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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

February 22, 1994

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

4WD-FFB

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

SUBJ: MCB Camp Lejeune - OU1
Draft Remedial Investigation Report

Dear Ms. Berry:

The Environmental Protection Agency (EPA) has partially completed its review of the above listed document. Comments are enclosed. EPA's comments on the human health aspects will be forwarded by 3-3-94.

Included in the comments are recommendations for a complete study of the ecosystem for Camp Lejeune. This is a recurring comment and it is probably time to initiate such a study.

If there are any questions or comments, please call me at (404) 347-3016.

Sincerely,

Gena D. Townsend
Senior Project Manager

Enclosure

cc: Mr. Neal Paul, MCB Camp Lejeune
Mr. Patrick Watters, NCDEHNR

1.0 GENERAL COMMENTS

The following general comments were developed from review of the Draft RI Report.

1. Some of the conclusions presented in the Draft RI Report do not consider all of the available data. For example, Building 1601 was described in Section 1.2.2.3 as a maintenance shop which may have housed an underground storage tank (UST) containing used oil and in which chemicals were highly suspected of being used. Analytical results for subsurface soil sample 78B16SB01, presented in Section 4.3, revealed detectable concentrations of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and pesticides. However, conclusions presented in Section 4.3 of the Draft RI Report never mention the subsurface contamination or a UST as a potential source. The Draft RI Report needs to completely evaluate each building and site so that data gaps can be identified and valid recommendations can be made.

2. Some of the data has not been transposed correctly from the tables to the text and figures. These data inconsistencies raise doubts about the validity of the data and, hence, the validity of the conclusions. In this TRC Report, Dynamac Corporation (Dynamac) has noted some of the data errors and inconsistencies, but has not performed a comprehensive check of all the analytical data. The Navy should reverify the analytical data. In addition, copies of the original laboratory analytical reports rather than condensed summary tables should be included in the Appendix of the Draft RI Report.

3. The Draft RI Report did not meet the objectives required for an ecological risk assessment (ERA). Most of the ecological risk assessment data collected during the RI is of the type generally used for screening purposes and does not fulfill the requirements for a complete ERA.

4. EPA currently does not have toxicity factors for lead. Therefore, the potential risks associated with exposure to lead at OU No. 1 cannot be quantitatively determined. However, lead has been identified in groundwater samples from OU No. 1 at concentrations as high as 2,000 micrograms per liter (ug/l); lead in groundwater samples exceeded the lead Maximum Contaminant Level (MCL) of 15.0 ug/l in 37 out of 59 samples collected (see page 6-62 of the Draft RI Report). Because lead occurrence is widespread and at elevated concentrations in the groundwater at OU No. 1, it is likely that lead in groundwater is a significant source of additional potential risk to users of groundwater. This should be

clearly emphasized in (1) the risk assessment, (2) the conclusions and (3) the Executive Summary.

5. The ERA did not meet all of its objectives. One objective was "to evaluate whether past reported disposal practices at OU No. 1 potentially are adversely impacting the ecological integrity of the terrestrial and aquatic habitats on, or adjacent to the sites." However, no new data were collected to meet this objective. The ERA states that historical information indicates that the aquatic and terrestrial ecosystems at OU No. 1 may be adversely affected by the site contaminants of potential concern (COPCs), but there is no data presented that supports this assertion. Moreover, areas adjacent to the site (within a 1-mile radius) were only briefly mentioned.

6. Another objective of the ERA, to evaluate "the potential effects of contaminants at OU No. 1 on sensitive environments including wetlands, protected species, and fish nursery areas," was also unmet. Too little information was provided on the sensitive environments to allow for an assessment of risks.

   The ERA did not include a site ecosystem map depicting the various habitats associated with the site and adjacent areas to the site. A habitat map should include wetlands, sensitive ecological areas, fisheries, waterways, woodlands, nesting areas, locations of observed vegetative stress, transition zones (ecotones), locations of observed special status flora and fauna and other relevant ecological data. This type of map would assist in evaluating the ecological nature of the site and its surroundings. Simply stating that one area or another does not appear to be a significant biological habitat or that development would preclude any wildlife inhabitants is not acceptable since no specific onsite ecological evaluations were provided for this ERA.

