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DEPARTMENT OF THE NAVY

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Ser EP/KK:4042/ 01193

28 APR 1995

From: Commanding Officer, Navy Environmental Health Center
To: Commanding Officer, Atlantic Division, Naval Facilities
Engineering Command, ATTN: Katherine Landman, 1510 Gilbert
Street, Norfolk, VA 23511-2699

Subj: MEDICAL REVIEW OF INSTALLATION RESTORATION PROGRAM
DOCUMENTS FOR MARINE CORPS BASE, CAMP LEJEUNE, NC

Ref: (a) Baker Environmental transmittal ltr of 19 Jan 95

Encl: (1) Medical Review of Draft Remedial Investigation Report,
Operable Unit 7 (OU#7) (Sites 1, 28, and 30), Marine
Corps Base, Camp Lejeune, North Carolina
(2) Medical/Health Comments Survey

1. As you requested in reference (a), we completed a medical review of the "Draft Remedial Investigation Report, Operable Unit 7 (OU#7) (Sites 1, 28, and 30), Marine Corps Base, Camp Lejeune, North Carolina." The attached comments are included for your information as enclosure (1).

2. Please complete and return enclosure (2). Your comments are needed to continually improve our services to you.

3. The points of contact for this review are Ms. Katharine Kurtz or Mr. David McConaughy, Health Risk Assessment Department. If you would like to discuss this medical review or if you desire further technical assistance, please call them at (804) 444-7575 or DSN 564-7575, extensions 490 and 434, respectively.

A handwritten signature in cursive script, appearing to read "A. F. Jones".

A. F. JONES
By direction

**MEDICAL REVIEW OF
DRAFT REMEDIAL INVESTIGATION REPORT
FOR OPERABLE UNIT NO. 7 (SITES 1, 28 AND 30)
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

- References:** (a) Risk Assessment Guidance for Superfund, Vol. 1, Part A: Human Health Evaluation Manual, Dec 1989 (EPA 540/1-89/002)
(b) "Guidelines for Exposure Assessment," EPA Final Guidelines, Notice Federal Register (57 FR No. 104, Friday 29 May 1992)

General Comment:

1. The draft documents entitled "Draft Remedial Investigation Report, Operable Unit No. 7 (O.U.#7) (Sites 1, 28 and 30), Marine Corps Base, Camp Lejeune, North Carolina," (Report Volumes I, II and III and Appendix Volumes I, II and III), dated January 19, 1995 were provided to the Navy Environmental Health Center (NAVENVIRHLTHCEN) for review on 26 January 1995. The draft Remedial Investigation (RI) report was prepared for the Atlantic Division, Naval Facilities Engineering Command by Baker Environmental, Inc. Our comments and recommendations are provided below.

Review Comments and Recommendations:

1. Tables ES-1, ES-2, Section 2.0 Tables; Tables 14-2, 14-12, 16-3

Comment: Tables throughout the documents indicate positive detections and ranges of contaminant concentrations measured in various media sampled. For numerous contaminants, the lower end of the range of the concentration term indicated is "ND," defined in the footnotes as "Not detected." The actual method detection limit (MDL) values are not on the tables or provided anywhere in the report.

Recommendation: Present actual MDL values and compare with regulatory limits; indicate specific test methods used so that data can be properly evaluated for inclusion in the quantitative risk assessment.

2. Table 12-4, Note 3

Comment: Field blanks were not collected during soil investigations.

Recommendation: Include a discussion of the potential impact on data validity.

3. Page 16-16, Section 16.3, "Quantification of Exposure"
Page 7.8, Section 7.3, "Exposure Assessment"
Table 16-7; Page 16-4, Section 16.2.3.2, "Frequency of Detection"

Comments:

a. Reference (a) recommends the use of one-half the sample quantitation limit (SQL) as a proxy concentration for non-detects if there is reason to believe that the chemical is present at a concentration that is below the SQL. SQLs are preferred over other detection limits such as MDLs, instrument detection limits (IDLs) and contract required quantitation limits (CRQLs) because they reflect sample specific characteristics. Only if SQLs are not available should other detection limits be used as proxy values for non-detects.

b. Reference (b) guidance recommends that "Several statistical estimators of exposure should be identified, e.g., the 50th, 90th, or 95th percentiles. The distribution should reflect exposures, not just concentrations." Although the guidance discusses the concept at length, the bottom line is that risk estimates for both the upper bound and the average case should be presented.

c. The health risk assessment presents only the reasonable maximum exposure (RME) risk estimates. Presenting a one-point (upper-bound) estimate of risk often results in an upwardly biased assessment of risk.

