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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, S.W.
ATLANTA, GEORGIA 30303-3104

March 5, 1998

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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 Focused Remedial Investigation
Operable Unit No.17-Sites 90, 91 & 92

Dear Ms. Landman:

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

If you have any questions or comments, please call me at (404) 562-8538

Sincerely,

Gena D. Townsend
Senior Project Manager

Enclosure

cc: David Lown, NCDEHNR
Neal Paul, MCB Camp Lejeune

1.0 GENERAL COMMENTS

1 The Preface, Paragraph 4, Sentence 3 states that these investigations focused on specific fuel-related and chlorinated hydrocarbon contamination in the soil and groundwater. However, surface soil was excluded and only subsurface soil was investigated. The text should give the rationale for excluding surface soil from the RI investigation. It should also be explained why the RI was focused instead of a being full scale.

2 The document on Site 90 does not have maps or figures showing surface water flow pattern, the potentiometric surface, the topography and figures with the analytical results showing isoconcentration lines. The aforementioned discrepancies should be corrected accordingly or explain why this is not appropriate.

This comment also applies to Sites 90 and 92.

3 Site 90, Section 1.1, Page 1-1, Paragraph 5 discusses the different surface water bodies that can be found at the site (OU17). These bodies are in close proximity to Sites 90, 91 and 92. However, no surface water nor sediment samples were collected and analyzed. The text should give the rationale for excluding surface water and sediments from the sampling media at the sites.

4 Site 90, Section 1.3.2.1, Page 1-4, Paragraphs 0 and 2 present maximum ranges of contaminants near the center of the northern plume. However, the term "maximum ranges" appears to be a contradiction since a range indicates that there is a minimum and a maximum. The text should be revised accordingly.

This comment also applies to the same issue for Sites 91 and 92.

5 Site 90, Section 4.3.2.2, Page 4-4, Paragraph 3, Sentence 2 states that in later sections only those inorganic parameters with concentrations exceeding applicable Federal and/or State regulations will be discussed. However, missing from the text is organic parameters and a discussion of comparing sampling results with RBC values and not just State and Federal standards. The text should give the rationale for omitting organic parameters and RBC values in its comparison.

This comment also applies to Sites 91 and 92.

6 Site 90, Section 4.4.1, Page 4-5, Paragraphs 3 through 5 discuss acetone detected in soil samples with its origin being unknown. However, the different ways that were discussed that could have resulted with acetone being in the soil are all inconclusive. The text should give a conclusive result as to acetone entering the soil. If not, acetone should be considered a site contaminant regardless of the fact that there is no history of its use at the site. **Note:** Since these are subsurface samples they should be screened for protection of groundwater.

This comment also applies to the presence of toluene in the soil and to Sites 91 and 92.

7 Site 90, Section 4.4.1, Page 4-6, Paragraph 4 discusses the detection of bis(2-ethylhexyl) phthalate in a soil sample and the fact that it could originate there from the plastic container used to store distilled water and even the protection gloves worn. However, bis(2-ethylhexyl) was detected in only one sample. Since gloves are worn during all sample collection and distilled water is used from plastic containers, it is surprising that the aforementioned contaminant was not present in other samples. This issue should be revisited with a conclusive result. If not, bis(2-ethylehexyl)phthalate should be considered site-related.

This comment also applies to Sites 91 and 92.

8 Site 90, Section 6.2, Page 6-3, Paragraph 4, Bullet 1 recommends no further studies to be conducted at Site 90. However, the conclusion regarding toluene, acetone and bis(2-ethylhexyl)phthalate is not supported.

This comment also applies to Sites 91 and 92.

2.0 SPECIFIC COMMENTS

1 **Site 90, Table 2-1**.
Table 2-1 shows geologic and hydrogeologic units in this Coastal Plain of North Carolina. However, no explanation is given for the dash lines in the table. An explanation should be given for the dash lines in the table.

This comment also applies to Table 2-2 and Sites 91 and 92.

2 **Site 90, Section 3.1.2, Page 3-2, Paragraph 3, Sentence 1**.
The text states that seven soil samples were collected and analyzed by an on-site mobile lab. However, this contradicts Sentence 2 which states that eight samples were analyzed by the mobile lab. The discrepancy should be resolved.

