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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

OCT 28 1991

4WD-RCRA & FFB

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Commander, Atlantic Division
Naval Facilities Engineering Command
Code 1822
Attn: Ms. Laurie A. Boucher, P.E.
Remedial Project Manager for MCB Camp Lejeune
Norfolk, Virginia 23511-6287

RE: Hadnot Point Industrial Area Documents
MCB Camp Lejeune, North Carolina

Dear Ms. Boucher:

The Environmental Protection Agency (EPA) has reviewed the following documents, all dated August 1991:

Draft Remedial Investigation Report for Hadnot Point Industrial Area, Characterization Study to Determine Existence and Possible Migration of Specific Chemicals In Situ (Volumes 1, 2 and 3).

Hadnot Point Industrial Area, Baseline Risk Assessment Final Draft.

Draft Feasibility Study (Shallow Soils and Deep Aquifer) for Marine Corps Base Camp Lejeune.

Site Assessment Report for Sites 6, 48 and 69, Characterization Study to Determine Existence and Possible Migration of Specific Chemicals In Situ.

EPA comments are included as an enclosure and must be addressed before concurrence and approval will be granted in accordance with the terms of the Federal Facility Agreement.

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If you have any questions concerning this matter, please contact me at (404) 347-3016.

Sincerely yours,

Carl R. Froede Jr

Carl R. Froede Jr.
Remedial Project Manager
DOD Remedial Unit
RCRA and Federal Facilities Branch
Waste Management Division

Enclosure

cc: Mr. Jack Butler, NCDEHNR
Mr Brynn Ashton, MCB Camp Lejeune

EPA Comments to Draft RI for Hadnot Point Industrial Area, Characterization Study to Determine Existence and Possible Migration of Specific Chemicals In Situ, (Volumes 1, 2 and 3).

GENERAL COMMENTS

1) The aquifers of concern at this site are the Castle Hayne aquifer averaging 340 feet thick and the surficial aquifer ranging from being nonexistent near drainage areas to 75 feet thick near the Hadnot Point Industrial Area. Groundwater from the Castle Hayne aquifer is used as a regional drinking water supply. As outlined by the Guidelines for Ground-Water Classification under the EPA Ground-Water Protection Strategy, Final Draft, December 1986, the Castle Hayne aquifer is classified as Class IIA, A Current Source of Drinking Water Supply. Based on information provided in the Remedial Investigation report, groundwater from the surficial aquifer is not currently used as a drinking water source. Therefore, the surficial aquifer is tentatively classified as Class IIB, A Potential Source of Drinking Water. Water level data collected 2/20/91 at the Hadnot Point Industrial Area indicate that the surficial aquifer is a potential source of recharge to the Castle Hayne aquifer. As more hydrogeologic data are supplied, the classification of the aquifer may change. Class IIA and Class IIB aquifers are subject to stringent clean-up standards based upon protection of human health (MCLs, proposed MCLs, MCLGs, and other criteria based upon protection of human health). Further monitoring of all intermediate and deep aquifer wells (including potable wells) at Hadnot Point Industrial Area should be performed by the Navy to determine the potential contamination threat to the deep aquifer.

2) A specific method has not been proposed for establishing soil clean-up goals with respect to groundwater. Soil partitioning coefficients should be determined to evaluate soil clean-up goals that are protective of groundwater. The methods and sources utilized to establish these parameters should be provided. If soil column testing is used to determine partition coefficients, the organic carbon content of the soils should be measured for use in the calculations (see USEPA Region IV SOP manual).

SPECIFIC COMMENTS

Volume 1

1) Page 2-3, Section 2.4; Which monitoring wells contained these contaminants? Revise to include this information.

2) Page 3-2, Top Of Page; Were any of these pits, tanks, etc. sampled?

3) Page 3-3, Section 3.2.2; These data plots should be included in an appendix.

4) Page 3-12, 3.3.3 Groundwater Sampling: EPA will not accept one round of sampling from the intermediate and deep wells as "representative" of conditions found in the subsurface. Further sampling will be necessary to define the amonut and extent of contamination in the intermediate/deep aquifer.

5) Page 3-14, Table 3-1. Hadnot Point Groundwater Field Measurements Summary: The ranges of variance for all three parameters appear to be drastic. Why the wide range of values? A column needs to be added showing the total depth of each well listed. Which wells are considered background?

