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RESPONSE TO SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL COMMENTS RESOURCE CONSERVATION AND RECOVERY FACILITY INVESTIGATION REPORT ZONE C DATED JANUARY 1996 CNC CHARLESTON SC

11/14/1997

ENSAFE INC.

RESPONSE TO COMMENTS FOR DRAFT RCRA FACILITY INVESTIGATION REPORT FOR ZONE C NAVAL BASE CHARLESTON DATED JANUARY 1996

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Prepared for:

Comprehensive Long-Term Environmental Action Navy (CLEAN)
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South Carolina Department of Health and Environmental Control
Comments on Charleston Naval Base
Draft Zone C RFI Report
Dated January 1996

Comments by: Johnny Tapia

Comment:

1. A map showing the distribution (depth) of Wando and Ashley formations should be included in the final version of the Zone C RFI Report. As stated in the report, this map should be available once data from deep wells on adjacent zones is obtained. Similarly, on Section 2.2.6 the report states that a vertical hydraulic gradient map will be prepared. The Department hopes to see this map on the final version of this report.

Response:

1. **A map of the distribution of the Wando and Ashley formations will be included; however, the reviewers need to keep in mind that correlations between the 2 deep wells in Zone C and wells in surrounding zones will be somewhat speculative due to the limited data point control. A vertical hydraulic gradient map will also be included but once again the data will be of limited usefulness because of the low number of data points. (Page 2.17)**

Comment:

2. Section 2.2.8 "Hydraulic Conductivity" states that the mean value of hydraulic conductivities contained in tables 2.3 and 2.4 are represented on Figure 2.3. The values of hydraulic conductivity represented in Figure 2.3 do not resemble the values contained in tables 2.3 and 2.4. This should be clarified.

Response:

2. **The data presented on figure 2.3 is incorrect and will be revised to depict the values presented in the referenced tables. (Pages 2.19 and 2.20)**

Comment:

3. Section 2.2.9, states that "No velocity estimates were made for the deep aquifer since only two deep wells are in Zone C." This statement contradicts the following statement "The groundwater velocity seems to remain relatively constant for both the shallow and deep portions of the aquifer". This comparison cannot be made since groundwater velocity was not calculated for the deep portions of the aquifer and the limited number of deep wells located in this zone. This contradiction should be clarified.

Response:

3. The two sentences regarding groundwater which follow table 2.5 are not applicable to the Zone C groundwater velocity discussion and have been deleted. (Page 2.21)

Comment:

4. Section 5.2.3. states that from the sampling event, chemical data set were put together for upper soil (surface soil) and the shallow groundwater to compare to background. The same should have been done for the lower interval soil and deep groundwater. How is the Navy planning to address any sort of contamination in the lower soil interval and deep groundwater? Should the number of samples be inadequate to make a thorough investigation of all Zone C media, more samples would be required to collect to complete the investigation.

Response:

4. Background values for surface soil, subsurface soil, shallow groundwater, and deep groundwater were agreed upon in May 1997 by the project team. These values are presented in Table 5.1. (Page 5.3) As has been the case with other zones, subsurface soil contamination is evaluated with respect to potential for migration to groundwater. In some instances the project team decides wells are needed and in some cases it is agreed that the concentrations are minimal enough shallow groundwater should not be impacted. Deep groundwater is being compared to background, MCLs, and being evaluated with respect to potential human health risk.

Comment:

5. No background values were calculated for lower soil interval or the deep groundwater. If these values are feasible to be calculated it should be done so. There is data from two deep wells at Zone C and not all the second ground interval soil samples were saturated. If there is no possibility of calculating these values, it should be explained; otherwise include these values in the final report.

Response:

5. Please refer to response #4 above.

Comment:

6. Shallow groundwater background data sets was derived from two sampling points, and on page 5-10 it is stated that reference concentrations were calculated by taking the mean of the two values. However, table 5.6 that depicts the shallow groundwater background

values shows that it was calculated using 2 x mean. This discrepancy should be clarified. The Navy should be reminded that the background values obtained for Zone C are being revised, the same way it was done for Zone B and A.

Response:

6. The text has been revised to state background was calculated using twice mean. (Page 5.11)

Comment:

7. Table 6.2 includes screening levels for constituents detected in soil and groundwater. Soil screening levels for Aroclor-1254 and Aroclor-1260 were calculated. The calculations of these Soils Screening Levels should be submitted for review. Additionally, some of the footnotes to table 6.2 make reference to Zone I and the acronym NAS has not been defined. These should be corrected.

Response:

7. The formula and chemical specific inputs for calculating SSLs are provided either within Table 6.2 or the footnotes with the exception of MCLs (for compounds which have promulgated MCLs) to be used as target soil leachate concentrations. The only part of the calculation possibly not readily apparent are the application of a DAF =20 and a HQ = 0.1 even though they are pointed out in the footnotes. The acronym NAS will be deleted and replaced with NAVBASE. (Page 6.4)

Comment:

8. Section 7.3.9.2 "Comparison of Site-Related Data to Background Concentrations", states that the statistical approach proposed in May 1995 for Zone H, was also approved for Zone C. Recent discussions by the Department questioned the use of this statistical approach to calculate reference concentrations (UTLs). This discussions concluded with the decision of very closely scrutinize grid-based analytical data, before it can be used to calculate UTLs, and even after these values are calculated, they still need to be approved on a zone-by-zone basis. This section should be modified to reflect the current approach taken, to determine "background reference concentrations" (UTLs).

Response:

8. The reference to the May 1995 memo has been deleted and a reference to the Zone C specific approach described in Section 5 inserted. (Page 7.12)

Comment:

9. The formula for calculating the UCL, in Section 7.3.6.4, a portion is depicted in one page an the rest in another. This minor problem should be corrected.

Response:

9. The editorial error will be corrected. (Page 7.17)

Comment:

10. Section 7.4 "Site-Specific Human Health Risk Assessments", describes the organization of the RFI risk assessment for each AOC or SWMU. At the end of this section on page 7-50, AOC 522 "Former Grease and Wash Building" and AOC 700 "Golf Course Maintenance Shop" are described as recently identified and added to the Work plan. The status of the investigations at these two site has changed from the time the Zone C RFI Report was submitted. The information related to AOC 522 and AOC 700 should be included (where applicable) and the results of the investigations submitted for review.

Response:

10. Site specific information related to the investigation of AOCs 522 and 700 has been included as Sections 10.8 and 10.9 of the revised report.

Comment:

11. Need clarification on the section of ECPC's in section 8.4 "Contaminant Fate and Transport". According to the text, "inorganic parameters in site surface soil exceeding twice the maximum concentration detected in reference sample concentrations, are identified as ECPC". For each sub-zone, the detected inorganic parameters are compared to the Upper Tolerance Limit (UTL) of background. These UTL values used for comparison are not the same as the UTL values determined in Section 5.0, table 5.4. It needs to be clarified how the UTL values for screening of inorganic parameters in the Ecological Risk Assessment were calculated. What samples were used for this determination, etc.? These comment applies through all Section 8.0 of the report.

Response:

11. The background values used in the ERA have been corrected. (Pages 5.3, 8.13, and 8.18)

Comment:

12. Section 10.1.2 repeats the paragraph of SVOCs in soil. One of them should be eliminated.

Response:

12. **The first paragraph referring to SVOCs will be deleted to eliminate the duplication and so that the organization of the compound specific discussions remains consistent with the remainder of the document. (Page 10.1.8)**

SWMU 44

Comment:

13. Figures 10.1.3 and 10.1.4 show the locations of 21 sediment and surface water samples. The sampling proposed in the Work plan was for 14 samples on each media. These locations cannot be differentiated to reach some kind of conclusion. These tables need to be updated.

Response:

13. **The figures actually show 13 sediment and 14 surface water sample locations. One sediment sample was not collected as proposed. Section 10.1.10.3, Exposure Assessment provides both a figure (Figure 10.1.5) and text (pages 10-47 and 10-48) which specifically present/discuss the results of soil and sediment sample results.**

Comment:

14. Section 10.1.5 "Sediment Sampling and Analysis" states that 14 samples were proposed in the Work plan and 13 were collected with the exception of 044M0022. Figure 10.1.3 shows 21 sampling locations, table 10.1.9 shows that the frequency of detection is compared to only 9 samples collected. Appendix D shows the analytical results of only 9 sediment samples. This is confusing and needs clarification.

Response:

14. **The figure is correct and shows 13 locations which are labeled as 044M0009 through 044M0021. The reason that the frequency of detection is compared to 9 samples is 4 of the samples were only analyzed for total organic carbon and grain size. This will be clarified in Section 10.1.5 of the revised report. (Page 10.1.14)**

Comment:

15. SWMU 44 soil sampling event detected many inorganics in soil in concentrations above the RBCs. A review of the Draft report and the "hits table" provided to this Department, it can be seen that additional sampling points have been located at SWMU 44, i.e. 044SB025 and 044SB026, which also detected inorganics at levels above the Region III RBCs. Toluene and Methylene Chloride were detected at the only sample location that

was specifically analyzed for those parameters. It is not known if these chemicals are present throughout the area of SWMU 44 or it was an isolated hit. From all the subsurface samples proposed, only 1 was collected and analyzed. From this analysis, several analytes exceeded soil screening levels for the protection of groundwater. Therefore, it could be misleading to generalize detections or non-detections in the lower soil level throughout the area of SWMU 44. Detections below SSLs may not be protective of groundwater for the area of SWMU 44. Additional information should be provided to reach a reasonable conclusion. Only 1 shallow groundwater well (#6) was analyzed for Appendix 9 parameters. Several detections occurred, and attention needs to be called to well #1, where beryllium, lead and nickel detections exceeded their respective MCLs. Again, only one well (#6) was analyzed for other parameters besides metals. Generalization about findings related to VOCs, SVOCs, and pesticides/PCBs will not be conclusive to render a certain media "clean" for those chemicals. Additional sampling and analyses is required in shallow groundwater at SWMU 44, for parameters other than inorganics. SWMU 44 text should be revised throughout, and if possible include the results of the interim measures performed at the site which will help to determine the current conditions at the site. The final version of this report should include all rounds of sampling for wells at SWMU 44.

