N60508.AR.000956
NAS WHITING FIELD
5090.3a

LETTER REGARDING REMEDIAL INVESTIGATION REPORT FOR SITE 15 NAS WHITING FIELD FL
1/19/1999
U S EPA REGION IV

03.01.15.0001

ID-00161

UNITED STATES ENVIRONMENTAL PROTECTI(
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

January 19, 1999

4WD-FFB

Ms. Linda Martin
Southern Division
Naval Facilities Engineering Command
P.O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

SUBJ: RI Report for Site 15

Dear Ms. Martin:

The United States Environmental Protection Agency (EPA) has received and reviewed the Remedial Investigation (RI) Report for Site 15, Southwest Landfill, at NAS Whiting Field, dated June 1998 . Enclosed are EPA's comments based on this review.

If you should have any questions or comments, please contact me at (404) 562-8555.

Sincerely,

Craig A. Benedikt

Craig A. Benedikt
Remedial Project Manager
Federal Facilities Branch

Enclosure

cc: Jim Cason, FDEP

EPA Review Comments Report for
Remedial Investigation Report for Site 15
Southwest Landfill
June 1998

GENERAL COMMENTS

1. In each of the statistical summary tables presented in the report, the mean of the detected concentrations is presented. Since any exceedances of the screening criteria should be based on the maximum detected concentrations, it is not clear why the mean of the detected concentrations are presented. This purpose of presenting the mean of the detected concentrations should be clarified.

2. The Soil Cleanup Goals for Florida (FSCGs) Memorandum from John M. Ruddell, dated September 29, 1995 states in the first paragraph that "If there is groundwater contamination above Florida standards and minimum criteria or if there was a recent discharge, the leachability-based cleanup goals should also be considered using the applicable direct contact scenario (residential and industrial). The lowest of the two should be the final cleanup goal for the upper two feet of soil. For below two feet, the leachability based-goal should be applied if the parameters of concern are detected above the Florida criteria." It is not apparent that this procedure was followed in the screening process. This should be clarified. It should also be noted that the FSCGs usually only apply to the upper two feet of soil as stated in the Applicability of Soil Cleanup Goals for Florida from John M. Ruddell, dated January 19, 1996. However, the report uses these goals for comparison to subsurface soils collected from depths to 12 feet below ground surface. This apparent deviation from the procedures specified in the RSCGs should be addressed.

3. Surface soil samples were collected from 0 to 12 inches. However, Florida guidance (as referenced in the previous comment) suggests that surface soil is defined as the upper two feet of soil. The rationale for collecting samples from 0 to 12 inches should be provided.

4. The statistical summary tables should identify the exceedances of the screening criteria by highlighting or bolding the analytes and/or the concentrations. In addition, figures should be provided to show the locations of the exceedances.

5. Several errors were noted in the text of the report including changes in font and redundant page numbers (for an example, see Page 5-46). The report should be reviewed carefully by the Navy.

SPECIFIC COMMENTS

6. **Page 1-1, Fifth Paragraph**. The depth of the trenches and information on whether the waste is located beneath the water table should be provided, if known (note that the test pit and monitoring well logs do not provide this information). This information is relevant to the Feasibility Study and the selection of alternatives and/or the design of the selected alternative. If not presently known, this information should be determined.

7. **Page 3-1, Eighth Paragraph**. Subsurface soil samples were collected in October 1992 and a soil gas survey for methane and total VOCs was conducted in September 1995. Figures 5-7 through 5-10 show the results of the screening at 1.5 feet and 3.0 feet below land surface. The following comments concern these soil gas survey results:

   It is not clear why subsurface soil samples were not collected during Phase IIB in the area from soil gas survey locations 17, 6, 97 and 98 (see Figures 5-7 and 5-9) on the western part of the site, or sample location 20 (Figure 5-9) on the northern part of the site. This additional information would have been useful in attempting to identify the source and nature of the VOCs which were shown by the soil gas concentrations as being in excess of 5,000 ppm. Justification for not collecting these subsurface soil samples should be provided.

   Groundwater samples collected downgradient of these elevated VOC areas (e.g., from WHF-15-1, WHF-15-6S, and WHF-15-6D) in 1996 and 1997 do not appear to substantiate the elevated VOC levels detected during the soil gas survey. Potential explanations for this anomaly should be provided.

8. **Page 3-5, Sixth Paragraph**. This paragraph does not continue logically to the next page of text (Page 3-7). It appears that a number of words are missing. This discrepancy should be corrected.

