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SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
COMMENTS ON RCRA FACILITY INVESTIGATION REPORT VOLUMES 1 THROUGH 5
ZONE K CNC CHARLESTON SC
9/30/1999
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL



2600 Bull Street
Columbia, SC 29201-1708

Henry
Billy
10/11
HNS 10/8/99
WCG
All

September 30, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Zone K RCRA Facility Investigation (RFI) Report, Volume I - V, Charleston Naval Complex, SCO 170 022 560, Revision 0, dated June 11, 1999.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced RFI Report (6/11/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. The attached comments were generated based on this review. These comments must be addressed prior to the approval of the above referenced document.

Further, the CNC should submit, to the Department, the comment responses to address these comments within thirty (30) calendar days of the receipt of this letter. This would facilitate the comment resolution meeting and expedite the review and approval process. CNC should submit the Revised Zone K RFI Report in its entirety after the attached comments have been addressed and additional field characterization and data analysis/evaluation completed.

Should you have any questions regarding this comments, please contact me at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

m.p. mehta

Mihir P. Mehta, Project Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

Attachments:

1. Memorandum from Susan Byrd to Mihir Mehta dated August 30, 1999.
2. Memorandum from Paul Bergstrand to Mihir Mehta dated September 30, 1999.

cc: Paul Bergstrand, Hydrogeology
Susan Byrd, Corrective Action Engineering
Rick Richter, Trident EQC
Paul Bristol, Underground Storage Tank
Tony Hunt, SOUTHDIV
Dann Spariosu, EPA Region IV

South Carolina Department of Health and Environmental Control comments on: Zone K RCRA Facility Investigation (RFI) Report, Volume I - V, Charleston Naval Complex, SCO 170 022 560, Revision 0, dated June 11, 1999.

Comments By Mihir Mehta:

General Comments:

1. The Navy should note that the referenced RFI report is not complete without the inclusions of information for SWMU 166 and SWMU 185.

The Department has not generated separate comments on all SWMUs and AOCs presented in the RFI because of the similar concerns and issues identified and repeated. Therefore, Navy-CNC should revise the entire document to address these comment as deemed appropriate.

2. Section 6.2.1; Soil to Groundwater Cross-Media Transport; page 6.10.
The text indicates that the organic and inorganic contaminants are screened against generic soil screening levels (SSLs) that are developed based on generic DAF of 10. The fact that groundwater is very shallow in this area and CNC have enough site-specific information to develop site specific SSLs, the Department expects and recommends CNC-Navy to develop site specific SSLs approach as described in the EPA SSL Guidance. Please revise the document to address this concern.

As per the discussion during the August 1999 CNC team meeting, this section and analysis should be revised to be consistent with the fate and transport approach discussed. CNC-Navy should also note that all pertinent sections (text and tables) of the referenced RFI Report should be adequately revised based on this comment and the likelihood of conclusions for the COCs selected being changed.

3. Throughout the entire document it is stated that the fate and transport contaminant of concerns (COCs) that exceeded their respective SSLs but are currently not detected in the groundwater above risk-based concentrations or background and absent in the subsurface soils should not be considered for further evaluations or corrective action. The Department does not agree with this concept and justification to eliminate the fate and transport COC because the fate and transport analysis is conducted for the future impact to groundwater quality and time for the contamination to travel from its current state through the soil column. Therefore, please revise all pertinent sections of the document to address this concerns and avoid elimination COCs based on this argument.
4. Throughout the entire document it is stated that “the risk-based pathway for shallow groundwater is currently an invalid pathway simply because there is no human consumption of the groundwater or is not a current source of potable water, e.g., there is no end-use receptor.” All groundwater in the State of South Carolina is considered as potable water regardless of the land use. Also, the Department evaluates the risk posed by groundwater for

future land use. Based on the stated facts, the Department does not agree with statements of this nature and recommends CNC to delete any and all language related to this issue or rewrite consistent with Departments expectations and evaluate the future and current impact to groundwater.

5. The entire document, specifically Chapter 5 and 10, fails to discuss the evaluation of the data against the site specific background concentrations, RBCs, SSLs, MCLs, etc for delineating the horizontal and vertical extent of contamination. As presented, the referenced document contains tables with numerous datasets and figures showing the sample locations which is then left to the Department discretion to understand, interpret, and make necessary conclusions.

The entire report should be revised to evaluate the vertical and horizontal extent of contamination based on background comparison, risk-based concentration screening, SSLs, MCLs, etc and provide appropriate maps and figures delineating the nature and extent in both vertical and horizontal directions with help of contouring, cross-sections, iso-concentrations, and other features necessary to provide adequate understanding. As written, the Department has no viable tools to agree or disagree or understand whether vertical and horizontal extent has been defined and what is the potential area of concern.

This issue has been discussed at the CNC team meetings more than once and therefore, the Department believes that appropriate revisions to the RFI Report should be performed to address this comment prior to approving the referenced document.

6. Section 6.2.2; Groundwater-to-Surface Water Cross-Media Transport; Page 6.18.
This section discusses the impact on ecological receptors from the contamination that migrates through groundwater into surface waters. Please note that this pathway should be evaluated in detail along with other pathways while conducting ecological risk assessment for various SWMUs and AOCs within Zone K.
7. Section 9.0; Corrective Measures; page 9.1.
This section details the generic outline for the development of the corrective measures work plan and report. The Department acknowledges the need to discuss the corrective measures study (CMS) outline and process in brief, but believes that the details provided in the subsequent are not required as a part of the RFI report. The review and approval of the referenced RFI reports does not constitute the approval of the generic CMS outline or details presented in subsections.
8. Navy-CNC should note that all pertinent sections of the referenced document that are affected by the general comments should be revised adequately. The Department is not providing comments on specific SWMUs and AOCs that could be related to the general comments.

