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

June 20, 1996

Joseph Joyce
BRAC Environmental Coordinator
Environment and Safety (Code 1AU)
MCAS El Toro
P.O. Box 95001
Santa Ana, CA 92709-5001

Dear Mr. Joyce:

EPA has reviewed the "Draft Phase II Remedial Investigation Report, Operable Unit 2B-Site 3" and the "Draft Phase II Remedial Investigation Report, Operable Unit 2B-Site 5" for MCAS El Toro, received on April 20, 1996. Overall, the reports are well written. We appreciate the high level of teamwork from the Navy/Marine Corps and contractors. Please address the enclosed comments (Enclosures) in the revised reports. If you have any questions, I can be reached at 415/744-2368.

Sincerely,

Barbara M Smith for

Bonnie Arthur
Remedial Project Manager
Federal Facilities Cleanup Office

Enclosures

cc: Mr. Tayseer Mahmoud, DTSC
Mr. Larry Vitale, RWQCB
Mr. Dante Tedaldi, Bechtel
✓ Mr. Bernie Lindsey, Southwest Div.

ENCLOSURE A

EPA COMMENTS ON THE DRAFT OU 2B - SITE 5
REMEDIAL INVESTIGATION REPORT

MAJOR COMMENTS

1) Page ES-9; MCPP is discussed in response to the question "Is leachate impacting soil or groundwater," however, not under "Is the nature and extent of groundwater contamination known?" Also, the discussion of chromium on page ES-8 is not consistent with the discussion in response to the question, "Is the nature and extent of groundwater contamination known?"

2) Page 1-16; Throughout the discussion under "Aerial Photography Reviews" it is difficult to discern which areas of potential interest/contamination are associated with Site 5. If these areas of interest are not associated with Site 5, it must be clear which site or program they will be investigated under. For future reports, it is very helpful to include drawings of the potential anomolies overlaid by site figures.

3) Pages 4-37, Section 4.4, 4-42; It is not appropriate to compare pesticide/herbicide levels at all depths to reference levels developed for use to screen out surface pesticide application.

4) Resolution of soil background levels must be completed prior to finalization of this remedial investigation. The meetings started this winter regarding Sites 2 and 17 must be expanded to include resolution of background concentrations at Sites 3 and 5. Please coordinate with the EPA and DTSC toxicologists to expedite resolution.

5) Maximum Contaminant Levels (MCLs) should not be utilized to screen chemicals for selection as COPCs. This results in an incorrect calculation of total risk.

6) It is mentioned throughout the report that risk is overestimated due to considering all chromium as hexavalent. What is the Navy/Marine Corps schedule for including chromium speciation in future groundwater sampling?

7) Page 5-16; Please provide some rationale for the elevated metals levels in the groundwater, based upon the on-site data.

MINOR COMMENTS

1) Page 4-3, Section 4.1.2; Typographical error. Please replace "Site 3" with "Site 5."

2) Page 4-4, Section 4.1.5; Typographical error. Please

replace "sandy" with "study" area.

3) Page 7-3, Table 7-1; Under "risk assessment" column add "hypothetical" prior to off-site residents.

ENCLOSURE B

EPA COMMENTS ON THE DRAFT OU 2B - SITE 3
REMEDIAL INVESTIGATION REPORT

MAJOR COMMENTS

1) Page 4-36; Please clarify how a sample which exceeds PRGs can be used to delineate extent of contamination.

2) Pages 4-36 and 4-66; It is not appropriate to compare pesticides/herbicides concentrations from all depths to the UTLs for anthropogenic reference levels. For example, on page 4-66, endosulfan II at a depth of 87 feet bgs is compared to the reference concentration, which was intended to assess pesticide levels in surface soils.

3) Page 4-141, Section 4.5.8; The Navy/Marine Corps should analyze for isotope specific analyses in the next round of groundwater sampling. Please coordinate with CDM, the Navy's groundwater monitoring contractor.

4) Pages 5-10, 7-21; It may not be appropriate to assert that all benzene detected in the groundwater at Site 3 is due to upgradient sources at Tank Farm #5. As benzene has been detected in air monitoring and limited soil sampling was conducted (as part of the presumptive remedy approach) at Site 3, it is not possible to postulate that all benzene in groundwater is due to Tank Farm #5.

5) Resolution of soil background levels must be completed prior to finalization of this remedial investigation report. The meetings started this winter regarding Sites 2 and 17 must be expanded to include resolution of background concentrations at Sites 3 and 5. Please coordinate with the EPA and DTSC toxicologists to expedite resolution.

6) Maximum Contaminant Levels (MCLs) should not be utilized to screen chemicals for selection as COPCs. This results in an incorrect calculation of total risk.

7) Clarify whether ecological risk screening for the wash will be completed as part of Site 25.

MINOR COMMENTS

1) Page 1-24; Selenium is listed under both categories: metals and inorganics.

2) Page 4-15, Table 4-3; The median benzene concentration from the CARB study is not consistent with the text on page 4-16.

ENCLOSURE C
COMMENTS ON THE DRAFT OU 2B-SITE 5
REMEDIAL INVESTIGATION REPORT

A. Technical Comments

General Comments

1) There are several areas which require further attention. There is an over reliance on PRGs and MCLs in both the Nature and Extent and the Fate and Transport Sections of this report. Although these thresholds were useful for limiting the extent of the field investigation they are not adequate for defining the extent of contamination. To assume that any analyte below a PRG does not possibly represent contamination is too simplistic. Furthermore, the exposure scenario used by USEPA to calculate residential PRGs is not compatible with the recreational scenario used in this report.

