of OU6.

2. <u>Page 6-9, Section 6.2, Paragraph 1</u>

Please explain the rationale for identifying chemicals of potential concern by site and aquifer.

3. <u>Page 6-10, Section 6.2.1, Paragraphs 1 and 2</u>

This section identifies the data collection process and data validation process. No comment is made about sites where aquifers A2, B2, B3 and/or C were not sampled and whether the lack of sampling from these aquifers affects the resulting risk assessment analysis.

4. **Page 6-14, Section 6.2.3, Paragraph 1**

The last sentence states that the data sampled from Sites 13 and 15 are included in Tables 6.2-1 et seq. No mention of these sites appears in these tables. The comment is made on page 6-5 that no data was collected for these sites and that adjacent sites' data was used. Please identify what data is being substituted to represent sites 13 and 15.

5. **Page 6-31, Section 6.2.4, Paragraph 1**

Please substantiate the rationale for the statement that the majority of detected metals reflects natural background levels due to salt water intrusion. Leachate and surface water samples have also been shown to be contaminated with metal components and may be a source of groundwater contamination.

6. **Page 6-32, Section 6.2.5, Paragraph 3**

This paragraph appears to have been duplicated from the BRA written for the West Side Groundwater Site Characterization Report. Is this information still valid for this analysis?

7. **Page 6-32, Section 6.2.5, Paragraph 4**

Please provide contract required quantitation limit (CRQL) values for all chemicals considered in this analysis.

8. **Page 6-42, Section 6.3.1.1, Paragraph 2**

Please identify the location of the agricultural well mentioned in this paragraph to confirm that the well does not present a pathway of concern for this OU.

9. **Page 6-45, Section 6.3.2 et seq.**

Adding a conceptual evaluation model would clarify this section of the BRA.

10. **Page 6-46, Section 6.3.2, Paragraphs 2 and 3**

The rationale for inclusion of duck hunting in this BRA is not entirely clear. It appears that the distinction being drawn between OU5 and OU6 is one of on-site vs off-site pathways of exposure. However, the statement that ducks are hunted in the vicinity of NAS Moffett Field presents some ambiguity about the pathway of exposure. Please provide further explanation regarding the inclusion of duck hunting as part of this OU.

11. **Page 6-47, Section 6.3.2, Paragraph 1**

Three standards are given for defining levels of TDS that render groundwater nonpotable. It should be clearly stated which standard was applied in this assessment.

12. **Page 6-48, Section 6.3.2, Paragraph 2**

Please provide a better explanation of how metals and potential false negatives (PFNs) were evaluated.

13. **Page 6-50, Section 6.3.3.2, Paragraph 2**

The BRA states that concentrations in duck tissue were modeled from concentrations in groundwater as shown in Exhibit E. No mention of this model is made in Exhibit E.

14. **Page 6-51, Section 6.3.3.2, Paragraph 2**

Please provide the rationale for choosing the ingestion rate of poultry, excluding chicken, to reflect duck consumption. Please provide a reference for the number used as the assumed weight of edible duck meat. The statement is made that exposure frequency is the same as the other routes of exposure which conflicts with the earlier statement that frequency is 16 days per year.

15. **Page 6-55, Section 6.4.2.2, Paragraph 3**

Please confirm whether default values or actual background sampling data were used to estimate lead soil concentrations. Please comment on whether any on-site sampling data reflect elevated lead levels.

16. **Page 6-60, Section 6.5.1.2, Paragraph 1**

The incremental lifetime cancer risk (ILCR) calculations and tables referenced should also include the assumptions made in calculating the ILCRs, for example how the mean concentrations in the slough and in the duck were calculated. The model for uptake in duck tissue was omitted. The Summary and Conclusions section (6.6) presents the assumption that groundwater was pumped from each site and aquifer undiluted before release to the slough. Please elaborate on this assumption and assess the real world application of such an assumption. Also comment on whether any sampling has been conducted in the slough which would better quantify actual exposures.

17. **Page 6-60, Section 6.5.1.2, Paragraph 2**

Please elaborate on why only one exposure pathway is included in the tables referenced in this paragraph (Tables 6.5-1 to 6.5-2). Please identify how chemicals were selected for inclusion in these tables.

