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MCAS EL TORO
SSIC # 5090.3

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Naval Facilities Engineering Command
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DATE: May 6, 1996
CTO #: 0080
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FROM: D. J. Tedaldi, CTO Leader

DESCRIPTION: Comments on Draft RI Report for Site 17 - Attachments A and B
Comments on Draft Quarterly Ground Water Monitoring Report-Attachment C

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CLEAN II Program
Bechtel Job No. 22214
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May 6, 1996

Joseph Joyce BRAC Environmental Coordinator
Department of the Navy - Southwest Division
Naval Facilities Engineering Command
Environmental Division
1220 Pacific Highway, RM 18
San Diego, CA 92132-5181

Subject: Submittal of Review Comments by Environmental Management for MCAS El Toro, CTO-0080 on:
Draft Remedial Investigation Report for Site 17 prepared by CLEAN II
Draft Quarterly Ground Water Monitoring Report prepared by CDM Federal Programs Corp.

Dear Mr. Joyce:

I have attached comments on the two draft documents identified above. The CLEAN II RI document is acceptable as a draft but will require revisions to ensure clarity within the final product. The CLEAN II authors are strongly encouraged to consider the comments noted on the two attachments to this letter. Comments on the draft remedial investigation report have been separated into Technical Comments-Attachment A and Editorial Comments-Attachment B. There are several key issues which require special attention:

- Clarification as to whether or not the landfill is leaking and affecting groundwater quality
- Inconsistencies between chemicals of potential concern identified in the Nature and Extent text (Section 4) and the Baseline Human Health Risk Assessment text (Section 6)
- Explicit identification of the depths of soil which represent surface and subsurface soil in Section 4, Section 6 and the Ecological Risk Assessment (Section 7) as well as the representative analyte levels within these depth intervals
- Clarification of the relationship of the calculated numerical risk to existing conditions, especially for risk drivers. Incremental risk which is dependent upon comparisons with background/ambient must be reexamined and should represent the risk presented by concentrations above the 95 percent UCL on the mean and not the 95 percent UTL

The CDM Federal Programs Corp. draft quarterly groundwater monitoring document is acceptable. The authors should consider the comments noted in Attachment C.

If I can be of any further assistance please call me in Bechtel's San Diego office at (619) 687-8780 or E-mail at DJTEDALD@Bechtel.com.

Sincerely,

Dante J. Tedaldi, Ph.D., P.E.
Technical Quality Assurance MCAS El Toro

Attachment: Comments on Draft RI Report for Site 17 - Attachments A and B
Comments on Draft Quarterly Ground Water Monitoring Report Attachment C

cc: Larry Vitale, RPM
Tayseer Mahmoud, RPM Base Closure Branch
Bonnie Arthur, RPM

1. Technical Comments

1.1. Page ES-6, 2nd paragraph

The text is inconsistent with respect to the issue of landfill leaching and the effect if any on groundwater quality.

The text states that "...elevated metals concentrations and low concentrations of organic compounds in soil and groundwater indicate that leaching of the landfill has occurred." However, in Section 5.1.3.2 the text states that "Samples taken from the monitoring wells surrounding the landfill have minimal reported concentrations of contaminants, except for manganese,. selenium, and thallium which exceed MCLs in one downgradient well and the upgradient well." Moreover, in Section 5.2.1.5 the text notes that "This exceedence is possibly due to marine siltstones and sandstones acting as water-bearing zones and as the source of the alluvial valley fill."

In addition, Section 5.1.2.3 states "Concentrations of VOCs and SVOCs were detected in downgradient wells but did not exceed their respective MCLs." However, in the next paragraph, the text states "[That for manganese. selenium, and thallium] These results are the only indication of a potential impact to groundwater in the area of the landfill..." It would seem that unless the upgradient well samples were found to contain VOCs and SVOCs, the presence of these classes of compounds at any level in the downgradient wells should be considered strong evidence of the landfill leaking.