   Although the National Wetlands Inventory maps were evaluated for OU No. 1, there was no site-specific wetlands investigation or delineation. Section 3.8 states that there are pure pine stands in high organic wet soils and pine-hardwood and pure hardwood stands in streamside zones and productive soils and hardwoods in floodplains of the major creeks. In light of the number of waterways, streams, wet habitats and water bodies mentioned as being present at the site, and with the potential for future remedial activities at OU No. 1, it should be obvious that a site-specific wetlands delineation is necessary to assess and document the current ecological conditions at the site.

7. Finally, the Draft RI Report failed to meet its third

objective of using the conclusions of the ERA "in conjunction with the human health risk assessment to evaluate the appropriate remedial action for this site for the overall protection of public health and the environment."

The sampling locations may be suitable for an initial screening, but would not be sufficient in a complete ERA to support remedial actions. The ERA has not justified the ecological sampling locations in the various media. Additional rationale will need to be provided in the Draft RI Report to support the current and future sample locations.

In addition to a site ecosystem map, a map should be included which correlates site ecosystems with site sampling locations, contaminant concentrations and plumes. Because the ERA lacks a clear presentation of sampling, extent of contamination, and impacts to the ecosystems, its conclusions cannot be used for risk management decisions.

In summary, the ERA did not include any site-specific ecological surveys or toxicity tests, did not provide data to support sampling locations and did not establish whether the data are representative of the nature and extent of contamination in ecologically relevant media at and adjacent to the site. A complete ERA should include a reference site evaluation for comparison of onsite data to determine ecological viability at the site.

The ERA uses screening techniques and screening data to assess the ecological risks for OU No.1. However, the screening data (e.g., terrestrial models, ambient water quality criteria and sediment criteria) do not fulfill the requirements of an ERA. While the conclusions indicate that there are potential adverse effects to aquatic and terrestrial receptors, information is insufficient to assess the implications of this conclusion. Therefore, the ERA should be considered only a preliminary ecological risk assessment, and cannot be used to make definitive conclusions about the ecological risks associated with the site or to guide risk management decisions.

It is recommended that the Draft RI Report include the following tasks to fill the existing data gaps in the ERA: (Lets discuss this if the additional work will cause a significant delay in the project schedule.)

1. Conduct an onsite ecological survey (aquatic and terrestrial);
2. Conduct a site-specific wetlands delineation;
3. Conduct aquatic toxicity tests for water and sediments;
4. Present a biohabitats and vegetation cover map (which includes sensitive environmental areas adjacent to the site);
5. Present a contaminant and biohabitat comparison map;

6. Conduct a reference site comparison;
7. Present information on the relationship between chemical concentrations in the various media (e.g., soil, sediment and surface water) and the locations of flora and fauna;
8. Evaluate data collection times and locations with respect to the effect of temporal variations in various media; and
9. Present data on site-specific maps.

Completing these tasks would reduce the high level of uncertainty that exists in this ERA and would provide more conclusive information about the adverse effects of the contaminants on the receptors and site ecosystems. These tasks would also aid in fulfilling the primary objectives for conducting an ERA, as stated in Section 7.1.1 of this Draft RI Report.

2.0 SPECIFIC COMMENTS

The specific comments are listed on the following pages in the order of their occurrence in the Draft RI Report. The comments are organized by section number, page number, paragraph number, figure and/or table number as appropriate.

1. Page ES-19, Human Health Risk Assessment Summary:
Please summarize the risk assessment approach and results for Site 78 in this section. It should be made clear that risks from exposure to soil at Site 78 were not evaluated.

2. Page ES-19, Paragraphs 2 and 4:
It is not clear what is meant by "ensuring" target risk ranges or criteria. Please reword.

3. Pages 3-28 and 3-29, Figures 3-8 and 3-9:
The Draft RI Report needs to discuss why different monitor wells were used to determine the potentiometric surface for OU No. 1 in the May 1993 interpretation (Figure 3-8) and in the August 1993 interpretation (Figure 3-9). The May 1993 data shows groundwater flow in a westerly direction toward the potable water supply wells while the later data utilizes different wells, yielding a southwestern groundwater flow direction.

