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CERTIFIED MAIL RETURN RECEIPT REQUESTED

North Carolina Department of Environment,
Health, and Natural Resources
Attn: Mr. Patrick Watters
P.O. Box 27687
401 Oberlin Road
Raleigh, North Carolina 27611

Re: MCB Camp Lejeune; Response to North Carolina DEHNR Comments on the Draft RI/FS Reports for Operable Unit 2

Dear Mr. Watters:

The enclosure to this letter addresses comments from the State of North Carolina Department of Environment, Health, and Natural Resources (NC DEHNR), Division of Solid Waste Management, for the referenced project. These comments were contained in a letter from Mr. E. Peter Burger, P.E., dated July 30, 1993.

Any questions concerning these responses should be directed to Ms. Linda Berry, P.E., at (804) 322-4793.

Sincerely,

L. A. BOUCHER, P.E.
Head
Installation Restoration Section
(South)
Environmental Programs Branch
Environmental Quality Division
By direction of the Commander

Enclosure:
Response to NC DEHNR Comments-Draft RI and FS Reports for Operable Unit No. 2, MCB Camp Lejeune, NC

Copy to:
EPA Region IV (Ms. Gina Townsend)
MCB Camp Lejeune (Mr. Neal Paul)
Baker Environmental Inc. (Mr. Ray Wattras)

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Response to Comments on the Draft RI Report
for Operable Unit No. 2, MCB, Camp Lejeune, North Carolina

Submitted by the North Carolina DEHNR Superfund Section
Letter Dated July 30, 1993

Responses to Specific Comments

Executive Summary

ES.1 The site history for Site 82 was inserted.

ES.2 The surface water classification was changed throughout the document to Class SB NSW.

ES.3 The 4th paragraph was modified to reflect the elevated chromium concentrations at Lot 203 and upgradient of Lot 203.

ES.4 The principal constituent of the PAH contamination was pyrene. This information was inserted into the sentence.

ES.5 The principal constituent of the PAH contamination was butyl benzyl phthalate. This information was inserted into the sentence.

ES.6 The term "surficial" groundwater will be used in the report.

ES.7 Specific groundwater quality was not evaluated within the ravine area. Because of the steep banks of the ravine, it was not possible to install monitoring wells in the ravine. However, several monitoring wells are located nearby. The ravine receives groundwater discharge on a seasonal basis. Several surface water samples were collected from the ravine. This will be discussed in the executive summary.

ES.8 The principal constituents of the PAH contamination were pyrene and fluoranthene. This information was inserted into the sentence.

ES.9 The TCE concentration of 98 ug/l detected at station WC7 exceeded the North Carolina Surface Water Standard of 92.4 ug/l. This correction was made throughout the document.

ES.10 Tidal changes may transport contaminants upstream from the point of entry into tidally influenced areas of Wallace Creek. The portion of Wallace Creek adjacent to the site is not significantly influenced by the tide, based on visual observations. The portion of Wallace Creek upstream of the site at sampling location WC3 is not believed to be influenced by the tide. Therefore, contaminants detected in surface water and sediment upstream of the site are not believed to be present due to tidal influence.

ES.11 No response required. (Note: The target risk range identified in the bullet is defined by CERCLA.)

ES.12 A bullet was inserted stating that low levels of TCE are present in groundwater but at concentrations below the NCWQS.

ES.13 A bullet was inserted stating that TCE and PCE are present in groundwater but at concentrations below the NCWQS.

ES.14 A bullet was inserted stating that total chromium concentrations in groundwater at two wells exceed NCWQS of 50 ug/l.

ES.15 A bullet was inserted stating that chloroform is present in groundwater at levels above the NCWQS.

ES.16 Chlorophenol was added to the list of VOCs for the fourth bullet.

ES.17 Shallow and deep groundwater within Site 82 exhibited elevated levels of VOC contaminants which exceed both the NCWQS and Federal MCLs. This information was added to the text.