Response:

15. **Per the July 1997 project team meeting, 9 soil samples were collected from the existing ground surface to provide confirmation of the effectiveness of the interim measure. The samples will be analyzed for metals and semi-volatile organics. In addition, the existing monitoring wells were sampled for metals and semi-volatile organics. Because of the geographic location of monitoring well NBCC-044-008 with respect to AOC 700, the groundwater sample collected from that were also analyzed for pesticides as part of the resolution to comment #70. (Page 10.1.110)**

Comment:

16. Section 10.1.9.1 "Soil-to-Groundwater Cross-Media Transport". SWMU 44 was a coal storage area that could have produced a change in the soil pH due to the production of sulfuric acid by rainwater infiltration through the coal. As stated in section 6, Fate and Transport, inorganics have low mobility in normal environments, however in low pH conditions, inorganics can become more mobile. From Appendix D, it was observed that Cation Exchange Capacity, analyzed only at 044SB006 surface soil, shows a comparatively higher value than results for other AOCs or SWMUs in Zone C. pH is one of the factors that affect Cation Exchange Capacity. It is not impossible that soil and possibly groundwater have been affected for the mobility of inorganics due to low pH. The relation of these parameters to soil/groundwater contamination at SWMU 44 should be discussed.

Response:

16. This section will be revised to provide more discussion of pH as the parameters relate to fate and transport at SWMU 44. It should be noted that these conditions no longer exist since the site has been altered by an interim measure. (Page 10.1.24)

Comment:

17. Tables 10.1.20, 10.1.21, and 10.1.22 do not have footnotes explaining all the keys used in the tables. Additionally, COPCs for groundwater were identified only based on the first round of sampling. All rounds of sampling should be included in the final report.

Response:

17. Footnotes will be added as necessary to explain the various keys used in the tables. The groundwater data presented was the only data available at the time the report was prepared due to the time constraints imposed by the "Facility Submission Schedule" included as Appendix C of the Part B permit and as reflected in the Corrective Action Management Plan required and approved by the Department. A "hits" summary of all four quarters of the data has been included as Appendix H to the report so the reviewer can evaluate trends in the data and the project team can reach conclusions regrading the need for further corrective action. The Navy has proposed that in circumstances where additional data are collected after the report submittal, that the impact that this data has on the recommendations section be evaluated and changed in the conclusions section only. The data will be provided in the form of an appendix in an addendum and referenced in the conclusions narrative. The Navy feels that it is unreasonable to require complete rewrite of the document on the basis of the additional data alone. If this is not acceptable, then the RFI report submittal dates should be after all quarterly groundwater sampling is complete and this submittal date should be reflected in the CAMP.

Comment:

18. From the hit tables for Zone C soil sampling, it was observed that Vanadium needs to be added to the list of COPCs in surface soil. It was detected in 044SB025 at a concentration of 68.2 mg/kg, which is higher than its respective RBC value.

Response:

18. Tables 10.1.13 and 10.1.20 have been updated to include data from sample locations 044SB025 and 044SB026. Vanadium has not specifically been added to the human health risk assessment since the site is already recommended for CMS and it would not be a primary driver at the concentrations observed.

Comment:

19. Figure 10.1.5 needs to include soil borings 044SB025 and 044SB026.

Response:

19. Figure 10.1.5 has been revised to include soil borings 25 and 26. (Page 10.1.50)

Comment:

20. The Department does not agree with the statement in page 10-89 about lead toxicity. This conclusion is premature, and results of additional rounds of sampling are needed to reach a reasonable conclusion. There is one exceedance on the action level of 15 ug/l, and further evaluation is warranted. The four rounds of sampling will provide additional data before reaching a conclusion.

    The nature and extent of Chemicals of Concern (COCs) in the shallow groundwater at SWMU 44, needs to be re-evaluated by considering subsequent rounds of sampling. The fact that arsenic was not detected in background monitoring wells could be due to the use of only two background monitoring wells.

    Comparison of maximum detections to other zones background reference concentrations is not acceptable at this time due to the fact that background numbers are in the process of revision for most of the zones at NAVBASE, including Zone C.

    The statement made on page 10-90 about the BEHP detections related to common laboratory contaminants should be confirmed and evaluated by subsequent rounds of sampling.

Response:

20. Even though SCDHEC may believe the conclusions regarding lead are premature, the recommendation to include the site in the CMS based on the presence of other organics is still valid so from a "big picture" perspective, the outcome for the site is unchanged. The hit of 19.8 ppb was detected in well NBCC-044-001. A review of the subsequent quarters of groundwater data for this well revealed results of 2.4 ppb, 5.7 ppb, and non-detect. Lead was not detected in any other wells above 1.7 ppb in subsequent rounds so the conclusion is still valid. The inclusion of subsequent rounds of sampling was discussed above in response to comment #17. The Navy agrees with SCDHECs concern related to BEHP which was the basis for the statement on page 10-90 in the report that subsequent data be evaluated to confirm or refute it's presence.

Comment:

21. It is agreed with the recommendation of considering future groundwater quarterly sampling to confirm the presence of contaminants identified as COPCs in groundwater. This recommendation was directed to 2,3,7,8-TCDD equivalents, but it should be applied to all the COPCs in groundwater, as stated above.

Response:

21. The Navy agrees that additional rounds of groundwater sampling will be necessary, most likely as part of the CMS.

Comment:

22. Section 10.1.10.6 "Risk Uncertainty" discusses the uncertainty related to the frequency of detection and spatial distribution. The argument is made that since SWMU 44 was almost all fill material, deposited in the past for land reclamation, it would be fair to expect that soils at SWMU 44 will be the same as those of other similar zones (H and I), where the same situation happened in the past. Based on this argument, contaminant detections are compared to calculated background values for the dredge-spoil formed zones. This argument is only partially acceptable. It is true that dredge spoils deposited in the area of SWMU 44 could be the same as those for Zones H and I, but comparing to reference concentrations for those zones seems inadequate, not knowing the origin of the dredge spoils that cover these areas. They could come from different sources that present different levels and types of contaminants. Additionally, according to maps provided to this Department, only about 1/4 of the area of Zone C was covered with dredge spoils, the rest of the area should resemble original soil conditions at Zone C. Reference values calculated for a "all dredge spoil" zone, will normally yield higher values for inorganics, that are being used to calculate reference concentrations. Zone C is expected to yield lower values than for Zones H or I. Therefore, soils and sediments results compared to reference concentrations of Zones H and I is not a good reference for comparison.

Response:

22. The SWMU 44 results were screened against Zone C background values, not Zone H and/or I values, to identify COPCs so the reason for the SCDHECs concern over the point made in the section is not really clear. The Navy agrees that the origin of the dredge spoils for the area of SWMU 44 may or may not be the same as those in Zones H and I. Even so, the probability is likely greater that the spoil material at SWMU 44 is more similar in composition to the Zones H and I spoils than to native soil found in other parts of Zone C. The comment correctly points out that as a whole, Zone C is expected to yield lower values than an all dredge spoil area, hence the reason to point out the uncertainty. Even if no mention were made to Zones H

and I there would still be uncertainty inherently built into the comparison of the two areas within Zone C. Therefore, the Navy feels this discussion is beneficial to the risk managers.

Comment:

23. On page 10-97, it is not clear if the third paragraph explains the Central Tendency Analysis for SWMU 44. This paragraph concludes by mentioning AOCs and SWMUs combined in SWMU 14. This should be clarified. The first paragraph of this page already talks about Central Tendency in soils and sediments for SWMU 44.

Response:

23. The reference to AOCs and SWMUs combined in SWMU 14 will be deleted and the accuracy of the paragraph verified. (Page 10.1.101)

Comment:

24. Section 10.1.11 "Corrective Measures Considerations at SWMU 44" does not express a clear recommendation by media and contaminant. SWMU 44 should be recommended either for a CMS, NFA, or future evaluation. It is imperative to look at subsequent rounds of groundwater sampling and to consider the present conditions at SWMU 44 before reaching a final decision. Groundwater, especially presents an unacceptable risk to human health in both, residential and worker scenario. For soil and sediments areas 1, 2, and 3 present a risk on the high end of what is acceptable for the residential scenario. Further evaluation and the completion of additional information is required for SWMU 44.

Response:

24. A CMS recommendation has been added. (Page 10.1.116)

SWMU 47/AOC 516

Comment:

25. Table 10.2.1 indicates that 17 soil samples were proposed for the lower soil interval, however only 13 samples were collected and the deviations column does not explain the reason. This should be corrected by adding the appropriate explanation for the deviations.

Response:

25. The explanation will be added to the revised table. (Page 10.2.3)

Comment:

26. From table 10.2.3 and 10.2.4 that displays the analytical results for SWMU 47 and AOC 516, for organics and inorganics respectively, it was found that the screening of detections for the lower soil interval, only RBCs were used. When no UTLs can be determined, the detections on the lower soil intervals should be screened against generic soil screening levels, when available. This is the approach currently used at NAVBASE. This table should be modified accordingly.

Response:

26. The Navy agrees with this comment and will revise the table accordingly. (Page 10.2.4)

Comment:

27. On page 10-11, Section "SVOCs in Soil" states that the three highest BEQs hits were located at 047SB005 (upper), 047SB016 (upper) and 047SB007 (lower). The first two detections were consistently higher than the rest of the samples for all PAHs in the upper and lower soil intervals. However, the Department was unable to verify the analytical results of location 047SB007. This analytical data is not present on Appendix D, nor in the new tables provided to the Department. This data should be provided for review.

Response:

27. The data for 047SB007 has been included in the revised report. (Appendix H)

Comment:

28. Section 10.2.5.1 "Soil to Groundwater Cross-Media Transport", concludes that concentrations of organics and inorganics detected in soil were above groundwater protective soil screening levels, and that they are considered protective enough of the shallow groundwater aquifer, due to non detections for this constituents in groundwater. These conclusions are premature and although it could be possible, it is reasonable to review additional rounds of groundwater sampling to make a final decision on the impact that soils are producing to groundwater. The final report should include all the results of the four rounds of sampling.