9. **Page 5-2, Figure 5-1**. It is recommended that an additional downgradient geologic cross-section be constructed. For example, WHF-1466-6 to WHF-15-7 to WH-15-6 to WHF-15-8 would be a good selection for constructing the additional geologic cross-section.

10. **Pages 5-16 and 5-17, Table 5-3**. Monitoring wells WHF-15-8S, WHF-15-8I, WHF-15-8D, WHF-16-7S, WHF-16-7I, and WHF-16-7D should be added to this table to provide vertical hydraulic gradients between Sites 15 & 16 and Clear Creek. In particular, the gradient for WHF- 16-7 may indicate whether the groundwater was discharging to Clear Creek on the date(s) that the measurements were collected.

11. **Page 5-19, First Paragraph**. This paragraph presents seepage velocities for the shallow zone of the aquifer only. The seepage velocities for the intermediate and deep zones should also be discussed.

12. **Page 5-20, Table 5-5**. The seepage velocities presented in this table only apply to the shallow zone of the sand and gravel aquifer. The seepage velocities for the intermediate and deep zones should also be presented in this table.

13. **Page 5-45, Second Paragraph**. This paragraph should be checked for accuracy (it appears that a sentence was repeated). In addition, a concentration of 1,7000 is listed. This should be corrected to 1,700, 17,000, or whatever is correct.

14. **Page 5-51, Table 5-14**. It seems highly coincidental that the mean of the detected concentrations is the same as the background concentrations for mercury through zinc. These numbers should be confirmed.

15. **Page 5-53, Fifth Paragraph**. It is stated that the preferred groundwater data set is from the Phase IIB sampling event since low-flow sampling methodology was applied. This statement is acceptable. However, Table 5-20 and 5-21 only present the statistics from the second Phase IIB sampling event in 1997. It is not clear why the data from the first Phase IIB sampling event in 1996 was not included. This should be explained and, if appropriate, the 1996 data should be added to the data set. In addition, note that the reference to Tables 6-20 and 6-21 in this paragraph should be Tables 5-20 and 5-21.

16. **Page 5-79, Fourth Paragraph**. With respect to the filtered and non-filtered samples, this paragraph should also note that, in several instances, the filtered samples contained higher concentrations of the same analytes than non-filtered samples. In addition, the authors of the RI report should be aware that EPA Region 4 will not consider the use of filtered samples in any steps of the CERCLA decision making process, including risk assessment determinations.

17. **Page 5-74, Table 5-20**. The reporting limit ranges for several analytes exceeded the screening criteria including 1,1-dichloroethene, 1,2-dichloroethane, benzene, trichloroethene, naphthalene, and bis-(2-ethylhexyl)phthalate. This should be noted in the text of the report.

18. **Page 5-76, Table 5-21**. The reporting limit range for antimony exceeded the screening criteria. This should be noted in the text of the report.

19. **Page 8-12, Sixth Paragraph**. It is noted in this paragraph that subsurface soil is discussed with respect to fate and transport. However, this discussion is missing from this section. A discussion of the fate and transport of contaminants in the subsurface soil should be added.

20. **Page 8-13, Second Paragraph**. This paragraph (regarding surface soil) states that the metals in the soil are not likely to be mobile since metal analytes readily adsorb to, or are natural constituents of, clays and other minerals. While the statement may be true, it is not apparent that it is highly applicable to the conditions at Site 15. The test pits and monitoring well logs show that the surface soil is predominantly sand. This paragraph should be modified or removed from the report.

21. **Page 8-13, Third Paragraph**. In addition to surface water contamination via runoff from contaminated surface soil, the potential for the contamination of Clear Creek via groundwater discharge should be discussed.

22. **Page 8-13, Seventh Paragraph**. According to this paragraph, contaminated sediment transport to Clear Creek is not believed possible. It should be stated that this hypothesis will be evaluated during the Site 39, Clear Creek Flood Plain investigation. Additionally, the surface transport of contaminated sediment to the ditch along the southern end of the site, and potential ecological exposure, should be discussed.

23. **Page 8-14, First Paragraph**. The last sentence states that Clear Creek is located 1500 feet southwest of the site. This is inconsistent with other statements in the report which specify the distance as 1200 feet (e.g., Page vi, Bullet 6). This discrepancy should be corrected.