6) Page 3-15, para. 4-a; Teflon bailers are to be used according to EPA/ESD QA/QC SOP (Section 4.9.3)

7) Page 3-18, 3.3.4 Water Level Measurements: Two rounds of water level measurements at HPIA during January and February 1991, will not be acceptable as representative of subsurface hydrologic gradient conditions. Groundwater monitoring of the potentiometric surface should be obtained throughout the year to determine if the gradient is consistent in one direction.

8) Page 4-3, Section 4.2.2: The statement is made that there was no attempt to correlate the hydrogeologic zones with the regional hydrogeology. In the report, the unconfined aquifer was referred to as the shallow aquifer and the lower semi-confined aquifer as the deep aquifer. On page 4-10 an implication was made that the deep aquifer and the Castle Hayne aquifer were the same. Based on the hydrogeologic description provided, the shallow wells (25 feet deep) penetrate the surficial aquifer, the intermediate wells (75 feet deep) penetrate the Castle Hayne aquifer, and the deep wells (150 feet deep) also penetrate the Castle Hayne aquifer. Reference to the aquifers should be consistent and regional hydrogeologic names should be used to avoid confusion with respect to the aquifers under discussion.

9) Page 4-8, Section 4.3.3 Hydraulic Gradients: The direction of groundwater flow at the site is toward the west-southwest based on 2/20/91 water level measurements. However, the hydraulic gradient is low in the aquifer (0.003) which could allow the plume to migrate radially. Further water sampling efforts might be necessary before an accurate statement can be made with regards to contaminant movement.

10) Page 4-9, 4.3.3 Hydraulic Gradients, first paragraph: The two wells used to calculate the intermediate and deep potentiometric surface beneath HPIA should clearly be shown. The values used to calculate the hydraulic gradient should be included. All contour lines shown between these values should be dashed with the figure legend reflecting that these dashed lines are projections. Once again values from only one sampling event (February 1991) will not be acceptable as representing the subsurface hydraulic gradient beneath HPIA. Further water level measurements will be necessary.

11) Page 4-9, 4.3.3 Hydraulic Gradients, fourth paragraph: How far away is the "closest producing wells...located to the northwest"? At what depth is it producing water? Is it sampled regularly (VOC's, metals, etc.)? Has the radius of influence been calculated to determine if a reverse in flow direction is occurring; drawing contamination to the northwest?

12) Page 4-10, 4.3.4 Hydraulic Conductivity, second paragraph: At what depth is the "limestone portion of the deep (Castle Hayne) aquifer" from which this pump test was performed?

13) Page 4-10, 4.3.4 Hydraulic Conductivity, third paragraph: The statement is made regarding recharge of the limestone portion of the deep aquifer from the overlaying clayey layer. What wells in the HPIA are the deepest and have the greatest potential for drawing contaminants downward the furthest?

14) Page 4-10, 4.4 METEOROLOGY: Data presented in this section reflect the possibility of a varied potentiometric hydraulic gradient in the subsurface and support further water level sampling to establish long term groundwater flow direction.

15) Page 5-1, 5.0 RESULTS OF INVESTIGATION: EPA will expect further sampling to be performed for both the intermediate and deep groundwater monitoring wells, due to possible laboratory contamination of samples and the fact that only one round of sampling has been performed.

16) Page 5-1, 5.0 RESULTS OF INVESTIGATION: Does the Navy suspect that the laboratory "Hits" masked or interfered with data resulting in contaminants going undetected?

17) Page 5-1, 5.0 RESULTS OF INVESTIGATION: The total depth of the water supply wells and the screen interval should be provided. If well construction data cannot be provided, additional monitoring wells that penetrate the Castle Hayne aquifer must be constructed to determine the vertical extent of the contaminant plume. Water level data from these wells are necessary to determine the vertical direction of the ground-water flow at this site.

18) Page 5-3, 5.2.1 Soil Gas Survey, Bldgs. 901, 902, and 903, second paragraph: The underground storage tank (UST) referenced here should be closed and/or removed. If this UST has leaked TCE into the subsurface, surrounding soils should be removed and disposed. This tank, along with any surrounding soils, will act as a source of contamination until they are removed.

19) Page 5-3, Bldg. 1100: Does an underground storage tank (UST) exist at this site and, if so, has it been tested and/or removed? If it exists, has it ever been used for storage of any hazardous substances? A leaking drum is referenced, were any soils removed from beneath the drum (potential source area)?

20) Page 5-3.A, Figure 5-1, SOIL GAS FINDINGS - BLDGS. 901, 902, and 903 - CONFIRMATORY STUDY: All monitor well locations within the confines of this and every other site specific location map should be identified. The wells should include both the name and depth of the well. This will better determine monitor well placement in relation to the soil samples obtained and groundwater flow direction.