Response:

28. This comment will be addressed by the actions described above in response to comment #17.

Comment:

29. Page 10.52, "Lead Toxicity" Section, states that even though detections at 047SB00701 were 1,120 mg/kg in surface soil and 1,190 mg/kg in the subsurface soil layer, a "mean" lead concentration of 112 mg/kg was used to calculate health effects for a child. It is not understood how a mean level is used to assess lead health risks while a UCL approach is used for other chemicals of potential concern. The use of this approach should be explained. Since lead concentration at 047SB00701 is above the residential threshold of 400 mg/Kg, the extent of contamination in both, surface and sub-surface soils should be determined.

    The Lead Uptake Biokinetic Model used to predict blood lead levels in children considers impacted environmental media such as soil and groundwater. Impacted subsurface at higher levels than the surface could affect the future reuse of the site. The model predicts a child's exposure to lead within a defined area of contamination. Averaging detected concentrations over the total area of SWMU 47 and AOC 516 would not predict the exposure to the area where levels are of concern (above 400 mg/kg). The extent of lead contamination around 047SB00701 first should be defined, before using the prediction model. Furthermore, the lead levels found at 047SB00701 indicate that groundwater may be affected. The analytical data suggests a possible contamination, therefore further evaluation of this area is recommended to evaluate lead's presence in all media. This section should be revised and conclusions rewritten.

Response:

29. **Per the July 1997 project team meeting discussions, additional sampling for lead around 047SB007 is not required at this time; however, the lead concentrations used in the lead uptake model will be replaced with the values from the much smaller area which includes the borings 516SB001, 515SB002, and 047SB007 since this is the where the battery charging operation was located. Lead in groundwater does present a concern at other portions of the site and will be addressed in the presentation of all 4 quarters of groundwater data. Revisions to the model predictions will not change the original recommendation that the site be included in the CMS. (Page 10.2.54)**

Comment:

30. Page 10.62, which describes in the text the COCs identified in groundwater at SWMU 47/AOC 516, recommends to wait for subsequent rounds of sampling to evaluate if the detections for lead, antimony, and 3-3'-Dimethylbenzidine were real. There are doubts about entrained sediments in the first round results. It is agreed with this recommendation, however should the detections be confirmed, additional work should be done at this site to determine the extent of groundwater contamination.

Response:

30. All 4 quarters of groundwater data were presented to the team as part of the Zone C comment resolution discussion at the July 1997 project team meeting. Levels of the constituents identified above either diminished or were non-detect in subsequent rounds but lead still remains a potential concern. There are currently 14 wells at this site, a number of which are downgradient of the areas of concern. No additional wells were proposed for this site during the meeting since it was apparent from the data the current groundwater data is adequate to characterize the site.

Comment:

31. Page 10.64, "Frequency of Detection and Spatial Distribution"
The writing of this section should be revised and modified according to the background reference concentrations approved on May 12, 1997.

Response:

31. The only change necessitated by this comment was the deletion of a reference to arsenic in the statement about UCLs being below background. (Page 10.2.65)

Comment:

32. The third paragraph of page 10.64 is confusing on making reference to lead and antimony detections in groundwater, in association with AOC 516. This paragraph should be revised.

Response:

32. The intent of the paragraph was to imply that AOC 516, due to it's operational history, would be the suspected source of the lead in the area. Contrary to this suspicion, the closest downgradient well to this site, NBCC-047-007 which was erroneously referred to as NBCC-047-001 in the text, did not contain significant levels of lead such as those found in well NBCC-047-001. The paragraph will be revised for clarity. (Page 10.2.65)

AOC 508/511

Comment:

33. Table 10.3.3 "Organic Compound Analytical Results for Soil" should be corrected for the following:

- There were no exceedances of Benzo(k)fluoranthene in the upper soil sampling interval. Table 10.3.3 states the opposite.
- There is no footnote at the end of the table to explain the meaning of the superscripts used, especially those on the RBCs column.
- The analytical results for Chlordane were not included in the table. It was detected at location 508SB008 at a concentration higher than the RBCs.
- Dieldrin also had a lower soil interval detection on sample 511SB002.
- The section that depicts the results of analyses for TPHs, does not show the same results as found in the analytical data (Appendix D), nor the units are appropriate.

Response:

33. Table 10.3.3 will be revised as noted.

Comment:

34. For tables 10.3.3 and 10.3.4, the reference concentrations should be updated and exceedances recounted.

Response:

34. The tables will be revised to reflect the updated reference concentration and screening results against these concentrations.

Comment:

35. Page 10.8, when explaining the SVOCs detections at AOCs 508/511, should clarify the number of samples collected in the lower soil interval. The detections are totalized for the area of these two AOCs, but the shallow water table, in several cases, interfered with the collection of samples in the lower interval. Detections cannot be generalized for an area if samples have not been collected and analyzed for the proposed parameters. In this case, at AOC 508 only one lower soil sample was collected, while at AOC 511 five lower soil samples were collected. The generalization that SVOCs were detected only in upper interval samples could apply to AOC 511, but not to AOC 508. This gives the reader the

wrong picture, which cannot be clarified without doing a thorough review of the analytical data. This comment should be clarified an should apply for all other sites were generalizations of this nature are made.

Response:

35. The generalized statement that SVOCs were only detected in upper level samples has been deleted. The available data was screened as suggested by SCDHEC comment #52 to assess the relative significance of the surface concentrations with respect to groundwater screening. (Page 10.3.8)

Comment:

36. Page 10.9 makes the statement that TPH concentrations exceeded the 100 mg/kg reference in every sample analyzed. This statement is not accurate and should be revised. Please revise the analytical data.

Response:

36. The statement on page 10.3.9 has been revised to accurately reflect the results.

Comment:

37. Section 10.3.3.1 "Soil-to-Groundwater Cross-Media Transport".
This section mentions that contaminant detections in soil and subsurface were compared to SSLs and background reference concentrations. Twelve constituents detected at AOC 508 and AOC 511 exceeded SSLs. Six subsurface samples were proposed to collect at AOC 508, however only 1 sample (508SB004) was collected and analyzed due to the shallow groundwater present at the site. To have an appropriate characterization of AOC 508, it is necessary to have additional samples collected, either soil or groundwater. Groundwater samples will clarify if the groundwater has been impacted by any of the constituents detected in the surface soil.

Response:

37. Per the July 1997 project team meeting, a consensus agreement was reached that 2 temporary wells will be installed at these sites. The wells were installed and the results are included in section 10.3.3.

Comment:

38. Tables 10.1.13, 10.2.8, and 10.3.5 should be revised to include updated values for UTLs, where applicable. Include also detailed footnotes as done on table 6.2. This comment on UTLs update and tables footnotes applies to all tables similar to the above mentioned ones.

Response:

38. The tables will be revised to reflect the current UTLs and appropriate footnotes. (Table 10.3.6, page 10.3.12; Table 10.1.13, page 10.1.22; Table 10.2.8, page 10.1.19)

Comment:

39. Mercury needs to included as a potential contaminant migration from soil to groundwater. It was detected at location 511SB006 lower soil at a concentration of 11.2 mg/kg, which is above the subsurface UTL = 0.30 mg/kg or the SSL = 3.0 mg/kg. Mercury was analyzed in only 3 of the 10 sampling points at AOC 511. Mercury should also be added to the list of COPCs in section 10.3.4.2 and table 10.3.9. In addition, the TPHs exceedances of 100 mg/kg should be revised. Some hits below 100 mg/kg were mistaken by hits above 100 mg/kg due to the units used. These should be revised.

Response:

39. Table 10.3.9 is now 10.3.10 and identifies COPCs in surface soil, not subsurface soil. The maximum concentration of mercury was 11.2 mg/kg. The next highest concentration in either surface or subsurface soil was 0.40 mg/kg. Considering the potential source area was less than 1000 ft^2, the potential for soil to groundwater migration of mercury is very minimal and no threat is anticipated. (Page 10.3.14) The TPH concentration units have been corrected in Appendix H.

Comment:

40. The groundwater paragraph of section 10.3.4.2 should be corrected to make reference to AOCs 508 and 511. The same correction needs to be made at tables 10.3.8 and 10.3.9.

Response:

40. The corrections were made as noted. (Pages 10.3.14, 10.3.17, and 10.3.18)

Comment:

41. On page 10-37 "Lead Toxicity", it is true that the mean of all lead detection falls below the identified protective level of 400 mg/kg, however there are still small areas impacted by

lead levels above 400 mg/kg. This needs to be addressed as a health concern. The Navy should propose further measures to address this contamination.

Response:

41. The potential for exposure was calculated separately for both AOC 508 and 511 which are each smaller than the standard ½ acre exposure area. As stated, chronic exposure is not expected to pose a health threat to hypothetical child residents. To state the Navy should take an over conservative approach and address lead at these levels is inconsistent with approaches taken at other NAVBASE sites. (Page 10.3.39)

Comment:

42. Section 10.3.4.6 "Risk Uncertainty", should also explain any reason why the risk might be underestimated. For AOC 508 and 511 grouped together, there is uncertainty at AOC 508 about the presence of contaminants in the subsurface unit and how they could be affecting groundwater. Additionally, groundwater was not sampled, therefore, it is not known what conditions the groundwater is in.

Response:

42. Monitoring wells were installed to address this concern and the data generated is presented in Section 10.3.3.

AOC 515/519

Comment:

43. Page 10-10, first paragraph, states that three organophosphorus pesticide compounds (disulfoton, methyl parathion, and parathion) were detected at concentrations below their RBCs in the upper interval soil samples collected for AOC 519. The detection of these compounds was actually at the lower soil level at AOC 515. These statements should be corrected and it should be explained why only the lower level was analyzed for organophosphorus pesticides, not the upper level.