ES.18 A bullet was inserted stating that total chromium and total lead were detected in well 9GW3 at concentrations which exceed both the NCWQS and Federal MCLs. Based on soil samples collected from the area and from the monitoring well borehole, the source of lead and chromium contamination does not appear to be related to disposal since these contaminants were not detected in soil at elevated levels.

ES.19 Pesticides were also detected in sediments at Wallace Creek. This information was added to the text.

ES.20 As discussed previously under response ES.10, the presence of contaminants upstream of the site are not likely due to tidal influences. Pesticides are widely found throughout many of the streams at MCB Camp Lejeune.

ES.21 The TCE concentration of 98 ug/l detected at WC7 exceeds the North Carolina Surface Water Standard of 92.4. This correction was made throughout the text.

ES.22 No response required. (Note: fencing may be appropriate from a standpoint that monitoring wells have been damaged by unauthorized use of motor vehicles in the wooded areas of the site.)

ES.23 Additional aquatic sampling activities are proposed in the near future to further evaluate environmental impacts to these areas. Following sample collection, the data will be evaluated to determine if fishing in both Wallace Creek and Bear Head Creek should be restricted. The current database (i.e., 7 fish samples) is limited to make this determination.

Section 3.0

3.1 The surface water classification was changed throughout the document to Class SB NSW.

Section 3.9.1.3

3.1 The correct acronym CAMA replaced NC CAMA.

3.2 Bear Head Creek, the inland portion of Wallace Creek, and any Coastal wetlands associated with these waters are regulated under CAMA. The tidal portion of Wallace Creek along with 75 feet adjacent to the mean water line also are regulated under CAMA. This change was noted in the text.

3.3 Based on discussions with Mr. Richard Carpenter (DEHNR), anadromous fish are not believed to utilize Wallace Creek or Bear Head Creek (these type fish were not identified in either stream during the aquatic survey). Therefore, there are no migratory pathways or feeding areas that could affect these fish. This has been clarified in the text.

Section 4.0

4.1 Unfiltered samples were collected to evaluate inorganic contaminant levels in groundwater. Therefore, both the State of North Carolina and EPA Region IV groundwater sampling requirements were satisfied. Filtered samples were also collected for comparison; however, the filtered sample analyses were not used in the baseline risk assessment.

4.2 The comment is not clear; there is no comment referencing page 4-12.

4.3 The text will not be changed since the intent of this section is to present VOCs which exceeded MCLs or NCWQS. To show all contaminants which are present, but do not have a corresponding NCWQS, would not provide significant information to the user of this document (the toxicity of these contaminants are likely low if there is no State or Federal standard).

4.4 Justification for the conclusion that the two SVOCs detected in Bear Head Creek are related to laboratory contamination is provided in Section 6.0 of the RI.

4.5 The discussion regarding SVOCs on page 4-42 is in reference to subsurface soil samples at location 9GW4. The discussion on page 4-4 is in reference to surface soil contamination at the site. The source of the SVOC contamination at well 9GW4 is not likely the result of surface releases of fuel from within Site 9 since this well is located approximately 800 feet away. However, the source of the SVOCs detected in soils collected within Site 9 is most likely related to surface releases of fuel because of their close proximity to the former aboveground storage tanks.

Section 6.0

6.1 For this Operable Unit, the list of Contaminants of Potential Concern (COPCs) were developed using the criteria presented in the USEPA's Risk Assessment Guidelines for Superfund (RAGs). According to RAGs, contaminants that are infrequently detected may be artifacts in the data due to sampling, analytical and other problems, and therefore may not be related to the site. The contaminant can be considered as a candidate for elimination if there is no reason to believe that the contaminant may be present. However, historical information was not the only criterion used in the selection of complex COPCs. Other criteria used in the selection of COPCs included: a comparison to applicable state and federal criteria and standards, an evaluation of frequency of

detection, comparison to available background data, evaluation of essential nutrients, and a comparison to blank sample results.