21) Page 5-5, Bldgs. 1502, 1601, and 1602: The underground storage tank at this site should be tagged for closure/removal to eliminate any possibility of further contamination.

22) Page 5-5, Bldgs 1709 and 1710: The underground storage tank at this site should be tagged for closure/removal to eliminate any possibility of further contamination.

23) Page 5-7, para. 4; If 19 of 27 samples contain Acetone and Methyl chloride, then stricter QA/QC standards are needed to eliminate these constituents from the list of possible contaminants. What are the Navy's plans to insure this does not happen in the future?

24) Page 5-7, Building 902: Was this underground storage tank (UST) ever located? The UST at this site should be tagged for closure/removal to eliminate any possibility of further contamination.

25) Page 5-11, Table 5-1, COMPARISON OF ANALYTICAL RESULTS - HITS ONLY SHALLOW GROUNDWATER MONITORING WELLS: The MCL's and proposed action levels for these contaminants should be shown somewhere in this table. This will enable the reader to determine which wells have contaminants above acceptable levels and the level of contamination found at that well.

26) Page 5-16, para. 2; The current MCL for lead in groundwater is 15 ppb. This places 22GW1 and 22GW2 in Set 1 and Set 2 above the MCL.

27) Page 5-16.A, Figure 5-4 TOTAL VOC ISOPLETH MAP - SHALLOW AQUIFER, CONFIRMATORY STUDY, HADNOT POINT INDUSTRIAL AREA: The fact that this figure is the result of 1987 data needs to be stated. It is confusing looking from this figure to the next one (next page) and determine exactly what you are looking at - without knowing that this is historical data.

28) Page 5-18, para. 5; Is the lead concentration that is "not of concern" based on the inaccurate MCL of 50 ug/l?

29) Page 5-36, sect. 5.4; Is "ultrapure water" organic free water or deionized water?

30) Page 5-42, Section 5.5.3; What is the thickness of the aquifer at each of the wells used for the aquifer test? Are the wells fully or partially penetrating? Are corrections for partial penetration necessary for any of the wells?

31) Page 6-5, Supplemental Characterization, second paragraph: The acronym "TCL" is not defined in the list of abbreviations and acronyms. Also the list of "full TCL parameters" is never identified. Please revise to include this information.

32) Page 6-7, Intermediate and Deep Wells: The acronym "TIC" is not defined in the list of abbreviations and acronyms. Please revise to include this information.

33) Page 6-10, para. 5; The average storage coefficient is reported as 8.8×10^{-4}, but the estimated storage coefficient reported on Page 4-10 and 5-43 is 8×10^{-4}. If the difference here is the term 'estimated', 8.8 should be rounded to 9 instead of 8.

Vol. II

1) Appendix A--Decontamination Procedures; The procedures discussed here are inconsistent with the procedures outlined on Page 3-7 (ESE, Draft RI-HPIA, 1991). Appendix A should have been followed, not the steps described on Page 3-7.

Vol. III

1) Appendix F-O; A key to the symbols used in the Analytical Results section should be included at least at the bottom of the first page of every section, if not at the bottom of each page of data.

EPA Comments to Draft FS (Shallow Soils and Deep Aquifer) for Marine Corps Base Camp Lejeune.

GENERAL COMMENT

1) As per agreement at the meeting of October 16, 1991 between NDEHNR, EPA and the Navy; an executive summary should be provided and referenced summarizing the historical nature of all sampling efforts undertaken by the Navy at Hadnot Point Industrial Area (to be designated an Operable Unit), providing justification for why these specific buildings (bldgs 900 and 1200) are the only areas of concern in relation to shallow soils contamination for HPIA.

2) The "FS" does not adequately address the amount and extent of contamination found in the deep aquifer. As such, the EPA will require the Navy to remove the deep aquifer from this document.

SPECIFIC COMMENTS

1) Page 1-2, Section 1.1; Risk Assessment calculations should consider residential development in Future Land Use. ESE's assumptions of restricted use are not acceptable.

2) Page 1-9, Section 1.4.2, para. 1; Fresh water extends to 300 feet bls. (Page 1-8, sect. 1.4.1, para. 2) Are monitoring wells to a depth of only 150 ft. bls adequate to fully determine the nature and extent of the contamination? Also, some attempt should be made to correlate these units to the regional stratigraphy.