Response:

43. The discrepancy in sample locations will be corrected. The organophosphorous pesticides were only analyzed for when duplicate samples were collected which is the reason the analyses appear inconsistent. (Page 10.4.10)

Comment:

44. According to the history of AOC 515, it was operated as a paint shop in the 1930s. Potential contaminants identified at this AOC were paints, solvents and petroleum hydrocarbons, among others. Groundwater has not been sampled at AOC 515/519. The focus of the investigations at these two sites was to do a Confirmatory Sampling Investigation, therefore, groundwater should also be sampled and analyzed to verify that no contamination is present at the site. The Navy should propose such strategy.

Response:

44. The concept of confirmatory sampling and the manner in which many sites were identified as SWMUs or AOCs simply on the basis of the shop names was discussed at length at the July 1997 project team meeting. The team agreed by consensus that the objectives of the investigation at this site were met and no further investigation is required.

Comment:

45. On table 10.4.8 which identifies the COPCs for AOC 515 and AOC 519. Disulfoton is identified as a COPC with a concentration of 1000 ug/kg in soil. This pesticide compound was identified in tables 10.4.3 and 10.4.5 with only one detection of 1.6 mg/kg. The analytical data tables (Appendix D) shows that sample number 519-C-B001-01 MSD had this value for disulfoton. It should be explained why this value of 1000 mg/kg was used to determine Disulfoton as a COPC. Was the same done on the other organophosphorus pesticides from the sample number mentioned above?

Response:

45. The list of COPCs will be revised to eliminate those compounds introduced to samples in the laboratory as surrogate recovery spikes and subsequently identified in error as site constituents.

Comment:

46. According to the human health risk assessment performed at AOC 515 and 519, no COC were identified because the individual risks fell below 1 x 10^{-6} and the individual hazard quotient was less than 0.1 for every COPC. It was previously suggested that no defined reuse has been established for these areas, therefore, according to the risk calculations, the contaminants present at the site seem to be protective of the residential exposure scenario. Lead was detected at one sampling point, at AOC 515, at levels marginally above 400 ppm, which is protective of the residential scenario. Assuming that current conditions

at these areas are maintained (paved parking lot), and that the groundwater presents no contamination, AOC 515 and 519 would not require additional investigation.

Response:

46. SCDHEC's concurrence with the assessment of these sites is noted.

AOC 523

Comment:

47. Section 10.5.4 "Nature and Extent of Contamination" reports THP (GRO) detection of 12.12 mg/l in monitoring well 523MW002, however, in the section "Other Organics in Groundwater" it is stated that no TPH was detected in groundwater samples from AOC 523. This discrepancy should be clarified.

Response:

47. The discrepancy has been clarified. (Page 10.5.12)

Comment:

48. According to the criteria for selection of COCs, "a chemical contributing to a cumulative risk level of $1E^{-6}$ or whose HQ exceeds 0.1" will be identified as a COC. Page 10-36 does not follow this criteria by not identifying Chromium in surface soil as a chemical of concern, contributing with a HQ = 0.15 on the incidental soil ingestion pathway for the potential future child resident. This should be explained. In addition, arsenic has been unnecessarily identified as a COPC for the general risk assessment of groundwater. It was detected at the range of 15.8 to 26.6 mg/l which is higher than the background reference value of 6.07 mg/l but lower than the MCL value. The screening process of these contaminants for groundwater should be redefined throughout the report. Tap water RBCs should be used for screening when no MCLs or background reference concentrations are available.

Response:

48. An explanation for the elimination of chromium has been added to the COC identification section. (Page 10.5.38) The screening process of identifying COPCs as described in the Comprehensive RFI Work Plan uses tap water RBCs and background concentrations. The use of MCLs in the screening process has not been clearly defined previously by the Department, except in the cases where background or the tap water RBC has exceeded an MCL. The Navy agrees with the use of MCLs as a value to use in the screening process but rather than redefine the process for identifying COPCs

this late in the RFI, the navy suggests that MCLs be considered during the risk management decision making process.

Comment:

49. Section 10.5.7 "CMS Considerations", states that four quarters of groundwater sampling will verify the presence of contamination in the shallow groundwater. The Department agrees with this approach and hopes to see the results of the four rounds of groundwater sampling in the final version of the Zone C RFI Report. Additionally, the Navy has to be reminded that the potential concerns at AOC 523 were gasoline and petroleum products, therefore, due to the detections of TPHs in both soil intervals and groundwater, these parameters should have been analyzed for in the three remaining rounds of groundwater sampling. Although TPH is not considered in the HHRA, it is still of concern, until analytical data shows the contrary.

Response:

49. All 4 quarters of groundwater were presented to the team at the July 1997 project team meeting and is presented again in Appendix H. The team agreed by consensus that no further investigation is warranted at this site.

AOC 510

Comment:

50. Table 10.6.1.3 shows the organic compounds analytical results, for soil in AOC 510. One of the VOCs present on the table is Methylene Chloride. After a review of the analytical data, it was found that Methylene Chloride was detected and qualified UJ or U in all the sampling points. Please explain why this compound was considered a detection. The text stating this should also be modified.

Response:

50. The error was made because the text was written prior to completion of data validation. The "UJ" values reflect detections that were eliminated due to contamination found in blanks associated with the samples. This section will be revised. (Page 10.6.1.8)

AOC 512

Comment:

51. Section 10.6.2.3.1 "Soil-to-Groundwater Cross-Media Transport", evaluates the potential for contamination of groundwater due to the presence of contaminants in the soil, specifically subsurface soil. The cross-media transport is usually evaluated by comparing

subsurface soil detections to the greater of SSLs or background reference concentrations. However, because of the shallow water table, subsurface soil samples were analyzed only at one location (512SB002). This section concludes the detection in the subsurface soil are below SSLs or background, therefore the shallow aquifer is protected. This conclusion is premature and based only on the analysis of one sample from six proposed. This conclusion should be revised and an explanation added to this section dealing with the sampling collection/analysis stated above. This should be added to all AOCs/SWMUs investigated in this zone, especially where groundwater was not analyzed to confirm or refute the conclusion that the shallow aquifer is protected.

Response:

51. As evidenced in table 10.6.2.5, surface soil results were compare to SSLs where the shallow groundwater table prevented the collection of subsurface samples. SCDHEC agreed with this approach in comment #52. Even so, at the July 1997 project team meeting, a consensus agreement was reached to install 2 temporary wells at this site. The results are presented in Section 10.6.2.3.

Comment:

52. AOC 512 was proposed to be sampled in surface soil and subsurface soil. Due to the shallow groundwater (less than 5 ft), only one of six samples were collected and analyzed. Since the lower soil interval was not adequately addressed, it is asked from the Navy that the screening of contaminants be done following the suggested approach:

- Screen surface soil detections against RBCs/UTLs (whichever is higher) identify COPCs for surface soil.

- In cases where subsurface soil was not adequately sampled due to shallow groundwater, screen surface soil detections against SSLs for protection of groundwater. This way will ensure that we don't live out any contaminant that potentially could affect groundwater and overcome the sampling problem.

- Another approach could be to take some groundwater samples to ensure that nothing has reached the groundwater.

Response:

52. As stated in response to comment #51, the Navy has done both. None of the pesticide compounds identified as a potential concern were detected in groundwater.

Comment:

53. The Risk Uncertainties section should also discuss the inability of collecting soil samples below one foot, and how this could affect risk calculations, specially if we don't have groundwater samples to verify that contaminants are not present in groundwater.

Response:

53. This comment is no longer applicable since groundwater samples were collected.

Comment:

54. Section 10.6.2.5 makes corrective measures recommendations according to the risk calculated at AOC 512. It should be added that Beryllium was also a COC for surface soil. Uncertainty related with presence of contaminants in the lower soil level needs to be evaluated as suggested in previous comments. The approach may identify new contaminants of concern that would need to be included in the risk assessment calculations, specially if they are affecting groundwater.

Response:

54. Beryllium has been addressed in Section 10.6.2.7 and as stated in response to comment #52.

AOC 513

Comment:

55. The Department agrees with the recommendation of No Further Action at AOC 513, the Former Morgue, due to lack of contaminant of potential concern identified at this site. No CMS is necessary at this site and can be reused as planned.

Response:

56. SCDHEC's concurrence with the assessment of this site is noted.

AOC 517

Comment:

57. No releases were identified at any media, therefore no CMS would be required based on the available information. The Navy however, should address the lead present inside the building (walls, floor), which according to the planned reuse, could be a health concern issue. This matter is outside the scope of the RCRA corrective action requirements.

Response:

56. SCDHEC's recommendation and concurrence with the assessment of this site is noted.

AOC 518

Comments:

57. Page 10-9, section "Pesticides and PCBs in Soil" states that all pesticides detected at AOC 518 were below their respective RBCs. This statement is mistaken. Chlordane was detected at 518SB001 at a concentration of 7,400 mg/kg which is well above its RBC of 410 mg/kg for soil ingestion. Additionally, extra soil samples were taken to determine the extent of Chlordane contamination around 518SB001. This statement should be corrected.

Response:

57. The text has been revised to correct the discrepancy. (Page 10.6.5.9)

Comment:

58. Chromium was detected at 518SB010-01 at a concentration of 39.1 mg/kg, which exceeds the residential RBC of 39 mg/kg. Chromium should have been included in the list of COPCs because it also exceeds the background reference concentration of 26.4 mg/kg. This should be corrected.

Response:

58. Chromium was excluded as a COPC because it was not detected on site in the hexavalent state. Therefore, the appropriate screening concentration is 7,800 mg/kg. (Page 10.6.5.18)

Comment:

59. Table 10.6.5.5 should be corrected to include the appropriate value for Chlordane highest detection in subsurface soil of 1,800 ug/kg. According to the sampling strategy at AOC 518, Chlordane was detected at 518SB001 upper and lower soil intervals. Two more samples were taken to determine the extent of contamination. These two samples, according to Figure 10.6.5.1 were located about 50 feet away from the high detection. This sampling is not considered appropriate to delineate Chlordane contamination. They are too far apart from the high detection. Pesticides have been found at the base on small areas. This sampling should be revised or otherwise explained the rational used to locate the extra sampling locations.