24. **Page 8-14, Fifth Paragraph**. In the second sentence, it is stated that a seepage velocity of 139 feet/year was calculated for the surficial aquifer from eight monitoring wells at Site 15. This sentence should be clarified since:

    the identification of discrete aquifers ("surficial aquifer" implies that there are deeper aquifers) has not been made in the report, and

    the seepage velocity was calculated from four monitoring wells at Site 15 and four monitoring wells at Site 16.

    Additionally, the seepage velocity of 139 feet/year was calculated based on data from shallow monitoring wells and does not represent the seepage velocity of the deeper aquifer zones. Information on the seepage velocities in the deeper aquifer zones should be added. Also, it should be noted that WHF-15-2I and WHF-15-3I had significantly higher hydraulic conductivities (see Page 5-18, Table 5-4) than the shallow wells at Site 15.

    It is not clear why the last sentence contains the phrase "50-year time frame". The distance of 4,587 feet for potential contaminant migration is calculated based on the seepage velocity of 139 feet/year and a 33-year time frame. To avoid confusion, the "50-year time frame" should be removed. Furthermore, the calculation of the distance of potential contaminant migration should be based on the "worst-case scenario" using the maximum seepage velocity from the shallow, intermediate, and deep zones.

25. **Page 8-14, Seventh Paragraph**. It should be clarified whether additional sediment and surface water samples will be collected from Clear Creek in the RI for Site 39, Clear Creek Flood Plain, to evaluate the potential impacts of Site 15.

26. **Page 9-1, First Paragraph**. The second bullet refers to "total organic carbon" which is not relevant with respect to the soil gas survey. "Total organic carbon" should be replaced with "total VOCs".

The fifth bullet incorrectly states that the detected concentrations of arsenic in surface soil did not exceed the FDEP-approved site-specific non-residential goal of 4.2 ug/l (note that ug/l is not the correct units for soil samples). Table 5-10 on page 5-43 shows that arsenic concentrations ranged from 0.75 mg/kg to 6.8 mg/kg. In addition, the FDEP-approved site specific non-residential goal is shown as 4.62 mg/kg in Table 5-10 and not 4.2 ug/l as stated in this paragraph. These discrepancies should be corrected.

The first sentence of the sixth bullet should refer to "subsurface soil" samples and not "surface soil" samples. In addition, it is stated that the concentration of Arochlor-1242 exceeded the Florida industrial-use soil cleanup goal. However, the detected concentration was 2,200 ug/kg and the Florida industrial-use soil cleanup goal is 3,500 ug/kg (see Page 5-49, Table 5-13). The Region III RBC (industrial) was exceeded, as stated. These discrepancies should be corrected.

Site 15 Human Health and Ecological Risk Review Comments:

GENERAL COMMENTS

27. The results of investigations conducted at Site 15 are presented in Section 5 (Investigative Results section) of the document. Throughout the chapter, the analytical results and the various screening criteria are presented in table form for each media evaluated. Generally, it appears that USEPA Region III Risk-Based Concentrations (RBCs) are not adjusted by 0.1 for noncarcinogenic constituents. However, this does not seem to be consistent throughout the section. For example, it appears that the values have been adjusted on Table 5-14. The RBCs have been appropriately adjusted during screening in the risk assessment section of the document. Therefore, it is acceptable for the values to remain unadjusted in the Investigative Results section since they are presented for informational purposes only. However, the information that is presented should be consistent. Section 5 of the document should be reviewed and corrected accordingly.

SPECIFIC COMMENTS

28. **Section 5.5, Page 5-45**. The section presents a discussion of the surface soil analytical results for Site 15. The text states that dibutylphthalate was detected in six samples at concentrations ranging from 730 to 1,100 ug/kg. This is inconsistent with the information presented on Table 5-9. According to the table, the range of dibutylphthalate concentrations is 560 to 1,100 ug/kg. The discrepancy between the text and table should be corrected.

29. **Table 6-8**. The table presents a summary of the risks calculated for receptors identified under future land use. According to Table 6-8, the hazard indices calculated for ingestion of groundwater for the adult and child are three and seven, respectively. However, this is inconsistent with the values presented in Tables G-24 and G-25. These tables indicate that adult and child hazard indices are four and eight, respectively. The discrepancy should be corrected.

30. **Section 6.8, Page 6-34**. It is stated in the text that the human health contaminants of potential concern (HHCPCs) detected in subsurface soil do not pose unacceptable carcinogenic risk to the receptors evaluated. However, no subsurface HHCPC were identified at Site 15. The text of this section and the Executive Summary should be amended in order to avoid unnecessary confusion.