3) Page 1-10, Section 1.5; The unconfined aquifer should not be referred to as both the shallow aquifer and the surficial aquifer. Using only one term will avoid any unnecessary confusion as to whether the unconfined aquifer or the shallowest confined aquifer is being referenced. "Surficial" is the preferred term to use for the unconfined aquifer.

4) Page 1-10, 1.5.2 HPIA HYDROLOGY, Third paragraph: "Groundwater flow in the lower water-bearing zones trends...", it is clear from other reports that groundwater flow direction has not been determined. This sentence should be changed to reflect groundwater flow in the intermediate and deep aquifers as "not conclusive, but estimated to flow toward the southwest", until conclusive evidence can accurately determine the groundwater flow direction. The determination of groundwater flow from the intermediate and deep aquifers will continue to be a "best guess" proposition, as long as wells continue to draw water from them.

5) Page 1-11, 1.5.2 HPIA HYDROLOGY, First and Second paragraphs: Potentiometric maps should be included in this section to graphically display what the text is describing. The hydraulic gradients proposed in these paragraphs reflect a discrete point in time (February 1991) from which these values were obtained. This should be reflected in the report as "seasonal" values which are subject to change based upon the time of year and precipitation events.

6) Page 1-11, 1.5.2 HPIA HYDROLOGY, Third paragraph: What depth is the "Limestone portion of the deep aquifer"? A generalized stratigraphic section should be included in this section. At what depth were the pump tests performed, and for how long were the tests run?

7) Page 1-11, para. 2; Well number 4 is identified as a well cluster, however, the symbol for a well cluster is not used on Figure 1-5.

8) Page 1-11, para. 3; What was the duration of the "short-term pump tests"?

9) Page 1-12, para. 1.2, para. 3; MCL is defined by EPA as "maximum contaminant level" pertaining to drinking water standards. The use of this acronym by ESE to designate other terms will create confusion and must be avoided.

10) Page 1-13, para. 4; Please identify the "floating product" referenced in this section.

11) Page 1-13, 1.7 <u>PREVIOUS FIELD INVESTIGATIONS</u>, Second paragraph: The statement is made that certain water supply wells were closed and other supply wells were sampled (back in 1985). Is there any sampling program on-going at any of the remaining drinking water wells in and around the HPIA?

12) Page 1-15, para. 2; Reference should be made here to Figure 1-4 when discussing areas 900-902. EPA questions the adequacy of the 4 deep (150 ft.) wells in determining the nature and extent of the contamination. What is the radius used in the "nearby water supply well"?

13) Page 1-16, para. 2; Since VOCs are involved, inhalation should be considered a legitimate exposure pathway.

14) Page 1-17, 1.8 SUMMARY OF RA STUDY, Second paragraph: EPA does not accept the Navy's proposal of no remedial action on either the shallow or deep aquifer until the free product recovery has been completed from the Hadnot Point Fuel Farm. Also EPA does not accept the Navy's proposal for removing the deep aquifer from selected sites. The deep aquifer is contiguous under the entire HPIA facility, any remedial efforts on the deep aquifer will encompass all "sites" above that aquifer.

15) Page 1-17, 1.8 SUMMARY OF RA STUDY, Fourth paragraph: What about the "Deep aquifer"? This feasibility study is incomplete as far as the deep aquifer is concerned.

16) Page 3-7, para. 1; The need for more sampling and analysis is clearly stated, but when is the sampling and analysis going to be conducted?

17) Page 4-3, 4.0 DEVELOPMENT AND SCREENING OF ALTERNATIVES: The statement is made that additional sampling will be required to define the extent of contamination at areas 900 and 1200. Once again this FS was for all shallow soils and the deep aquifer underlying HPIA. What information will be required to complete the FS for the shallow soils and deep aquifer?

18) Page 5-2, Table 5-1; Since the level of contamination is within the EPA level of acceptance (10^{-6}), but is still significant, monitoring should be added to the no-action alternative.

19) Page 6-8, Section 6.2.1.3; Provide an explanation for why the reduction in mobility can't be quantified.

EPA Comments to Final Draft Hadnot Point Industrial Area Baseline Risk Assessment.