The fate and transport analysis should concentrate more on the individual analytes in the site-specific database and less on generalizations about potential fate for large classes of analytes; especially for the groundwater data. There are low levels of COPCs in groundwater which require further scrutiny.

2) Executive Summary
The summary does not mention PRGs with respect to Nature and Extent and Fate and Transport; however, PRGs are prominently relied upon in these sections within the text. Thus, the Executive Summary seems to be more in line with the intent of the comments presented herein.

3) Page 2-29, Table 2-7
The analyses biochemical oxygen demand and chemical oxygen demand were apparently not performed for the soil samples. This would be expected since these analyses are not used for solids such as dry soil. The total organic carbon measurement for soil should have been adequate. Confirm that these analyses were not performed or provide the data with interpretation.

4) Page 4-5, Figure 4-1
The figure is somewhat difficult to interpret because the line types and weighing are similar for several descriptors. Consider using color for clarity.

5) Page 4-36, first full paragraph
The discussion and presentation of data; specifically with respect to the term contaminants of potential concern, are inconsistent with the complementary discussions in the Human Health Risk Assessment in Section 6. The text states that "If a reported concentration of a given organic compound equaled or

exceeded its corresponding PRG in one or more samples tested, the sample would be used to delineate extent of contamination." This approach tends to confuse the issues. The discussion of nature and extent should focus on all analytes detected above the risk assessment selection criteria; not PRGs. The use of PRGs and other arbitrary threshold criteria results in figures in the RI report not displaying organic and inorganic analytes detected in soil and groundwater.

6) Page 4-43, Figure 4-6
The units for metals are incorrect and should be milligrams/kilogram.

7) Page 4-45, Table 4-15
This table and several other similar ones throughout the document should be corrected so that the units of any comparative criteria (if they continue to be used in the final draft) are consistent with the detection levels presented. For example, PRGs are in milligrams/kilogram, but detection levels for pesticides and herbicides are in micrograms/kilogram.

8) Page 4-51, first sentence
The comparison of acetone and toluene with their residential PRGs seems inappropriate. A more useful and pertinent assessment could be conducted through an evaluation of the validation results to ascertain if these analytes are laboratory contaminants.

9) Page 4-51, second full paragraph
Reported concentrations of pesticides are compared to PRGs and MCAS El Toro reference levels and for some analytes the reference level was exceeded but not the PRG. Because of the dual comparisons it is difficult to discern what the significance of the detected level is. Are the reference levels the appropriate comparator? If so then why also use PRGs?

10) Page 4-51, last paragraph
Within this paragraph the text moves into risk assessment issues.

The authors should consider moving the discussion to Section 6 or deleting it entirely.

11) Page 4-52, Section 4.4.1.2
The authors should consider that there is some difficulty in data evaluation by the reader with respect to the exposure scenarios used in the risk assessment. This is due to the presentation of shallow soil in Section 4 as 0 to 10 feet, while shallow soil in the recreational exposure scenario for the risk assessment is for shallow soil between 0 to 2 feet. In actuality, only two samples out of seven were greater than 2 feet.

12) Page 4-52, Section 4.4.1.2

The text notes that residential PRGs and MCAS El Toro metal and pesticide reference levels apply to shallow soils. It is not clear if the term shallow refers to the 0 to 2 ft interval of the Risk Assessment or the 0 to 10 foot interval of the soil sampling for the RI. In addition, the text notes that shallow soil threshold values were used for the purposes of comparison only, even though they clearly do not apply to the deep soils. This seems inappropriate and tends to confuse the significance of any subsequent presentations within the document. The authors should make comparisons to directly relevant criteria and abstain from the use of nonapplicable surrogates.

13) Page 4-52, Section 4.4.1.2
Here and numerous times elsewhere in this document the text includes speculation regarding the association of laboratory or field contamination with detected analytes. These speculations seem unnecessary. The authors should confirm that verification and validation of the data have been performed and if so, identify definitively whether or not laboratory or field contamination affected the results. If there is ambiguity because the data were not validated, then there should be an explanation in the text. Another notable example is on page 4-142 within the first complete paragraph.

14) Page 4-67, Figure 4-7
The figure shows that TPH-gasoline was reported in soil at 215 ft bgs. This situation requires further discussion in the text since TPH-gasoline was also reported at much shallower levels and the extent and source should be clarified.

15) Page 4-71, Figure 4-8
The units for metals are incorrect and should be milligrams/kilogram.

16) Page 4-71, Figure 4-8
The figure is entitled COPCs in shallow soil; however, it is not clear if the listing is consistent with other COPC listings in the RI.

17) Page 4-83, Figure 4-9
The units for metals are incorrect and should be milligrams/kilogram.

18) Page 4-118, Section 4.5.1
The text here and on the figures and tables throughout should be corrected to indicate that Contract Required Detection Limits CRDL apply to inorganic analyses and Contract Required Quantitation Limits CRQL apply to organics.

19) Page 4-118, Section 4.5.1
As noted previously, many organics analytes were detected in groundwater; however, since they were below MCLs they were not

presented on the summary figure - Figure 4-12. The presentation should be corrected in the final draft to clearly show the distribution of all anthropogenic analytes in groundwater.