Recommendations:

a. State whether non-detects were always included (regardless of frequency of detection), whether proxy values for non-detects were used, etc.

b. When it is appropriate to use substitute values for non-detects, use one-half the SQL. If SQLs cannot be obtained, then consider using one-half the CRQL, MDL or IDL, in that order, with caution.

c. If MDLs or other detection limits are used, state specifically that they were used because SQLs could not be obtained.

d. For future investigations, ensure that analytical laboratories are required to provide sample-specific SQLs.

e. Calculate and present several risk estimates; as a minimum, calculate and present risks posed by the average exposure concentrations in addition to the upper-bound RME concentrations.

4. Table 14-1, " Summary of Rejected Data, Biotic Media"

Comments:

a. Brief comments are given for laboratory data qualifiers that resulted in data being rejected or designated as estimated concentrations.

b. For example, both the Target Compound List (TCL) volatile and semivolatile fractions for Site 28 Biota media were qualified with either a "J" or a "R" qualifier for all samples because the holding times were exceeded per Table 14-1 Comments. The Executive Summary, page ES-31, stated that "Positive detections of Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs) in whole body tissue samples were rejected due to laboratory contamination" from Orde Pond. "The majority of volatile and semivolatile contaminant analyses from Orde Pond fillet samples were rejected due to laboratory interference. Therefore, the results of those analyses are inconclusive."

c. Laboratory Matrix Spike and/or Matrix Spike Duplicate recoveries, as indicated, also failed to meet the Contract Laboratory Program (CLP) requirements.

Recommendations:

a. Request that the third party data validator's comments be reviewed to determine if additional, more explicit detailed information was requested from the laboratory to explain the comments provided for data qualifications.

b. Determine if the laboratory recently has received an audit for CLP work and state the date of the audit and who conducted the audit.

c. State whether resampling of various media will be required to meet the data quality objectives of the Remedial Investigation (RI). State if the original data quality objectives of the investigation have been met.

d. Request that the laboratory provide data concerning their levels of VOCs/SVOCs that are found routinely in their sample blanks.

5. Pages 16-5, 16-6, 16-9, Elimination of "Common Laboratory Contaminants" as Chemicals of Potential Concern

Comments:

a. BEHP (bis(2-ethyl hexyl)phthalate) can be considered a common laboratory contaminant; however, sample contamination for this compound also can result from the sampling techniques used in the field (e.g., using tubing other than tygon tubing).

b. Reference (a) details specific criteria for determining whether “common laboratory contaminants” can be disregarded on the basis of detection in blank samples. In general, the ratio of concentrations found in samples and in blanks are used to demonstrate that a contaminant is not likely attributable to a site contamination source. Samples exceeding the blank concentrations by a factor of 10 are considered to be site-related contamination.

c. The text on page 16-6, section 16.2.4.1 (Site 28) states that “Seven of the 19 detections were greater than 940 ug/L” for BEHP; section 16.2.3.5 indicates that BEHP was detected in the blank at 94 ug/L. Various rationales are used to conclude that the BEHP detections are due to laboratory contamination, and therefore should be discounted. We do not agree.

Recommendations:

a. Provide information concerning sampling methods that would rule out field contamination.

b. Discuss the concentrations of BEHP in the samples versus the concentrations in the blanks to determine by what factor the samples exceeded the blank concentrations.

c. Reconsider elimination of BEHP from the risk assessment if the basis of rejection was based on laboratory practice.

6. Data Qualifiers

Comment: All tables do not provide explanations for data qualifiers used.

Recommendation: Provide descriptions of all data qualifiers used in the reports. Reference (a), Exhibit 5-4, lists CLP Laboratory data qualifiers and their potential use in quantitative risk assessment.

7. Page ES-35, “Groundwater”; Pages 9-1, 9-2, Section 9.0, “Conclusions and Summary”
Table 16-2; Appendix M; Page 16-4, Section 16.2.3.3, “Comparison to Background”

Comments:

a. Throughout the report, the statement is made pertaining to inorganic elements that “sample concentrations were compared to site-specific (i.e., twice the base-wide average concentration) background levels,” even for those inorganics detected at levels exceeding maximum contaminant levels (MCLs) for drinking water or North Carolina Water Quality Standards (NCWQSS).

b. References throughout the Remedial Investigation report are made to a Baker report concerning an independent study of base-wide inorganic levels (Baker 1994) and comparisons to published values of various soil metals.

c. The text on page 9-2, paragraph 2 states that "based on a comparison of base-specific background levels, positive detections of inorganics at Site 1 do not appear to be the result of past disposal practices."

d. Sufficient justification does not appear to have been given for the elimination of inorganics at Site 1. Additional information concerning the location of Site 1 background samples, as well as Sites 28 and 30, and the methods used to select sampling locations appears to be needed before any conclusions can be made. Consideration should be given to using **site-specific** background samples for comparison purposes.