GENERAL COMMENTS

1) The Ecological Baseline Risk Assessment should address the entire Marine Base/Naval Air Station Complex. The ecological effects of hazardous waste sites are exerted on the immediate terrestrial environment, the adjacent aquatic system through storm water runoff and possibly by groundwater impaction, and the New River Estuary. Piece-mealing the ecological risk assessment by individual sites, or groups, regardless of their connection in the ecosystems will result in an inadequate description of possible cumulative impacts. Therefore it is the recommendation of the Environmental Technical Assistance Group (ETAG) that a work plan be drafted, possibly by a work group including a representative with expertise in statistical methods, to address the environmental effects of the cumulative impacts of all the hazardous waste sites contained in the Camp Lejeune Military Reservation. This work group may choose to break the entire military reservation into units consisting of the New River estuary, and the watersheds of the various tributaries of the New River contained on the military reservation. This work plan should address the environmental impact within the watersheds, and the combined impact on the New River Estuary, through the development of an Interim Ecological Risk Assessment document which would be periodically updated as additional information becomes available. Sampling plans designed to determine area of impacts and conducted during the appropriate seasons should be drafted and submitted for review. The end result, after the identification and adequate description of all sources, would be the Final Baseline Risk Assessment. This work plan should be submitted to the ETAG for review.

2) Exact locations, relating to the four areas of contamination, of the water supply wells and residential housing in the Hadnot Point Industrial Area (HPIA) should be provided. Also, the discussion on the future development plans of the HPIA should be enhanced with formalized plans if they are available.

3) There is no discussion about the present or future uses of the surficial aquifer. This aquifer is a Class II-B, potential drinking water source, and is very heavily contaminated. This potential pathway should be evaluated in the BRA.

SPECIFIC COMMENTS

1) Executive Summary, x, 1-1 - Clean-up goals may be based on human health or to be protective of the environment.

2) Executive Summary, xi - The Baseline Risk Assesment should address exposure pathways which would result from the implementation of the no action alternative, in this case, the long-term effect of contaminated groundwater on aquatic and terrestrial systems.

3) Introduction, 1-1 - The Baseline Risk Assessment must address the impacts of the hazardous waste site whether the effects occur on or offsite. Therefore the potential offsite effects must also be addressed.

4) The Baseline Risk Assessment cannot omit adjacent locations from the evaluation unless information exists to justify their exemption based on the lack of contamination or an existing estimate of their environmental effect. See General Comment 1.

5) Page 1-4; Fig. 1-2 should reflect the entire HPIA area.

6) Page 1-6, Table 1-1, Verification Step Description; Change "maximum contaminant level" to "maximum contaminant concentration" since the EPA-established MCL is not being referred to here.

7) Page 1-7: References are made to water supply wells which were taken offline due to groundwater contamination. The location of these wells should be plotted on a base map and presented in this report. Also, all wells used as groundwater point sources should be shown on this base map.

8) Page 1-7, Fifth paragraph: "Inorganics, including mercury, were detected...but were generally within EPA maximum...". What values represent "generally"?

9) Pages 1-8, 1-9, Tables 1-2 and 1-3: A column should be added to these tables reflecting exactly which wells had these concentrations of contamination.

10) Page 1-9, Table 1-3; Maximum concentration of Zinc is omitted from this table.

11) Page 2-2, Second paragraph: If only groundwater samples were obtained from Site 22, then the baseline risk assessment for this area is incomplete. It should be stated and shown (by the operable unit boundary) exactly what area Site 22 comprises.

12) Page 2-2, 2.1.1.1 <u>Soil</u>, Second paragraph, last sentence: There is no data presented within Table 2-1 for any of the deeper soil samples (2 to 10 feet deep). However as is referenced in this paragraph there is a possibility of leaching of contaminants into the groundwater. Data should be presented reflecting the potential for contaminant leaching.

13) Page 2-2, 2.1.1.1: What is the justification for using only 10% of the soil samples for analysis using the Target Compound List and Target Analyte List? 10% equates to only one sample per area. Is this enough sampling data to characterize the area?

14) Page 2-2, 2.1.1.2 Intermediate and Deep Groundwater: A map showing the location of the intermediate and deep monitor wells should be referenced or presented in this section.

15) Page 2-2, 2.1.1.2: It is stated that the deep and intermediate well data was combined for determination of exposure concentrations because they tap the same aquifer. This is exceptable only if the maximum detected concentrations were used for these exposure concentrations. An average concentration of these two well types will not be exceptable.

16) Page 2-7, Table 2-1: A column should be added which reflects maximum contamination levels or proposed corrective action levels (FR Friday July 27, 1990) for the contaminants listed. This would better reflect the magnitude of contamination. This information should be included, where appropriate, on every table found within this report.

17) Pages 2-7 thru 2-13, Tables 2-1 thru 2-4: These tables should also provide the detection limits for each constituent in each media.