20) Page 4-137, Figure 4-12
The Figure should include the groundwater flow direction and all organics detected.

21) Page 4-140, Section 4.5.7
There is negligible benefit if any to the assessment of nature and extent based on comparisons with Secondary MCLs. Secondary MCLs are regulations set by U.S. EPA that estimate desirable levels for drinking water that may adversely affect the aesthetic value of drinking water. They are not enforceable by the federal government.

22) Page 4-143, Figure 4-13
The units for thallium are incorrect and should be milligrams/kilogram.

23) Page 4-143, Figure 4-13
It is not clear if sample location O3SE5 is supposed to be O3SE4. Please confirm and correct if necessary. Also see Table 4-35 where O3SE4, but not O3SE5 is listed.

24) Page 4-154, Table 4-36
The location O3SE4 would appear to have the highest level of thallium at 0.77 mg/kg. Confirm and correct if necessary.

25) Page 4-157, last paragraph
The discussion appears to introduce a new method for the determination of COPCs; i.e., if any analyte at a fixed location differed by an order of magnitude it was identified as a COPC. This method seems to be without precedent or basis and should be justified.

26) Page 5-8, first full paragraph
Here and elsewhere, as noted in the preceding comments, comparisons with inappropriate threshold criteria are provided. "Nature and Extent" and "Fate and Transport" sections should not include inapplicable risk screening which conflicts with the Baseline Risk Assessment. The discussion regarding metals provides little information since it uses the dual comparative criteria of MCAS background and PRGs. If the background levels are acceptable to the BCT why use PRGs?

27) Page 5-13, first partial paragraph
The text should clarify the reasons why the surface water is considered to have the potential to mobilize waste materials under current conditions. Are wastes exposed in the channel? Are wastes present just below the channel?

28) Page 5-11, Table 5-2
The presentation of data is helpful; however, the decision to only show "selected" analytes is peculiar. For example, MCPP is often mentioned in Nature and Extent yet it is not included in this table.

29) Page 5-19, Section 5.2.1.5
It seems unlikely that the authors intended to state that the precipitation from solution of dissolved metal contaminants forms sediments. Confirm and correct as required.

30) Page 5-19, Section 5.2.1.5
The authors should use the voluminous data on-hand to evaluate the apparent mobility of metals at Site 3. Comparisons of dissolved metals, electron acceptors, and general chemistry indicators should be made.

31) Page 5-19, Section 5.2.1.6
Here again, the authors should focus their attention on the assessment of the fate and transport of the pesticides and herbicides detected at the site and refrain from comparisons to arbitrary threshold criteria.

32) Page 5-22, Table 5-4
Since arsenic, copper and manganese levels were all below MCAS El Toro reference levels, why model and compare to PRGs for air?

33) Page 5-22, Section 5.3.2.3
The text includes the sentence, "Concentrations of inorganics were reported in soil and groundwater." This statement requires revision. There is nothing particularly unusual about the presence of dissolved metals in groundwater, it is a completely normal occurrence and certainly samples collected upgradient support this. Likewise for metals in soil.

34) Page 5-22, Section 5.3.2.3
The text makes the statement that the landfill may have leached thallium (to groundwater). Other than the fact that thallium exceeded background in the shallow and deep samples at Unit 4 there is no assessment of regional trends or at least station-wide trends for this analytes. Consideration of the presence of this element in soil and groundwater on other parts of the station seems to be in order.

35) Page 5-24, Section 5.3.2.4
The fact that pesticides and herbicides were detected at low levels in groundwater is not sufficient basis for the statement that the "...data indicate that pesticides and herbicides are not leaching from Site 5."

36) Page 5-23, Section 5.3.2.5
The text notes that high gross beta is common in areas such as

Site 5. It would be helpful if the authors provided local and regional information regarding the reported levels of gross alpha and gross beta in Orange County.

37) Page 5-25, Section 5.3.3.2
As noted previously, the authors should focus their attention on the assessment of the fate and transport of the analytes detected at the site and refrain from comparisons to arbitrary threshold criteria; in this case MCLs. See also Section 5.3.3.4 for another notable example.

38) Page 5-25, Section 5.3.3.3
The text notes that the inorganic groundwater levels were not significantly different from those upgradient. Exactly what constitutes a significant difference is not explained.

39) Page 6-11
The exposure pathway to water in the wash seems reasonable; however, the presence of any COPCs in the wash cannot be directly attributed to the site based on the data presented in this report. Therefore the basis for risk assessment seems uncertain.

40) Page 6-20 and 6-24 and 6-28, Table 6-4 Figure 6-4 and 6-6
The majority of the CAL-EPA risk was due to ingestion of chromium as hexavalent chromium. The substantial difference (about four orders of magnitude) between the USEPA and CAL-EPA carcinogenic risk needs greater attention and assessment so that the information presented can be of use by risk managers.

41) Page 6-16, Table 6-16
The authors should explain why chromium in groundwater was not speciated and if additional samples will be collected to address the high apparent risk due to hexavalent chromium.