Response:

59. The sample locations were discussed at the July 1997 project team meeting where it was agreed that while the spacing may be such that a precise, small area cannot be defined, the sample locations do serve as a boundary for the site to demonstrate a large scale problem does not exist. Consensus was reached that no further investigation is required. The site is recommended for CMS and possibly an interim measure so the overall outcome is not affected.

Comment:

60. COCs identified at AOC 518 were Chlordane due to its individual risk greater than 1.0E-6 and HQ=0.6 greater than 0.1. Aluminum and copper should have also been identified as COCs based on their HQ greater than 0.1 for the potential future resident child. This section should be corrected.

Response:

60. Aluminum and copper have been considered in the cumulative HI for the site which is only 0.6. Since the HI < 1 it was determined that chronic exposures would not result in unacceptable health risks. As a result, COC identification was limited to primary contributors to cumulative risk/hazard. (Page 10.6.5.53)

Comment:

61. The recommendation for corrective measures at AOC 518 should be revised in accordance with the answers to be provided for comments on the Draft RFI report. To address the comments, it may be necessary to see what is concluded after the changes. Further assessment may be needed at AOC 518.

Response:

61. The CMS recommendations for Zone C have been revised per the October 1997 project team meeting. (Section 11.0)

AOC 520

Comment:

62. Table 10.6.6.3 should be modified for lower soil detections of beta-BHC pesticide. There were no detections for beta-BHC in the lower soil interval at AOC 520. Methylene Chloride was also detected at the concentration of 37 mg/kg instead of 3.6 mg/kg. These should be corrected accordingly, including the text on page 10-7.

Response:

62. The table has been modified to reflect methylene chloride was detected at 37 μg/kg. (Page 10.6.6.3)

Comment:

63. The Corrective Measures recommendations in Section 10.6.6.4.9 was for no further action (NFA). Methylene Chloride and Cobalt were detected at levels above their respective soil screening levels for protection of groundwater. However, the detections were limited to one sampling point 520SB002 which could produce very limited impact to groundwater. Chlordane, the most often present pesticide in soil, presents a risk below 1E-6 which is protective of the residential scenario. Based on the available information, the Department concurs with the recommendation of NFA for AOC 520.

Response:

63. SCDHEC's concurrence with the assessment of this site is noted.

GRID SAMPLING

Comment:

64. Table 10.7.3 "Organic Compounds Analytical Result for Soils" does not list PCBs detections. These should be included in the list, especially since they were detected above acceptable concentrations (RBCs). This table should also be corrected for the pesticide 4,4-DDE that presented one exceedance, 1,900 ug/kg, above its RBC.

Response:

64. The table has been corrected as noted. (Page 10.7.6 and 10.7.7)

Comment:

65. According to page 10-11, section "Pesticide/PCB Compounds in Soil", all pesticides detected in the lower interval were at concentrations below their respective RBCs. This statement is incorrect. Chlordane was detected in the lower interval of sample GDCSB039 at 2800 mg/kg, which is above the RBC=490 ug/kg. In addition, 4-4-DDE was also detected at levels higher than its RBC in the upper interval, at locations GDCSB001, GDCSB006, GDCSB008, and GDCSB009. Three of them were above the RBC for Aroclor-1260 in the upper interval, and one of them much higher than the RBC in the lower soil interval. These should be corrected accordingly.

Response:

65. The text has been revised as noted in the revised report. (Page 10.7.12)

Comment:

66. From the review of grid-based groundwater data, Methylene Chloride was detected in one of two deep groundwater samples at levels of 12 ug/l, which is above its MCL=5 ug/l. It was concluded, based on literature , that the presence of Methylene Chloride is due to laboratory contamination. It should be demonstrated to the Department's satisfaction that this was the case. Otherwise, this detection could warrant further evaluation.

Response:

66. As noted previously, a summary of all quarters of groundwater data is presented in the final report. A review of the data has revealed that methylene chloride was not detected in any of the deep grid wells during any of the remaining quarters.

Comment:

67. Table 10.7.7 should be corrected according to the new approved reference concentrations for Zone C. The text should also be modified, if the change of reference concentrations warrants so.

Response:

67. Please refer to response to comment #4 above.

Comment:

68. The following grid-based locations, have signs of contamination in soil and possible effects to groundwater. These areas should be discussed further:

GDCSB001: High detections of PCBs and pesticides in soil. Four extra samples were taken to define the extent of contamination, if any (GDCSB045-GDCSB048). Pesticides were detected at lower concentrations which could have defined the area of contamination. This area could not be verified due to the impossibility of locating in the figures, locations GDCSB001, GDCSB045-GCDSB048. This draft report does not provide a conclusion about the effort put on this site. This should be addressed in the final report.

GDCSB008: PCBs and TPHs were both detected in upper and lower soil intervals. The lower interval detections could have very well impacted groundwater, due to the its

shallow nature. Again, this possibility should be discussed and a conclusion reached in the final report.

GDCSB039: This soil sample was taken as part of the effort to determine petroleum contamination around building 400. This sample found Chlordane, Dieldrin, and alpha-BHC in the lower soil interval, all above soil screening levels (SSLs). In addition, Chlordane was detected at levels greater than its RBCs in the upper soil level. There is the possibility of impact to groundwater and it should be discussed and a conclusion reached in the final report.

Response:

68. GDCSB001- The figure and text will be revised. GDCSB008 - The text will be revised to include a discussion of the potential for groundwater impacts. GDCSB039 - The text will be revised as noted and will include a review of data from wells in SWMU 25 which are immediately downgradient of the site. (Pages 10.7.13 and 10.7.14)

Comment:

69. Section 10.8 AOC 522 "The former grease and wash building". This site was designated for a CSI and only soil samples were proposed for this site. According to preliminary investigation results, Methylene Chloride has been detected in four of five samples at upper and lower soil intervals, with the concentrations at lower interval above soil screening levels, it is asked from the Navy to collect several groundwater samples to verify that it has not been impacted. These groundwater samples should be analyzed for volatile compounds (VOCs) and metals.

Response:

69. At the July 1997 project team meeting, data from the downgradient AOC 523 wells was reviewed and a consensus agreement was reached that no further investigation is required; however, at the October 1997 meeting the team reversed it's decision and agreed to collect two groundwater samples using DPT. This is the reason for the additional sampling recommendation in Section 11.0.

Comment:

70. Section 10.9 AOC 700 "Golf Course Maintenance Building" was designated for an RFI. For this purpose, only soil samples were proposed to collect. The preliminary results of the samples has the indication that VOCs were present at low concentrations. Also, dieldrin detection at 700SB005 was at levels higher than SSLs. Metals like Arsenic, were also detected at concentrations above SSLs and RBCs/UTLs . Chromium was detected at

levels above RBCs/UTLs and SSLs/UTLs at four locations. Nickel detections in the lower soil interval exceeded SSLs/UTLs. These detections warrant the collection of groundwater samples and analyze for pesticides, VOCs, and metals.

Response:

70. Per the July 1997 project team meeting, well NBCC-044-008, which is about 50 feet downgradient of the site was sampled for pesticides, SVOCs, and metals The results are discussed in Section 10.9.3.

Comment:

71. Corrective Measures requirements were discussed for each area investigation at Zone C. Table 11.1 "Zone C Site Conclusions" should be modified to reflect the considerations and comments produced from the review of the draft Zone C RFI report. Some of the conclusion would change after review and response to comments. This table should be modified accordingly. Section 11.0 may change also, depending on the re-evaluation of risk and selection of COPCs according to the new reference concentrations, therefore sections 11-1 to 11-8 were not reviewed due to the fact that they are subject to change due to previous comments.

Response:

71. The Zone C site conclusions and preliminary recommendations have been revised per the October 1997 project team meeting. (Section 11.0)

Comment:

72. The ecological risk summary in section 11.9, indicates that only subzone C-1 was evaluated for contaminants present in different media that could affect ecological receptors. According to this, subzone C-1 does not present a risk to terrestrial wildlife. There is a potential risk for vegetation due to copper and arsenic. Sediments in subzone C-1 has potential of risk for aquatic receptors because of the presence of As, Cu, Pb, Hg, Ni. The water quality at C-1 does not pose a risk. Subzones C-2 and C-3 were evaluated only for the presence of contaminants in soil. Data gaps still need to be filled. There is a potential risk to birds at subzone C-2 due to DDT. Terrestrial wildlife is not at risk at subzones C-2 or C-3. Vegetation is at risk at C-2 due to the presence of copper, lead, manganese and zinc. Based on this summary, subzone C-1 needs further evaluation and subzones C-2 and C-3 need to fill data gaps and possible further evaluation.

Response:

72. The Navy agrees with this comment. This section is already being revised to address the issues raised at the meeting in Atlanta, October 1996 at which many of the ecological issues were resolved.

ENVIRONMENTAL PROTECTION AGENCY
COMMENTS ON THE DRAFT ZONE C
RCRA FACILITY INVESTIGATION REPORT
Dated January 1996

GENERAL

Comment:

1. Comments on human health risk assessment are limited to Zone C specific concerns. Comments on the general procedure for human health risk assessment which were made in the Zone H RFI Report apply here also without restatement.

Response:

1. **The human health risk assessments comments made for the Zone H RFI Report will be reviewed and applicable changes made to the Zone C RFI Report.**

Comment:

2. The format used for Sections 5.0 (Nature and Extent of Contamination) and 10.0 (Site-Specific Evaluations) makes the text difficult to follow. Except for a discussion of data related to background comparisons, the actual nature and extent of contamination are not presented until Section 10.0, after the presentation of the risk assessments. It would be better to incorporate Section 10.0 in Section 5.0 for the Final Zone C RFI Report.