Recommendations:

a. State if a statistical method of analysis was used to determine O.U.# 7 background levels. Indicate background sampling locations on a site map for each location. Discuss adequacy of background samples site selection on the basis of uniform site characteristics; e.g., geological, hydrological, analytical results, etc.

b. Levels of contaminants that exceed Applicable or Relevant and Appropriate Requirements (ARARs) and Region IV Guidelines but are considered to be below site background levels may be carried through the quantitative risk assessment process to determine the potential risks that the contaminants present to human health.

8. Table 14-2

Comment: Numerous tables in the reports, such as Table 14-2, have a column heading entitled "ARAR." In these columns, regulatory documents and State or Regional EPA guidance are cited. The specific regulatory standard values for applicable analytes are only identified in a few tables, such as Tables 7-3 and 25-3. Therefore, the information is not readily evident and the data comparisons are difficult to evaluate.

Recommendation: Provide the regulatory compliance and State or Regional EPA guidance values in additional tables.

9. Data Validation Summary

Comment: The EPA Office of Solid Waste and Emergency Response has published "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94-013, February 1994) and "USEPA Contract Laboratory Program National Functional

Guidelines for Organic Data Review" (EPA-540/R-94/012, February, 1994). These documents supersede the documents referenced in the text: "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses-Draft" (USEPA, 1991) and "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses" USEPA federal guidelines.

Recommendation: Cite the latest revisions; correct any discrepancies deemed necessary (these documents do not constitute rule making).

10. Page 7-13, Page 7-14, Section 7.3.3, "Quantification of Exposure"
Page 16-15, Section 16.3.3

Comments:

a. The second paragraph of section 7.3.3 states that "For the sake of conservatism, the 95 percent UCL for the lognormal distribution was used for each contaminant in a given data set for quantifying potential exposures..."

b. The text does not indicate whether geometric means (vice arithmetic means) were derived for each data set. Geometric means usually are associated with lognormal distributions.

c. Reference (a) states "Because of the uncertainty associated with any estimate of exposure concentration, the upper confidence limit (i.e., the 95 percent upper confidence limit) on the arithmetic average will be used for this variable" unless the upper confidence level on the average concentration is above the maximum detected or modeled concentration.

d. Region IV risk assessment guidance discusses the use of a statistical "H" parameter in the equation for calculating the 95 percent upper confidence limit (UCL).

e. When calculations show that use of arithmetic means and associated normal 95 percent UCLs result in unrealistically high concentration estimates, (i.e., that are greater, in most cases, than the maximum detected values), it is more practical to use geometric means and normal UCLs. In our opinion this explanation would be sufficient justification to avoid using arithmetic means and associated normal UCLs (modified by "H" parameter exponents).

Recommendations:

a. State whether normal UCLs presented in Appendix L were calculated according to Region IV guidance risk equations; i.e., state whether the "H" parameters were determined and used in the calculations.

b. Calculate and present the risk posed by the normal 95 percent UCL, or provide sufficient justification for use of the lognormal values.

11. Blood Lead Levels

Page ES-37, Page 16-11; Appendices O and P

Comments:

a. Page ES-37 text states that "...use of the UBK model indicates that exposure to surface soil, subsurface soil and ground water at this site generates blood lead levels in children that are slightly greater than the threshold level of 10 ug/dL."

b. Because maximum levels of lead were used to generate these USEPA lead uptake/biokinetic modeled results, the report indicates that the potential health impacts to young children may be overestimated.

c. The UBK value for blood-lead levels in children is within the lower range considered significant by ATSDR Public Health Assessments (PHAs). Therefore, additional justification appears to be warranted for the reports' conclusions that the UBK value for blood lead obtained may be an overestimation of the potential human health impact from exposure to lead in soil and ground water.

d. There is already a blood-lead screening effort at MCB Camp Lejeune, based on elevated lead levels in some tap water samples.