Specific Comments:

9. Section 2.0; Physical Settings; Figure 2.4; Monitoring Well Locations.
The referenced figure indicates the monitoring well locations for the Naval Annex area. It is recommended that the depiction/boundaries of SWMUs and AOCs, on this figure. This presentation would be beneficial to the reviewer to get a better perspective of the well locations with respect to the SWMUs and AOCs associated with this area.
10. Section 2.0; Physical Settings; Figure 2.7 & 2.8.
The referenced figures indicates the lithostratigraphic cross-section profile lines, but the referenced document does not include any figures that illustrate these cross-sections. Please revise the document.
11. Section 3.2.2.2; Soil Sample Collection; Page 3.2.
Line 20 states that, "Composite soil samples were collected for laboratory analysis from 0 to 1 foot bgs and from 3 to 5 feet bgs." Please elaborate to explain what is meant by composite sample (i.e., individual samples combined and then analyzed or individual sample analyzed and the data were consolidated). The Department believes that compositing all data may not be the best way to characterize the site and manage the uncertainty associated with defining the risk and hot spot areas. Please revise and clarify the stated concern.
12. Section 4.2.1.10; Diluted Samples; Page 4.7.
Second line references "referenced concentrations" as MCLs, RBCs, etc. This term is also used to indicate the background concentrations on page 5.3 line 5. Please be consistent with the use of the term "referenced concentrations". The Department recommends that the reference concentrations not be used to indicate background concentrations.
13. Section 4.3; Zone K Data Validation Reports; Page 4.11.
It appears that the SWMUs and AOCs within this zone are indicated by "Site" (e.g., Site 162, Site 163) in this section. Please be consistent and revise the document to indicate the sites with appropriate SWUM or AOC designations.
14. Section 5.2; Inorganic Analytical Results Evaluations; Page 5.2.
Line 22 mentions the USEPA Region IV guidance for the use of twice the mean of the background values as an upper bound for differentiating between the background and unit related contamination. Please reference the stated guidance.
15. Section 5.2.1; Background Datasets; Page 5.3.
The referenced section discusses the background dataset, analysis, and results that are then used to make risk management decisions. The section failed to provide maps and figures that illustrates the sample locations with respect to the SWMUs, AOCs, and zone boundary. Also, the section fails to provide the information as to why the sample locations and numbers are appropriate, what the background numbers mean with respect the other variables, and rationalize the naturally occurring verses anthropogenic background. Please revise this section to adequately address this concerns.

16. Section 5.2.2; Nondetect Data; page 5.4.
Line 11-12 indicates that one-half of the sample quantitation limit (SQL) was used to represent nondetect for inorganic in the background data set. The SQL is not the lowest detectable number and is dependent on many factors such as type of laboratory and type of equipment-its capacity etc. Whereas method detection limit (MDL) is the lowest amount for the chemical that can be measured and is not dependent on the type of lab or equipment. This is specially important in determining the background data set where the use of SQL could increase the background number and use of MDL could lower the background number. Please discuss the problems associated with the use of SQLs verses MDLs specially for the background dataset.
17. Section 6.2.1; Soils to Groundwater Cross-Media Transport; Page 6.17.
Line 6-9 states that, "For comparison of groundwater concentrations with risk-based standards at the Naval Annex, the greater of the background reference values for shallow and deep groundwater was used as the screening alternative to inorganic tap-water RBCs." The Department does not understand the relevance of this analysis being conducted in this section. Also, the issues of inorganics in groundwater needs further discussion between the Department, Navy, and EnSafe. At present the groundwater concentrations are first compared to MCLs or tap-water RBCs if MCLs are not available. Please revise the document to address this concern.
18. Section 7.2; Objectives; Page 7.5.
Line 4-6 discusses the remedial goal options to be considered for the selection of clean-up goals. For noncarcinogenic COCs the remedial goal options are target Hazard Index and not Hazard Quotient of 0.1, 1.0, & 3.0. Please change the Hazard Quotient to Hazard Index in all pertinent sections.
19. Section 7.3.4; Selection of Chemical of Potential Concern; Page 7.6.
This section and throughout the entire document the acronym "CPSS" is used to indicate the substances detected in the data set. The Department believes that the acronym "CPSS" is not a standard acronym used in the risk assessment nor during the COC selection process. As presented it confuses the reader and therefore, should be deleted or substituted with a standard acronyms as applicable to the analysis conducted.
20. Section 7.3.4; Selection of Chemical of Potential Concern; Page 7.7.
Line 19 and 20 states that, "CPSSs with maximum detected concentrations exceeding their corresponding concentrations, goals, levels, and/or standards were retained for further evaluation and reference screening in the risk assessment." Please clarify the intent and relevance of this statement.
21. Section 7.3.4; Selection of Chemical of Potential Concern; Page 7.10.
Line 20-21 states that, "No risk based screening values are available for the generic group TPH. As a result, TPH assessment was consistent with the CNC soil action level of 100 mg/kg." As stated earlier if no risk-based screening value is available then the constituent automatically becomes a COPC. Action levels are used during the remedial goal option

development and selection of COCs for corrective actions. Also, state how was the action level of 100 mg/kg was established for TPH for CNC. The Department is not aware of any promulgated action level for TPH.