1.2. Page 1-21, Section 1.2.3.1

Clarify that the PRGs used represented residential exposure conditions. This is of considerable interest because the subsequent baseline risk assessment did not consider residential on-site exposures. Rather, residential exposures were to groundwater via ingestion and dermal contact and inhalation of vapors from groundwater.

1.3. Page 2-30, 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.

1.4. Page 4-43, Section 4.4.1

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 "All organic compounds detected in shallow soil with concentrations that exceed U.S. EPA residential soil PRGs are considered COPCs." However, in

Section 6 the text indicates that a very different process was used to identify COPCs, see page 6-2, all of section 6.1.1. A notable example of the inconsistency is that iron, calcium, and sodium are identified in Section 4 as a COPC and efforts have been expended to track these analytes in the text and figures; however, these same essential nutritional elements are excluded from the baseline human health risk assessment.

Note that the text indicates that the distributions of COPCs in soil are presented on numerous figures in Section 4. These figures seem to perpetuate the inconsistency between the COPC listing in Section 6.

1.5. Page 4-91, Figure 4-20

See previous comment.

The figure includes iron, sodium, calcium and magnesium which are essential nutritional elements. This leads the reader to believe that there is a justified level of concern with these elements when in fact there is not.

1.6. Page 4-105, Section 4.6.4

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.

1.7. Page 4-107, 3rd paragraph

See previous comment, it applies to this situation.

1.8. Page 5-7, Figure 5-2

The indicated groundwater flow direction appears to be different than the apparent flow direction shown on Figure 3-8 of the RI.

1.9. Page 5-8, Figure 5-2

Based on the cross-sections in Figure 3-7 of the RI the waste (landfill) is not present to extent indicated on Figure 5-2. However, the trenching performed in this area seems to confirm some landfill in the area. Confirm and correct if necessary.

1.10. Page 5-10, Table 5-1

As noted in preceding comments the COPCs listed in this table are not consistent with those presented in the Baseline Human Health Risk Assessment.

1.11. Page 5-14, Section 5.2.1.3

The text states that there are no VOCs at concentrations of concern at Site 17. It is not clear what is the intent of the term "...concentration of concern..." Is this a conclusion based on a screening against PRGs and MCLs or is it based on the baseline risk assessment results? The issue is further confounded by the statement two sentences later, "While trace concentrations of VOCs were detected in both media none were reported at levels that exceed the regulatory or established risk criteria for the Site."

1.12. Page 5-15, Section 5.2.1.5

Considering the numerous statements in this RI regarding the leaching of metals from the landfill to groundwater it seems that the discussion of the presence of apparently elevated levels of metals in groundwater is insufficient. The authors should expand upon the single sentence which provides a very cursory explanation for the presence of selected metals. Moreover, the statement on page 5-15 seems to conflict with the statements about the leaching of metals from the landfill to the groundwater.

1.13. Page 5-15, Section 5.2.1.6

The text does not attempt to relate site-specific results for pesticides and herbicides to the generic fate and transport discussion provided. The authors should avoid making broad-based statements without providing site-specific analytical support. For example, they might indicate the types of pesticides and herbicides detected and the relative levels; and then indicate if they are found at the surface or at depth or in groundwater. Is the fate and transport analysis for these compounds intended to address agricultural application, or does it address the possibility that the materials were disposed of in the landfill as waste? It is possible that the mobility and fate may be different under these circumstances.

1.14. Page 5-21, Section 5.3.2

The text includes the sentences, "There are dissolved metals in groundwater in a downgradient monitoring well. No significant additional impact is expected in the future..." This statement requires revision. First, 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 (see last sentence on page 5-5). Second, the implication is made that the presence of dissolved metals is considered to be an "...impact..."; however, "No significant additional impact is expected in the future...". The authors seem to be implying that (1) the landfill has caused a degradation of groundwater quality; and yet (2) the same impact could not continue in the future even though all current and past conditions would tend to remain the same. This is a conflicting argument which should be corrected.