Recommendations:

a. Run the UBK model again.

b. Make sure that correct default parameters and lead concentrations are used.

c. Add the tap water lead levels found at MCB Camp Lejeune into the UBK Model if a correlation is found to exist between the drinking water lead source and Site 28 lead contamination.

12. Page 16-4, Section 16.2.3.1, "Site History;" Figure 1-4
Page 3-7, Section 3.3.5, "Groundwater Sampling Procedures"
Page 5-6, Section 5.3.2, "Groundwater Investigation"
Pages 1-4, 1-5, "Hydrogeology"

Comments:

a. The text states that "the first round of ground water results indicated elevated levels of metals. Therefore, a second round of ground water data was collected for metal analysis. Because these results were much lower than the round one results, the second round results for metals were used to determine potential risk."

b. This comment is made for the various sites in this report. Section 3.0 of this report indicates that the round two sampling method ("low flow purge method") was different than the round one method.

c. The text also states that seasonal variation in the water table is known to be between 2 and 4 feet. No correlations between sampling times and high or low water table variations are made. Ground water sample composition may vary with the time of the year. The text does not address the need for seasonal sampling. Uncertainties resulting from seasonal water table fluctuations are not addressed in the uncertainty section. The hydro-geology section indicates that recharge to the drinking water aquifer (Castle Hayne Aquifer) is directly related to the amount of recharge it receives from the surficial aquifer.

d. Figure 1-4 provides water level data from a U.S. Geological Survey dated 1966.

Recommendations:

a. Determine potential risk separately using results from both round one and round two data. Otherwise, it would appear that the results were biased toward the less conservative results. Further justification of the sampling technique chosen in round two as being a technique more appropriate and more frequently used for sampling ground water is needed, in our opinion, to eliminate the round one sampling results.

b. Provide information regarding the level of the water table during ground water sampling event(s). Address data uncertainties pertaining to the time of sample collection vice other seasons of the year. Discuss possibility of inaccuracies in 1966 water level survey data as applied to current water levels at the site.

c. The current ground-water pathway scenario was eliminated based on the fact that the shallow ground water currently is not used as a potable source. A discussion should be presented concerning the potential for migration of chemicals from the shallow to the deep aquifer and any impact this may have on the supply wells. Consideration should be given to presenting risks for shallow and deep ground water pathways for both the current and future scenarios, as appropriate.

13. Pages 16-3, 16-10 and 16-12, Section 16.2.2, "Biota Investigation" Site 28

Comments:

a. The text states that "an insufficient amount of fish tissue sample was collected from Cogdels Creek. Consequently, there were no fish tissue results to evaluate from Cogdels Creek..." "Fish ingestion for the fisherman was evaluated using fish tissue samples (fillets) collected from the New River and Orde Pond," according to the report. Page 16-11 states that "Fishing at Cogdels Creek is less frequent."

b. The text should provide an explanation for the lack of sufficient fish tissue samples taken at Cogdels Creek. For example, the text should indicate that Cogdels Creek is too shallow/small to support significant populations of fish of edible size if this is the case. This fact also would explain why the fisherman scenario was not addressed for this area.

c. Page 4-16 of Reference (a) states that "If only human exposure is of concern, chemical concentrations should be measured only in edible portion(s) of the biota. For many fish species, estimates of concentrations in fillets (skin on or skin off) are the most appropriate measures of exposure concentrations. Whole body measurements may be needed, however, for certain species of fish..." as determined by food preparation methodology of the local consumers.

Recommendations:

a. We feel that several data gaps need to be addressed in the baseline human health assessment (i.e., this document should be a "stand alone" document and should be separate from an ecological risk assessment):

- (1) The type(s) of fish caught, the type(s) of fish ingested, and how the fish are prepared, (fillets, cooked whole in stews, etc.).
- (2) The recreational fishermen's average consumption rate of fish and/or shellfish caught from the New River, Cogdels Creek and Orde Pond, if applicable.
- (3) Whether there are subsistence fishermen harvesting from these surface waters.
- (4) Whether fish and/or shellfish caught from these surface waters are sold for consumption.
- (5) Whether sampling locations and/or seasonal variations are likely to impact fish populations in the surface waters.

b. We recommend that fish analyses include fillets (skin-on) where appropriate from individual fish of edible size. Both bottom dwelling (such as catfish) and open water species should be sampled if both are used as a food source.

c. Additional fish analyses should include retesting of those parameters, such as VOCs and SVOCs, where data was determined to be inconclusive due to laboratory data qualifications.