22. Section 7.3.6; Exposure Assessment; Page 7.11.
Line 8 states that, "One Zone K RFI site is currently being used as a soccer field. As a result, a current recreational use scenario was considered for this site." This may be one of the scenario to be considered but is not the only one. The future industrial and residential scenarios should be evaluated for restricted and unrestricted land use. Please revise the referenced document.
23. Section 7.3.11; Remedial Goal Options; Page 7.23.
This section states that, "Section 7.3.11 of the Zone A RFI Report discusses the remedial goal options for the HHRA for Zone K." As the concept of remedial goal option is important to zone specific and SWMU/AOC specific, the Department recommends that the referenced discussion should be presented in the Zone specific RFI Reports and tailored to zone specific conditions if necessary.

SWMU 161:

24. Section 10.1; SWMU 161, Vehicle Maintenance Shop, Naval Annex; Page 10.1.2.
Line 2 states that, "Potential receptors are current and future site users involved in invasive activities." This may be one of the scenario to be considered but is not the only one. The future industrial and residential scenarios should be evaluated for restricted and unrestricted land use. This issue is persistent throughout the entire document and therefore, please revise all pertinent sections of the referenced document to address this concern.
25. Figure 10.1.1; Site Map for SWMU 161.
The figure should be revised to clearly indicate the boundary of the SWMU 161 and show any physical and topographical features that would influence the migration of contamination both in soils and groundwater.
26. Section 10.1.2; Nature and Extent of Contamination in Soils; Page 10.1.5.
Table 10.1.2, compares the contaminant to RBCs and SSLs based on the upper and lower sample interval respectively (upper = 0-1 foot and lower = 3-5 feet). The preliminary comparison of contaminant against SSLs should be based on the maximum contaminant concentration detected anywhere from 0-water table (complete vadose zone) and not from 3-5 feet soil sample interval. The comparison is not technically justifiable for determining the nature and extent of contamination. Therefore, the Department recommends that all pertinent section of the referenced document should be revised to define the nature and extent of contamination based of residential 1-E6 risk and/or background.
27. Section 10.1.2; Nature and Extent of Contamination in Soils; Page 10.1.5.
Table 10.1.2 and 10.1.3 illustrate the number of samples that exceeded the RBCs or SSLs.

The table does not provide information regarding the maximum contaminant concentration that is being used to compare against the RBCs or SSLs. Further, Table 10.1.4 provides this information. As presented it is very difficult to interpret the information provided in this two tables. Therefore, the Department recommends that the two table be revised in order to present the relevant information in a format that is easily readable.

28. Section 10.1.2; Nature and Extent of Contamination in Soils; Page 10.1.5.
Table 10.1.3 last column indicates the number of samples that exceeded RBCs and background or SSLs and background concentrations for inorganic constituents. This information is not useful for screening the data to define nature and extent. The comparison to RBCs and SSLs should be different from background in order to evaluate and understand the differences between naturally occurring background, anthropogenic background, and zone wide background concentrations. Please revise all pertinent sections (including all SWMUs and AOCs specific discussions) of the referenced document to address this comment.
29. Section 10.1.4; Nature and Extent of Contamination in Groundwater; Page 10.1.17.
Based on the information provided and Figure 10.1.1, it appears that the absence of groundwater contamination has not been proven as there are no groundwater sampling locations down gradient of the source or the SWMU. Please provide adequate information to address this concern or propose a characterization strategy to fill in the data gaps.
30. It appears that the sources associated with this SWMU (e.g., oil-water separator) are not characterized, evaluated, nor discussed in this chapter. Please revise the document to address this comment.

SWMU 162:

31. Figure 10.2.1; Site Map for SWMU 162.
Please distinguish between the sample locations that are installed during various rounds of sampling which would help in understand the rational for selection of locations with respect to previous locations.
32. Section 10.2.2; Nature and Extent of Contamination in Soils; Page 10.2.2.
Figure 10.2.1 indicates only one soil sample collected from approximately 325 ft by 100 ft drying bed # 1 and two soil samples collected from drying bed # 2. The Department believes that the number of soil samples may not be sufficient to determine the nature and extent of contamination for the drying beds. Please propose additional sampling or justify the current scenario to address this comment.
33. Figures 10.2.2, 10.2.3, and 10.2.4 are appropriate figures that illustrates the extent of soil contamination based on screening values. Figure 10.2.2 illustrates the extent of contamination from BEQs. Please provide the rational as to how the extent was determined based on one or two sample locations which are above the screening criteria. It appears that no samples were collected that would result in concentrations below the screening values. Please propose additional sampling or justify the current scenario to address this comment.