This comment also applies to discrepancies in Section 3.1.2, page 3-2 of Sites 91 and 92.

3 **Site 91, Figure 2-4**.
Figure 2-4 depicts hydrogeologic cross - section A-A'. However, several of the monitoring wells are depicted with the water table above the screens, as shown by 91-MW16 and 91-MW08. The EPA SOPQAM states that monitoring well screens should be screened a minimum of two feet above the water table.

This comment also applies to Figure 2-5.

4 **Site 91, Table 3-1**.
The text in the notes states that "Boring 91-TWS BO9 was installed to 50 feet bgs and was installed next to 91-TWS BO6 due to its proximity to 91-TWS BO6 was not sampled." However, the proximity should not make a difference because the wells were installed at different distances bgs and are not necessarily representative of each other, i.e.

the analytical results. The text should be discussed further so that the logic can be followed.

5 **Appendix C-1**.
Appendix C-1 contains test boring and well construction records. However, the water levels are not depicted on the test boring and well construction record forms. The well construction record forms should be revised accordingly.

Risk Assessment

1.0 GENERAL COMMENTS

1 The qualitative risk assessments performed for these Sites 90, 91 and 92 at Camp Lejeune are incomplete as written. Although it is stated in Section 5.0 for each site that the qualitative risk assessment performed evaluates the projected impact of COPCs on human health and/or the environment, in fact, no environmental impacts were examined.

2 There is a strong suggestion that the decontamination practiced for these field investigations did not follow established procedures based on the amount of acetone contamination found in the samples. The high levels of acetone cannot be explained by suggesting laboratory contamination. In addition, there is a systematic contamination of the samples with bis(2-hexyl)phthalate which in the report is attributed to the gloves used by the samplers. Although such contamination is possible, the widespread contamination suggests poor sample handling practices. The practices of sample handling raise questions about the reliability of the sample data. The issue regarding reliability needs to be discussed further.

3 This report presents both mobile and fixed laboratory data. However, an overview of the comparison of the mobile laboratory data and the fixed laboratory data suggests zero correspondence. Therefore, the mobile laboratory data may not be of sufficient quality for use in a risk assessment. For example, chloroform was detected in only the mobile laboratory samples. If this chloroform contamination is due to contamination from tap water used in the mobile laboratory as the report suggested, this explanation is indicative of poor QA/QC by the mobile laboratory regarding tap water contamination. Poor QA/QC then raises questions about all results produced by the mobile laboratory. Consequently, there are concerns about the usability of the data in a risk assessment.

4 Section 3.2.4 (for all sites) discusses the analytical methods used for the groundwater which were the CLP methods. However, it is noted that the initial investigations and CSA investigations used different methods which had lower detection limits. For example, the CSA used Method 502.2 for the chlorinated hydrocarbons (detections limits of 1 ug/L or less), Method 602 for the BTEX compounds (detection limits of 2 ug/L or less), and Method 610 for the PAH compounds (detection limits of 1 ug/L or less). In contrast, the fixed lab CLP methods for these compounds have detection limits of 10 ug/L and the mobile lab Method 8240 has detection limits of 10 ug/L. It should also be noted that the list of compounds reported by Method 602 includes the trimethylbenzenes,

propylbenzenes and butylbenzenes while the CLP VOC analysis and Method 8240 do not normally report these compounds. To some extent, the differences in detection limits between the mobile lab and fixed lab could explain the discrepancies between the earlier investigations and the Focused RI investigations, but these method discrepancies are not discussed in the text. This serious lack of comparability should be addressed by re-sampling. Otherwise, a discussion should be included to address why the re-sampling is not necessary.

5 Section (Site 90) 4.4.2, Page 4-4, Paragraph 2, Sentence 1 states that existing wells were used in the groundwater sampling. However, it is noted that the well names were changed from the CSA investigation (see Table 2-3). This change makes it difficult to review and match table data. It is suggested that the text describe the name changes. This comment applies to other sites.

6 Table 5-1 (for all sites) shows residential RBCs used for subsurface soil screening. However, since the screening is for subsurface soils, the lower of the oral RBC or the Soil Screening Guidance (SSL) for soil to groundwater should be used. A DAF value of 1.0 should be used for this screening. The COPC selection should be re-performed accordingly.

