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NAS KEY WEST
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LETTER OF TRANSMITTAL AND U S EPA REGION IV COMMENTS ON SUPPLEMENTAL RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION AND REMEDIAL INVESTIGATION FOR EIGHT SITES NAS KEY WEST FL
9/25/1997
U S EPA REGION IV

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Mr. Dudley Patrick
Code 1852
Southern Division
Naval Facilities Engineering Command
2155 Eagle Dr.
Charleston, S.C. 29418

SUBJ: Naval Air Station (NAS) Key West, Florida
EPA ID# FL6 170 022 952
EPA Comments

Dear Mr. Patrick:

EPA has reviewed the following document:

o **Supplemental RFI and RI Report for Naval Air Station Key West - Eight Sites**; Brown & Root, Env., June 1997

and has enclosed its comments with this letter. If you have any questions, please contact me at 404/562-8533.

Sincerely,

Martha Berry
Remedial Project Manager
Federal Facilities Branch

Enclosure

cc: Jorge Caspary, FDEP
Ron Demes, NAS Key West
Phillip Williams, NAS Key West
Charles Bryan, Brown & Root
Roy Hoekstra, Bechtel

EPA COMMENTS
DRAFT SUPPLEMENTAL RCRA FACILITY INVESTIGATION AND REMEDIAL INVESTIGATION REPORT FOR
NAVAL AIR STATION KEY WEST
EIGHT SITES
BROWN & ROOT, Env., JUNE 1997

For convenience, these comments are organized into two sections. Sections 2.0 and 3.0 of this enclosure contain general and specific comments, respectively. The general comments in Section 2.0 pertain to concerns identified throughout the Supplemental RFI/RI Report. The specific comments in Section 3.0 identify concerns within individual chapters, pages, sections, paragraphs, figures, tables and appendices of the document.

2.0 GENERAL COMMENTS

1. Significant amounts of fill material appear to be associated with almost all of the building structures and improved parking areas. Some of the unusual patterns/trends in the contaminant level data, which lead to the conclusion that the identified contaminants are not site related, could in fact be related to the fill material. The text does not provide adequate detail on the surface and subsurface soil conditions to indicate if unexplained elevated contaminant levels could be associated with the fill materials in these areas. A general review of the historical and typical practices for obtaining and using fill material should be provided in the text.

2. It is stated in chapters 2, 5, 7, 8 and 9 that inorganic contamination detected in groundwater samples collected during the 1996 investigation was greatly reduced compared to inorganic contamination detected in previous investigations. From this text, it can be inferred that sampling methods used in prior investigations may have had an impact on the level of sample turbidity and on inorganic analysis results (e.g. samples with higher turbidity can result in higher inorganic concentration results). If this inference is correct, then the previous groundwater sample collection techniques, including methods for purging the monitoring wells, should be included as an explanation for the differences in detected inorganic contamination.

3. Shellfish tissues were collected at several of the eight sites, but neither recreational nor subsistence fisherman scenarios were evaluated at any of the sites. It seems reasonable that the types of shellfish sampled may be actively pursued and consumed by local fisherman. These potential exposure pathways should be evaluated at the applicable sites.

4. The Lower Keys marsh rabbit, cotton rat, raccoon, American kestrel, and great blue heron were chosen as ecological receptors for all eight sites at Naval Air Station (NAS) Key West, regardless of the nature and extent of contamination or the habitat at the sites. These receptors are not sufficient for some sites, and as a result, ecological risk was not adequately assessed. For example, the nature and extent of contamination at Area of Concern (AOC) B is primarily aquatic. Concentrations of metals in the sediment and surface water, such as iron and zinc, exceeded sediment and surface water ecological thresholds. Although these

contaminants may not pose a risk to the five chosen ecological receptors, they may pose a risk to the aquatic community. Similar scenarios occur at sites with terrestrial habitats. As a result, aquatic organisms and passerine birds should be included as ecological receptors in the risk assessment, where appropriate.

5. Some less conservative ecological threshold values are used in the ecological risk assessment to screen for chemicals of potential concern (COPC) when more conservative threshold values are available. For example, the sediment threshold values of 261 µg/kg (Effects Range Low, Long et al. 1995, as stated in the document) and 1,600 µg/kg (Effects Range Median, Long et al. 1995, as stated in the document) for benzo(a)anthracene were chosen as sediment threshold values (Table C.3-20, page C-134) to screen for COPCs in the ecological risk assessment. More conservative sediment threshold values of 74.8 µg/kg and 693 µg/kg from the Florida Department of Environmental Protection (FDEP) are available (FDEP 1994). The most conservative ecological threshold values should be used in ecological risk assessments to ensure protection of ecological receptors. The current ecological threshold values used in this document should be replaced with the more conservative threshold values, if available, and the ecological risk assessment should be revised to reflect these changes.

6. It is stated in the text of the "Ecological Effects Characterization" sections for each site that contaminant intake dose models, estimated doses, and toxicity reference values (TRV) for each ecological receptor are provided in Appendix B, Part 4. This is incorrect. Only example dose calculations for representative receptors using analytical data from solid waste management unit (SWMU) 4 are presented in Appendix B, Part 4. These calculations should be included for each site. Without these calculations, risk estimates cannot be verified for the remaining sites.

7. Conceptual site models do not include aquatic plant uptake and ingestion of aquatic plants for the sediment exposure scenario or ingestion of prey for the surface water exposure scenario, although these exposures were assessed in the risk assessment. These exposure scenarios should be included in the conceptual site models.

   In addition, ingestion of prey is included in the plant exposure scenario in the conceptual site models. This exposure seems unlikely and ingestion of prey should be omitted from the plant exposure scenario in the conceptual site model.