31. **Figure 7-2, Page 7-6**. Figure 7-2 shows the contaminant pathway model for Site 15 ecological receptors. Shading of the boxes indicates exposure pathways that are quantitatively evaluated for receptors in Site 15. Nonshaded boxes indicate insignificant exposure pathways. The soil-to-food-to-ingestion pathway for terrestrial invertebrates is not shaded meaning it is not considered to be a significant exposure pathway. This is somewhat misleading because the soil-to-food-to-ingestion pathway is a significant route of exposure. However, since the majority of food for terrestrial invertebrates comes from soil, exposure via soil ingestion and food ingestion can be lumped into one exposure route. Soil ingestion and food ingestion should both be shaded and a note should be provided about them being essentially one pathway and that they will be analyzed as such.

32. **Section 7.2.3, Pages 7-7 and 7-8**. This section presents the hypotheses developed to gauge risks associated with exposure to surface soil. Hypothesis number 4 on page 7-8 discusses ECPC in groundwater. The first sentence of the fifth paragraph on page 7-7 should be changed to, "Four hypotheses were developed to gauge potential risks associated with exposure to Site 15 surface soil *and groundwater*."

33. **Table 7-1, Page 7-8**. Table 7-1 shows the endpoints selected for the ecological risk assessment. In Section 7.2.3, the assessment endpoints are defined as representing the ecological component to be protected. However, in Table 7-1 the assessment endpoints for terrestrial plants and terrestrial invertebrates are stated as being a reduction in the biomass of terrestrial plants used as forage material and a reduction in the abundance of earthworms used as forage material, respectively. Reductions in forage material are not ecological components to be protected. The assessment endpoints in Table 7-1 are not consistent with the definition of an assessment endpoint provided in section 7.2.3. This inconsistency should be corrected.

34. **Table 7-2, Page 7-13**. Table 7-2 provides information on the selection of ECPCs such as detected concentrations and screening values. It is reported in Table 7-2 that the ecological screening value for zinc is not available. However, when referencing Beyer (1990), a screening value of 200 mg/kg was found. This value should be use in Table 7-2.

35. **Section 7.4.1, Page 7-18**. The second paragraph on page 7-18 involves groundwater EPCs. It is explained that a 10-fold attenuation factor is applied to the RME concentration in order to derive a realistic exposure concentration for groundwater constituents in the surface water of Clear Creek. It is unclear as to how the "10-fold attenuation factor" was derived. This needs to be clarified.

36. **Section 7.4.2, Page 7-18**. Several sections in chapter 7 (e.g. Section 7.4.2 and Section 7.3) refer the reader to information in the General Information Report (GIR) prepared by ABB-ES in 1998. Information such as PDE calculation methodologies and background investigation data are only available in the GIR and are not provided in this report. It would be helpful for pertinent information to be provided in an appendix to this report.

37. **Table 7-4, Page 7-19**. This table provides the equations used to calculate the potential dietary exposures for wildlife receptors. The variable "TN" is given three different definitions in Table 7-3. They are as follows, 1) the tissue concentration in food item N, 2) the secondary prey item concentration, and 3) the primary prey item concentration. Clarification (e.g., T_p for primary prey item tissue concentration and T_s for secondary prey item tissue concentration) in Table 7-3 would be beneficial.

The rationale provided in the ERA for not calculating bird tissue concentrations is the lack of avian bioaccumulation factors (BAFs). Since contaminant concentrations in birds as a secondary prey items were not calculated, it should be stated in section 7.4 how PDEs for the red fox and red-tailed hawk were calculated without the avian BAFs.

38. **Section 7.4.2, Pages 7-18 and 7-20**. The second bullet in Section 7.4.2 provides a discussion of the short-tailed shrew as a wildlife receptor. The home range of the short-tailed shrew is not provided in this discussion although the home ranges for other ecological receptors are provided in this section. The home range of the short-tailed shrew should be provided in the first bullet.

The second bullet on page 7-20 provides a discussion of the red-tailed hawk as a wildlife receptor. The home range of the red-tailed hawk is not provided in this discussion, although the home ranges for other ecological receptors are provided in this section. The home range of the red-tailed hawk should be provided in the fourth bullet.