Response:

2. **The format used is intended to consolidate all the site specific information in one section to facilitate the review process. This format has been accepted by the project team and will continue to be used unless the team decides otherwise.**

Comment:

3. Based upon the data presented on Page 8-11, Table 8.2a, only one surface soil samples was used to evaluate risk to terrestrial receptors in Sub-zone C-1. Use of only one sample greatly increases the uncertainty associated with the risk characterization, since it is not known how representative it is of site conditions. Also, since the sample contained elevated levels of inorganics and was located at the northern part of SWMU 44, the northern extent of the surface soil contamination has not been defined. It is recommended that at least two additional surface soil samples be collected in Sub-zone C-1 and analyzed for use in the terrestrial ecological risk assessment for this sub-zone.

Response:

3. **Two additional surface soil samples were collected in the northern part of Subzone C-1 to define the northern extent of SWMU 44 contamination. The analytical results from**

these samples have been incorporated into Section 8.0 of the revised Zone C RFI Report. The locations are identified as 044SB025 and 044SB026 on Figure 8.2.

Comment:

4. The main purpose of sampling surface water and sediment at SWMU 44 (located in the vicinity of sub-zone C-1) was to check for possible contaminant migration from the SWMU 44 coal piles toward Noisette Creek. Pages 8-12 and 8-13, Tables 8.2b and 8.2c, apparently present sediment and surface water data for the drainage ditches/runoff pathways at SWMU 44. If these ditches contain aquatic habitats, risk can be determined for ecological receptors in the ditches themselves. However, the ditches are important as migration pathways to Noisette Creek and its aquatic receptors. This must be addressed in the risk assessment.

Response:

4. At the time of the sampling, aquatic habitats were not observed in the drainage ditches. The ecological risk posed by SWMU 44 to downgradient aquatic receptors has been preliminarily assessed through the evaluation of surface water and sediment samples collected in both the onsite drainage ditches themselves and at the outfall to Noisette Creek. A complete assessment of Noisette Creek will be conducted during the Zone J RFI and summarized in that RFI Report.

Comment:

5. Analytical data from the surface water and sediment samples collected in Noisette Creek in conjunctions with SWMU 44 (Pages 10-16 and 10-17, Figures 10.1.3 and 10.1.4) should be qualitatively compared to analytical data from the SWMU 44 surface soil and the ditch surface water and sediment to evaluate contaminant migration from SWMU 44 into Noisette Creek. The Noisette Creek data must also be compared to the surface water and sediment screening values to determine the potential for ecological risk. An further evaluation of risk through site-specific ecological sampling or testing would be deferred to the Zone J investigation.

Response:

5. See response to comment 4. The SWMU 44 surface water and sediment samples in Noisette Creek have been compared to upgradient SWMU 44 ditch samples. For a preliminary ecological risk assessment, the concentrations detected in the Zone C Noisette Creek samples will be compared to applicable screening values.

Comment:

6. Based upon Page 8-3, Figure 8.2, and the individual figures for the SWMUs and AOCs in Section 10, there are no SWMUs or AOCs at Sub-zone C-3 (detention ponds). In addition, it is not clear whether there are any SWMUs or AOCs with contaminant migration pathways to the Sub-zone C-3 ponds. Data used to evaluate risk to Sub-zone C-3 receptors apparently consists of grid-based surface soil data (Figure 8.2). According to Page 5-4, Section 5.2.1, the purpose of the grid-based soil samples was to determine background levels of inorganics, rather than soil contaminant concentrations related to SWMUs or AOCs. Therefore, the determination of terrestrial risk based upon the grid-based soil data is not appropriate and should be deleted from the risk assessment. If there are contaminant migration pathways from SWMUs and AOCs to the C-3 detention ponds, then surface water and sediment samples should be collected from the ponds, and the analytical data should be used to determine risk to receptors inhabiting or using the ponds.

Response:

6. **During the basewide ecological survey which was conducted prior to any AOC or SWMU-specific investigations in Zone C, the assessment of Subzone C-3 (formerly AEC III-2) was properly included in the Zone C RFI Work Plan because of the sensitive habitat types found therein and the uncertainty of any NAVBASE impacts on them. After subsequent Zone C assessments of the surrounding area, however, no significant SWMU or AOC-related contaminant migration pathways to the detention ponds were observed. Thus, it is agreed that with the absence of such pathways, an ecological risk assessment of Subzone C-3 is unnecessary. Therefore, the ERA of Subzone C-3 has been deleted from the revised Zone C RFI Report.**

   Furthermore, the only NAVBASE RFI site identified in the vicinity of the detention ponds is a portion of AOC 504, the base railyards. These railyards are being assessed during the Zone L RFI. If any contaminant migration pathways to Subzone C-3 are identified during the Zone L investigation of AOC 504, the necessary ecological risk assessment will be performed.

SPECIFIC

Comment:

1. Page vi, Table of Contents, List of Tables, Tables 2.7 and 8.7 - The footnotes are missing.

Response:

1. **The footnotes are included in the tables themselves. The footnote annotations have been removed from the Table of Contents.**

Comment:

2. Page xiii, Abbreviations, Acronyms, and Symbols for NAVBASE Zone C- The acronym and definition are provided for Wisconsin Occupational Health Laboratory. EPA does not understand the significance of these in the Naval Base Charleston Zone C RFI Report in South Carolina.

Response:

2. The acronym list provided is a generic, all inclusive list of acronyms used to date in the NAVBASE RFI documents.

Comment:

3. Pages 1-2 and 1-3, Figures 1.1 and Figure 1.2 - These figures are identical. Replace one of them with a figure showing the locations of all of the Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) within Zone C.

Response:

3. The figures have been replaced as follows: Figure 1.1 Vicinity Map; Figure 1.2 Locations of Land Holdings and Occupants; Figure 1.3 Investigative Zone Boundaries; Figure 1.4 Zone C Location Map.

Comment:

4. Page 5-2, Sections 5.0 and 5.1 - In the text, clarify that the comparison of detected organic and inorganic chemical concentrations to the USEPA Region 3 RBC Table pertains only to the protection of human health and does not address protection of ecological receptors.

Response:

4. The text has been revised as noted in the comment. (Page 5.1)

Comment:

5. Page 5-9, Section 5.2.5 - The statement is made that: This is the approach favored by the Ohio Environmental Protection Agency and the Texas Natural Resource Conservation Commission to determine whether onsite contamination is greater than background.

   Since Naval Base Charleston is located in South Carolina, the appropriate issue is not "the approach favored by the Ohio EPA and the Texas NRCC to determine whether onsite contamination is greater than background" but rather the approach favored by South Carolina.

Response:

5. Section 5.2.1 provides a description of the background method accepted by the project team for use in Zone C.

Comment:

6. Page 5-13, Section 5.2.9 - Reference to EPA documents is appropriate anytime; reference to other State's documents is not.

Response:

6. The reference to other state documents has been deleted. (Page 5.14)

Comment:

7. Page 6-1, Section 6.0 - The theory and application of Fate and Transport are discussed. The discussion leads up to, but stops short of, making a conclusion. The questions that need to be answered here are:

   a. What is the contamination, where is it coming from, where is it going, and how is it getting there? And,

   b. What is the horizontal and vertical extent of contamination?

Response:

7. The answers to these questions are provided in the Section 10 site specific discussions. Similar to comment 2 above, the intent was only to provide the theory in the early sections and provide the application in Section 10.

Comment:

8. Page 7-18, Section 7.3.6.5 - the statement is made that: Because Zone C is part of BRAC III, future site use cannot be assumed with certainty. The intent of this statement is unclear and open for a wide variety of interpretations. It should be clarified and specific.

Response:

8. Text has been added to state what is known about the intended future use of the Zone C area. The intent of the sentence was to inform the reader that, while proposed reuse plans exist, the plans are subject to change. To accommodate the potential for change, the risk assessment evaluates both a conservative future child resident

scenario and a less conservative future adult worker scenario to provide the risk managers a wide range of remedial goals. (Page 7.19)

Comment:

9. Page 8-1, Section 8.0 - The statement is made that: This methodology is described in detail in the Final Zone J RFI Work Plan (submitted November 22, 1995). This raises two points:

   a. A Comprehensive RFI Work Plan has been developed and approved for work to be done at two or more zones. Each Zone Work Plan is intended to be specific for that zone. Thus, any reference to a more detailed description of this methodology should be to either the Comprehensive RFI Work Plan or a Section in the Zone C RFI Work Plan.

   b. The Zone J RFI Work Plan is still draft and should be referred to accordingly.

Response:

9. The text has been revised to read: "This survey methodology, which is used in conjunction with the Zone C RFI Report, is also described in the Zone J RFI Work Plan." (Page 8.1)

Comment:

10. Page 8-3, Figure 8.2 - a. In the legend, add short descriptive phrases for the three ecological sub-zones (e.g., C1 - scrub-shrub area; C2 - low-lying grassy area with trees; C3 - detention ponds). b. In order to determine the possible relationship between SWMUs/AOCs and the ecological sub-zones, show the locations of the Zone C SWMUs and AOCs in this figure.

Response:

10. Figure 8.2 has been revised as requested.

Comment:

11. Page 8-4, Section 8.1 - In this section, or Page 8-8, Section 8.3, include a list of SWMUs and AOCs potentially affecting each of the three sub-zones in Zone C.

Response:

11. A table of SWMUs and AOCs associated with each subzone has been added. (Page 8.4)

Comment:

12. Page 8-5, Section 8.1 - For Sub-zone C-2, indicate whether the runoff ditches are possible contaminant migration pathways from AOC 512, and whether they flow into a tributary or end in the low-lying area at C-2.

Response:

12. The text has been revised to include the statement that the Subzone C-2 ditches are potential contaminant migration pathways from AOC 512 and that they ultimately drain into Noisette Creek. (Page 8.5)

Comment:

13. Page 8-8, Section 8.2 - Sub-zone C-1 and SWMU 44 are located adjacent to Noisette Creek. Therefore, add a comparison (table and text) of SWMU 44 ground water chemical concentrations to the Region 4 surface water screening values (See Page 10-24, Section 10.1.9.2).

Response:

13. Because Section 10.1.9.2 acknowledges the potential significance of groundwater to surface water contaminant transfer, either table 10.1.13 will be modified or a similar table created which compares groundwater data to ambient water quality criteria.