34. Please provide a figure superimposing the nature and extent of soil contamination for various contaminants that would enable the Department to see and understand the complete picture of soil contamination at this SWMU.
35. Section 10.2.3; Groundwater Sampling and Analysis; Page 10.2.31.
The referenced section and Figure 10.2.5 & 10.2.6 describes the groundwater contamination for SWMU 162. These figures are inadequate as the key information like groundwater flow direction and plume delineation are not presented. It appears that current sampling locations are not enough to determine the extent of groundwater contamination below screening values (i.e., MCLs or residential tap-water standards). Please propose additional sampling or justify the current scenario to address this comment.
36. Section 10.2.6.2; COPC Identification; Page 10.2.39.
Table 10.2.10 uses average detected concentration to screen against RBCs and background to determine the COPCs. The maximum detected concentrations are supposed to be used for this first screen. The use of average or reasonable maximum exposure (RME) values are then used for risk calculation for determining COCs.
- Also, the last column indicates number of exceeds that has no relevance to the analysis in question and therefore, should be deleted after the CNC- team decision. The table should have a column that indicates whether a constituent is a COPC or not.
- Therefore, please revise all table for all SWMUs and AOCs within this RFI Report to address this concern.
37. Section 10.2.6.2; COPC Identification; Page 10.2.39.
Table 10.2.11 identifies the COPCs for current groundwater contamination. Please add MCLs as one of the screening criteria for COPCs identification.
38. Section 10.2.6.3; Exposure Assessment; Page 10.2.42.
Exposure pathway discussion defines exposure pathway as “dermal contact” or “incidental ingestion”. These terms are defined as exposure routes by EPA-RAGS Part A. Exposure pathway is defined as a term which is composed of source, media, receptor, exposure point concentration, and exposure route. Please revise the document accordingly.
39. Table 10.2.12; Page 10.2.43.
The table states that the produce pathway (fruits, vegetable, ingestion of plant tissues) is not considered for human health risk analysis because the exposure via this pathway is relatively low compared to other pathways. This is not the logical reason not to consider the produce pathway. The goal of the risk assessment is to provide risk number for individual pathways within a media and total cumulative risk for the site. Therefore, please provide adequate justification not to include this pathway or revise the document to include the produce pathway.

40. Section 10.2.6.5; Risk Characterization; Page 10.2.54.
This section discusses the risk range and selection of COCs within the risk range. It states that 1E-4 is the risk level for establishing the COCs. This is not correct. EPA had established an acceptable risk range of 1E-4 to 1E-6 for risk management decisions i.e., if the risk falls within this range then the involved parties can make risk management decisions for remedy selection of no further action, limited actions, institutional controls, or aggressive actions. The COCs are defined as a constituent of concern with risk greater than or equal to 1E-6 or hazard index of 1.0 (hazard quotient of 0.1). The discussion, analysis, and COC selection should be revised to address the stated concern and accurately describe the COC selection process. Please address this concern for all pertinent sections of the document.
41. Figures 10.2.7 and 10.2.8.
These figures indicates the point risk estimates for surface soil under residential scenario. These figures do not provide any relevant information that would aid in the selection of COCs or development of RGOs. The Department would like to see figures that presents the extent of contamination and extent for various RGO scenario that would be beneficial for further analysis into the CMS process. The Department will be available to discuss this issue and help clarify any question that Navy or EnSafe has related to this comment.

SWMU 163:

42. Figure 10.3.1; Site Map.
The figure should be revised to include the DPT sample locations, differentiate between sample locations for various sampling rounds, provide general groundwater directions, key topographical features, and information that would relate the site to surrounding areas and the zone.
43. Figure 10.3.2; BEQs in Surface Soils.
The referenced figure defines the extent of contamination based on one sample location in both area that are shaded. It is very difficult to understand as to how the extent was defined when no samples were collected whose results were below the screening values. Please revise the text and figure or propose additional field work to address this comment.



2600 Bull Street
Columbia, SC 29201-1708

MEMORANDUM

TO: Mihir P. Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Division of Hazardous and Infectious Waste
Bureau of Land and Waste Management

FROM: Susan K. Byrd, Risk Assessor *Susan K. Byrd*
Corrective Action Engineering Section
Division of Hazardous and Infectious Waste
Bureau of Land and Waste Management

DATE: August 30, 1999

RE: Charleston Naval Base
Charleston, South Carolina
SC 0170022560

Document:
Zone K RCRA Facility Investigation Report
NavBase Charleston
Volumes I-V
Dated June 11, 1999

The above referenced document completed by Ensafe Inc has been reviewed. Zone K consists of five noncontiguous properties, only two of which required RFI investigations (Naval Annex and Clouter Island). Based on the review of this document, SCDHEC has the following comments relating to the risk assessment

GENERAL COMMENTS:

The general comments may include specific examples from the text, however, the comment should apply to the whole report and may require revisions to each SWMU or AOC

Section 8

1.) The ecological risk assessment does not clearly identify the assessment endpoint selections for the Zone K RFI. Step 3 of the ecological risk assessment process is Problem Formulation which includes the selection of the assessment endpoints or working hypotheses. The endpoints should include entities, attributes, and spacial/temporal extent. This is usually conducted in the

Conceptual Model section. The Conceptual Model section of the Zone K report primarily discusses how contamination in the sediment will be addressed in the Zone J RFI. No explanation was given for the conceptual model presented in Figure 8.3. The conceptual model should include contaminants of concern, assessment endpoints, exposure pathways (including a source, an exposure point, and an exposure route), and risk questions/working hypotheses.

Section 7 Human Health Risk Assessment

2.) **Risk Uncertainty-** In the uncertainty section, it should be mentioned that contaminants present in site samples were screened against background values. Several of the background values were above residential RBCs. Therefore, contamination above the residential RBC values may have been eliminated in the risk calculations causing an underestimation of risk. The differences between anthropogenic risk, background risk, and site related risk should be discussed.

SPECIFIC COMMENTS.

Section 3, Page 3.2

1.) **3.2.2.2 Soil Sample Collection-** The text states that composite soil samples were collected from 0 to 1 foot bgs and from 3 to 5 feet bgs. Risk Assessment Guidance for Superfund Volume I (Section 4.6.3) states that composite samples may dilute or misrepresent sample points and may need to be avoided for use in the risk assessment. Composite sampling may be appropriate in the RFI; however, more detailed information should be provided as to the type of compositing that was conducted. It is unclear if the samples were composited vertically from various depths, horizontally from different locations, or analytically. Please clarify.

