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From: Commanding Officer, Navy Environmental Health Center
To: Commanding Officer, Atlantic Division, Naval Facilities Engineering Command (Kirk Stevens), 1510 Gilbert Street, Norfolk, VA 23511-2699

Subj: MEDICAL REVIEW OF DRAFT TECHNOLOGY EVALUATION OPERABLE UNIT NO.16 (SITE 93), MARINE CORPS BASE CAMP LEJEUNE, NC

Ref: (a) CH2MHILL ltr 174057.TS.ED.93 of 30 Jan 03

Encl: (1) Subject Medical Review

1. Per reference (a), we have completed a review of the subject document and forward our comments to you as enclosure (1).

2. We are available to discuss the enclosed information by telephone with you and, if you desire, with you and your contractor. If you require additional assistance, please call Mr. Kenneth Gene Astley at (757) 953-0937 or Mr. David McConaughy at (757) 953-0942. The DSN prefix is 377. The e-mail addresses are: astleyg@nehc.med.navy.mil and mcconaughyd@nehc.med.navy.mil.

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NAVY ENVIRONMENTAL HEALTH CENTER
ENVIRONMENTAL PROGRAMS DIRECTORATE

Technology Evaluation Review

Location: Jacksonville, North Carolina

Command: Marine Corp Base Camp Lejeune

Site: Site 93

Work Description: Technology Evaluation

Document Date: January 2003

Contract No/Delivery Order No: N62470-95-D-6007/0253

EP Document No: 4421

Prepared for: LANTNAVFACENGCOM

Prepared by: CHM2 Hill

Date Received: 13 February 2003

Reviewed by:
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Enclosure (1)

MEDICAL REVIEW OF
DRAFT TECHNOLOGY EVALUATION
OPERABLE UNIT 16 SITE 93
MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA

General Comments:

1. The document entitled "Draft Technology Evaluation Operable Unit 16 Site 93 Marine Corps Base Camp Lejeune, North Carolina," was provided to the Navy Environmental Health Center (NAVENVIRHLTHCEN) for review on 13 February 2003. CHM2 Hill prepared the report for the Atlantic Division, Naval Facilities Engineering Command.

2. The final cleanup objective was unclear. The stated objective for the predictive modeling is to determine the period of time required for the plume to reach steady state, and to estimate the maximum extent of dissolved-phase plume migration under steady state conditions. This information will allow the user to estimate the location of a point of compliance (distance required to reach the 2L Standards) under different combinations of active and passive remediation scenarios. The text states that groundwater impacts are most concentrated at shallow depth (approximately 15-19 feet). The maximum depth of any groundwater contamination is approximately 30 feet below grade. However, the shallow aquifer at this site is unlikely to be used for drinking water purposes in the future, so the 2L Standards would not apply. The contamination at the site is undergoing natural bioremediation, therefore a steady state condition would not be reached until all the contamination has been degraded or it reaches Edwards Creek.

3. A risk evaluation of remedial alternatives (RERA) is not presented as required by the Navy Policy on conducting human health and ecological risk assessments. The RERA typically evaluates risks associated with each remedial alternative before risk management decisions are made. This is to ensure that the well-intentioned act of remediating a site does not have the unintentional act of introducing actual human health fatalities that are higher than the estimated future hypothetical fatalities estimated in the baseline risk assessment.

Review Comments and Recommendations:

1. Page 5-1, Section 5.2, "Methodology":

Comments:

a. The text states on Page 5-1, "A conservative approach was taken by assuming a constant source concentration for each remedial scenario and using maximum concentrations as inputs..."

b. The text does not discuss, in detail, whether using the highest concentrations of contaminants as computer model inputs will bias the results towards a particular remedial option. The text also does not discuss if using the maximum concentrations will adequately characterize "hot spots." A hot spot may, or may not exceed the boundaries from where the highest concentrations were detected.

Recommendation: The text should discuss, in detail, whether using the highest concentrations of contaminants as computer model inputs will bias the results towards a particular remedial option.

2. Page 5-2, Section 5.3, "Assumptions":
Page 5-2, Section 5.4, "Calibration":

Comments:

a. The text states on Page 5-2 "Previous Site 93 reports estimated groundwater seepage velocity to be approximately 60 ft/yr [feet per year]. To conservatively model plume migration, 268 ft/yr was used." The reason for the selection of the very conservative seepage velocity was not discussed fully in the text.

b. The text also states on Page 5-2 Section 5.3 "Although a continuous source is not expected to exist at Site 93, the continuous source option was selected as an input parameter due to the lack of analytical data showing source-zone reductions over time." The text also states on Page 5-2 Section 5.4 "The model was calibrated to actual field data to determine biotransformation rates..." The reason for the selection of the very conservative continuous source option was not discussed fully in the text.

Recommendations:

a. The reason for the selection of the very conservative seepage velocity should be discussed fully in the text.

b. The reason for the selection of the very conservative continuous source option should be discussed fully in the text.

3. Page 6-2, Section 6.1, "Cost":

Comment: The text does not discuss in detail the CERCLA requirement that a remedial action be protective of human health and the environment as well as be cost effective. For example, the underlying aquifer at this site is not used as a source for drinking water at present and is unlikely to be used for this purpose in the future. The TCE contamination is being reduced by natural biodegradation. Therefore, given the cost associated with the selected remedial alternative as compared to the "overall protection of human health and the environment," the best option may be the no action scenario with land use restrictions.

Recommendation: The report should compare how the remedial alternatives compare to the nine evaluation criteria of the National Contingency Plan (NCP).