18) Page 2-11, 2.1.1.3 Water Supply Wells: A basemap should be included within this report which shows the exact location of all wells used for this report. Where is the "zone of deep water contamination" and how has the Navy determined it?

19) Page 2-11, 2.1.1.3: Water supply well #642 was considered background because it was the closest active well and not within the zone of deep water contamination. There is no mention as to whether or not this well is upgradient or downgradient of potential sources or if it is in the same aquifer.

20) Page 2-11, Section 2.1.1.3: This section refers to 9 water supply wells, but only 7 are listed. Only 4 are located in Fig. 2-5 (#601, 602, 608, 634). All figures and listings should include all wells used as reference.

21) Pages 2-14 thru 2-18, Table 2-5:

A) Units for the oral slope factors should be $(ug/l)^{-1}$ not $(ug/m^3)^{-1}$.

B) The toxicity values should be referenced as IRIS (Intergrated Risk Information System) or HEAST (Health Effects Assessment Summary Table).

C) It should be indicated in this table that the carcinogenic slope factor (CSF) for benzo(a)pyrene (BaP) will be used for all carcinogenic PAHs (polynuclear aromatic hydrocarbons). Also, the reference dose (RfD) for pyrene should be used for all non-carcinogenic PAHs without a RfD.

D) It should also be mentioned that even though sub-chronic RfDs are provided in the table that only the chronic RfDs will be used in the BRA.

22) Pages 2-20 and 2-21, Table 2-7: There should be a column on this table for MCLGs (Maximum Contaminant Level Goals).

23) Page 2-22, Table 2-8: Local background samples should be taken for comparison with sampling data.

24) Page 2-23, Section 2.2, para. 1; "or contribution of a large percentage of the total risk factor." What constitutes a large percentage?

25) Page 2-28, Section 2.2.2; At what levels are PCB's present?

26) Page 2-28, Section 2.2.2, para. 2; Does this mean pesticides are not considered a threat?

27) Page 2-29 & 30, Last line on 2-29; Methylene chloride is not a laboratory solvent, methyl chloride is.

28) Page 2-29, Section 2.2.4, para. 2; The phrase "...and it is not unexpected to detect..." does not address the actual concentration present. Are concentrations expected to be higher than background?

29) Page 3-4, 3.1.1.4 <u>Geohydrology</u>: The second paragraph states that a potentiometric surface map could not be generated for the deep aquifer, why not? Has the Navy given thought as to why water levels for the intermediate and deep aquifer are at the same levels as the shallow water levels?

30) Page 3-8, 3.1.1.7 <u>Water Supply Source</u>, Second paragraph: Were any of the original contaminated water supply wells sampled for this baseline risk assessment? Is there any current or on-going sampling schedule at MCB Camp Lejeune for drinking water wells that potentially could become contaminated with VOC's?

31) Page 3-8, 3.1.1.7: It is mentioned that the treatment process for the water supply system is sand filtration and lime softening. Several times throughout the BRA it is mentioned that the contaminated water supply wells are not a problem because it is treated before going into the distribution system. It should be explained how this treatment process will remove the various types of contaminants (i.e. volatile organics, semi-volatile organics, pesticides, and metals) which are in the ground water.

32) Page 3-12, 3.1.3 Potentially Exposed Wildlife and Aquatic Populations: What species is red gum? What is type 1 gum? The source of the water from the pipe should be described.

33) Page 3-12, 3.1.3.1 Threatened/Endangered Species and State Special Animals: The United States Fish and Wildlife Service and the appropriate state agency should be contacted for information concerning threatened or endangered species.

34) Page 3-17, 3.2.3.1 Soil-to-Groundwater, Second paragraph: The Navy cannot make this statement. The potential for contamination migration always exists and based on previous information an "impermeable layer" has not been shown to exist.

35) Page 3-18, 3.2.3.4 Other Routes: All possible groundwater migration routes should be investigated before the Navy writes off this section (the Navy currently uses a groundwater irrigation system believed to be supplied from the deep aquifer to provide irrigation for the golf course). All points of water withdrawal from the deep aquifer should be identified to determine their impact on that aquifer.

36) Page 3-21, 3.3.1 COMPLETED HUMAN EXPOSURE PATHWAYS: The results of the water supply wells should be included as part of this section. This information would represent a "worst case" exposure pathway.

37) Page 3-23, Table 3-5: Groundwater wells used to generate this table could not be located in the report. Need to include a basemap showing all wells used for this report. Reference is made to soils data collected from "HBSB" should this be "HPSB"?