4. Page 3-40, Figure 3-10:
The Draft RI Report should provide an adequate map showing the potable water supply wells in relation to the areas of concern (Sites 21, 24 and 78) at OU No. 1. Many of the potable water supply wells may in fact be located hydraulically downgradient or side-gradient with respect to OU No. 1; therefore, these wells are a concern to human health and are potential migration pathways for cross-contaminating deeper aquifers. The potable water supply well locations should also be included on shallow groundwater maps (figures 3-8 through 3-9)

as well as figures 4-19 through 4-27 to assist in evaluating groundwater contamination in relation to potable water supply wells.

5. Page 3-43, Paragraph 3:
The text states that potable water supply well HP-603 is "in the upgradient groundwater flow direction." However, based on Figure 3-8, well HP-603 is in the downgradient flow direction with respect to OU 1. In addition, the Draft RI Report has not considered the potential change in hydraulic gradient which may be caused by the groundwater capture zone of the potable water supply wells and thus induce contaminated groundwater towards the well. The relationship of HP-603 to groundwater flow direction and OU No. 1 is important since TCE has been detected in groundwater samples from this well.

6. Page 3-43, Paragraph 2:
Please provide complete information concerning whether potable water supply well HP-630 is currently in use or could be used in the future.

7. Page 4-57, Figure 4-1:
Figure 4-1 indicates positive detections of organic compounds at surface soil locations 21PCBSB17, 21PCBSB18 and 21PCBSB19. According to the figure, 11 separate SVOCs were detected at each sample location; however, Table 4-1 does not indicate that these 11 SVOCs were detected at these three sample locations. The laboratory data needs to be verified and either Figure 4-1 or Table 4-1 needs to be corrected.

8. Page 4-59, Section 4.3.1.1, Paragraph 3:
The text and Figure 4-1 disagree on the highest overall concentrations for polychlorinated biphenyls (PCBs) detected in surface soil samples at the northern portion of Site 21. According to the figure, the highest overall PCB concentrations are sample locations 21PCBSB17 (4,300 micrograms per kilogram [ug/kg]), 21PCBSB18 (3,700 ug/kg) and 21PCBSB19 (4,600 ug/kg). The text states that the highest overall concentrations for PCBs are at sample locations 21PCBSB04 (2,100 ug/kg), 21PCBSB07 (310(J) ug/kg) and 21PCBSB19 (4,600 ug/kg). The Draft RI Report needs to include verification of the laboratory data and correction of either Figure 4-1 or the text.

The analytical data presented for the PCBs in Section 4.3.1.1 needs to be reverified with the original laboratory data reports. PCB concentrations in areas where PCB-contaminated transformer oil was reportedly disposed appears to be low (maximum concentration of 4.6 milligrams per kilogram [mg/kg]). Concentrations of PCBs would be expected to be higher based on concentrations normally associated with PCBs in transformer oils (1E+01 to 1E+05 mg/kg). A copy of the

original laboratory data reports should be presented in the Appendix so that raw data can be verified against the text and analytical data summary tables.

9. Page 4-68, Paragraph 2:
Change the test pit sample designation from 24TPP01 to 24BMTB.

10. Page 4-77, Figure 4-15:
Figure 4-15 shows analytical results for VOCs and SVOCs as not detected ("ND") for Building 1300. However the Draft RI Report states that VOCs and SVOCs were not analyzed. The sample designation should be corrected by adding "NA" for "not analyzed." In addition, all other analytical results designated "ND" should be reconfirmed.

11. Page 4-80, Table 4-18:
The designation "mg/kg" for micrograms per kilogram in the "Notes" section of Table 4-18 needs to be change to the correct designation, "ug/kg".

12. Page 4-83, Paragraph 4:
Correct the typographical error and change Building 1103 to Building 1502.

13. Page 4-85, Paragraph 3:
The Draft RI Report needs to evaluate the source of contamination and all contaminants detected in the subsurface soil sample at Building 1601. The text does not address VOC and SVOC contamination detected in subsurface soil samples collected and analyzed at the 6- to 8-foot interval, nor is there a discussion of any potential source of contamination, such as the UST. The Comments and Concerns section in Table 1-1 for Building 1601 stated "potential inactive UST (used oil); use of chemicals highly suspect." The conclusion for this site needs to be reevaluated.

Also, the building number (1103) needs to be corrected to 1601.

14. Page 4-87, Figure 4-17:
The designation "mg/kg" for micrograms per kilogram in the "Notes" section of Table 4-18 needs to be changed to the correct designation, "ug/kg".