ENCLOSURE D

COMMENTS ON THE DRAFT OU 2B-SITE 3
REMEDIAL INVESTIGATION REPORT

Technical Comments

1) General Comments
There are several areas which require further attention. There is an over reliance on PRGs and MCLs in both the Nature and Extent and the Fate and Transport Sections of this report. Although these thresholds were useful for limiting the extent of the field investigation they are not adequate for defining the extent of contamination. To assume that any analyte below a PRG does not possibly represent contamination is too simplistic. Furthermore, the exposure scenario used by USEPA to calculate residential PRGs is not compatible with the recreational scenario used in this report.

The fate and transport analysis should concentrate more on the individual analytes in the site-specific database and less on generalizations about potential fate for large classes of analytes; especially for the groundwater data. There are low levels of COPCs in groundwater which require further scrutiny.

2) Executive Summary,
The summary does not mention PRGs with respect to Nature and Extent and Fate and Transport; however, PRGs are prominently relied upon in these sections within the text. Thus, the Executive Summary seems to be more in line with the intent of the comments presented herein.

3) Page 2-26, Table 2-6
The analyses biochemical oxygen demand and chemical oxygen demand were apparently not performed for the soil samples. This would be expected since these analyses are not used for solids such as dry soil. The total organic carbon measurement for soil should have been adequate. Confirm that these analyses were not performed or provide the data with interpretation.

4) Page 4-2, first full paragraph, Section 4.0
The discussion and presentation of data; specifically with respect to the term contaminants of potential concern, are inconsistent with the complementary discussions in the Human Health Risk Assessment in Section 6. Initially on page 4-1 and the top of page 4-2 the selection process for COPCs appears to be consistent with Section 6. However, in the first full paragraph the text indicates that the COPC list was further refined by comparisons to thresholds; i.e., residential PRGs, background or other regulatory agency standards. The text states that "The distribution of COPCs with concentrations greater than these thresholds is used to describe the extent of contamination." This approach tends to confuse the issues. The discussion of

nature and extent should focus on all analytes detected above the risk assessment selection criteria; not arbitrary comparison thresholds. The use of these thresholds results in figures in the RI report not displaying organic and inorganic analytes detected in groundwater. This skewed style of presentation tends to discount the possible significance of these analytes in groundwater. For example, the principal risk driver for this site is chromium in groundwater; yet the chromium concentrations and distribution are not shown on the figures since only analytes greater than MCLs are presented. For soil, MCPP is often displayed in Nature and Extent figures and identified as a COPC. While the presentation of the data is useful, MCPP is not considered a COPC within Section 6.

5) Page 4-21, Figure 4-6
The authors should consider the identification of the detection limit for those analyses where that presentation currently only specifies "ND."

6) Page 4-37, Section 4.4
The authors should consider that there is some difficulty in data evaluation by the reader with respect to the exposure scenarios used in the risk assessment. This is due to the presentation of shallow soil in Section 4 as 0 to 10 feet, while shallow soil in the recreational exposure scenario for the risk assessment is for shallow soil between 0 to 2 feet. In actuality, only two samples out of seven were greater than 2 feet.

7) Page 4-41, Section 4.4.1
The comparisons with residential PRGs are inappropriate for the reasons identified previously, as well as due to the fact that surface soil exposure are defined in Section 6 as recreational and thus, the residential scenario used to develop the soil PRGs would not apply. Here, as well as elsewhere in the subsections which follow, numerous organic analytes detected but below PRGs are excluded from the data presentation in the complementary figures. This screening step should be eliminated and the figures corrected.

8) Page 4-45, Table 4-13
This table and several other similar ones throughout the document should be corrected so that the units of any comparative criteria (if they continue to be used in the final draft) are consistent with the detection levels presented. For example, PRGs are in milligrams/kilogram, but detection levels for pesticides and herbicides are in micrograms/kilogram.

9) Page 4-51, Section 4.4.2
The text notes that PRGs, pesticide reference levels, and MCAS El Toro background apply to shallow soils. It is not clear if the term shallow refers to the 0 to 2 ft interval of the Risk Assessment or the 0 to 10 foot interval of the soil sampling for

the RI. In addition, the text notes that shallow soil threshold values were used for the purposes of comparison only, even though they clearly do not apply to the deep soils. This seems inappropriate and tends to confuse the significance of any subsequent presentations within the document. The authors should make comparisons to directly relevant criteria and abstain from the use of nonapplicable surrogates.

10) Page 4-51, Section 4.4.2
Here and numerous times elsewhere in this document the text includes speculation regarding the association of laboratory or field contamination with detected analytes. These speculations seem unnecessary. The authors should confirm that verification and validation of the data have been performed and if so, identify definitively whether or not laboratory or field contamination affected the results. If there is ambiguity because the data were not validated, then there should be an explanation in the text.

11) Page 4-51, Section 4.4.2
The text notes that TPH as diesel was reported at concentrations of about 2 percent in soil at 185 ft bgs. This seems highly unusual for this site since no other samples, shallow or deep had concentrations as high, and thus this occurrence requires greater explanation.

12) Page 4-68, Section 4.5.1.2
The text here and on the figures and tables throughout should be corrected to indicate that Contract Required Detection Limits CRDL apply to inorganic analyses and Contract Required Quantitation Limits CRQL apply to organics.

13) Page 4-68, Section 4.5.1.2
As noted previously, many organics analytes were detected in groundwater; however, since they were below MCLs they were not presented on the summary figure - Figure 4-11. The presentation should be corrected in the final draft to clearly show the distribution of all anthropogenic analytes in groundwater.