Blank data should be compared with results from samples with which the blanks are associated. However, due to the complex sampling effort it is difficult to associate certain blanks with applicable site data. Therefore, RAGs allows for the comparison of the highest blank data to the entire sample data set. Examination of Appendix R of this report presents the results of all blank data for this Operable Unit. The maximum contaminant concentration detected in these blanks was used to eliminate COPCs using the five and ten times rule as presented in RAGs and the National Functional Guidelines for Organics.

Inorganic contaminants for this Operable Unit were compared to base-specific background concentrations. Base-specific background concentrations were developed from surface and subsurface soil samples collected in areas which were not influenced or potentially influenced by site activities. Inorganic surface and subsurface soil results are compared to base-specific findings on Tables 6-2, 6-4, 6-6, and 6-8. According to the USEPA, since a sufficient number of samples are rarely obtained to perform a statistical analyses, two times the average background concentration should be compared to the site's maximum concentration to determine significance. However, the two times rule cannot be used exclusively for the selection of inorganic COPCs.

A better, more defensible comparison of site inorganic data to background data is obtained by comparing sample analytical results for a given inorganic to the range of background inorganic results. The frequency with which an inorganic constituent exceeds the background range can then be considered in the selection of COPC. If only a limited number of samples contain inorganics in excess of background, the analytical data can be re-examined to determine if analytical variability is causing exceedence. If analytical variability is suspected, then one-half of the analytical results can be compared to the highest value in the background range of inorganic concentrations. If one-half of the analytical results exceed the background ranges, then the inorganic should be retained and evaluated against the other selection criteria.

Contaminants which were excluded as COPCs because concentrations do not warrant inclusion are presented in Appendix L of this report. In this Appendix (Data and Frequency Summary) the validated analytical results, along with a summary depicting maximum concentrations and frequency of detection for each contaminant are presented. A contaminant detected at a frequency greater than 5 percent (1 in 20) can warrant inclusion as a COPC.

6.2 Page 6-7 has been corrected to indicate 1,1,1-trichloroethane and tetrachloroethene.

6.3 The wording of the sentence has been corrected to indicate that off-site receptors would be exposed to concentrations much lower than those detected in on-site air samples because of the nearly infinite dilution capacity of outdoor air. Consequently, the inclusion of off-site receptors of particulates is not warranted for inclusion.

6.4 The wording has been corrected to indicate surface soil.

6.5 The wording has been corrected to indicate surface soil.

6.6 This route was retained under the heading On-site Surface Soil, Civilian Personnel, Dermal Contact.

6.7 The last sentence has been corrected to indicate 9,125 days not 25,550 days.

6.8 The table number has been corrected to 6-25.

6.9 This sentence will be corrected. The reference pertaining to identification of potential health and environmental effects will be reworded.

6.10 The term i-1 has been corrected to read i=1.

6.11 The target risk range identified in CERCLA is 1.0E-04 to 1.0E-06. The "acceptable" risk range for the State is not an ARAR since it is not promulgated.

6.12 The text has been corrected to show that HIs estimated for children and adults exceeds unity.

6.13 Groundwater sampled from a monitoring well is not considered representative of potable water due to the variation in the construction and development of these wells as opposed to potable wells. Potable supply wells used for drinking are usually constructed to tap a reasonably prolific aquifer and to produce water with good clarity (the surficial aquifer would not be used for potable water due to insufficient yields). In addition, water withdrawn for public potable resources often undergoes pretreatment prior to being withdrawn at the tap. Pretreatment (i.e., chlorination, fluoridation, filtration, settling) of the groundwater often changes the chemical and physical nature of the groundwater. In contrast, monitoring wells are sometimes screened in silty or clayey zones and groundwater may contain substantial amounts of fine sediment, which will increase the level of inorganic concentrations.

Water collected from monitoring wells can carry sediments even after well development. The amount of suspended matter is an artifact of the method of water collection and well construction. Suspended sediments can be responsible for the presence of inorganics in groundwaters because they are constituents of the sediments which they have been adsorbed onto them. Therefore, the groundwater collected from a monitoring well is not truly representative of potable water. The use of total inorganic results for groundwater can overestimate the potential human health risk because dissolved concentrations of chemical analytes are usually significantly lower than the total concentrations.