Section 7, Page 7.10

2.) **Summary of COPCs-** The last sentence of the page states, "If no groundwater impacts were identified, the current soil concentrations were considered sufficiently protective of the underlying aquifer." This may not always be the case. Several scenarios could occur that would allow the groundwater to appear clean even though contamination is present in the soil. This statement and consideration should be deleted from the text.

Section 7, Page 7.11

3.) **Table 7.1-** Table 7.1 lists the parameters used to estimate the chronic daily intake at the reasonable maximum exposure. Please give a justification/rationale for the numbers selected that were not the EPA RAGS standard default values.

Section 8, Page 8.15

4.) **Figure 8.3 Contaminant Pathway Model for Ecological Receptors-** The circle symbol represents possible ecological receptors that were not evaluated due to insufficient information. Since the pathways leading to the receptors were identified as possible release mechanisms, a more thorough explanation should be given for not evaluating that receptor. A detailed discussion for the selection and deletion of receptors should be included in the conceptual model.

section of the RFI.

Page 8.17

5.) The text states that HQs exceeding 10 indicate moderate risk and HQs exceeding 100, indicate extreme risk. EPA guidance refers to an HQ values of 1 as causing an adverse ecological effect. It has not been determined if the magnitude of the effect is linearly represented by the HQ value. Therefore, the magnitude of the risk should not be defined based solely upon the HQ value. This statement should be deleted from the text.

Page 8.68

6.) **Table 8.11a** - The HI value for the eastern cottontail rabbit is listed as 5.6. The sum of the HQ values listed does not equal the HI. Please recheck the values and correct the table if necessary.

Section 8, Page 8.72

7.) **Subzone K-4**- The text states that the contamination of TCE was detected beneath a concrete pad, therefore, TCE is not likely to be a source for uptake by resident wildlife species. However, terrestrial invertebrates or burrowing mammals could be exposed to subsurface contamination of TCE below the concrete pad. Please revise the text accordingly.

Section 10.0, Page 10.1.1

8.) **SWMU 161** - The last paragraph describes an oil-water separator and associated sump and tank. Please provide the depths of these structures in the site description.

Page 10.1.5

9.) **Table 10.1.2** - Dioxin was detected in the lower interval soil sample. Please explain why dioxin analysis was not performed on the upper interval soil sample from the same location.

Page 10.2.32

10.) **SWMU 162**- Soil to air fate and transport states that the pathway is valid but is not significant. Based on sample location maps for SWMU 162, it is not clear if samples were collected from the soccer field. If samples 162SB001 and 162SB002 were collected from the soccer field, then contaminant migration via fugitive dust should be evaluated. Please clarify this concern in the text.

Page 10.4.26

11.) **SWMU 164**- The soil to air cross media transport states that no VOCs were detected in surface soils and therefore, the air migration pathway is considered insignificant. Table 10.4.1 indicates that only the duplicate sample was analyzed for VOCs. The significance of the soil to air migration is not known since VOC analysis was not performed on the soil samples. Please revise the text accordingly.

Page 10.6.97

12.) **AOCs 693 and 694**- Line 5 of the Exposure Pathway states, "COPCs identified for AOCs

693 and 694 were VOCs; therefore, the inhalation of volatiles pathway was not addressed for this site.” This statement is confusing. If volatiles are identified as COPCs, the inhalation of volatiles pathway should be evaluated. Please correct the statement or clarify in the text.

Page 10.8.2

13.) **AOC 696, Figure 10.8.1** – Two areas of stressed vegetation were identified on the site map. Why were no samples collected from the northwestern shaded area that extends outside of the fencing?

Page 10.9.56, 57, 58, and 59

14.) **AOC 698** – The text lists alpha-BHC as a contributor to the groundwater ingestion pathway; however it was not included in Table 10.9.20

If you have any further questions or comments, feel free to contact me at (803)896-4188

D H E C



2600 Bull Street
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MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Paul M. Bergstrand, P.G., Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: 30 September 1999

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Draft RFI Report
Zone K
Dated 14 June 1999, Revision 0

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996 and the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994.

Some replies to the response to comments and subsequent comments on this document have been provided. Please note, due to the repetitive nature of comments on the SWMUs and AOCs in Chapter 10, only SWMUs 161 - 164 received comment. All SWMUs and AOCs should be revised accordingly.

Zone K, Draft RFI Report Comments
Paul M. Bergstrand
30 September 1999

REPLY TO THE RESPONSE TO COMMENTS

1. The maps and figures provided in this document show improvement from the previous document. However the information remains limited. One example is SWMU 161. The oil water separator is indicated, direct push well locations and the locations of adjacent monitoring wells installed for SWMU 166 were included but groundwater flow, which could be represented by an arrow, is not shown. Another example is SWMU 164. The focus of the RFI at this SWMU has been the fugitive sand blast dust emissions. This dust would tend to accumulate in low areas such as the ditches which surround a portion of the building. Those ditches, which are pertinent to this investigation, have not been represented. This information is extremely important when evaluating the analytical data in relation to the sample locations. All maps and figures in RFI reports should accurately convey as much relevant information as accurately as possible. Maps and figures in this report could be much better and should be revised.
2. The “hits” table within the text and the maps depicting COC contamination show improvement from the previous document. However the information remains limited in cases with multiple COC detections. In order to graphically represent the extent of contaminant detections, the reviewer must refer to the individual maps and figures and manually enter the data on a separate site map. This could be resolved with a map depicting the exceedences of all COCs. Maps and figures representing the full extent of contamination detections must also be provided in the RFI Report format.
3. One of the primary objectives of the RFI Report is to document the nature and extent of contaminants. The Navy must carefully delineate the vertical and horizontal extent of contamination once RFI sampling has confirmed the presence of contamination.
5. Not all DPT location analytical data was presented. Please include all DPT data.