1.15. Section 6, General Issues Related to the Human Health Risk Assessment

1.15.1. The text does not provide an adequate discussion of the relationship of the primary risk drivers to their occurrence and magnitude in the vicinity of Site 17. For example, the primary USEPA carcinogenic risk driver for groundwater is arsenic; however, the unfiltered value of 12.9 micrograms/liter is questionable as representative of groundwater conditions. This is evidenced by the maximum detected filtered concentration of 5 micrograms per liter which is barely above the detection limit and thus suspect itself. Of additional interest is the fact that the MCL is about four time greater than the highest measured arsenic concentration. It therefore appears that the risk managers would benefit from additional interpretation of the data presented in this RI. The authors should attempt to provide greater perspective on the relativism of the risk values presented. For organic compounds the primary risk drivers for groundwater were chloroform and bromodichloromethane; their detected levels were 0.9J and 0.4J microgram/L, respectively. Since these concentrations, as indicated by the "J" qualifier, are estimated and below the detection limit of 1 microgram/L; the final discussion should highlight this point as well as the fact that the MCLs for the compounds are one hundred times greater than the reported levels.

1.15.2. The text does not appear to adequately address the issue of incremental cancer risk; defined as the cancer risk presented by the difference between the total and the background/ambient levels of a carcinogenic analyte. When the difference is calculated, both concentrations must be the same statistic. Risk assessment guidelines recommend using the 95 percent UCL on the mean concentration to calculate risk under the RME scenario. This draft RI report uses the 95 percent UTL of the background/ambient data set to identify the reference concentration. An analyte is considered a contaminant when a measured concentration exceeds the 95 percent UTL and this approach is appropriate for screening risk assessments. However, for baseline risk assessments the UTL value should not be compared to the UCL for decision-making on background risk. For these purposes, the 95 percent UCL on the mean should be estimated for the background/ambient data set. This suggestion was explicity made by CTO-080 at a meeting between CLEAN I, CLEAN II and SWDIV in early December at CH2M-Hill's office in Santa Ana. At that time it was agreed that CLEAN II would recalculate the background inorganic levels using the 95 percent UCL on the mean. However, the draft RI report does not indicate that the calculations were completed.

1.16. Page 6-8, Section 6.2.3

Include a table which lists the exposure point concentrations for each analyte under each exposure scenario.

1.17. Page 6-17, 2nd paragraph

The text does not indicate if total or hexavalent chromium values were used to calculate risk. This is significant considering that, according to the text, "Chromium was the sole contributor to the risk [for inhalation]."

1.18. Page 6-17, Last sentence on the page

Similar to previous comment. Identify whether speciated chromium values were used.

The sentence indicates that chromium contributed to over 70 percent of CAL-EPA risk from ingestion of drinking water.

1.19. Page 8-3, Table 8-1

The text presents conclusions about landfill leaching and the effect on groundwater quality which are unsupported by the discussions in the RI.

The text states that VOCs, metals, petroleum hydrocarbons, and general water quality parameters indicate that landfill contents have been leached to groundwater. There is limited (see comments regarding page ES-6) if any discussion of the basis for such a statement for these parameters.

1.20. Page 8-14, Section 8.1.4

This subsection should include an enhanced discussion of relative risk, as described in the comments above.

For example, the text notes that the majority of the groundwater risk is due to arsenic but fails to mention that all arsenic values were well below the MCL.

1.21. Page G-19, Figure 1

The text associated with this figure does not include an adequate discussion of the flow chart items which extend out past the "yes" following the "Proportion of Non-Detect Data ≥15%." Include an explanation as to why an adjustment to the mean and standard deviation would be required and how it would be performed. In addition, explain why an adjustment is only required for data sets with percentage non-detects ≥15 percent but ≤ 50 percent.

1.22. Page S-9, Table S-15

There is no explanation for the use of identical values for all subsurface concentrations of PAHs. A 95 percent UCL is presented in the table for what is apparently (though not labeled as such) the surface concentrations; however, no complementary UCL is provided for the subsurface soil. Maximum and minimum and other basic statistics are provided; however, the data set (surface or subsurface) to which they apply is not indicated.

Attachment B

1. Editorial Comments

1.1. Page ES-5, 4th full paragraph.

Provide an explanation for the term reference level versus background concentration.