Comment:

14. Page 8-10, Section 8.3 - Clarify whether the inorganic analytical data for surface soils were compared to two times the background inorganic concentrations or to the "Upper Tolerance Limit of Background" (e.g., Page 8-18, Table 8.4b).

Response:

14. Inorganic analytical data were compared to Upper Tolerance Limits of background. The text has been corrected. (Page 8.9)

Comment:

15. Pages 8-11 through 8-18, Tables 8.2a through 8.4b - Include the measurement units for the columns headed "Upper Tolerance Limit of Background" and Effects Level."

Response:

15. The appropriate units have been added in the revised RFI Report. (Page 8.13)

Comment:

16. Page 8-13, Table 8.2c - a. Since the surface water quality criteria and screening values for some metals are hardness-dependent, add a footnote indicating what hardness value was used. (That is, were the criteria adjusted for site-specific hardness?). b. Since total chromium was measured in surface water, and hexavalent chromium is more soluble than trivalent chromium, include the chronic effects levels for both trivalent (103 μg/l) and hexavalent (50 μg/l) chromium. c. Include the freshwater screening value for iron (i.e., 1,000 μg/l).

Response:

16. A footnote has been added stating that the reported concentrations of hardness-dependent compounds have not been adjusted for site-specific hardness. (Page 8.15)

To be consistent with the effect levels presented in the table, the 1995 USEPA Chronic Freshwater Surface Water Screening Values for chromium III and VI (117.32 μg/l and 11μg/l, respectively) have been added.

The freshwater screening value for iron has been added.

Comment:

17. Pages 8-19 to 8-22, Section 8.4 - Although this section on "Stressor Characteristics" is under the heading "Contaminant Fate and Transport", it includes some information on ecological effects. In future RFI reports for other zones, it would be better to include all of the effects information in the same section.

Response:

17. **The ERA format has been revised so section headings are more consistent with the text provided below them.**

Comment:

18. Page 8-23, Section 8.5.1 - Revised the last line to read "qualitatively measured by comparing literature data on toxic effects to actual soil concentrations."

Response:

18. The text has been revised as requested. (Page 8.20)

Comment:

19. Page 8-24, Section 8.5.4 - Since Sub-zone C-3 consists of two detention ponds, check the first sentence to see if it should refer to Sub-zone C-1 instead of C-3.

Response:

19. The referenced text has been corrected. (Page 8.23)

Comment:

20. Page 8-30, Section 8.7 - The point made in Paragraph 1 about the use of different concentration units is understandable. However, since the analytical data are presented in units of μg/kg or mg/kg (for example), rather than in ppb or ppm, it is preferred that the former units be used in future discussions.

Response:

20. The units have been converted to μg/kg and mg/kg rather than ppb and ppm. The statement regarding different concentration units has been deleted since a "standardized" convention is now being used. (Page 8.30)

Comment:

21. Pages 8-30 to 8-37, Section 8.7 and 8.7.1, and Pages 8-54 to 8-56, Section 8.7.3 - Most of the information in these sections pertains to ecological effects and, therefore, would be more appropriate in Section 8.6 (Ecological Effects Assessment), beginning on Page 8-24. Risk characterization actually begins on Page 8-37 for terrestrial infaunal invertebrates and Page 8-56 for terrestrial vegetation.

Response:

21. This format discrepancy is noted and revisions have been made to Section 8 as requested.

Comment:

22. Page 8-37, Section 8.7.1 - a. General Comment - Include a statement indicating how risk to terrestrial infaunal invertebrates was characterized (e.g., for Sub-zone C-1, comparison of maximum surface soil concentrations for the Ecological Chemicals of Potential Concern (ECPCs) in Table 8.2a to ecological effects concentrations in Table 8.6). b. For Subzone C-1, the statement is made that, aside from copper, "Other inorganic concentrations were below effects levels reported in the literature." This statement is not fully supported. For example, Table 8.2a lists arsenic as an ECPC, but Table 8.6 does not include the ecological effects data for arsenic. Therefore, it is not clear whether arsenic presents a risk to terrestrial infaunal invertebrates. If ecological effects data are not available for particular ECPCs, say so in the text; the lack of effects data is an uncertainty with respect to the risk characterization, as mentioned on Page 8-58, Section 8.8. (This comment also applies to the other subzones discussed in this section.) c. Include the basis for the statement that "No risk to infaunal organisms from organic concentrations found at Subzone C-2 are predicted." d. This section states that "No inorganic data were available for soil within Subzone C-3." Since inorganic data for Subzone C-3 are presented on Page 8-18, Table 8.4b, the statement must be clarified.

Response:

22. **The text has been revised to explain the comparative method used for terrestrial infaunal invertebrate risk characterization. (Page 8.33)**

Further discussion regarding the uncertainties resulting from incalculable risk (i.e., no effects data) has been added to the revised section.

This statement has been revised to read "Risk to infaunal organisms from organic concentrations found at Subzone C-2 cannot be predicted due to lack of effects level information on the detected parameters."

Subzone C-3 has been deleted from the Zone C ERA (See the response to comment 6).

Comment:

23. Page 8-42, Table 8.11a - Check the series of U.S. Fish and Wildlife Service Contaminant Hazard Reviews by Ronald Eisler for reference toxicity values (RTVs) for the inorganics for birds (e.g., Eisler, Ronald. 1988. Arsenic Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review. USFWS Contaminant Hazard Reviews, Report No. 12.). Also, see RTVs for inorganics for the American Robin, Page 8-43, Table 8.11b.

Response:

23. The TRV values have been updated as requested in the revised RFI Report. (Page 8.41)

Comment:

24. Pages 8-38 to 8-53, Section 8.7.2 - Food chain calculations based upon maximum surface soil contaminant concentrations show a potential risk (sublethal effects) for terrestrial wildlife. Therefore, it is recommended that mean contaminant concentrations also be used in determining potential dietary exposure, to give a risk range and to determine whether risk is related to localized vs. widespread areas of high contaminant concentrations.

Response:

24. Both the maximum and mean contaminant concentrations will be used to assess localized and widespread risk. (Pages 8.34 - 8.49)

Comment:

25. Pages 8-56 to 8-57, Section 8.7.3 - a. Include a statement indicating how risk to terrestrial vegetation was characterized (e.g., for Sub-zone C-2, comparison of the maximum soil chemical concentrations for the ECPCs in Table 8.3 to the ecological effects concentrations in Table 8.14 and in the text.) b. For each sub-zone, indicate why "Effects from organic concentrations could not be assessed." (For example, lack of sampling data or lack of ecological effects data.)

Response:

25. The text has been revised to explain the comparative method used to characterize risk to terrestrial vegetation. (Pages 8.49 - 8.52)

Text has been added regarding how the absence of ecological effects data and sampling data for certain subzones prohibited the assessment of ecological effects from organic constituents.

Comment:

26. Page 8-57, Section 8.7.3 - The text states that the manganese concentration exceeded the effects levels reported in the literature, yet no literature data for manganese are presented on Page 8-55, Table 8.14, or in the text. Include the effects levels.

Response:

26. The reference to a manganese effect level was in error and has been deleted from the revised text.

Comment:

27. Page 8-57, Section 8.7.4 - a. In paragraph 1, last line, change "surface water quality" to "aquatic receptors." b. For Sub-zone C-1, include a reference to Page 8-13, Table 8.2c. State that iron and cadmium exceeded the water quality criteria (Table 8.2c and comment given above). Also, mention that surface water and sediment samples were not analyzed for organic compounds. c. As mentioned above, if the drainage ditches contain aquatic habitat, risk must be evaluated for aquatic receptors in the ditches. The risk characterization must include an evaluation of the potential for SWMU 44 contaminants (based upon concentrations of chemicals found in ditch surface water and sediment and in ground water) to migrate to Noisette Creek at levels that could pose a risk to aquatic receptors in the creek. Also, include an initial risk evaluation of the Noisette Creek surface water and sediment samples collected near SWMU 44. d. Explain why it would be difficult to determine "specific impacts to receptors" in relation to surface water and sediment chemicals which exceeded their effects levels. EPA Region 4 generally recommends that further evaluation and possibly site-specific biological testing be conducted for media samples with chemical concentrations exceeding the screening values.

Response:

27. The text has been revised as requested. (Page 8.53)

A reference to the table of inorganic constituents detected in Subzone C-1 surface water has been added. The fact that organic constituents were not analyzed for at Subzone C-1 has also been added along with a list of those inorganic concentrations which exceeded the water quality criteria. (Page 8.52)

Based on the conditions observed in the SWMU 44 ditches, it is unlikely that they could support a significant viable aquatic habitat.

The Navy agrees that biological testing could be used to answer the question concerning minimal impacts. However, since concentrations only minimally exceed screening values, a risk management decision should be made as to whether more sampling is really needed. The statement in the text has been revised. (Page 8.53)

Comment:

28. Page 8-59, Section 8.9 - a. As written, the ecological risk assessment does not present sufficient information to make a decision concerning the possible need for corrective action at different AOCs or SWMUs. Several data gaps are mentioned in the text and in comments contained herein. These data gaps must be addressed in order to finalize the ecological risk assessment. This again points out the apparent lack of a mechanism for proceeding from Phases I and II to Phase III of the ecological risk assessment prior to submission of a draft RFI Report. (EPA can work with EnSafe to recommend a mechanism appropriate to the Navy and EPA). b. Revise this section, based upon ecological risk comments given above.

Response:

28. Following the October 30, 1996 meeting with EPA and SCDHEC in Atlanta, the only data gap identified was the need to collect a couple more samples at SWMU 44. The mechanism to discuss site specific results and need for further action appears to be the project team meetings. The text is being revised per these comments and the October 1996 meeting agreements.

Comment:

29. Page 9-1 to 9-3, Sections 9.0 and 9.1, and Page 9-7, Section 9.4 - The wording in these sections implies that only human health concerns will be the basis for determining the need for a Corrective Measures Study. Depending upon the final outcome of the Ecological Risk Assessment, ecological concerns might also need to be addressed through corrective action.