7 Section 5.4 (for all sites) presents an uncertainty analysis. However, the analysis is incomplete. The uncertainty relating to the spatial locations of the samples, different analytical methodologies, screening parameters, and blank contamination are not discussed. This section needs to be expanded to cover these discussions.

8 Tables 5-2 and 5-3 (for all sites) present the data summaries for the selection of groundwater COPCs. However, these tables do not include the background data. It is suggested that the HA and MCL columns be removed and the background values be included. Consideration should also be given to combining the mobile lab data and fixed lab data into one table.

9 Section 6.0 (for all sites) presents conclusions regarding detected acetone and chloroform. However, throughout the review the acetone and chloroform issue raises questions on laboratory QA/QC which can affect the final results of the risk assessment.

2.0 SPECIFIC COMMENTS

1 <u>Section (Site 90) 3.2.4, Page 3-4, Paragraph 2, Sentence 2</u>.
This sentence states which well samples were sent to the fixed lab for SVOC analyses. However, a review of the CSA data revealed that wells 7, 14 and 15 had detected PAH compounds, but samples from these wells were not re-analyzed for PAH compounds. At least, this data should be included in the risk assessment.

2 <u>Section (Site 90) 4.3.1, Page 4-3, Paragraph 2, Sentence 1</u>.
This sentence states that the maximum concentration of any blank was applied to all samples. However, the usual practice is to apply the blank correction to only those

samples associated with that analytical batch. This point should be noted for future reference.

3 **Section (Site 90) 4.3.2.2, Page 4-4, Paragraph 4, Sentence 1**.
This sentence states that the groundwater exceeds the federal MCLs for iron and manganese. However, these values are for secondary MCLs which are not risk or health based values. Secondary MCLs are not usually used as a screening criteria and should not be used in this context. This reference should be removed.

4 **Section (Site 90) 4.4.1, Page 4-5, Paragraph 5, Sentence 3**.
This sentence states that the elution time for isopropanol is similar to acetone and can sometimes be mistaken for acetone. However, while the elution times are similar, the mass spectrogram for these two compounds is different and GC/MS procedures such as 8240 and the CLP VOC procedure can distinguish between these two compounds. The real problem is that isopropanol (even pesticide grade) is contaminated with acetone. Thus, inadequate drying time can lead to acetone contamination. The pattern of acetone detected does strongly suggest that the acetone detected in the samples may be caused by inadequate drying of field equipment. It is suggested that this paragraph be re-written. This comment applies to all sites.

5 **Section (Site 90) 4.4.1, Page 4-6, Paragraph 3, Sentence 1**.
This sentence states that toluene may be present in samples because of laboratory contamination. However, toluene is not a normal laboratory contaminant even though it is used in laboratories. Since this is a UST site, it is more likely that the toluene present in these samples is due to site contamination rather than the laboratory contamination. Thus, this paragraph should be deleted.
This comment also applies to other sites.

6 **Section (Site 90) 4.4.2, Page 4-7, Paragraph 3**.
This paragraph attempts to make the point that chloroform contained in chlorinated tap water is responsible for the presence of chloroform contamination in the groundwater. However, there are several problems with this conclusion. First, as noted in Section 3.4, the order of decontamination is scrubbing with soap and potable water, rinsing with distilled water, rinsing with isopropanol, and air drying. The drinking water standard for trihalomethanes is 100 ug/L. If these procedures are followed, there should be no chloroform remaining on the equipment since chloroform has a solubility in water and isopropanol. Air drying should also remove any chloroform present. Therefore, to suggest that chloroform would still remain after the decontamination procedures can only raise questions on the procedures and all data handling. Secondly, since chloroform was found in the groundwater samples collected by the CSA investigation, this finding strongly suggests that the chloroform is site related. Therefore, this paragraph should be removed and chloroform should be retained as a site contaminant.