Furthermore, the DPT data that was included in the appendix was not coherent. Sample

identifiers, such as H-P, G-JB, G-P, H-JB were not defined. The data with H-P, G-JB, G-P, H-JB identifiers do not correspond to map locations. Finally, the alphabetic component of the sample identifiers disrupted the numeric presentation of the DPT data. Please revise.

7. Tabs help the presentation of the lab validation data. However, the validation data summary reports (SDG) were not arranged numerically. Revising this section is not critical but note that finding a specific SDG is very difficult.

Specific Comments

9. 4.3 Zone K Data Validation Reports

There were no substantial or significant changes made in this section of the report. This information could be placed in a table format in order to compare detections versus blanks and organized by SWMU/AOC.

BLANK TYPE	NUMBER OF DETECTIONS	BLANK SOURCE	SAMPLING EVENT
Method	43	At the Laboratory	?
Field	9	From decontamination of field implements	?
Equipment	21	From well installation materials	?
Trip (Distilled Water)	12	Round Trip of Distilled water in cooler	?
Distilled Water	10	Unknown use in blanks	?
Rinsate (none taken)	NA	NA	?

It is not clear which sample event the blank detections were from. It is also not clear which data should be rejected as a result of the blank detection. This section need to be completely revised.

10. 4.3 Method Detection Limit Study

The text provided has not served the Navy as intended. If the MDLs in the tables were listed to demonstrate that they were below MCL or RBC the said values should also be included in the table. This section should be revised.

12. Page 6.19

This section of the report states *“If groundwater concentrations do not exceed tap water risk-based screening levels or background concentrations, no significant threat relative to migration potential exists”*. This statement is still not correct as it assumes that the most contaminated groundwater has been identified, which is not always the case. The wells in question could actually be located at the leading or trailing edge of the contamination plume. RFI Reports should evaluate and discuss groundwater contaminant concentrations with respect to seasonal groundwater flow patterns, soil variability, known waste management processes, the potential influence of leaky sewers, RBCs, MCLs, etc. This section of the RFI Report should be revised.

13. Page 9.8 Groundwater Cleanup Goals

The response states *“The Navy acknowledges SCDHECs position and has revised this section of the Zone A (sic) report.”* The revised text of the Zone K report references the August 1998 Zone A report which is identical to the text which generated the original comment. When a response to comments states a section will be revised and the section is not revised as stated, the response to comments will undergo intense review that could potentially delay the approval process.

14. SWMU 161

The Navy has not proven the detections are the maximum values of the contaminants in the subsurface soils. The Navy has not adequately explained the presence of these contaminants in the subsurface soils in the vicinity of an automotive garage. The presence of these contaminants was confirmed, however the extent has not been determined. Additional assessment is necessary to complete the RFI Report.

15. SWMU 161

SWMU 161 had one monitoring well installed upgradient of the oil water separator. One congener of dioxin was detected in the first found of groundwater samples. The remaining three rounds of groundwater samples did not include analysis for dioxin. The presence of this contaminant has been confirmed, however the extent has not been examined. Additional samples are necessary to complete the RFI Report.

18. Page 10.2.9 Figure 10.2.2, SWMU 162

The Figure has been redrawn using a dashed line to represent the approximate boundary of the contamination. The fact remains that there are no surrounding soil samples to document the gradient. Additional samples may be necessary to complete the RFI Report.

19. Page 10.2.14 Table 10.2.6, SWMU 162

The response states that *“The Navy is going to compile (the dioxin) data from all samples analyzed for dioxins, regardless of zone, and perform statistical analyses on the data set so that the project team can make an informed decision regarding whether or not more sampling is required.”* At this time, the Department understands this study will not be conducted. Please revise all appropriate sections.

Also, it still remains the Navy’s responsibility to first determine the extent of contamination before informed decisions can be made. As previously stated, there were no groundwater samples collected and analyzed for dioxins. There is no evidence that groundwater is not contaminated with dioxins. Groundwater samples should be collected to complete the RFI Report.

20. Page 10.3.7 Figure 10.3.2, SWMU 163

The response states that a wash rack once existed to the southeast of the concrete pit. This washrack and drains should be indicated on the appropriate figures. The Navy should also determine if an oil-water separator was a component of the washrack.

22. Section 10.4, SWMU 164

The paint shop portion of this SWMU has not been addressed. Samples for paint constituents and volatiles are necessary to complete the RFI Report.

Seven of nine surface soil samples were positive for Diesel Range Organics (DRO). Second round soil samples did not analyze for DRO. Additional samples for DRO constituents are necessary to complete the RFI Report.

The inorganic samples were apparently collected from along the road and not in the ditch where blasting materials would accumulate. Additional samples for inorganics are necessary to complete the RFI Report.

The AST, which reported to have numerous stains, was not investigated. If an investigation was conducted by the Storage Tank Program, please reference the report in the text and submit a copy of the report to this office. If an investigation was not completed additional samples for petroleum constituents is necessary to complete the RFI Report.

None of the surficial or subsurface soil samples were analyzed for VOCs. Additional samples for paint constituents and volatiles are necessary to complete the RFI Report.