18. **Page 6-60, Section 6.5.1.2, Paragraph 4**

Please explain how you estimated the value for population at risk from ingestion of duck meat.

19. **Page 6-63, Section 6.6**

The Summary and Conclusions section states that, in general, metals were not discharged to Moffett Field (except for landfilling) and therefore are not considered to be significant chemicals of potential concern. Metals were detected in groundwater samples at levels greater than stated background means and, in some cases, at a level one order of magnitude greater than background. Please address this issue in your conclusion. This section also references Table 6.6-1 in paragraph 3 and states that chemicals are included on this table if their ILCRs are equal to or greater than 10^{-6}. However, chemicals are included that do not meet this criteria. Please reference all chemicals carried through the risk characterization analyses in this table.

20. **Page 6-75, Section 6.7.4, Paragraph 2**

This section entitled Conclusions presents contradictory statements. Groundwater is not effectively isolated if it is discharged to nearby wetlands. Please elaborate further on the potential environmental impacts.

21. **Tables 6.2-1 to 6.2-10**

The concentration range provided should be defined in a footnote. It is unclear if the lower end of the range is the detection limit or half the detection limit. It also must be assumed that the upper end of the range is the maximum value detected. The equation used to calculate the 95% upper confidence limit (UCL) of the arithmetic mean should also be provided.

22. **Table 6.2-9, Page 2 of 3**

Under "Reason for Exclusion," "no tox value" is stated for Aquifer C, JP-5. Please explain how this reference differs from other mentions of JP-5 which say "constituents sampled."

23. <u>Table 6.3-2, Table 6.3.3</u>

Best professional judgment is not an acceptable rationale.

24. <u>Table 6.3-10 et seq</u>

Regarding the future residential exposure pathway, please explain further the "ND" footnote. Are there no data or is there another reason these pathways were not evaluated?

25. <u>Table 6.4-1</u>

The column entitled "Species Tested" should read "Species." The implication is that humans were also tested. Please explain why arsenic and beryllium were not considered for both exposure pathways. The cancer potency factors (CPFs) for the following chemicals should be rechecked and revised:

a. Chloroform (ingestion): California's CPF is higher than EPA's and should be used. That value is 3.1E-02. (Cal EPA, 1992)
b. Arsenic (ingestion): the CPF is available on IRIS and is 1.8E+00.
c. Beryllium (ingestion): California's CPF is higher than EPA's value. Please recheck. (Cal EPA, 1992)
d. Carbon tetrachloride (inhalation): EPA's CPF for ingestion was referenced instead of inhalation.
e. Chloroform (inhalation): since EPA's value is higher, it should be the one used in the calculations and not the state's.
f. 1,1-Dichloroethene (inhalation): please recheck the number used for the CPF.

26. <u>Table 6.5-25 and Table 6.5-26</u>

Incorrect values for lead in water were used on these tables. The values should have been 3,360 not 3.36, and 4,830 not 4.83.

REFERENCES

1. California Environmental Protection Agency, Memorandum Regarding California Cancer Potency Factors, June 18, 1992.

2. EPA's *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, Part A.* (1989)

EDITORIAL COMMENTS

1. Page 6-13, third sentence: "contributes" should read "contribute."

2. Page 6-53, second paragraph, last sentence requires rewriting.

3. Table 6.2-8, page 2 of 4: regarding Silver, 95% UCL, there is an extra 3 in the column.

4. Table 6.2-1, page 2 of 3: regarding Manganese, there is a + sign in the second column that does not belong.

5. Page 6-47: The RCRA standard for TDS is presented twice in this paragraph.

6. Tables should be numbered in the order they appear in the text. They are difficult to reference if someone is reviewing the text and tables side-by-side.

7. References used in the BRA should be provided at the end of this assessment.

8. Page 6-63, last paragraph: "TDC" should read "TDS."

9. Table 6.3-42 references the hazard quotient instead of ILCR.

10. Table 6.5-2: Aldrin is listed twice in this table.