Response:

29. The text has been revised to clearly state that ecological concerns will be included and addressed in the Corrective Measures Study. (Page 9.1)

Comment:

30. Page 9-9 to 9-11, Sections 9.4.2, 9.4.3, and 9.4.4 - These sections include consideration of "The potential for damage to domestic animals, wildlife, food chains, crops, vegetation, and physical structures caused by exposure to waste constituents." Since domestic animals, crops, and physical structures are not addressed in ecological risk assessments, it would be better to include them in a separate sentence.

Response:

30. The text has been revised as requested. (Page 9.9)

Comment:

31. Page 9-1, Section 9.0 says in part that: the RFI Report should discuss whether the extent of contamination has been defined, and propose recommended actions for the SWMUs and AOCs, such as collection of additional samples, proceed into a Corrective Measures Study, or No Further Investigation, whichever is appropriate.

    EPA agrees with this former SCDHEC comment. Yet, Section 9.0 does not fully satisfy this comment. This section summarizes what is contained in the USEPA guidance documents RCRA Corrective Action Plan (USEPA, 1994) rather than dealing with the site specific CMS issues. Section 9.0 is a very important section which should serve as a focal point for the rest of the Zone C RFI Report. It should summarize which areas are clean and require No Further Investigation, which areas need additional samples (how many, where, what type, etc.), and which areas should proceed into the Corrective Measures Study. Further, it should identify the boundaries of each site ("the extent of contamination"). The extent of contamination is critical to designing a CMS.

Response:

31. **Like most of the other sections which precede Section 10, Section 9 was primarily intended to discuss general issues. Section 10 and the conclusions/recommendations in Section 11.0 reflect consensus opinion of the project team regarding NFI on CMS decisions. The Navy agrees that if the extent of contamination is not adequately defined, these decisions cannot be made.**

Comment:

32. Page 9-26, Section 9.8 - A discussion is presented of a system for ranking the corrective measure alternatives. The statement is made that: The ranking system will apply a weighing factor selected by the Navy to determine the importance of each corrective measure criterion. However, the use to be made of that information is not provided. It should be noted that RCRA corrective action includes a public participation process. Specifically, while the Navy can recommend corrective measure alternatives, public input will be actively solicited and weighed heavily in the decision which will be made by the RCRA Permitting Authority (i.e., SCDHEC) as to which actual corrective measure is selected for each site. This emphasizes the importance of getting and keeping the Restoration Advisory Board informed and actively involved in the decision making process throughout the RFI and CMS.

Response:

32. The concerns expressed in this comment have been addressed by the development of a Comprehensive CMS Work Plan. During the development of that plan, the RAB's input was sought in determining the order of importance of the weighting factors.

Comment:

33. Page 10-2, Figure 10.1.1 - Since two sampling locations are labeled 044SB006, one of them needs to be corrected.

Response:

33. The discrepancy has been corrected.

Comment:

34. Page 10-9, Section 10.1.2 - In the cyanide discussion, the subject document states that 4.3 mg/kg is below the RBC of 160 μg/kg. The document seems to contain many errors such as this. It is recommended that this document be thoroughly proofed before resubmission.

Response:

34. The Navy agrees. The document will undergo both professional peer review and technical editing.

Comment:

35. Page 10-12, Table 10.1.6 - Please check the units. Even if it were possible to accurately analyze a contaminant at such levels, it is not possible to get samples that could be duplicated.

Response:

35. The units in the table have been verified.

Comment:

36. Page 10-13, Table 10.1.7 - This data should be reviewed and discussed in terms of sample turbidity.

Response:

36. Turbidity measurements were reviewed and are generally below 10 NTU. For inorganics and organics that have an affinity for adsorbing to entrained sediment, it is unlikely turbidity has had a significant effect on results.

Comment:

37. Page 10-1, Section 10.1, SWMU 44, Coal Storage Area - Apparently, arsenic (from the coal???) has contaminated the soil and groundwater at levels that may present a problem. This requires clear delineation.

Response:

37. Arsenic in shallow groundwater has been identified as a potential human health risk driver in Section 10.1.10.5 even though it was present a concentrations below it's MCL.

Comment:

38. Page 10-1, Section 10.2, SWMU 47 and AOC 516, Former Burning Dump - The cancer risk from groundwater is driven by a single detection of dimethyl benzidine. This is remarkable in that a benzidine compound was also found in groundwater at Zone H. Lead is present in groundwater at unacceptable levels. Lead is present in soil above the residential screening level of 400 mg/kg; however, the average lead concentration in soil is about 800 mg/kg and below the adult cleanup level of 1,300 mg/kg derived using the Bowers model. Given that the future use is expected to be a parking lot, lead in soil should not present a risk management problem.

Response:

38. The dimethyl benzidine was only detected during the first quarter of sampling and it's apparent presence can not be explained. The Navy shares a concern with lead levels in groundwater but is not ready to concede that remedial measures are required until ambient water quality issues are resolved. The exposure area for lead at the sites is being reduced to look at a 120 foot by 120 foot area with the maximum detection at 0445B007 used as the EPC. This should answer SCDHEC concerns regarding worst case.

Comment:

39. Page 10-1, Section 10.3, AOC 508, and AOC 511, Former Incinerator and Oil House - Lead was present in surface soil above the residential screening level of 400 mg/kg;

however, the high hit of lead was 768 mg/kg and should not present an unacceptable risk based on the future land use as a community support area.

Response:

39. The project team has agreed with this observation.

Comment:

40. Page 10-1, Section 10.4, AOC 515 and AOC 519, Former Incinerator and Boiler House - Disulfoton was indicated in Table 10.4.8 to be a COPC. However, it was detected below its RBC. The concentration given in the table was wrong and should be corrected.

Response:

40. The value presented was for a matrix spike sample which should not have been presented as a site constituent. Table 10.4.8 has been revised.

Comment:

41. Page 10-1, Section 10.5, AOC 523, Former Gas Station - Aluminum is a COPC in groundwater; for a residential scenario, it is present only very slightly above its RBC. Given the uncertainty with aluminum toxicity, this might become a risk management decision.

Response:

41. The Navy agrees with this observation.

Comment:

42. Page 11-1, Conclusions - The table on this page presents conclusions for the risk assessment to determine which sites should move to CMS. In general, EPA is in agreements with the conclusions in this table and feel, if anything, that these conclusions are overly conservative. For the ubiquitous contaminants lead and PAHs, the land use should be factored into the decision to perform a CMS.

Response:

42. The conclusions will be reviewed and a consensus agreement on site status reached by the project team prior to resubmittal of the report.

Comment:

43. Page 10-1, Section 10 - These discussions need to conclude with a discussion of the horizontal and vertical extent of contamination which is critical to the design of a Corrective Measures Study (CMS) where a CMS is needed and to the transfer of property where an area is demonstrated to be "environmentally clean". Maps should display these areas. Subsequent to the submission of this draft RFI Report, EPA has reviewed draft maps which have been developed to address this concern. EPA is satisfied that if these maps are developed, this concern would be adequately addressed.

Response:

43. The maps referred to are assumed to be the risk based maps presented to the project team. Risk and/or concentration maps have been included in the revised report.

Comment:

44. Page 10-1, Section 10.6.1 - The statement is made that: The Final Zone C Work Plan (E/A&H, February 1995) required residue sampling to be collected from a pit on the west of Building NH-21; however, no samples were collected since no sediment, liquid, or other residue was observed in the pit. The purpose for the pit sampling was to determine the results of possible releases of solvents from Building NH-21. This determination still needs to be made. In the future, EPA recommends that before such deviations are made from an approved work plan, Naval Base Charleston consult with SCDHEC and EPA.

Response:

44. The purpose of the pit sampling was to determine if any wastes remain which need to be properly characterized for disposal. The objective of assessing whether a release had occurred was met by installing soil borings outside the pit.

Comment:

45. Page 10-7, Table 10.6.2.4 - Check the high-end concentration in the chromium concentration range for a possible decimal error (i.e., 21.7 mg/kg rather than 21,700 mg/kg chromium?).

Response:

45. The result in question was for soil sample 512SB006-01 and the result was 21.7 ppm. Table 10.6.2.4 has been corrected.

Comment:

46. Page 10-14, Section 10.1.5, and Page 10-15, Section 10.1.7 - In the text, tell why sediment sample 044M0013 (Page 10-16, Figure 10.1.3) and surface water sample 044W0013 (Page 10-17, Figure 10.1.4) were not collected at the same location.

Response:

46. The text has been revised to note that no water was present when the sediment sample was collected; therefore, an alternate location was sampled. (Page 10.1.14)

Comment:

47. Page 10-90, Section 10.1.10.5 - The statement is made that: BEHP is a common lab artifact and detections in this range are often related to exogenous source. This raises three points: a. Good laboratory practice has ways of avoiding, or at least minimizing, lab artifacts. b. Good laboratory practice has ways of identifying when a chemical in a sample is a true sample ingredient and when it is a laboratory artifact. c. Simply identifying that a chemical is sometimes found as a lab artifact does not explain the chemical in the samples collected at Naval Base Charleston. Should such a lab artifact question arise, EPA would expect the laboratory to identify and resolve the issue or the Contractor to collect additional samples for analysis in a different laboratory. Fact rather than conjecture is needed here.

Response:

47. The Navy and their contractor have ensured via contractual mechanisms that the subcontract laboratories will follow proper quality assurance protocol. The data validation reports were provided as an appendix to support the statement made.

Comment:

48. Page 11-1, Section 11.0 - The discussion focuses on specific sites but does not relate the grid sites to the specific hazardous waste sites. This correlation needs to be made.

Response:

48. For those samples collected in conjunction with possible sites such as those collected around Building 400, a correlation has been made. (Page 10.7.3)

Comment:

49. Page 11-6, Section 11.9 - Revise this section as needed, based upon the comments given above.

Response:

49. This section will be revised per the comment responses and the October 1996 meeting in Atlanta.

Comment:

50. Page 13-1, Section 13.0 - The certification, required by regulation, is neither dated nor signed.

Response:

50. The final document will include a dated and signed certification page.