14. Pages 16-12, 16-13, Section 16.3.2, "Exposure Pathways"
Page 7-29, Section 7.7.2, "Exposure Assessment Uncertainty"

Comments:

a. The ground water pathway is not assessed for the current exposure pathway scenario. The text indicates that ground water is not utilized, at present, for potable purposes. The report further states that "...military personnel, military dependents and civilian base personnel are exposed to groundwater drawn from the deep zone via ingestion, dermal contact and inhalation."

The potential for contaminants to be transported between the shallow and deep aquifers (or *vice versa*) is not addressed directly.

b. The subsurface soil exposure pathway also is not assessed for the current exposure scenario.

c. The text indicates that Orde Pond is utilized as a training site for current military receptors, to include activities in Orde Pond itself. The text also indicates that adults and children use the New River and Cogdels Creek areas for recreational purposes. Orde Pond is not included as a site for recreational activities. Page 16-11 indicates that signs are posted at Orde Pond that prohibit swimming; however, an explanation as to the reason for the warning signs is not given. In addition, the report indicates that swimming has not been observed at any of the three surface water sites (wading is possible); however, a swimming pathway is assumed for an exposure assessment.

d. The text also indicates that "Soil (subsurface soil in the future case), surface water, sediment and biota exposure, as calculated in the current scenario for the child and adult receptor, was expected to remain the same in the future case" (future residential scenario).

Recommendations:

a. We feel that the current military and current recreational exposure scenarios should address the subsurface soil exposure pathway as a potential route of exposure. The reasoning is that training and recreational activities that occur on site have the potential to disturb the surface soil. If this is not the case, provide additional site-related information to support the exclusion of this pathway. (see Recommendation (12c) for ground water pathway exposure scenarios).

b. Discuss any known public health concerns related to O.U. #7 sites at this time and identify any efforts that already may have been undertaken to limit human exposures to site contaminants; e.g., are there any warning signs posted for site contamination reasons.

c. Discuss the possibilities for lack of swimming reported at the surface waters; e.g., alligator sightings.

d. For all sediment and surface water exposure pathways, reassess parts of the body likely to come in contact with the surface water and sediment if swimming is not a possible route of exposure. Ingestion of surface water and sediment while wading will have different input variables than for those assuming a swimming pathway.

e. As the future exposure considerations for the adult and child receptor include a residential scenario, either provide additional comments to explain how the subsurface soil, surface water, sediment and biota exposures, with appropriate default parameters, are expected to

remain the same as calculated in the current scenario for the adult and child receptor (*see* Comment (14d)) or revise the text.

15. Page 16-31, Section 16.4.4, "COPCs Not Quantitatively Included in BRA"

Comments:

a. We agree that if there are no USEPA- verified toxicity factors (i.e., reference doses (RfDs) and cancer slope factors (CSFs)) then chemicals cannot be carried through the quantitative risk assessment. However, chemicals cannot be eliminated from risk consideration based on inclusion of another metal and/or semi-volatile chemical. Chemicals may have synergistic effects or other toxicological effects that would not be considered by their exclusion.

b. Region IV risk assessment guidance discusses the use of a toxicity equivalence factor (TEF) methodology for carcinogenic polynuclear aromatic hydrocarbons (PAHs) based on each compounds relative potency to the potency of benzo(a)pyrene. Thus, other PAH concentrations can be converted to an equivalent benzo(a)pyrene concentration and used in the quantitative risk assessment calculations to determine cumulative risks.

Recommendations:

a. A qualitative risk assessment should be done for those chemicals that cannot be carried through the risk assessment.

b. Discuss if Region IV Guidance (11 February 1992) concerning the use of TEF methodology for PAHs was followed to include indeno(1,2,3-c,d)pyrene in the quantitative risk assessment.

16. Page ES-4, Page 20-1, Section 20.2, "Site History"

Comment: The report indicates that Site 30 is located in close proximity to the Combat Town Training Area and adjacent artillery ranges, but it does not discuss investigations of possible past and/or on-going ordnance-related (or other) contamination impacting Site 30.

Recommendation: Address this issue in the report.

17. Page 2-6, Section 2.3.3.2, "Soil Investigations"

Comments:

a. Soil samples were recovered from between the surface and the first one to two feet below ground surface (bgs).

b. Reference (a) defines surface soil samples as samples taken from depths of zero to 6 inches; a number of other EPA guidance documents also define surface soil samples in this way.

c. The *ATSDR Public Health Guidance Manual* (1994) (Agency for Toxic Substances and Disease Registry) describes the protocols used to develop public health assessments (PHAs). In the guidance manual, "surface soil" samples are defined as soil samples taken from depths of zero to three inches, and "subsurface soil" samples are defined as samples taken at depths greater than three inches.