7 **Section (Site 90) 4.4.2, Page 4-7, Paragraph 4**.
This paragraph discusses the groundwater sampling results of the mobile lab and fixed lab results. However, there is no comparison of the mobile lab and fixed lab results. There should be a comparison of all mobile lab and fixed lab results for all the sites

especially since the fixed lab analyses were used to confirm the mobile lab results. A review of the data strongly suggests that the two sets of results are not comparable. Since not all groundwater samples were analyzed by the fixed laboratory, there is a suggestion that the mobile lab results are not definitive and all wells should be re-sampled. For example, chloroform was only found in the mobile lab samples suggesting that the mobile lab was contaminated and its analytical results are questionable. A comparison of all mobile lab results for all the sites be performed. This comment also applies to other sites.

8 <u>**Section (Site 90) 4.5, Page 4-8, Paragraph 1, Sentence 1**</u>.
This sentence states that the only inorganic elements detected in the groundwater which exceeded the NCWQS were iron and manganese. However, based on the review of the CSA data, elements such as lead and silver at levels exceeding the NCWQS were detected in the CSA investigation. This discrepancy should be resolved.

9 <u>**Section (Site 90) 5.2.2.1, Page 5-3, Paragraph 1**</u>.
This paragraph states that historical information can be used in the selection of COPCs. However, this practice is not accepted by the Region 4 in the COPC screening process. This paragraph should be removed.
This comment also applies to other sites.

10 <u>**Section (Site 90) 5.2.2.5, Page 5-4**</u>.
This paragraph discusses the use of State and Federal criteria standards in the COPC selection process. However, MCLs should not be used in the COPC selection process for a risk assessment since they are not entirely risk based. The Health Advisories (HAs) should not be used because they represent short-term exposures and do not consider carcinogenic effects. Standards based on secondary MCLs should also not be used in the COPC selection process as they are not risk based. State standards can be used if they are risk-based and are more conservative than the RBCs. This section should be deleted. This comment also applies to other sites.

11 <u>**Section (Site 90) 5.2.3.2, Page 5-6, Paragraph 7, Sentence 5**</u>.
This sentence states that bis(2-ethylhexyl)phthalate is retained as a COPC. However, this sentence is not consistent with the previous sentence which stated that bis(2-ethylhexyl)phthalate is not retained as a COPC. The discrepancy should be resolved.

12 <u>**Section (Site 90) 5.5, Page 5-8**</u>.
This section presents the summary of the results of the qualitative risk assessment and indicates no COPCs retained for Site 90. However, this conclusion is not supported by the site data. In particular, chloroform and tetrachloroethene should be retained as a COPC. In addition, when all the site data is included in the evaluation, this conclusion may be changed. This section should be re-written.

13 <u>**Section (Site 91) 4.4.2, Page 4-6, Paragraph 3, Sentence 3**</u>.

This sentence states that one sample was submitted for confirmatory analysis. However, sentence 1 of paragraph 6 states that nine samples were submitted for confirmatory analysis. This discrepancy should be resolved.

14 **<u>Section (Site 91) 4.4.2, Page 4-6, Paragraph 6, Sentence 1</u>**.
This sentence states which well samples were sent for confirmatory analysis. However, it is observed that wells which had detected PAH compounds in the CSA investigation were not re-analyzed for the PAH compounds. The text should include an explanation of why these wells were not re-sampled for the PAH compounds.

15 **<u>Section (Site 92) 4.4.1, Page 4-5, Paragraph 3, Sentence 3</u>**.
This sentence states that acetone was not one of the compounds analyzed by the mobile laboratory. However, it was previously stated that the mobile laboratory was using a modified Method 8240, and acetone is usually one of the compounds in the 8240 list. In addition, this is the first mention that the compound list utilized by the mobile laboratory is not the same list as for the fixed laboratory. A table should be included in the report to compare the compound lists and detection limits. A discussion should also be included to evaluate the impact of differing laboratory lists.

16 **<u>Section (Site 92) 4.4.1, Page 4-5, Paragraph 3 and 4</u>**.
These paragraphs discuss the presence of high levels of acetone in the soils and attempt to justify these levels as a laboratory problem, either through laboratory contamination or misreading isopropanol as acetone. However, it is very rare for laboratory contamination to have 3100 ug/kg or 8100 ug/kg levels in blanks. If so, it suggest very poor laboratory QC. Also, the GC/MS is capable of distinguishing acetone from isopropanol and acetone is a contaminant of pesticide grade isopropanol. Therefore, it suggests that the decontamination practices during the investigations were not performed properly.