1.2. Page 1-21, Section 1.2.3.1

Clarify that the PRGs used represented residential exposure conditions.

1.3. Page 1-21, Section 1.2.3.1

The text does not include explanation of all laboratory qualifiers presented. Although "J" is described, "b", "D", and "B" are not.

1.4. Page 2-20, Section 2.7.1

The number of samples is inconsistent with the number of sampling stations for soil.

The text identifies fifteen stations at the reference area and fifteen more stations at Site 17. However, in the next paragraph the text notes that "Thirteen soil samples were collected from each of the Phase II sampling stations and the 0- to 1-foot depth..."

1.5. Page 2-21, Figure 2-4.

The distinction between the two diamonds which identify soil gas locations is difficult to notice. Consider filling in one diamond size or using a different symbol.

1.6. Page 2-40, Section 2.10.5

The text reports that dissolved oxygen measurements were recorded and presented in Appendix L. However, these data are not reported in Appendix L or anywhere else in the RI.

1.7. Page 4-4, Table 4-1

The table should identify a density range of 10-100 for Type 3 wastes; not 10-50.

1.8. Page 4-33, Figure 4-10

The flux rate should be corrected to micrograms/square meter/minute; not [micrograms/ meter/minute]squared.

1.9. Page 4-35, Figure 4-11

The concentration units should be corrected to micrograms/liter; not micrograms/kilogram.

1.10. Page 4-45, Figure 4-13

In the notes, the concentration units should be corrected to micrograms/kilogram; not micrograms/kilogramsLiter.

1.11. Page 4-51, Table 4-12

The table does not achieve consistency between the indicated and the apparent units of measure for some of the organic analytes. For example, TPH is presented for each boring in units [apparently] equivalent to mg/kg. However, SVOC data are [apparently] in units of microgram/kg; yet the indicated unit is mg/kg (as indicated by the complementary comparison PRG to the left column in the table).

1.12. Page 4-55, Table 4-13

See previous comment, it applies to this table as well.

1.13. Page 4-61, Table 4-14

Add a note to title or footer which indicates that the frequency table includes all data from Phase I and Phase II.

1.14. Page 4-73, Table 4-16

The units for the subsurface detections should be the same as the listed PRGs to facilitate comparisons. That is, mg/kg and mg/kg when appropriate and microgram/kg and microgram/kg.

1.15. Page 4-85, Figure 4-17

The concentration of 77 mg/kg TPH at a depth of 235 feet below ground surface seems unusual. Confirm the value with the original CLEAN I data reports.

1.16. Page 4-82, Table 4-18

Add the words "Minimum" and "Maximum" to columns five and seven, respectively.

1.17. Page 4-97, Table 4-21

The data from Well 17NEW1 are missing.

1.18. Page 4-107, 1st paragraph

If possible, the text should be updated with the latest information collected by the Marine Corps' indefinite quantity contractor currently performing quarterly monitoring of all wells at the Station.

1.19. Page 6-17, Section 6.4.1.1

Since anthropogenic PAH reference levels have now been established for MCAS El Toro this new information should be included in the final RI if possible.

1.20. Page 6-17, Section 6.4.1.2

The last sentence should probably read as, "Chromium contribute over 70 percent of the risk..."

1.21. Page 6-27, Section 6.5

Consider inclusion of a summary table similar to the one presented on Page 7-21, Table 7-6, Uncertainties Associated with the Ecological Risk Assessment.

1.22. Page G-15, Table G-4

The table presents UCL concentrations with apparently arbitrary degrees of significant figures. The original data set should be checked and the values presented should represent a realistic degree of significance. For example, it would seen that the authors do not mean to imply that they know with certainty that ambient magnesium is found at precisely 7.05339269 mg/kg while for arsenic the value is about 8.50 mg/kg.

1.23. Page G-15, Table G-4

The table should include a footnote to indicate the depths considered as "Surface Soil and Subsurface Soil" and indicate which applies to the data presented.

1.24. Page G-17, Table G-4

The table includes superscripts which are apparently incorrect with respect to their definitions at the end of the table. Check on the following and correct as needed: "b", "c", "d", and "e".