Recommendation: To facilitate correlation between PHAs and health risk assessments (HRAs), and to minimize costs between redundant sample collection and analyses, we are encouraging the adoption of "zero to three inches" as the norm for surface soil sample collection for any future site soil sampling investigation and/or monitoring efforts that may be undertaken. The adoption of this sampling protocol will not be in controversy with current USEPA guidance, since Reference (a) does direct that surface soil samples should be collected at the "shallowest depth practicable" to accurately reflect potential surface soil exposure pathways.

18. Page 3-1, Section 3.0, "Study Area Investigation"

Page 6-3, Section 6.2.2, "Leaching of Sediment Contaminants to Surface Waters"

Comments:

a. The text states that "due to a lack of rainfall and the intermittent nature of surrounding drainages, a surface water and sediment investigation intended for Site 1 was not completed."

b. This explanation does not appear sufficient to explain why sediment samples were not taken. In addition, future plans to sample the surface water need to be addressed.

c. Page 6-3 text states that there are no surface water bodies of concern at Site 1. Sampling a drainage ditch for sediment and surface water is mentioned; however, additional information describing the drainage ditch is absent.

Recommendations:

a. Clarify apparent contradictory statements made in the report concerning surface water and sediment investigations for Site 1 (*see* Comment (18a) and Comment (18c) given here).

b. Perform the sediment investigation and discuss the time frame for the surface water investigation.

c. Readdress the conclusions made in the report concerning the surface water statements and provide recommendations for future investigation directions that are site specific.

19. Page 3-2, Section 3.2.2, "Soil Sampling Locations"
Page 12-2, Section 12.2.2, "Sampling Locations"
Figures 12-1, 12-2, 13-1; Tables 12-1 - 12-3

Comments:

a. At Site 28, a total of 47 borings were advanced to assess suspected disposal practices, with seven of those borings being converted to monitoring wells.

b. Review of the site maps depicting the locations of soil borings and monitoring wells at Site 28 indicate that more sampling may be needed to adequately characterize the area. Additional site characterization appears to be warranted by the data obtained and the fact that the site operated as a burn area for a variety of solid wastes generated on base for approximately 25 years. (For example, the area down gradient of the suspected disposal areas does not appear to have a monitoring well installed (28-GW03 is shown on Figure 12-2)).

Recommendation: Page 16-40, Section 16.9 entitled "Conclusions of the BRA for Site 28" should address the need for additional sampling for Site 28 to adequately assess the human health risk.

20. Page ES-4, Page 20-1, Section 20.2, "Site History"; Figure 20-1

Comment: We are concerned that Site 30 contained fuel tanks that stored leaded gasoline; in addition, a number of comments were made in the text concerning past disposal practices and sampling did not indicate that these occurrences took place on the site.

Recommendation: Indicate if either further site characterization or looking for contamination elsewhere based on past practices is planned.

21. Page 22-3, Section 22.6, "Identification of Water Supply Wells"

Comments:

a. The text indicates that two water supply wells currently in use, HP-632 and HP-640, are located within one-mile of Site 30.

b. These wells were sampled in 1992 and reportedly did not exceed any Federal or State standards. The types of tests performed, with results obtained, were not provided in the report.

Recommendations: Provide a copy of the analytical testing results for HP-632 and HP-640 so that the results can be compared to site-related ground water contamination data. Specifically address the potential impact of site-related contamination on the supply wells.

22. Page 7-28, Section 7.7.1, "Analytical Data Uncertainty"
Appendix M, "Base Background"

Comments:

a. The text states that "Contract Laboratory Program (CLP) methods have, in general, a precision of approximately plus or minus 50 percent depending on the sample media and the presence of interfering compounds. A value of 100 ug/kg could be as high as 150 ug/kg or as low as 50 ug/kg..."

b. The text further states that "Organic data qualified "B" (detected in blank) or "R" (unreliable) were not used in the estimation of risk due to the unusable nature of the data..."

c. Guidance provided on page 5-13 of the RAGS manual (reference (b)) indicates that data qualified with a "B" qualifier (analyte found in associated blank as well as in sample) should be included in a quantitative risk assessment. The manual also states that "R" qualified data should not be included in the quantitative risk assessment; however, re-sampling and/or re-analysis is necessary for verification.

d. The footnotes in Appendix M tables of base background indicates that the "B" qualifier has been removed from the data so qualified, with no detection value change. This statement appears to be inconsistent with the text.