6.15 Toxicological values for phenanthrene are not currently available. The Integrated Risk Information System (IRIS) and the Health Effects Assessment Summary Tables (HEAST) have determined that the data available for the development of toxicity values are inadequate for quantitative risk assessment. If EPA-derived toxicity values are unavailable but adequate toxicity studies are available, one may derive toxicity values using Agency methodology. Therefore, because adequate toxicity data are not available for phenanthrene toxicity values were not derived. Using toxicity values for pyrene as a surrogate to evaluate phenanthrene is toxicologically inappropriate because pyrene is a 4-ring PAH and phenanthrene is a 3-ring PAH, therefore, their modes of toxic action cannot be considered similar. Using the toxicity values for pyrene to evaluate the potential risks for phenanthrene is not advised by the Agency and will not be incorporated in this report.

6.14 The potential exposure to construction workers from subsurface soil was not estimated in this report because of the determination of future use of these properties. Because there are no rules for determining alternate future land use, and because the residential land use scenarios for surface soil (in which the highest contamination was detected) indicated no risk, a construction scenario

was not developed. In addition, because residential land use is most often associated with the greatest exposures, it is generally the most conservative choice to make when deciding what type of alternate land use may occur in the future.

6.15 The potential risk to children from the ingestion of biota was not calculated in this report because reliable fish ingestion data for children are not available, and it was determined that there is a potential risk to adults from the ingestion of fish. Estimating potential risks to children is usually a more conservative approach.

6.16 In general, the accuracy for CLP analytical methods is plus or minus 50 percent (Federal Register Vol 49, No. 209. October 26, 1984).

6.17 The PEF calculated for this scenario was based on the Cowherd, 1985 equation presented in RAGs. However, site and regional specific inputs were used in the determination.

6.18 The recommendation will be considered in future documents.

6.19 The reference USEPA, May 1989 has been added to indicate where the inhalation rate for children was obtained. This value is derived for a child, age 6 who is either resting or involved in light activity. Very few data are available for preschool-aged children.

6.20 Values have not been published for the ingestion rate of sediment during recreational activities. However, it is safe to assume that ingestion of sediments should be less than soil ingestion rates because of the differences in dry-weight between soil and sediments. Therefore, the 50 mg/day soil ingestion rate published in USEPA, December 1989 was applied for this exposure route.

6.21 Based on discussions with the USEPA Region IV it was determined that the surface water bodies in the area of the Operable Unit were not used for recreational purposes (i.e. swimming); therefore, using a whole body exposure is an overconservative estimation.

6.22 The ingestion rate of 0.284 kg/day (event) was obtained from RAGs. This distribution for total consumption of fish was calculated by Pao et al. (1982) from the USEPA 1977-78 USDA consumption survey. The consumption rate of 6.5 g/day is used to represent the average per capita nonmarine fish consumption rate. This value was established for setting Ambient Water Quality Criteria. This value is estimated over a per capita basis and represents the average over the entire population including fish-eaters and nonfish-eaters. Thus, they underestimate actual consumption rates for recreational fisherman and are not accurate for assessing exposure to recreational fisherman at a specific site. The consumption rate of 54.0 g/day, established by Pierce et al. (1981), was derived from local values on the west coast and is to be used to estimate consumption of fish/shellfish in any area with large water bodies.

No specific values are recommended for small water bodies or for areas of localized contamination of large water bodies. For areas like these, the USEPA recommends developing standard exposure scenarios assuming the number of fish meals eaten from the area per year and applying a meal size in the range of 100 to 200 g/meal (USEPA, Exposure Factors Handbook, May 1989).

An exposure frequency of 48 days/year is published in RAGs. Without specific local population pattern information, this value was used.