15. Pages 4-89 through 4-98, Figures 4-19 through 4-27:
The "estimated flow directions," indicated with the red arrow on figures 4-19 through 4-27, is not representative of the groundwater flow directions presented on the potentiometric surface maps in Section 3.6, Hydrogeology. The Draft RI Report needs to discuss why groundwater flow directions were taken from portions of the equipotential lines which are extrapolated and located outside the areas of groundwater

contamination. In addition, the rationale for selecting the groundwater flow direction from the data presented on Figure 3-9 and not Figure 3-8 needs to be included.

16. Page 4-92, Figure 4-23:
Verify whether the concentration of TCE in monitor well 78GW31-2 is 33 ug/l as shown on Figure 4-23 or 3 ug/l as shown in the tables.

17. Page 4-107, Section 4.4.1, Paragraph 3:
The conclusion that SVOCs were not extensively found at Site 21 may need to be revised (see Specific Comment No. 6). According to data presented on Figure 4-1, SVOCs appear in numerous samples located around the former PCB Oil Disposal Pit.

18. Page 6-10, Paragraph 6:
Potential risks associated with exposure to the surface soil at Site 78 should also be assessed since contaminants are present in the surface soil.

19. Page 6-15, Paragraph 3:
Subsurface soil risks at Site 78 should be recalculated considering 4-4'-DDD, 4-4'-DDT, 4-4'-DDE and dieldrin as contaminants of concern (COCs). These compounds have been detected and retained as COCs at other areas and in other media at OU No. 1. Furthermore, they were detected in Site 78 subsurface soils at a frequency of 9 percent or more. For this reason, they cannot be excluded due to infrequent detection (RAGS - Part A). These compounds can reasonably be expected to be of concern and cannot be excluded from the assessment of risks in Site 78 subsurface soils.

20. Page 6-23, Paragraph 4:
Whether a normal or lognormal underlying distribution is assumed, RAGS - Part A unequivocally requires that the 95 percent upper confidence limit of the arithmetic mean concentration of the samples collected be used in calculating the reasonable maximum exposure concentration (RME). It is not clear from this paragraph whether the arithmetic or geometric mean was used in the calculation of RME concentrations. Please clarify, and if necessary, recalculate the exposure concentration using the 95 percent upper confidence limit on the arithmetic mean rather than the geometric mean.

21. Page 6-31, Paragraph 5:
The ERA states that "groundwater is not currently being used as a potable supply at OU No. 1." However, Figure 3-10 and Table 3-12 indicate that groundwater is currently being drawn for potable water supply from wells as close as 180 feet from the OU No. 1 boundary. Although wells within the OU No. 1

boundaries are not in use, wells in close proximity to OU No. 1 are in use. Based on the data provided in the Draft RI Report for potable water supply well HP-603 and Specific Comment No. 4, this well should have been identified as containing contaminated groundwater. This information is vital for risk management and should not be selectively removed from further consideration in the ERA.

22. Page 6-43, Paragraph 3:
The text states that EPA considers a target risk range of excess cancer risks between 1E-04 and 1E-06 "to be safe and protective of public health." The reference given for this statement is "USEPA, 1989." In the reference section, there are six documents with this designation, USEPA 1989a through USEPA 1989f. EPA has not stated in any of these reference materials that this target risk range is safe and protective of human health.

If there is a valid reference for this statement, please provide it. Otherwise, refer to the range only as the "target risk range" in the risk assessment.

23. Page 7-15, Paragraph 1:
The text states that "water solubility for metals is negligible because they are practically insoluble in water." "Practically insoluble" is a very relative term. Solubilities of metals in water can be high enough to cause dissolved metals concentrations to exceed MCLs. For risk assessment purposes, exceeding MCLs constitutes "high solubility." This statement should be deleted. Furthermore, the ERA did not indicate whether or not the surface water samples were filtered or whether location or temporal cycles were considered when the samples were collected. It is also not known from the ERA if the surface water samples were co-located with the sediment samples.

