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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

April 23, 1996

4WD-FFB

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Katherine Landman
Department of the Navy - Atlantic Division
Naval Facilities Engineering Command
Code 1823
Norfolk, Virginia 23511-6287

SUBJ: MCB Camp Lejeune
Draft Treatability Study
Operable Unit No. 10 - Site 35

Dear Ms. Landman:

The Environmental Protection Agency (EPA) has completed its review of the above subject document. Comments are enclosed.

If you have any questions or comments, please call me at (404) 347-3016 or voice mail, (404) 347-3555, x-6459.

Sincerely,


Genia D. Townsend
Senior Project Manager

Enclosure

cc: Patrick Waters, NCDEHNR
Neal Paul, MCB Camp Lejeune

1.0 General Comments

1. Section 1.2.3, Page 1-4, Paragraph 1, details the ROD for OU 10-Site 35. However, cleanup criteria for contaminants at Site 35 are not listed. A listing of the Interim ROD remedial action objectives should be presented.
2. Figure 1-3 depicts detected organics in the upper portion of the surficial aquifer. However, the figure presents semivolatiles (SVOCs) as a single constituent instead of a group of organics. Like VOCs, each detected organic in SVOCs should be presented to compare with its MCL and N.C. standard. A total concentration of SVOCs does not provide information about the concentration of each organic detected in the SVOC group. Thus, it is unknown whether any SVOCs exceeded the standards. The figure should present all detected SVOC data along with the data for the VOCs.
3. Figures 1-3 and 1-4 depict detected organics in the upper and lower portions of the surficial aquifer. However, according to Figures 2-2 and 2-3, all monitoring wells are not depicted in the study area on Figures 1-3 and 1-4. For example, well MW17 with a BTEX concentration of 0.5 ug/L is missing. All monitoring wells that will impact the study area should be depicted on Figures 1-3 and 1-4.
4. Section 2.2, Page 2-1, discusses technology limitations for in-situ air sparging (IAS). However, the text does not discuss how site geology may affect the effectiveness of IAS. Site geology is an important design parameter. IAS is normally more effective in coarse-grained soil (Marley, 1992). In addition, the text does not discuss contaminant characteristics that affect the use of IAS. The Henry's Law constants for the contaminants to be treated should be less than 10^{-5} atm-m³/mole, indicating a strippable volatile constituent (Angell, 1992). An explanation of site geology and contaminant characteristics should be included within the discussion of IAS technology limitations.
5. Section 2.3, Page 2-3, Paragraph 1, Sentences 4 and 5, indicates that contamination levels (Figure 2-2) in the area of plume D only slightly exceed established cleanup levels, so natural attainment of the cleanup levels in plume D may be possible through dilution and dispersion. However, the contaminant levels of plume D are not presented. The text should present the contaminant levels of plume D in order to verify that cleanup levels in plume D may be possible through dilution and dispersion.
6. Section 2.3, Page 2-2, Paragraph 3, refers to 43 sparging points in Remedial Action Alternative 4 (RAA 4) as depicted in Figure 2-1. However, the text does not discuss extraction wells. It is unclear whether the air extraction wells should be included in Figure 2-1. Previous text indicates that uncontrolled loss through the ground surface

is acceptable for the air sparging alternative. RAA 4 is not described in sufficient detail. The text should state whether air extraction is part of the alternative being tested in the treatability study. If extraction is a part of RAA 4, then an extraction well should be installed as part of the treatability testing. Also, the use of one sparge cluster (i.e. sparge points at two depths in one location) as part of RAA 4 should be clarified. A description of RAA 4 should be added as an appendix.

7. Section 3, Page 3-1, presents the treatability study objectives. The USEPA Guide for Conducting Treatability Studies Under CERCLA indicates that the test objectives should include performance goals (EPA, 1992a). However, these goals are not provided. The performance goals that will be used to evaluate the testing should be added to this section.
8. Sections 4.2.1 and 4.2.2, Pages 4-2 and 4-3, describe monitoring wells, sparging wells, and soil gas probe hardware and installation. However, no schematic diagrams showing well construction details or probe details are presented. The report should include figures showing typical sparge well, monitoring well, and gas probe construction diagrams.
9. Section 4.3, Pages 4-3 through 4-7, describes the pilot test design and operation. However, it is not clear if air will be injected simultaneously into the shallow and deep sparge wells in each phase. If this is the procedure, it is not clear how the radius of influence (ROI) for each sparge well will be determined since the ROIs will overlap. Attachment A does not discuss the use of multiple sparge points in the vertical direction. From the text in the work plan, it is unclear if vertical sparge point clusters are a component of RAA 4. The text should clarify what sparge configuration is envisioned for RAA 4. The methods to be used to interpret data for overlapping ROIs should also be presented.
10. Table 4.1 lists the locations of groundwater samples to be sent off for groundwater analyses of wells 49A, B and 53A, B. However, only sampling these wells will not provide sufficient data to evaluate removal of VOCs upgradient and downgradient of the curtain. One of the newly installed well clusters downgradient of the curtain should be sampled before, during, and after the test. Groundwater VOC samples for off-site analyses (SW 846 8240) should also be collected at 51A and 51B, during and after sparging.
11. Figure 4-4 describes and shows the proposed blower equipment. However, balancing of air flow to the two sparge wells may require valves that allow regulation of flow. Ball valves are primarily on/off valves and do not allow throttling of flow (Sherwood, 1973). Therefore, the ball valves (with the exception of the sample port) should be

replaced with valves that allow both on/off action and air flow regulation. Also, a bleed valve should be installed close to the blower discharge to allow better control of flow to the wells. This valve should provide for both air flow regulation and on/off action.