39. **Table 7-6, Page 7-21**. This table describes the exposure parameters for representative wildlife species used as receptors in this remedial investigation. Many of the parameters are cited from the *Wildlife Exposure Factors Handbook* (USEPA, 1993); however, it is not consistently stated whether an average of the exposure parameter is calculated or if a certain study was selected. For example, it is not explained in Table 7-5 how the values in the column titled, "Assumed Diet for Terrestrial Exposure Assessment (% of diet)," were derived. The dietary composition data for the deer mouse (surrogate for the cotton mouse) provided in the handbook are seasonal percentages with invertebrates comprising as much as 63% of the deer mouse's diet, but Table 7-6 states that invertebrates make up 10% of the deer mouse's diet. It should be clarified in Table 7-6 how the values in the dietary composition column were derived from the data provided in the handbook.

The food ingestion rate (FIR) for the red-tailed hawk was calculated using the bird equation based on body weight from the *Wildlife Exposure Factors Handbook* (USEPA, 1993). An FIR of 0.133 kg/day for the red-tailed hawk is presented in table 7-6; however, when calculated using the EPA bird equation and the body weight provided in Table 7-6, an FIR of 0.059 kg/day results. This calculation should be reevaluated and checked for accuracy.

In Table 7-6 it is stated that the body weight of the red-tailed hawk is 1.02 kg with a footnote of [I]. However, footnote [I] refers to the bird food ingestion equation, not to the derivation of body weight. The footnote for the red-tailed hawk body weight should be changed to indicate the source of the body weight value.

40. **Section 7.6.4, Page 7-32**. In this section, it was concluded that it is unlikely that the predicted levels of zinc in the groundwater will have an adverse effect on aquatic receptors in Clear Creek. This was concluded in spite of the fact that the predicted groundwater exposure concentrations of zinc (27 μg/L) exceed the AQUIRE value of 17 μg/L. The reasoning behind this conclusion is that a review of additional AQUIRE data for zinc indicated that the predicted 27 μg/L exposure concentration would not result in adverse effects to the majority of the aquatic receptors in Clear Creek. Although this conclusion is believed to be accurate, the reasoning behind this conclusion should be further discussed in this section.

41. **Section 9.1, Page 9-1**. The text states that three volatile organic compounds (VOCs), seven semi-volatile organic compounds (SVOCs), and one pesticide compound were detected in Site 15 surface soil samples. However, these constituents are actually found in subsurface soil samples. The text of this section and the Executive Summary should be corrected accordingly.

42. **Table H-1**. This table presents bioaccumulation factors (BAFs) for terrestrial invertebrates, terrestrial plants, mammals, and birds.

It is not possible to confirm the mammal BAFs for semivolatiles using the cited Travis and Arms equation for biotransfer factors with conversion to BAFs. The average ingestion rate used for this calculation in the ERA was not provided. Provide more information on the calculation of the mammal BAFs and re-confirm the calculated mammal BAFs.

Table F-1 provides a plant BAF of 6.7E-03 for bis(2-ethylhexyl)phthalate, Di-n-butylphthalate, and butylbenzylphthalate. However, when recalculated using the equation in footnote [d], a plant BAF of 8.7E-03 was obtained for bis(2-ethylhexyl)phthalate, 7.6E-03 for Di-n-butylphthalate, and 1.1E-02 for butylbenzylphthalate. Please review these calculations and address the discrepancies.

43. **Table H-2**. Table H-2 presents ingestion toxicity information. The Lowest Observed Adverse Effect Level (LOAEL) column heading should not be under the lethal reference toxicity value (RTV) heading. The LOAEL should be presented only with sublethal RTVs. The column headings need to be verified to ensure that they reflect the data in the column and be revised as necessary.

44. **Table H-3**. Table H-3 presents the RTVs selected for the ERA while Table H-2 presents ingestion toxicity data for wildlife.

For zinc, an LD50 derived lethal RTV of 502 mg/kg/BW/day was used in Table H-3 and a LOAEL derived sublethal RTV of 20 mg/kg/BW/day was used in Table H-3. However a lower lethal RTV of 3.9 mg/kg/BW/day and a lower sublethal RTV of 16 mg/kg/BW/day are both available as listed in Table H-2. The lowest possible RTVs should be used in Table H-3. Please review this calculation and address this discrepancy.

EDITORIAL COMMENTS

45. **Section 7.5, Page 7-25**. The first sentence on page 7-25 mentions Site 18 when it is believed that Site 15 is being referred to. This discrepancy should be addressed.