Recommendations:

a. Provide quality control acceptance criteria for the determined accuracy and precision of the specific CLP methods in the various matrices that were run.

b. Follow the guidance provided in Reference (a) for usability of data and re-sampling/re-analysis to determine if the compound is or is not present. Clarify any discrepancies between text and tables.

23. Appendix G, Site 1 Lab Sample ID: 942398-02, page .059, Sample ID 1-RB02, TCLP
Lab Sample ID: 943248-25, page .020, Sample ID 28-W-SB41 TCLP

Comments:

a. Concentration units "(ug/L or mg/Kg dry weight): ug/L" are given for the metals analyses in numerous TCLP metals analyses laboratory reports. As ug/L represents parts per billion (ppb) and mg/Kg represents parts per million (ppm), this laboratory report format appears to contain an error in units reported.

b. Laboratory reports use codes and/or data qualifiers that are not defined in the laboratory analyses report.

Recommendations:

a. Clarify whether units were reported in ppm or ppb.

b. Inform the laboratory of the numerous errors in units on their reports and have corrections made to all affected data. Recheck the reports to ensure that units in text and tables agree and are correct throughout. Revalidate any decisions/calculations made on the basis of incorrect data. Define all codes and/or data qualifiers used in the laboratory reports.

24. Appendix Q, "Site Conceptual Model" Site 1

Comments:

a. Table 1 does not indicate whether the exposure is for the current or future exposure scenarios and what the designated land use assumption is; i.e., whether they are to be used, for example, for a recreational or residential pathway.

b. Figure 1 flowchart for potential exposure pathways and receptors for Site 1 does not indicate a complete pathway for ingestion/dermal contact of surface water or sediment. If sampling was a problem that should not automatically eliminate these routes of exposure from the human health risk assessment.

c. Future construction workers inhalation of fugitive dusts emanating from surface and/or subsurface soils also needs to be addressed as a potential pathway unless substantial evidence indicates this exposure pathway is not applicable to Site 1 conditions.

Recommendations:

a. Provide more information concerning the exposure scenarios in the table; e.g. what default values will be used for the future construction worker scenario. The information in the text is insufficient.

b. For ease of review, flowcharts with separate exposure pathways for construction workers, residential population and military personnel, depicting both current and future scenarios is recommended for each site.

25. Page ES-9, Site 1

Comments:

a. The text states that “The pesticides dieldrin, 4,4'-DDE, 4,4'-DDD, 4,4'DDT, endrin aldehyde, alpha-chlordane, and gamma-chlordane appear to be the most prevalent contaminants within soils at Site 1.”

b. The text does not appear to address the potential source(s) of the pesticide contamination or indicate whether it is believed to be from past disposal practices or from agricultural usage.

Recommendations:

a. Provide additional information concerning the pesticide contamination at Site 1.

b. Conduct a records search on pesticide application for O.U. #7. The Navy Disease Vector Ecology and Control Center, Alameda California may provide additional information. Their phone number is (415) 263-2806.

26. Appendix R, “CDI Calculations”
Appendix Q, “Site Conceptual Model”

Comments:

a. The example “Surface Water Ingestion Calculations” contains several discrepancies. The “IR” term defined as “Daily intake ingestion rate (kg/meal)” appears to apply to a food pathway and not a surface water ingestion pathway. As mentioned already in Comment (14c), the report indicates that potential exposures were assessed for a swimming pathway.

b. The default parameter used for the “IR” term in the example equations is given as 0.005 L/day. Page 6-36 of Reference (a), Exhibit 6-12 provides the term contact rate “CR” (liters/hour) for ingestion of chemicals in surface water while swimming, residential exposure pathway. The default value is 50 ml/hour or **0.05 L/hour**.

c. Appendix Q, Table 1 also lists the surface water ingestion rate input parameter incorrectly; i.e., 0.005 L/h instead of 0.05 L/h.

Recommendation: Use the correct EPA terminology for surface water ingestion contact rate “CR” and numerical value of 0.05 L/h in Table 1 and in the calculations in Appendix R. Recalculate the Intakes and Risks that are affected by these discrepancies. Verify that all other default parameters used are correct for the exposure scenarios.

27. Appendix Q, Page 6 Site 1

Comment: The text is not clear as to the potential exposure of the civilian hot dog stand operator and other civilians that may be working on Site 1.