14) Page 4-79, Table 4-20
The discussions in the text do not highlight and explain why concentrations of many dissolved inorganics were reported to be substantially higher in downgradient wells 05_DGMW68 and 05_NEW1.

For example, chromium, zinc, and nickel were typically undetected in groundwater with the exception of these two wells.

15) Page 4-81, Table 4-20
Confirm the units for each of the MCLs listed. For example, the MCL for chloride is not 250,000 milligrams/liter, but rather, 250,000 micrograms/liter.

16) Page 4-83, Section 4.5.3
The units for the MCL for bis(2-ethylhexyl)phthalate are incorrect and should be milligrams/liter. Likewise, the units for diethylphthalate and di-n-butylphthalate are incorrect and should be micrograms/liter.

17) Page 4-83, Section 4.5.3
The units for 2,4,5-T are incorrect and should be micrograms/liter.

18) Page 4-86, Section 4.5.8
There is negligible benefit if any to the assessment of nature and extent based on comparisons with Secondary MCLs. Secondary MCLs are regulations set by U.S. EPA that estimate desirable levels for drinking water that may adversely affect the aesthetic value of drinking water. They are not enforceable by the federal government.

19) Page 5-3, Section 5.1.2.2 and 5.1.2.3
Here and elsewhere, as noted in the preceding comments, comparisons with inappropriate threshold criteria are provided. Risk screening which conflicts with the Baseline Risk Assessment should not be included in either the "Nature and Extent" nor Fate and Transport" sections.

20) Page 5-4, Table 5-1
The analytes listed in this table are not consistent with those presented as COPCs in the Nature and Extent section as well as in the Baseline Human Health Risk Assessment.

21) Page 5-11, Table 5-2
The presentation of data is helpful; however, the decision to only show "selected" analytes is peculiar. For example, MCPP is often mentioned in Nature and Extent yet it is not included in this table.

22) Page 5-15, Section 5.2.1.4
The SVOCs most often detected were phthalates and yet these do not appear in the Risk Assessment. Were these SVOCs excluded from further consideration after data validation?

23) Page 5-15-16, Section 5.2.1.5
It seems unlikely that the authors intended to state that the precipitation from solution of dissolved metal contaminants forms sediments. Confirm and correct as required.

24) Page 5-16, Section 5.2.1.5
The text would benefit from the substitution of "organic" for the term "PAH."

25) Page 5-16, Section 5.2.1.5
Rather than simply speculating about the possibility that

elevated metal levels in groundwater may be due to phenomena reported in the scientific literature, the authors should use the voluminous data on-hand to evaluate the situation at Site 5. Comparisons of dissolved metals, electron acceptors, and general chemistry indicators should be made.

26) Page 5-16, Section 5.2.1.6
Here again, the authors should focus their attention on the assessment of the fate and transport of the analytes detected at the site and refrain from comparisons to arbitrary threshold criteria.

27) Page 5-22, Section 5.3.2.1
Here also the text includes speculation related to laboratory contamination of samples. This type of discussion does not belong in Fate and Transport and these determinations should be definitive, not speculative, and included in the validation summary.

28) Page 5-22, Section 5.3.2.3
The text includes the sentence, "Trace concentrations of inorganics were reported in soil and groundwater." This statement requires revision. There is nothing particularly unusual about the presence of dissolved metals in groundwater, it is a completely normal occurrence and certainly samples collected upgradient support this. Likewise for metals in soil.

29) Page 5-22, Section 5.3.2.3
The text makes the statement that the landfill may have leached manganese, nickel, and thallium to groundwater. Other than the site-specific upgradient to downgradient concentration comparison there is no assessment of regional trends or at least station-wide trends for these analytes. Were these analytes elevated due to leaching or is it possible that there were other processes involved; for example biodegradation which would tend to release metals?

30) Page 5-22, Section 5.3.2.4
The text identifies a "...significant concentration of MCPP at 20 and 25 feet bgs in soil near the landfill..." and speculates that the presence "...indicates that some leaching may have occurred."

It would be helpful if the authors defined what the term "significant" means in this context. In addition, since MCPP and its properties were not included in Table 5-2 it is not possible to assess the likelihood that MCPP would migrate through soil or groundwater.

31) Page 5-23, Section 5.3.2.5
The text notes that high gross beta is common in areas such as Site 5. It would be helpful if the authors provided local and regional information regarding the reported levels of gross alpha

and gross beta in Orange County.

32) Page 5-23, Section 5.3.3
As noted previously, the authors should focus their attention on the assessment of the fate and transport of the analytes detected at the site and refrain from comparisons to arbitrary threshold criteria; in this case MCLs.

33) Page 5-23, Section 5.3.3.3
The text notes that the inorganic groundwater levels were not significantly different from those measured station wide. This appears to introduce a hypothesis not examined on the previous page. Exactly what constitutes a significant difference is not explained however; nor is there a listing of the data set that was used for the station wide comparison. The intent of the first
paragraph seems to be that the landfill is not
contributing to the elevated levels of certain inorganics in groundwater, yet the second paragraph implies the opposite.

The text notes that "...wide off-site dispersion of metals from the landfill is not expected." The authors should explain how the factors listed in the preceding sentence would affect dispersion. The authors should clarify the intent of the term dispersion to avoid confusion with molecular diffusion and mechanical dispersion descriptions which often appear in fate and transport discussions.