There were no monitoring wells installed at this SWMU. Additional monitoring wells sampled for the parameters discussed above may be necessary to complete the RFI Report.

23. Section 10.6, AOCs 693 and 694

- B) The extent of mercury contamination in soil and groundwater at Clouter Island should be defined to complete the RFI Report.
- C) Please read # 19 regarding Dioxin. Dioxins in soil and groundwater at Clouter Island should be addressed to complete the RFI Report.
- D) The VOCs should be addressed to complete the RFI Report.

24. AOCs 693 and 694

The response stated "*The text has been revised...*" The text has been revised for this AOC. However, the same language remains in other Corrective Measures Consideration sections. The Navy should avoid bias in the presentation of potential corrective measures (i.e.,

in addition to no further action) and should rely on the CMS process to determine the appropriate corrective action to be taken in all sections of this and other reports.

26. Section 10.8, AOC 696

There are no monitoring wells associated with this AOC. It appears the Navy assumes layer cake geology and sequential contamination of media. Because the PCB contamination exceeded the “*de facto*” groundwater protection screening level of 1,000 ppb groundwater monitoring wells should be installed to complete the RFI Report.

27. Page 10.9.1, AOC 698

- A) The “J” flag is not an obvious indication of blank contamination. Please revise.
- D) The problem which remains is the specific source of the petroleum contamination has not been defined. This issue should be resolved.
- E) Additional soil samples terminated at 3 to 5 feet BGS and not at the water-table. The Navy assumes layer cake geology and sequential contamination of media. Permanent downgradient groundwater monitoring wells should be installed to verify the extent of contamination.
- F) Even though pesticides were detected in groundwater the text states “*Based on soil data, no pesticides appear to be leaching to groundwater.*” Downgradient groundwater monitoring wells should be installed to verify the extent of contamination. Additional groundwater samples analyzed for VOCs, SVOCs, metals, and pesticides should be taken to complete the RFI Report.

GENERAL COMMENTS

29. SECTION 2.2.2, Geotechnical Sampling

In light of the extensive chlorinated groundwater contamination at SWMU 166 the generalized description of lithology was disappointing. The “*soft to very stiff inorganic clay*” from a depth ranging from 9 to 40 feet has been invoked during team meetings but has never been

represented on any maps or figures. A brief review of the well boring logs in Appendix A indicates a highly variable subsurface with the potential to channel contaminants. This subsurface information should be compiled and presented in the RFI Report.

In addition to a detailed description of subsurface, a detailed investigation of the top of the Ashley Formation is in order. A review of the wells 23D, 3D, 5D and 8D as shown on Figure 2.6 reveal that the wells drilled to within 3 feet of the Ashley Formation (3D and 8D) have elevated levels of contamination while well 5D which terminates 7 feet above the Ashley Formation is non-detect (5D). Well 23D which reported 4 ppb chlorinated solvent did not intersect the Ashley Formation at all. Chlorinated contaminants have the potential to migrate downslope or in paleochannels against the flow of groundwater. The physical and chemical nature of the top of the Ashley Formation must be thoroughly investigated, possibly during the 163 investigation.

30. 2.3.2, Surficial Aquifer

This document reports water elevations collected 21 May 1997, 22 January 1998 and 6 March 1998. Corresponding groundwater maps were not provided. This document also references a NOAA web page for normal monthly precipitation at Charleston International Airport based on data from the last 30 years. This data reveals the monthly precipitation averaged 4.04 inches per month. The precipitation ranges from 2.6 inches in April to 7.22 inches in August. The months of June, July and August average 6.83 inches of rain per month. The data from the web page indicates Zone groundwater elevations were collected from May (4.01") January (3.45") and March (4.34") and not from the months with the most rainfall. The variability of groundwater flow over the course of a year remains unanswered. The Navy should, at the least, produce maps from the data available.

31. 2.3.9.2 Quaternary-age Sediments

The conclusion of this section is that the Quaternary age sediments are hydraulically connected and behave as one surficial aquifer under unconfined conditions. This applies to how groundwater migrates in the subsurface, however, chlorinated solvents may not have the same response. This should be taken into consideration in revisions of the RFI.

32. 5.0 DATA EVALUATION AND BACKGROUND COMPARISON

This section describes how detections are compared to USEPA Region III RBCs. Use of this methodology is appropriate when the mechanism of the spill or release is well known. In such

a case, when constituents are detected below RBC values we may assume no contamination. However, when contaminants detected are not related to the SWMU/AOC, when a large number of detections below RBC occur, if detections increase either upgradient or downgradient from the SWMU/AOC or if there is low sample density, this methodology may not be appropriate. This section in the report needs to be revised.

33. Table 5.6 Organic Screening Values

The MCLs for Methylene Chloride and Bis(2-ethylhexyl)phthalate were omitted. This is not the first time this problem has been addressed in comments to the Navy. Please revise all appropriate sections of the report.

34. 6.1.2 Media Properties Affecting Fate and Transport

This section is devoted to the description of the variabilities of environmental media as related to contaminant fate and transport. Unfortunately, the report vacillates between a broad brush description of variables which influence contaminant migration, to an “averaging” of sand parameters based upon analysis of 4 Shelby tubes, to statements such as “the surficial aquifer is mostly sand”. Such generalities are acceptable in the confines of an RFA but the widespread chlorinated solvent contamination of soil and groundwater at the Naval Annex demand detail and accuracy when describing environmental media. This subsurface information should be compiled and presented in the RFI Report.