38) Page 3-25, 3.3.3.3 Estimation of Nonhuman Pathway-Specific Chemical Intakes: Reference is made to "earthworms or voles", is "voles" correct?

39) Page 6-1, Second paragraph: Both short and long term exposure should be calculated and extrapolated for this report. Military personnel exposed for whatever timeframes should be considered. Drinking water and/or surface (irrigation) water exposure should be calculated as worst case exposure values.

EPA Comments to Site Assessment Report for Sites 6, 48 and 69, Characterization Study to Determine Existence and Possible Migration of Specific Chemicals In Situ.

GENERAL COMMENTS

1) The EPA Environmental Technical Assistance Group (ETAG) members feel that a site such as the Marine Corps Base Camp Lejeune, with numerous hazardous waste sites, and a possibility of additional sites to be discovered, distributed throughout the military reservation, must be addressed in an systematic study which will adequately locate areas of contamination, describe the extent of the contamination, and evaluate the ecological effects of the contamination. If you have any questions, or wish to contact the ETAG members for further consultation, please do not hesitate to call Mr. Lynn H. Wellman at (404) 347-1586.

2) The toxicity values (Tables 6-6, 6-10), some of which are incorrect, serve no purpose since no risks are calculated. A more useful approach for a qualitative assessment would be to list the effect and target organ for each contaminant of concern in a table.

3) Initial sampling in all media should be analyzed for the complete TCL/TAL.

SPECIFIC COMMENTS

1) Page 1-5, 1.3 RI APPROACH AND SCOPE: Site 48 is not referenced in this section and needs to be added.

2) Page 2-4, Site 6 - Lots 201 and 203, first paragraph: The acronym TCL is used and not stated in the "List of Acronyms and Abbreviations", also what compounds makeup this TCL list of chemicals?

3) Page 2-5, Site 48 - MCAS New River Mercury Dump, second paragraph: EPA will not accept this one time attempt during the middle of winter (January 14 and 17, 1991) as representative of conditions at this site. The site should be reevaluated/resampled when it is anticipated that fish, crabs and other benthic organisms would be present.

4) Page 2-6, Site 69 - Rifle Range Chemical Dump, third paragraph: EPA will not accept this one time attempt during the middle of winter (January 14 and 17, 1991) as representative of conditions at this site. The site should be reevaluated/resampled when it is anticipated that fish, crabs and other benthic organisms would be present.

5) Page 2-6, Supplemental Characterization Investigation: The species name for the oysters collected should be Crassostrea virginica, not Clostridius virginica. Please verify the species name of the mussel collected, Geukensia demissa.

6) Page 5-1, 5.0 RESULTS OF INVESTIGATION: Could contamination have been mask or not detected by the presence of suspected laboratory cleaning chemicals and/or reagents?

7) Page 5-1, 5.0 RESULTS OF INVESTIGATION, third paragraph: The abbreviation UICs is stated at this point and used henceforth throughout this report, but never again explained as to what the abbreviation stands for. Recommend that all abbreviations/acronyms be included in the list in the front of the report.

8) Page 6-2, 6-17, 6-18, 6-22, 6-34, 6-46: Statements are made regarding the lack of information obtained in this round of sampling/reporting to make a qualified decision in both various parts of this section 6.0 and in the the "Conclusions" sections. How is the Navy going to address the data gaps inferred in this report?

9) Page 6-7, para. 1: Exposure scenarios should be considered for both current and future land uses in order to assess the reasonable maximum exposure (RME) for humans. Dermal and ingestion exposure to soil should be considered in the risk assessment since site areas are unpaved. This would apply to all exposure scenarios.

10) Page 6-18, para. 2; 6. Justification for precluding possible residential development in the future is inadequate. Many residences are found along railroads and along major roads. Also it is unclear as to whether this assumption for future land use is meant to apply to sites 48 & 69 as well as site 6.

11) Page 6-42, 6.3 <u>RECOMMENDATIONS</u>: Statements are made regarding the lack of information obtained in this round of sampling/reporting to make a qualified decision in both various parts of this section 6.0 and in the the "Conclusions" sections. How is the Navy going to address the data gaps inferred in this report?