34) Page 6-9, Section 6.2.3
Include a table which lists the exposure point concentrations for each analyte under each exposure scenario.

35) Page 6-16, Table 6-16
The majority of the CAL-EPA risk was due to ingestion of chromium as hexavalent chromium. The substantial difference (about four orders of magnitude) between the USEPA and CAL-EPA carcinogenic risk needs greater attention and assessment so that the information presented can be of use by risk managers.

36) Page 6-17, Section 6.4.1.2
The authors should explain why chromium in groundwater was not speciated and if additional samples will be collected to address the high apparent risk due to hexavalent chromium.

Enclosure E

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

MEMORANDUM

To: Bonnie Arthur
Remedial Project Manager
Federal Facilities Cleanup Office

From: Jeffrey M. Paull, MS HYG, MPH, CIH
Regional Toxicologist
Superfund Technical Support Section

Date: June 20, 1996

Subject: Review of "Draft Phase II Remedial Investigation Reports, Operable Unit 2C, Sites 3 and 5," Marine Corps Air Station (MCAS) El Toro, California

Background

Remedial Investigation (RI) reports for Site 3, the Original Landfill, and Site 5, the Perimeter Road Landfill, were prepared by Bechtel National Inc. (BNI) on behalf of U.S. Department of the Navy, Southwest Division Naval Facilities Engineering Command (SWDIV), under the Comprehensive Long-Term Environmental Action Navy (CLEAN) II Program. The documents are dated April 12, 1996. The overall goal of the RIs was to collect sufficient data to support decisions regarding the need for, and scope of future remediation at these two sites, based upon USEPA presumptive remedies for municipal landfills, and federal, state, and local requirements for landfill closure.

We previously reviewed the Phase II RI/FS Risk Assessment Work Plan (January 20, 1995), the Revised Draft Work Plan (May 24, 1995), and the Final Work Plan (September 28, 1995). We also previously reviewed and commented upon the risk assessment-related portions of the draft Phase II RI/FS for Site 2--the Magazine Road Landfill, and for Site 17--the Communication Station Landfill (May 16, 1996).

Scope of Review

We reviewed the sections of the above-referenced documents pertaining to human health risk assessment, principally Sections 4 through 7, and Appendices P and R. The documents were reviewed for scientific and technical accuracy, and for conformance with USEPA Region IX risk assessment guidelines, policies, and procedures. The RI documents were nearly identical with respect to methodology, organization, and format, therefore unless otherwise specified, our comments, and page citations apply to both documents.

We assume that sampling of environmental media, analytical chemistry and QA/QC procedures or data, and the assessment of contamination described and summarized in the RIs, have been adequately reviewed by appropriate USEPA Region IX and Cal/EPA staff. In addition, minor editorial and grammatical errors that do not affect the interpretation of the risk assessment are not addressed. We request that future changes in the document made in response to these comments be clearly identified.

Summary

The information and data presented in the Remedial Investigations Reports for these sites is comprehensive, logically structured, well-organized, and professionally presented. In general, the human health risk assessment sections of the RIs were consistent with USEPA Region IX risk assessment guidelines for conducting human health risk assessments, and no major methodological problems were evident. Several procedural deficiencies were identified in the reports which could affect the quantification of health risks, particularly for the groundwater exposure pathway, and we are requesting some additional information regarding the evaluation of ambient emissions from the landfills. Although these remaining technical issues, presented in our specific comment below, will need to be addressed before USEPA Region IX can issue its final approval, they should not prevent the Navy from proceeding to finalize the RI reports.

Specific Comments

Executive Summary, Human Health Risk Assessment, p. ES-8: For the Site 3 RI, the sentence which reads "The risk assessment concluded that the lifetime excess upper-bound cancer risk to the Site 3 industrial office worker was 1.7×10^{-6} *statewide*" has a typo in the last word of the sentence, which should be corrected to *site-wide*.

Executive Summary, Conclusions, p. ES-8 to ES-9: For both Sites 3 and 5, we have several questions (see our comments regarding air sampling, below) regarding the conclusion that "controls for landfill gases do not need to be considered in the remedial design."

Instantaneous Air Sampling, § 4.2.1, p.4-9 to 4-13: For both Sites 3 and 5, instantaneous air sampling performed over a two-day period just above the landfill surface showed no detectable levels of methane. However this type of sampling is unreliable for measuring methane emissions from a landfill for several reasons, including:

(1) In an unlined landfill, it is difficult to predict where peak methane emissions will emanate, and emissions above the landfill surface on-, or off-site could easily be missed;

(2) Seasonal variations, including temperature, barometric pressure, and wind speed could exert a significant effect on ambient methane concentrations, which would not be picked up over a two-day sampling period, and;

(3) Depending on the size and composition of the landfill, and the characteristics of the waste, methane concentrations could either be increasing, or decreasing over time.

There are more reliable methods for estimating methane emissions from a landfill, including the use of emission modeling, which we recommend.

Integrated Surface Air Sampling, § 4.2.2, p.4-10 to 4-14: Total organic carbon (TOC, as methane) screening analysis yields little useful information regarding a landfill's methane or VOC emission potential. The fact that for Site 3, chloroform, methylene chloride, and 1,1,1-TCA ambient concentrations reported during the Site 3 Phase II RI exceed CARB median values for ten VOCs required to be controlled by California law, for 251 landfills statewide, is of greater significance for evaluating potential landfill VOC emissions.