1.25. Page G-19, Figure 1

The text associated with this figure does not include an adequate discussion of the flow chart items which extend out past the "yes" following the "Proportion of Non-Detect Data ≥15%." Include an explanation as to why and adjustment to the mean and standard deviation would be required and how it would be performed. In addition, explain why an adjustment is only required for data sets with percentage non-detects ≥15 percent but ≤ 50 percent.

1.26. Page S-10, Table S-6

The headers to the third and fourth columns in this table should be modified to note that values indicated represent the calculated concentrations in earthworms and not the soil concentrations at Site 17 or the reference site.

1.27. Page S-19, Table S-13

The table should include a footnote to indicate the depths considered as "Surface Soil and Subsurface Soil."

1. Technical Comments

1.1. AIR ENTRAINMENT

In Appendix D the report notes that air entrainment in water collected at selected locations as reported by DTSC in 1993 has been confirmed. The issue of air entrainment in the discharge of 4-inch well pumps appears to have been deferred to the "...well pump maintenance activities." It is not clear what the intent of this statement is. Please provide detail as to what the next actions are with respect to this confirmed problem.

1.2. DISSOLVED METALS

Table 7-1. Inspection of the data indicates that significant increases in the measured concentrations of several metals have occurred. Of particular interest are chromium and iron which in some cases increased by over two orders of magnitude. A brief review indicates that there is often a strong relationship between these two analytes. In unfiltered samples, iron levels are approximately 10 times the chromium levels. This situation should be examined in detail since the elevated chromium levels are significant. A recent publication, 1996 Winter Ground Water Monitoring Review pp. 93-99, "Nickel and Chromium in Ground Water Samples as Influenced by Well Construction and Sampling Methods," provides an excellent reference on this phenomenon. The authors should examine the potential reasons for the apparent increase and provide an explanation of the situation in the final report. Crevice corrosion in the stainless steel wells may be the source of the chromium; however, modifications to samplings technique may be successful in alleviating the inclusion of corrosion releases into the samples. The filtered and unfiltered samples are an excellent source of information for the examination of the effect of colloids on the measured metals values. It appears that the effect of filtering was significant for only these two metals.

1.3. DISSOLVED OXYGEN

The measured dissolved oxygen levels listed in Appendix C are often in excess of the theoretical maximum for natural waters. The solubility of oxygen for water exposed to water-saturated air at atmospheric pressure and no salinity ranges between 9.7 and 8.1 mg/L between 17 and 26°C respectively. Moreover, with increasing salinity the solubility of oxygen decreases. See the table below.

Dissolved Oxygen Relationships Standard Methods, 17th Ed. 1989

Temperature, °C	Dissolved Oxygen, mg/L Chlorinity = 0	Dissolved Oxygen, mg/L Chlorinity = 10
17	9.7	8.7
18	9.5	8.5
19	9.3	8.3
20	9.1	8.2
21	8.9	8.0
22	8.7	7.9
23	8.6	7.7
24	8.4	7.6
25	8.3	7.5
26	8.1	7.3

At least 25 percent (43 out of 163) of the reported dissolved oxygen values for MCAS El Toro are in excess of the theoretical maximum. A closer examination of these data is required because a substantial proportion of the other measurements are at or very near saturation. This situation does not appear likely given that the Marine Corps' geochemical model for the station proposes that substantial pyrite oxidation is occurring throughout the vadose and saturated zone. Therefore it can be expected that oxygen consumption during pyrite oxidation would reduce dissolved oxygen values to levels noticeably less than those reported. This decrease does not include further reductions due to the consumption of dissolved oxygen by reaction in the organic-rich layers of the surface soils. Freeze and Cherry (Groundwater, 1979; p. 245) have noted that in recharge areas of silty or clayey soils, groundwater commonly does not contain detectable dissolved oxygen. Thus, the predictions and expected conditions do not support the measured dissolved oxygen values and the data collection techniques should be reexamined to ensure that proper procedures were followed and instrument calibrations were verified.