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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) LANTDIV CLEAN Program Contract N62470-89-D-4814, Cto-0231

Encl: (1) Medical Review of Draft Feasibility Study Report, Operable Unit No. 7 (Sites 1 and 28), Marine Corps Base, Camp Lejune, North Carolina
(2) Medical/Health Comments Survey

1. As you requested in reference (a), we completed a medical review of the "Draft Feasibility Study Report, Operable Unit No. 7 (Sites 1 and 28), Marine Corps Base, Camp Lejune, 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 point of contact for this review is Mr. David McConaughy, Health Risk Assessment Department, Environmental Programs. If you would like to discuss this medical review or if you desire further technical assistance, please call him at (804) 444-7575 or DSN 564-7575, extension 434.

A. F. JONES
By direction

MEDICAL REVIEW OF DRAFT FEASIBILITY STUDY REPORT OPERABLE UNIT NO. 7 (SITES 1 AND 28) MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA

References: (a) *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, October 1988 (EPA/540/G-89/004)
(b) *Exposure Factors Handbook, Final Report*, March 1989 (EPA/600/8-89-043)

Review Comments and Recommendations:

SITE 1, THE FRENCH CREEK LIQUIDS DISPOSAL AREA

1. Page 6-1, Section 6.0, Detailed Analysis Of Remedial Action Alternative-Site 1; Table 6-1, Summary Of Detailed Analysis-Groundwater RAAs

Comments:

(a) Reference (a) section 6.2.3.4 states that the reduction of toxicity, mobility, or volume through treatment evaluation criterion should address the amount of hazardous materials that will be destroyed or treated, the degree of expected reduction in toxicity, mobility, or volume measured as a percentage of reduction (or order of magnitude), and the quantity of treatment residuals that will remain following treatment. The reduction of toxicity, mobility, or volume through treatment evaluation criterion of remedial action alternatives 3, 4 and 5 in the feasibility study text was very general and did not address the above criterion in a quantitative manner.

(b) Reference (a) section 6.2.3.5 states that the short-term effectiveness evaluation criterion should address protection of the community during remedial actions and protection of workers during remedial actions. Section 6.3.5 of the feasibility study comparative analysis states that the community will be at risk during treatment plant installation but this was not addressed in the analysis of short-term effectiveness of the remedial action alternatives. The effectiveness and reliability of workers protective measures was not addressed in the analysis of short-term effectiveness of the remedial action alternatives 3, 4 and 5.

Recommendations:

(a) The reduction of toxicity, mobility, or volume through treatment evaluation criterion of remedial action alternatives 3, 4 and 5 in the feasibility study text should be more specific.

(b) The risk to the community during treatment plant installation should be addressed in the analysis of short-term effectiveness of the remedial action alternatives. The effectiveness and

reliability of workers protective measures should be addressed in the analysis of short-term effectiveness of the remedial action alternatives 3, 4 and 5.

2. Appendix A-Risk-Based Action Level Calculations-Site 1

Comment: The equation and input values provided in Appendix A gave answers in milligrams per liter instead of the indicated micrograms per liter. An example is the ingestion of groundwater action level calculation for military personnel. The concentration value provided in the text for the noncarcinogen trichloroethene was 307 micrograms per liter (ug/L), however when using the equation provided on the table, the resulting value appears to be 0.307 ug/L. The equations provided are missing a conversion factor for converting mg/L (milligrams per liter) to mg/L.

Recommendation: A conversion factor should be added to the equation so the answers are in micrograms per liter.

SITE 28-HADNOT POINT BURN DUMP

1. Page 8-14, Section 8.3.4, Summary Of Remediation Levels And Final COCs; Page 8-15, Section 8.5, Remedial Action Objectives

Comment: Section 8.3.4 of the FS stated that the contaminants of concern (COC) in groundwater at Site 28 were lead and manganese. However, Section 8.5 states "The groundwater objectives do not involve preventing horizontal and vertical COC migration or restoration of the aquifers. The only objective is to lessen the potential for exposure. This is because manganese naturally occurs at levels exceeding ARARs in groundwater throughout MCB, Camp Lejeune. As a result, the vertical and horizontal migration of high manganese levels will never be prevented at the base. In addition, it is pointless to restore high manganese levels at Site 28 when these high levels naturally exist throughout the surrounding areas." The contamination of groundwater with lead is not addressed.

Recommendation: The remedial action objectives should address the lead groundwater contamination because lead was found to be a COC at the site.

2. Page 11-1, Detailed Analysis Of Remedial Action Alternatives-Site 28; Table 11-2, Summary Of Detailed Analyses-Surface Soil RAAs

Comment: Reference (a) Section 6.2.3.5 states that short-term effectiveness evaluation criterion should address protection of workers during remedial actions. This factor should address threats that may be posed to workers and the effectiveness and reliability of protective measures that would be taken. The short-term effectiveness evaluation did not address the effectiveness and reliability of protective measures where required.

Recommendation: The short-term effectiveness evaluation criterion should address the effectiveness and reliability of protective measures where required.

2. Page 8-4, Section 8.3.2.1, Chemical-Specific ARARs; Section 8.0, Table 8-5

Comment: The text in Section 8.3.2.1 states "These guidelines are designed to consider both acute and chronic toxic effects in children (assumed body weight 10 kg [kilogram]) who consume 1 liter of water per day or in adults (assumed body weight 70 kg) who consume 2 liters of water per day." The Table 8-5 conflicts with the text in that it indicates the body weight of a child is assumed to be 15 kg. We recommend the use of 15 kg for children. Table 5.3 of reference (c) indicates that the average body weights of children less than 3 years of age is 11.9 kg and 11.2 kg for boys and girls, respectively. This table also indicates that average weights for boys and girls ages 3 to 6 are 17.6 kg and 17.1 kg, respectively.

Recommendation: The text in Section 8.3.2.1 and Table 8-5 information should be changed so that it does not conflict. Consider using 15 kg as the average weight for a child.

3. Appendix A-Risk-Based Action Level Calculations-Site 28

Comment: The calculated results obtained did not always agree with the answers given in Appendix A when using the provided equation and inputs to calculate the exposure to future adult residents by ingestion of soil. An example is the contaminant 4,4 DDE concentration value was given as 5.0E+05 micrograms per kilogram (ug/kg), however the calculated value using the provided equation and input values was 5.0E+02 ug/kg.

Recommendation: The equation should be modified to include a conversion factor so that the calculated answers are in micrograms per kilogram.