Ambient Air Sampling, § 4.2.3, p.4-14 to 4-16: Regarding the statement on p. 4-16, "The concentrations of organic compounds measured in ambient air at Site 3 were of the same order of magnitude as those observed in urban areas," we draw a different interpretation from the data of Table 4-5. It appears that ambient concentrations of six of the 15 VOCs monitored (carbon tetrachloride, chloroform, chloromethane, Freon 12, 1,2,4-trichlorobenzene, and xylene) were either significantly above statewide urban average concentrations reported in the table, or else could not be directly compared due to a lack of statewide data in the CARB reference document. For Site 5, seven of 17 VOCs monitored were either above statewide urban average concentrations, or could not be directly compared. It should also be noted that VOC concentrations statewide have generally decreased since 1988, the year in which the statewide comparison data were collected.

In addition, ambient monitoring data have only limited value for estimating landfill VOC emissions. Under USEPA Waste Disposal Regulations (AP-42), and New Source Performance Standards (40CFR60, part WWW), the recommended method for estimating VOC emissions from a landfill is via modeling. Since as many as 13 VOCs, including benzene, chloroform, chloromethane, methylene chloride, 1,1,1-TCA, and vinyl chloride were found above detection limits in surface air samples above the Sites 3 and 5 landfills, and since VOCs are regulated air pollutants, a more detailed estimate of potential landfill emissions (tons/year) is necessary, in order to comply with all relevant air quality requirements, regarding the need for a landfill gas collection system.

Perimeter Landfill Gas, § 4.3.1.2, p.4-24 to 4-37: The Lower Explosive Limit (LEL) of 5% (50,000 ppm) is not the appropriate ARAR for evaluating whether methane is migrating beyond the facility property boundaries of landfill Sites 3 and 5. The federal standard for migration of methane cited here, CCR Title 14, is based upon safety considerations (explosion) rather than toxicity, or degradation of air quality, and is therefore not adequately protective of human health, or the environment.

Shallow Soil, § 4.4.1.1, p.4-41 to 4-52: The background concentration of 11.4 mg/kg for cadmium, cited in Tables 4-14 and 4-16, for Sites 3 and 5, respectively, appears to be about an order of magnitude higher than levels generally encountered in site soils from the Orange County area. As previously discussed, the background cadmium concentration distribution should be carefully examined, in order to eliminate outliers, which may be indicative of possible contamination from anthropogenic sources. Elimination of cadmium (detected at a maximum soil concentration of 3.2 ppm) as a COPC, due to an elevated background concentration, could result in an underestimation of health risk. It would be helpful to provide the cumulative probability vs. concentration plots for the background data somewhere in the RI reports, or in an appendix.

Groundwater, § 4.5, p. 4-52 to 4-113, and Tables 4-20 and 4-31: Although MCLs, which factor in technical feasibility and cost, are often utilized as ARARs for establishing cleanup criteria in groundwater, they are not the appropriate criteria for evaluating human health risk, or for the purpose of identifying COPCs. Use of MCLs for this purpose often results in omitting contaminants which significantly contribute to health risk from ingestion and inhalation of contaminants in groundwater. Since COPCs in groundwater were not identified in this section, the purpose of comparing groundwater contaminant concentrations with MCLs in Tables 4-31 (Site 3) and 4-20 (Site 5) is unclear.

Volatile Organic Compounds, § 4.5.1, p.4-117 to 4-118: Although the Site 3 monitoring well in which benzene was detected is located downgradient of Tank Farm No. 5 Area, there is not enough groundwater monitoring data to rule out the landfill as the source of the benzene contamination.

Frequency of Compounds Detected in Groundwater--Phase I and II RI, Site 3, Table 4-32, p.4-133, and Site 5, Table 4-21, p. 4-84: Of the Site 3 compounds listed in this table, the maximum concentrations of the following contaminants exceed their respective PRGs, and hence should be retained as COPCs in the risk assessment: arsenic, benzene, chloroform, bis (2-ethylhexyl)phthalate, dieldrin, and heptachlor. The following contaminants are within a factor of ten of their PRGs, and should also be retained as COPCs: antimony, nickel, selenium, vanadium, DDT, and lindane.

Chromium, since it has not been speciated, is not sufficiently characterized to determine whether it exceeds the Cal-EPA PRG of 0.16 µg/L for hexavalent chromium. In the absence of speciation, all chromium in groundwater (as well as in soil) must be considered in the hexavalent state.

Additionally, for Site 3, there appears to be calculation errors in Table 4-32, with respect to the frequency of detections (percent) for the following compounds: antimony, cadmium, chromium, cobalt, copper, selenium, silver, and zinc.

There is a paucity of data for Site 5 groundwater contaminants, particularly for benzene, chlorobenzene, and toluene, which were analyzed for and detected in a single sample. This is not an adequate data set for estimating potential exposures and risks for these contaminants.

Methane Migration, § 5.3.1.3, p. 5-20 to 5-23: As indicated in the comment on § 4.3.1.2 above, the Lower Explosive Limit (LEL) of 5% (50,000 ppm) is but one criteria for evaluation of potential hazard due to methane migration, but is not the most appropriate ARAR for evaluating whether methane is migrating beyond the facility property boundaries of the landfills at concentrations which pose potential health risks.