24. Page 7-20, Paragraph 2:
It is not clear whether an ecological field survey was conducted. The ERA previously stated that an ecological survey was not conducted. This paragraph states that aquatic biological sampling was not conducted, which supports the previous statement. However, the following sentence states that "no aquatic organisms were observed in Cogdels Creek or Beaver Dam Creek (Site 78)," which implies that ecological field surveys were conducted and that the stream does not support aquatic life. The ERA also states that "fish and benthic macroinvertebrates potentially may inhabit the creek" and that "potential ecological receptors are at risk." Please clarify and make the ERA internally consistent. Given that the ERA states aquatic organisms "may potentially inhabit the creek" and that potential ecological receptors are at risk, a toxicity assessment and aquatic sampling program are

warranted. The ERA also needs to clarify whether "creek" refers to one or both creeks.

25. Page 7-25, Paragraphs 3 and 5:
Statements in these paragraphs eliminate protected, threatened and endangered species from investigation because they were not observed during this RI. Paragraph 3 states that intensive investigations were "previously conducted" for the site. Without clearly presented data and investigative techniques describing these "previously conducted" investigations, statements in the ERA eliminating these species from the investigation are unfounded. Therefore, it cannot be claimed with certainty at this point that there are no protected, threatened or endangered species at OU No. 1.

26. Page 7-27, Other Sensitive Environments:
The ERA has not presented sufficient information to justify eliminating the sensitive environments from further evaluation. The ERA lists and evaluates potentially sensitive environments identified by State and Federal agencies and their presence or absence at OU No. 1; however, almost all of OU No. 1 is eliminated from further consideration because it is not located within the area designated as a sensitive environment. To adequately justify eliminating the sensitive environments, the ERA will need to provide additional information which includes how close the subject site is in relationship to these sensitive environments, whether the site contaminants can potentially migrate to these areas and whether migrating species are likely to cross into OU No. 1.

27. Page 7-28, Paragraph 6:
This paragraph implies that fish and shellfish species do not spawn in the creeks in OU No. 1. Without a site-specific aquatic investigation, this conclusion is premature. Although the State agencies may not have yet identified these creeks as a critical spawning area, historical ecological data indicates that the creeks in OU No. 1 would have populations similar to the nearby creeks that were surveyed at MCB Camp Lejeune (page 7-23, paragraph 6).

28. Page 7-28, Paragraph 7:
The ERA should establish whether the contaminants associated with the subject site adversely affect the waterways that receive runoff, surface water and sediments that migrate from the site. It is not clear from the ERA whether these data have been collected. Furthermore, it is not clear from the ERA, if these creeks flow directly into more substantial waterways (such as those mentioned on page 7-22 that do support anadromous populations). For example, the text states that there is a significant population of anadromous fish in Cogdels Creek and Beaver Dam Creek. This is a subjective and unsupported statement without a population estimate or census.

29. Page 7-28, Paragraph 8:
The statement that OU No. 1 is highly developed so that the potential for breeding of animals within the site is greatly reduced is unsubstantiated. Furthermore, such a statement is inconsistent with other sentences in the same paragraph that state that large and dense aggregations of terrestrial species inhabit MCB Camp Lejeune. Without an ecohabitats map or onsite ecological field investigation this conclusion cannot be supported. Please substantiate this claim and make the ERA internally consistent.

30. Pages 8-1 through 8-11, Section 8.0:
Please describe in this section the contaminants in each medium that present the greatest risks to potential receptors. For example, the text should indicate that the contaminants in groundwater posing the highest potential risks are vinyl chloride, arsenic, chromium and vanadium.

In addition, it should be stated in the conclusions section that risks from lead in groundwater were not evaluated quantitatively.

31. Page 8-3, Paragraph 2:
The use of Toxicity Characteristic Leaching Procedure (TCLP) analytical results to eliminate contaminants from further consideration is unacceptable. TCLP is used to evaluate the leaching potential of contaminants, not to determine the potential risk to human health or the environment. The non-TCLP test pit sample analytical results need to be included in the Draft RI Report for further evaluation.

Ecological Review Comments

1. Table 7-9:
   The Acute and Chronic columns are reversed.

2. Table 7-10:
   There are mistakes in some of the calculations, i.e. arsenic and 4,4'-DDE.

3. Toxicity of certain metals increases or decreases on water hardness, for Operable Unit #5 the default value for calcium carbonate was 100 mg/l, in this document 50 mg/l is used for OU #1. Please explain the reason for the change. Criteria values should be adjusted using site specific information.

4. Due to widespread contamination at Camp Lejeune and the large number of sites under study it is appropriate for a cumulative ecological impact evaluation to be developed.