12. Section 6.2, Page 6-1, Paragraph 2, Sentence 2, discusses the distribution of copies of the final Treatability Report. However, the distribution list does not include the USEPA Reel Treatability Laboratory in Cincinnati, Ohio (EPA, 1992a). This addressee should be added to the list to receive a copy of the final report.
13. Section 8.0 describes the project management and staffing. However, the organization chart and text do not describe the roles of North Carolina or EPA in this study. The text and organization chart should be modified to include EPA and N.C. DEHNR (EPA, 1992a).

2.0 Specific Comments

1. Section 1.2.2, Page 1-3, Paragraph 2, Sentence 3.
A six-lane highway proposed by the North Carolina Department Of Transportation is referenced as being shown in Figure 1-2. However, the highway is not shown in Figure 1-2. The text should show the highway location in Figure 1-2.
2. Section 1.2.3, Page 1-3, Paragraph 6, Sentence 1.
The text refers to two areas of solvent-related groundwater contamination that have been identified adjacent to Site 35. However, the locations of these plumes are not shown in the report. The text should add a figure showing locations of all plumes referenced in the text.
3. Figure 1-1.
The location of Brinson Creek is not shown on Figure 1-1. The figure should label Brinson Creek on Figure 1-1.
4. Section 2.1, Page 2-1, Paragraph 2, Sentence 3.
The text indicates that in theory there is no limit to the application of IAS technology according to the available literature. However, the text does not mention the particular literature. The only literature referenced in this document is presented in Appendix A, but that literature does not correspond with the text in this section. The references regarding the limit to the application of IAS technology for groundwater remediation should be presented.
5. Section 2.2, Page 2-2, Paragraph 2, Sentence 2.
This paragraph calculates and presents the maximum estimated emission rate. However, the emitted contaminants are not defined (as BTEX or halogenated compounds). In addition, it is unclear what standards are being used to determine risk from these emissions. The text should also state to which contaminant the emission rate is referring (ie. pound of particular contaminant per day). The text should also define what standards these calculated emissions were compared to, in order to determine risk.
6. Section 2.3, Page 2-2, Paragraph 4, Sentence 8.
This paragraph discusses hypothetical plumes at the site. However, the location of plume D is not shown on any of the figures. The location of plume D should be shown on an additional figure.
7. Section 3.0, Page 3-1, Paragraph 2, Bullet 3.
The text states that an objective of the study is to assess the impact of treatability testing on human health, the environment, and the proposed highway project. Contaminant emissions are calculated in section 4.3.2.3; however, the results are not compared to health criteria. The criteria or emission limits that will be used to assess impacts should be presented in this section.

8. Section 4.1.1, Page 4-1, Paragraph 4.

The text states: "However, the treatability study is in a low-lying portion of the site, which is subject to occasional flooding flooded and is generally soft." However, this sentence is unclear and apparently contains a grammatical error. The word "flooded" should be removed from the sentence.

9. Section 4.2.1, Page 4-2, Paragraph 3, Sentence 5.

The text indicates that the deep sparging well will be placed either at the 26-foot depth or 30-foot depth, depending on the density of the sand above the clayey semi-confining layer. However, the text does not specify what criteria will be used to determine the depth of the deep well. According to the USEPA on air sparging, soil permeability should be 10^{-3} cm/sec or greater (EPA, 1992b). RI soil data and any other available information should be reviewed to estimate the soil permeability (i.e. hydraulic conductivity) of the semi-confining layer.

10. Figure 4-2.

The line format for the water table elevation line is the same as the line format that separates geologic units. Also, the measurement date for the water table elevation shown is also not provided. The text should show a different line type for the water table elevation line. A legend for the water table symbol, indicating if the level is an average of multiple measurements or a measurement for a specific date, should be added to the figure.

11. Section 4.3.1.2, Page 4-6, Paragraph 2, Sentence 2.

The text indicates that water samples for oxygen measurements will be pumped to the surface and measured. However, pumping of samples should be avoided as this can cause erroneous readings (Newman et. al, 1991). A downhole probe should be used to measure the DO levels in the well.

Also, purging or instrument calibration procedures for the dissolved oxygen (DO) measurements were not presented. To determine if purging is required before taking DO measurements, the test wells should be purged and DO measurements should be taken before and after purging. If the DO values are significantly different (above instrument error), then purging is required for DO measurements during the pilot test. The purge testing could be performed during development of the wells.

12. Section 4.3.2.2, Page 4-7, Paragraph 3, Sentence 1.

The text references Table 4-1 for pilot test sampling. However, the actual testing is listed in Table 4-2. The text should be revised to refer to Table 4-2.

13. Section 6.0, Page 6-1, Paragraph 1, Sentence 1.

The sentence contains grammatical errors. The text is ambiguous about the number of reports generated, as the word "main" is used. Moreover, only the Treatability Study Report will document results and conclusions. The text should be revised accordingly.