Volatile Organic Compounds in Groundwater, § 5.3.3.1, p. 5-25: As indicated in the comment on § 5.3.2.1 above,there is not enough groundwater monitoring data for Site 3 to draw any definitive conclusions regarding the source of the benzene contamination.

Groundwater Data, § 6.1.3, p. 6-5 to 6-6: For Site 3, the selection of COPCs based on comparison of contaminants between downgradient and upgradient monitoring wells resulted in the identification of only three organics--ammonia, chloroform, and diethyl phthalate.

A more complete explanation is needed for the elimination of the other VOCs in groundwater, which were detected at concentrations close to, or above their respective PRG values, including benzene, chloroform, bis (2-ethylhexyl)phthalate, dieldrin, DDT, heptachlor, and lindane (e.g., the pesticides dieldrin, DDT, heptachlor, and lindane were detected in only one groundwater sample from a monitoring wellin January 1993, and were not detected in subsequent samples from that well in June 1993, or January 1996). For Site 5, benzene cannot be eliminated as a COPC on the basis of only one sample result.

Receptor Analysis, § 6.2.1, p. 6-5 to 6-8: We agree with the selection of the office/industrial worker, recreational child, off-site resident, and utility maintenance worker, as potential receptors for Site 3, and the latter three receptors for Site 5. Despite short and infrequent exposures, however, the risks to the utility maintenance worker should still be quantitatively, rather than qualitatively assessed.

Toxicity Criteria for Dermal Exposure, § 6.3.6, p. 6-13 to 6-16, and Table s PII-3 and R II-3: The dermal absorption values used to calculate the Dermal Reference Doses shown in Table PII-3 and R II-3 for Sites 3 and 5 should be consistent with the values cited in the USEPA Region IX PRGs, and the Cal-EPA Endangerment Assessment Manual. Specifically the following values should be used: arsenic (3%), cadmium (0.1%), chlorinated dioxins and furans (3%), chlorinated insecticides (5%), PAHs (15%), and PCBs (15%).

It is stated in this section, that when RfDs and CSFs are adjusted for gastrointestinal absorption, "oral toxicity criteria causes the dermal risk to exceed the oral risk by a considerable margin." This statement is followed by the editorial remark, "Toxicologically, this is rarely possible, and suggests that the standard procedure for estimating dermal risk needs further refinement."

However, adjusting RfDs and CSFs for gastrointestinal absorption, does *not* always result in the dermal risk exceeding the oral risk "by a considerable margin." A combination of exposure factors, including the skin surface area exposed, the duration of exposure, the skin and oral absorption factors, and the ingestion rate, will determine which exposure route will predominate, and drive the risk. Often the oral route will predominate, even when toxicity factors, adjusted for oral absorption are used. Although we are not specifically objecting to the practice of using unadjusted toxicity factors to evaluate dermal risk, the rationale presented here for not considering adjustment overstates the case, and the editorial remark is unnecessary.

On-Site Industrial Use, § 6.4.2.1, p. 6-21 to 6-26: This section erroneously refers to the USEPA Region IX residential PRG for lead, citing a value of 130 mg/kg, which is the Cal-EPA residential PRG value.

Risk to Utility Maintenance Worker, § 6.4.3, p. 6-24 to 6-31: The rationale presented in this section for not quantifying the utility maintenance worker's health risk is that the exposure time associated with typical repairs is usually short and infrequent, that with short exposure times acute systemic toxicity is more of a concern than chronic toxicity, and that chemical concentrations in the surface soil are not high enough to cause acute systemic toxicity. All of these statements may in fact be correct, but they should nonetheless be demonstrated through a quantitation of health risk for this particular receptor, employing appropriate exposure assumptions (e.g., a soil ingestion rate of 480 mg/day).

Exposure Assessment, § 6.5.2, p. 6-27 to 6-33: A discussion should be added to this section involving environmental fate and transport, including contaminant degradation rates and breakdown products, and the associated impact on heath risks via each potential exposure pathway.

Toxicity Assessment, § 6.5.3, p. 6-27 to 6-34: In this section, the following two statements are made: "The rate and extent of chemical absorption via the stomach and intestines are higher than via the skin. Therefore, the dose and risk associated with ingested chemicals should be higher than those associated with contact of chemicals with the skin." The first of these statements is generally true. However, the second statement does not follow from the first, but rather, is dependent upon the relative degree of exposure via the two routes.

In addition, the use of the hexavalent chromium toxicity criteria may not result in as large an overestimation of the groundwater risk as stated here, since hexavalent chromium compounds are often more water soluble than the trivalent form, and may be the predominate species in groundwater.

Fate and Transport, § 7.1.3, p. 7-19 to 7-20: We do not agree with the statement for Site 3, that, "Groundwater is not currently a significant migration pathway due to the low level of contaminants present in this medium," since the groundwater exposure pathway accounts for most of the estimated risk to potential off-site residents.

Risk Assessment, § 7.1.4, p. 7-19 to 7-21: This section should include a comparison of the health-risks estimated for Sites 3 and 5, with the background risks calculated in Appendices P and R.

Conclusions, § 7.2, p. 7-20 to 7-22: In the absence of more precise estimates of peak landfill emissions of methane and VOCs, it is premature to conclude that controls for landfill gas do not need to be considered in the remedial design for Sites 3 and 5.

cc: Doug Steele, USEPA Region IX
John Christopher, CAL-EPA/DTSC

jmp/eltoro8.mem