Recommendation: Clarify the potential exposures possible for other than current military personnel. Provide information concerning the number of civilian personnel potentially also working in this area, if applicable.

28. Site 1, Section 7.2.3, "Criteria Used in Selection of COPCs"
Site 28, Section 16.2.3

Comments:

a. The text of the report states that the Risk-Based Concentration (RBC) Tables' values are used as criteria in the selection of COPCs; however, the date of the revision is not identified in the text.

b. The RBC values used as comparisons could not be found readily in any of the tables in the document. Because significant changes may have been made to the RBC tables since the 1994 RBC tables cited and for ease of comparison with site specific data, it would be useful to list the RBC values used and cite the complete reference information.

Recommendations:

a. Use the latest revision (currently 07 March 1995) of the RBC Tables and cite the complete reference, with month and year included.

b. Provide the RBC values used for ease of review and comparison to site-related data.

29. Appendix M, "Base Background"; Page 16-4, Section 16.2.3.3
Table 16-2, "Summary of Standards/Criteria Comparison Results"
Appendix K, "Data and Frequency Summaries"

Comments:

a. Table 16-2 is used as an example of the difficulty in interpreting the information given in the summary tables where the specific parameters' sample concentrations were compared to site-specific (twice the base-wide average concentration) background concentration. The Table 16-2 Column Heading "No. Times Exceeds" is reported as "0/51" throughout the table for each parameter (total metals in subsurface soil, Site 28) despite the fact that the concentrations of specific metals, such as lead and arsenic, appear to exceed the "Twice Site Background Average" levels given.

b. Table 16-2 does not provide any explanations to aide in data interpretation. Appendix M tables that provide Base background information; e.g., average and two times the average, do not appear to agree with the data in Table 16-2. For example, the lead mg/kg average of 3.636 (two times the average is listed as 7.273 mg/kg) for lead in subsurface soil base background is given in Appendix M. Table 16-2 provides a "Twice Site Background Average" value of 5.84 mg/kg for subsurface soil base background lead. These values do not agree. Several analytes also were reviewed for ground water background comparisons and similar discrepancies appear to exist with the data treatment.

c. The majority of the tables in Appendix K do not indicate which sampling round the data is from (the data summary tables do) although sampling dates are provided that can be correlated with text information.

Recommendations:

a. Correct all errors and discrepancies in the tables and text concerning the evaluation of site-related contamination versus "site-related" background data. Provide explanations to interpret data tables, as required.

b. Indicate sampling rounds on data tables so that tables can be viewed as "stand alone" documents, if feasible.

30. Page 7-30, Section "Sampling Strategy Uncertainty"

Comment: The text states that "Due to the nature of contaminants (i.e., chemical agents) at the site, the soil investigation was limited to the surface soil." Similar statements are made for Sites 28 and 30 in the "Sources of Uncertainty" sections of the RI report. We believe that these discussions of uncertainty apply to sites from another operable unit at Camp Lejeune, such as O.U.#4.

Recommendation: Revise the sections to be reflective of O.U.#7 sites' conditions and uncertainties.

FROM: _____
 (YOUR NAME/COMMAND)
TO: NAVENVIRHLTHCEN, ENVIRONMENTAL PROGRAMS
FAX: COM: (804) 444-7261/DSN: 564-7261

MEDICAL/HEALTH COMMENTS - YOUR VIEW

Please help us improve our review process by indicating the extent to which you agree or disagree about the comments we provided for to your activity.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. "Value added" to IR/BRAC process?	1	2	3	4	5
2. Received in a timely manner?	1	2	3	4	5
3. High level of technical expertise?	1	2	3	4	5
4. Very useful to the RPM?	1	2	3	4	5
5. Contractor incorporated comments?	1	2	3	4	5
6. Easily readable/useful format?	1	2	3	4	5
7. Overall review was of high quality?	1	2	3	4	5
8. NAVENVIRHLTHCEN was easily accessible?	1	2	3	4	5
9. NAVENVIRHLTHCEN input during scoping or workplan development would be "value added"?	1	2	3	4	5
10. Added involvement in IR/BRAC document needed?	1	2	3	4	5

Please return by fax using the box provided at the top of this page. If you have any other comments, please list them below or call Mr. David McConaughy, Health/Risk Assessment Department, at (804) 444-7575, or DSN 564, extension 434, at any time to discuss your viewpoint. As our customer, your comments and suggestions of how we can improve our services to you are important!