35. Table 6.4 Soil to Groundwater; Soil Screening Levels

It is not clear how multiple detections at a single location would be treated using this SSL calculation method. Please explain how multiple detections would be addressed.

36. 7.2 Objectives

This section states “Chemical contamination at the site must be characterized adequately before a risk assessment can be used to determine whether detected concentrations have the potential for toxic effects or increased cancer incidences and before it can become a basis for making remedial decisions.” All applications of screening values to determine the COC list is dependent on a complete understanding of how the spill release occurred and on the complete definition of the horizontal and vertical extent of contamination. Please see comment #32.

37. 7.3.4 Selection of Chemicals of Potential Concern, Page 7.8

This section states “*Because shallow and deep groundwater beneath most Zone K area contain chlorides and/or TDS exceeding South Carolina potable source criteria, water from these aquifers is not appropriate for domestic use.*” The Navy has not presented any data to document this statement.

This same “*non-potable*” argument is presented throughout each of the SWMU/AOC presentations in chapter 10 (table 10.2.12 for example). The Department has previously informed the Navy about the determination that all groundwater in this State is considered Class GB. As such the Navy must cleanup groundwater contamination to these standards (MCL). If no MCL exists, the Navy must cleanup to the RBC water standard. If no MCL or RBC exists, cleanup levels will be the PQL, natural background, or anthropogenic background as appropriate. Alternate concentration limits (ACLs) can be established in some cases as appropriate under the regulatory requirements of the particular program and/or the Departments regulation (R.61-68) and guidance on groundwater mixing zones/monitored natural attenuation. If all requirements are met, ACLs may become the cleanup standards. In addition, technical impracticability may be a consideration and, if so, determination should be made following EPA Directive 9234.2-25. All appropriate sections of the report should be modified.

38. Table 8.5 Organic Constituents in Soil, Page 8.24

This table presents the determination of ECPC. It is noted that contaminants are detected from 5 to 89 times the ecological benchmark value and has not become an ECPC because the frequency of detection is <5%. This approach is not justified since the Navy has not presented a discernable zone of influence and has not presented maps showing contaminated sample detection location and adequate surrounding nondetect samples. Furthermore, the Navy should not use frequency of detection as a screening tool. The Navy may use frequency of detection in the CoC refinement process after nature and extent and risk analysis have been conducted. This section of the report should be modified.

39. 9.5.2 Description of Prescreened Technologies, Page 9.17

This section states “*However, groundwater extraction and subsequent exsitu treatment (i.e., pump and treat) is not a preferred remedial alternative of the Navy.*” The Navy is responsible for cleanup of groundwater contamination to appropriate standards by the most suitable method which may in fact be pump and treat. The Navy should not bias any remedial technology prior

to the CMS process which will determine the appropriate corrective action to be taken. Please revise.

40. 10.1 SWMU 161, Page 10.1.1

This section of the report states “*Before the wash bay roof was constructed, the oil-water separator’s contents would have overflowed into the storm water drainage system during heavy precipitation.*” On reviewing the Figure 10.1.1 it is not at all clear how overflow would be able to move into the storm water system without flowing towards the interstate highway. There are no samples between the oil-water separator system and the highway. Furthermore, the monitoring well 161001 is upgradient of the oil water separator and all other wells are side gradient. Finally, the data for 166GP066 could not be located in Appendix F. Additional assessment is necessary to complete the RFI Report.

41. SWMU 162

The problems remaining with the SWMU is that the extent of Arsenic and BEQs have not been confined. Also, by referring to the groundwater flow maps (Figure 2.6) there are no downgradient wells for this SWMU. The Navy should address these issues before a determination can be made.

42. Figure 10.3.1 SWMU 163

DPT sample taken in this vicinity were not presented on this figure. The Figure should be revised.

43. Figure 10.3.2 SWMU 163, BEQs in Surface Soil

The area west of samples 163SB001 and 163SB008 and to the east of the parking area have not been defined. Additional assessment is necessary to complete the RFI Report.

44. Figure 10.3.3 SWMU 163, VOCs in Shallow Groundwater

This figure is misleading. Monitoring well 163001 was not sampled at the same time as wells 163002 and 163003. The date of sampling should be included on figures such as these or some indication that only maximum detections are being reported. This should be corrected in this and all other RFI reports.

45. 10.3.4 Semivolatile Organic Compounds in Groundwater, Page 10.3.29

This section cites the detection of DEHP in groundwater above the MCL. The detection of DEHP, however, was not explained or discussed in this or any other section. DEHP, whether a sampling artifact, lab contaminant or actual groundwater contaminant, must be addressed.

46. 10.3.4 Other Organic Compounds in Groundwater, Page 10.3.29

This section cites the detection of dioxin in monitoring well 163001 during the second round of sampling. The Navy has not proven the dioxin detection was at the edge or center of the contamination. The next round and subsequent sampling events should include analysis for dioxin.

47. 10.3.5.2 SWMU 163 - Risk Based Groundwater Transport, Page 10.3.33

The conclusion on lines 18-20 that the spatial lack of persistence of contamination also points to a small affected groundwater mass is premature. Conclusions such as these can only be made at the conclusion of the investigation. Please revise at that time.

48. 10.3.6.4 Toxicity Assessment- DEHP, Page 10.3.47

This section has omitted the other uses of DEHP which may have contributed to contamination at Navy facilities. The text also has stated that the “Phthalate esters are ubiquitously in the environment.” This statement has not been proven by background samples. This section of the report should be revised.