6.23 In accordance with RAGs the future potential of exposure for residential children was addressed because this subpopulation may have increased sensitivity to COPC exposure, and have behavior patterns which result in higher exposure. The lifetime value is the period of time over which the administered dose is averaged. For carcinogens, this represents the average life expectancy of the exposed population. Estimating carcinogenic risks to children was conducted using this 70-year lifetime but an exposure duration of six years. The latency period for carcinogenicity allows for the estimation of risk to a child. It is possible to be exposed at an early age and then be removed from that exposure an still develop cancer at a later stage of life.

6.24

a. These toxicity values were obtained from the USEPA Region III Risk Based Concentration Table. The reference in the Toxicity Values Table will be modified to reflect this reference.

b. The oral slope factor for dieldrin has been corrected to 1.6E+01.

c. The oral RfD for manganese used in this report (5E-03) was obtained from USEPA's IRIS database. This value is based on the arithmetic mean of the range of manganese concentrations for the NOAEL and LOAEL. This RfD assumes a separate dietary intake of manganese, as this essential element is found in varying amounts in all diets. The RfD (1E-01) is based on NOAEL of 10 mg/day for chronic human consumption of manganese in the diet, and is based on a composite of data from three references. Therefore the RfD (5E-03) was used to estimate noncarcinogenic risks in this report.

d. The term "AI" on this table indicates that the weight of evidence (A) is for inhalation (I).

e. The term ND indicates that toxicity values have not been determined for a chemical. The symbol "--" indicates that this value is not on line in the IRIS Database.

Response to Comments Submitted by the
North Carolina DEHNR
on the Draft Feasibility Study Report
for Operable Unit No. 2
MCB Camp Lejeune, North Carolina

GENERAL COMMENTS

1. The requirements of air permitting will be considered in the design if the contaminated soils are thermally treated on site or for the treatment of groundwater via air stripping at the sites.

2. Mr. Waynon Johnson (NOAA) and Mr. Tom Augspurger (U.S. Fish and Wildlife) have been contacted. Both individuals have indicated that "best professional judgment" should be used in determining ecological impacts. Based on the estimated flow of water in Wallace Creek (14.1 CFS), the discharge rate of approximately 300 gpm should not have significant ecological effects for several reasons.

   - Wallace Creek is a gaining stream for groundwater discharge; therefore, the additional discharge of treated groundwater should not impact the habitat given that freshwater is already discharging into the stream.

   - The water quality adjacent to the site is primarily freshwater and not saltwater, based on measurements collected during the aquatic survey.

   - The amount of water to be discharged into the stream is only a fraction of the flow and volume of groundwater discharging into the stream.

   Land farming/spray irrigation is not feasible given poor drainage and volume of water to be discharged. Injection wells are feasible, but are not proven effective without pilot scale testing. In addition, the capital costs of the alternative would increase by approximately one-half million dollars. Discharging to the New River is feasible, but the cost is substantially greater and would not likely be accepted by the fishing community.

3. No response necessary for this general comment.

4. The preferred Groundwater RAA for this Operable Unit is No. 4, Intensive Groundwater Extraction and Treatment (formerly referred to as Partial Groundwater Treatment). Under this alternative, the plume will be remediated until the remediation goals are met. Under this alternative, the contaminated groundwater will be treated to meet surface water quality criteria for the protection of human and aquatic life. The placement of the extraction wells in only the most contaminated portions of the groundwater plumes is the reason the word "partial" was used in the alternative name. The estimated cone of influence should capture the entire plume. The implementation of this alternative will result in the remediation of the plumes, but not as quickly as with Groundwater RAA No. 6.

SPECIFIC COMMENTS

Section 2

2.1 The contaminants of concern will be revised based on changes made in the Risk Assessment, which is presented in the Remedial Investigation Report.

2.2 The last paragraph on Page 2-4 will be revised to state that the substantive requirements of Federal, State, or local permits must be complied with.

2.3 Based on the results of the Risk Assessment, 2-chloroethylvinyl is not a contaminant of concern, therefore, it is not included on Table 2-2.