APPENDIX A

As part of the comments to Appendix A; EPA is enclosing comments made during EPA Region IV, Environmental Services Division overview conducted at MCB Camp Lejeune in Jacksonville, NC, during the week of January 14, 1991. The remedial investigation (RI) was conducted by personnel from ESE. Comments are not required for this section, however, the Navy is strongly cautioned that future field work performed at this level will not be acceptable to EPA and could result in the non-acceptance of future reports. The following deviations from the EPA Region IV ESB SOPQAM were noted:

A) Open top bailers were used to purge and sample the wells at site 69. EPA does not recommend the use of PVC due to its potential to contaminate the sample with phthalates. An open top bailer is not recommended since it has potential, as was the case in well 69-MW-02, to scrape off material from the sides of the well, depositing it in the sample, thus causing the sample to be biased. An open top bailer will also cause the VOA samples to be poured faster, thus causing the sample to be aerated and stripped of VOAs.

B) Decontamination and storage of the sampling equipment was being conducted in the same room of the decontamination trailer. Dirt and mud was tracked into the trailer, with no appearence of cleaning occurring during the overview.

C) Occasionally, heat guns were used to dry the equipment faster. The plastic on the heat guns melted when it became hot and may have caused the equipment to become contaminated by the chemicals in the plastic.

D) The isopropanol rinse was applied using a polyethylene bottle. A bottle made of teflon should be used when applying the isopropanol, unless dispensed from the manufacturer's shipping bottle.

E) A nitric acid rinse step was used for field cleaning. It is not recommended to use nitric acid due to safety hazards from splashes, spills, or leaks. Also, the Department of Transportation regulations governing shipping must be followed, and disposal of the nitric acid must be done according to appropriate RCRA regulations.

F) Samples for metals and cyanide were preserved upon returning to the command trailer (half the day would pass before preservative was added). Several bottles were preserved at one time and after the preservation for the metals was added, only <u>one</u> bottle was checked for proper pH. The same procedure was followed for the preservation of the cyanide samples. After preservation all bottles must be checked to insure proper preservation. Also, when checking the pH of the bottle the pH paper was dipped into the sample, which may potentially add contaminants, rather than pouring the preserved sample onto the pH paper.

G) The samples were not labeled immediately after collection and several samples were collected before returning to the command trailer The samples were marked with the sample number on the lid or on the sticky label if possible, but were not separated when placed in the cooler. The sample number was not always easily identifiable when marked in this manner, thus creating the potential for later mislabeling the samples.

H) All equipment calibrations should be recorded in a permanently bound field log book, instead of on loose sheets of paper in a loose leaf binder.

I) Additional construction work on the wells at Site 69 needs to be performed. Well number 69-MW-01 did not have an inner cap to prevent contaminants from entering the well, and did not have a concrete pad around the surface of the well to prevent infiltration of surface water into the groundwater regime. Also, weep holes need to be placed in the protective casing of each well.

J) Dirt and mud had accumulated on the floor of the command trailer Samples were placed on the muddy floor without concern for the potential of contamination. The spikes and blanks provided to the contractor by EPA were also handled in the same manner. The contractor was made aware of the potential for contamination; however, the bottles were not moved until they were labeled for shipment.

K) Samples should <u>always</u> be collected from the least contaminated to the most contaminated locations. At Site 48, the samplers were observed collecting samples from the most contaminated location near the photo lab, followed by collection of the remaining samples as they moved away from the lab. A background sample was not collected prior to sampling of the contaminated areas.

L) Before collecting the samples at Site 48, the samplers waded into the sample locations causing sediments to be stirred up. The tide was coming in causing the suspended sediments to flow toward the photo lab where the first, and potentially the most contaminated sample, was collected. The samplers tried to prevent the stirred up suspended sediments from being collected, but some sediment was collected. The samplers walked through the area from which they were to collect a sediment sample, stood next to the boat and dropped the ponar dredge into the sediment at their feet. The sediment samples should have been collected by dropping the ponar dredge over the side of the boat, or by scooping a sample by means of a scoop attached to a conduit pipe or pole. The water samples should have been collected by leaning over the side of the boat and submerging the water bottles. These methods do not cause the sampler to come into contact with the sample media, only the sampling device.

M) Water dripped into the collection bowl, from a previous sampling event, during the sampling of sample 48-SE-04. The water came from the sampling devices when entering and leaving the boat. Since the water came directly from the source, contamination of the bowl probably did not occur. However, to prevent any problems in the future, the sampling equipment should be kept in a cooler or an area away from the sampling location or other sources of contamination.

N) Once or twice the samplers did not change their gloves when handling the sample after conducting other activities. They immediately realized they did not change their gloves and proceeded to change them. One sampler, however, wore diving gloves and did not make an effort to cover or wear clean latex gloves over them while sampling.

(end of comments)

RCVD

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