2.4 Based on the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004), Section 4.2.3, volumes or areas of media are to be identified in the FS. To clarify this misunderstanding, the first paragraph under Section 2.3.3 of the FS will be revised.

2.5 The second paragraph under Section 2.3.3 will be rewritten for clarity.

2.6 The first paragraph under Section 2.3.3.2 will be revised so that it does not state that it reviews the BRA.

2.7 The target risk range identified in CERCLA is 1.0E-04 to 1.0E-06. The "acceptable" risk range for the State is not an ARAR since it is not promulgated.

2.8 Agree with the comment. The first paragraph under Section 2.3.3.2 will be revised to clarify misunderstandings. The remediation goals developed for this Operable Unit will be based on a risk level of 1.0E-04, it will not be stated that this is an NCP "point of departure". Note that 40 CFR 300.430(e)(2)(i)(A)(2) states that "For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 1.0E-04 and 1.0E-06 using information on the relationship between dose and response."

2.9 The paragraph will be revised (as stated in the previous comment).

2.10 The term "cleanup standards" has been replaced with "action levels".

2.11 Agreed. The statement will be clarified

2.12 Agreed. The paragraph will be rewritten.

2.13 The exposure pathways will be discussed. Note that this does nothing with respect to determining whether cleanup is needed. The determination of whether cleanup is needed is obvious since contaminant levels exceed ARARs. In addition, we already know that there is a risk (above 1.0E-04) based solely on ingestion of groundwater. To discuss other exposure routes is a moot point given that the groundwater will be remediated.

2.14 The information is not meaningless. The document may be reviewed by the public. This information is important and will not be deleted.

2.15 A site-specific particulate emission factor was calculated in the BRA. This value was used in the determination of site-specific particulate inhalation action levels.

2.16 Base personnel addressed in the BRA are civilian base personnel who are employed by the base but do not reside on base grounds. Therefore, an 8-hour duration was used for the action level estimation.

2.17 This value was referenced because it is presented in the USEPA guidance.

2.18 The reference will be provided.

2.19 Agreed. The units will be corrected.

2.20 The term CF will be defined.

2.21 Agreed. The text will be modified.

2.22 Professional judgment was used in the determination of this ingestion rate. This ingestion rate is the upper 95th percent ingestion rate for residents, therefore, this value would be conservative for this action level.

2.23 Agreed. The term CF (conversion factor) was omitted. It will be provided.

2.24 This comment will be considered. However, this section was reviewed by a technical editor. She understood the intent of the section. This section will not be rewritten.

2.25 This comment will be considered. However, the information in the table was clear to the various qualified personnel who reviewed the report.

2.26 This comment will be considered. However, the information in the table was clear to the various qualified personnel who reviewed the report.

2.27 Scientific notation should not be used to express a concentration.

2.28 In accordance with the USEPA guidance, potential exposure for children was addressed since this subpopulation may have an increased sensitivity to COPC, and beacuse behavior patterns may result in higher exposure. Estimating carcinogenic action levels for children was conducted using a 70-year lifetime but an exposure duration of 6 years. The latency period for carcinogenicity allows for the estimation of risk to a child. It is possible to be exposed at an early age and then be removed from that exposure and still develop cancer at a later stage of life.

2.29 This RfD will be removed from the spreadsheets. The RfDs and CSFs are provided in the BRA.

2.30 See comment response 2.15.

2.31 See comment response 2.15.

2.32 The comment is misnumbered. For soil, the overall risk is between 1.0E-04 and 1.0E-06. Although the overall risk is within the acceptable range (as defined by CERCLA), certain areas of the site exhibited contamination that if evaluated separately, would exceed the action level of 1.0E-04. These areas of concern are targeted for remediation. Note that you can have an overall risk that is "acceptable" and also have areas requiring remediation.

Section 3.0

3.1 The table will be revised to state that both the surficial aquifer and the Castle Hayne aquifer are the Areas of Concern. In addition, the table will be footnoted to state that there is no distinct confining layer between these two aquifers and, therefore, they act as one water-bearing zone. Note that both aquifers are being remediated.