8. Brief descriptions of each COPC at NAS Key West are provided in Appendix B, Part 3. These descriptions are used in the ecological effects characterization for each of the eight sites within NAS Key West. Although some COPC descriptions include the information necessary to characterize ecological effects, some do not. Ecological effects characterization should include an evaluation of effects data relevant to the stressor and should encompass all ecosystems found at NAS Key West. Fate in the environment, site-specific conditions, and chemical structure-activity relationships should be included when characterizing stressors. Sublethal effects and modes of toxicity should be presented for all types of ecological receptors found at NAS Key West.

9. Bioaccumulation/bioconcentration factors (BAF/BCF) and soil-to-plant biotransfer factors were not provided for food chain modeling calculations. For example, models were used to predict contaminant concentration in kestrel prey from soil and plant contaminant concentrations. Values such as predicted contaminant concentrations from intake of meat were provided, but BAFs used to model these concentrations were not. All parameters used in the food chain models for all ecological receptors should be presented in the risk assessment.

10. It is not clear in the text whether concentrations of metals in surface water are measured as total or as dissolved. The method used to analyze surface water metal concentrations should be provided.

11. Page numbers are not provided for pages in Appendix B, Part 4 or Appendix G. Page numbers should be provided on all pages in the document.

3.0 SPECIFIC COMMENTS

1. **Executive Summary, Table ES-1, Summary of Conclusions, Page ES-4.** This table summarizes the human health and ecological risk assessment conclusions. The table identifies potential ecological risk for SWMU 7, installation restoration (IR) 1, and IR 8. A brief description of the potential ecological risk should be included for each of these sites in the table.

2. **Chapter 2, Page 2-3, Section 2.2.1, Paragraph 2**. The text states "Characterization of releases at the site indicated that contaminants exceeding regulatory standards did not appear to be the result of onsite waste disposal operations (IT Corporation, 1994)." Information on the affected media and the contaminant concentrations should be provided to support this statement.

3. **Chapter 2, Page 2-21, Figure 2-6**. Figure 2-6 details the subsurface soil chemical concentrations for Solid Waste Management Unit 4 (SWMU 4). Sample location S4SB-2 is identified as being collected at 0.5 feet; however, this sample should be designated as a surface soil sample. This discrepancy should be revised.

4. **Chapter 2, Section 2.6.2.2, Page 2-66, Paragraph 2**. The text states that dibromomethane was selected as a COPC and that the compound has an "available quantitative toxicity value." However, the listing of COPCs on Page 2-61 indicates that dibromomethane does not have a quantitative toxicity value. This discrepancy should be corrected.

5. **Section 2.7.2, Page 2-97, Paragraph 1.** The text states that the raccoon was not selected as a representative mammalian carnivore in the food chain modeling at SWMU 4 because COPCs did not include contaminants that biomagnify in the food chain, or were detected infrequently and at low concentrations. Organochlorine pesticides, such as dieldrin and heptachlor, were found in fish tissue at the site. Because crustaceans were not sampled for contamination, it should be conservatively assumed that crustacean tissue would also contain similar concentrations of pesticides as fish tissue. If raccoons are found at the site and ingest

potentially contaminated prey, the raccoon should be included as a representative species in the food chain model.

6. **Section 2.7.4.1.4, Pages 2-103 through 2-112.** This section discusses the food chain modeling for ecological receptors on site SWMU 4. The text previously states in Section 2.7.4.1.3 that 4,4'-dichlorodiphenyl dichloroethane (DDD), 4,4'-dichlorodiphenyl trichloroethane (DDT), gamma-benzene hexachloride (BHC), and endrin aldehyde were detected in red mangrove foliage collected from the edge of the marsh where Lower Keys marsh rabbit scat was observed. These contaminants are not included in the food chain modeling for the marsh rabbit or the cotton rat, even though both species are herbivores. Either the reason these contaminants were excluded should be explained or these contaminants should be included in the risk assessment.

7. **Chapter 2, Section 2.8**. The conclusion should include a reference to the need for land use restrictions.

8. **Chapter 3, Page 3-3, Section 3.2, General**. From Section 3.2.1, it can be inferred that an Interim Remedial Action (IRA) was conducted to reduce migration of contamination. However, the text does not mention what IRA activities were conducted or how these activities relate to the rationale for the current investigation. This discrepancy should be addressed.

9. **Chapter 3, Page 3-17, Figure 3-6**. Surface and subsurface results should be reported on different figures.

10. **Chapter 3, Section 3.6.7.1, Page 3-68, Paragraph 1**. The text states that "arsenic was chosen as a COC in soil." However, this paragraph describes the selection of COCs in sediment. The text should be amended accordingly.

11. **Section 3.7.2, Page 3-89, Paragraph 2.** The text states that the raccoon was not selected as a representative mammalian carnivore in the food chain modeling at SWMU 5 because COPCs did not include contaminants that biomagnify in the food chain, or were detected infrequently and at low concentrations. Organochlorine pesticides, such as DDT and endosulfan sulfate, were found in fish tissue at the site. Because crustaceans were not sampled for contamination, it should be conservatively assumed that crustacean tissue would also contain similar concentrations of pesticides as fish tissue. If raccoons are found at the site and ingest potentially contaminated prey, the raccoon should be included as a representative species in the food chain model.

12. **Section 3.7.4.1.4, Page 3-103, Paragraph 0.** The sentence at the end of the paragraph should be completed, or the word "discussion" should be deleted from the text.

13. **Chapter 4, Page 4-1, Section 4.1**. This section states, "Sediment in the ditch is eroded from the limestone and fill material present at the site." Information should be included about the condition of the area from which the fill material was taken in order to clarify whether or not the contamination in the ditch is caused by chemicals found in the fill material.

14. **Chapter 4, Page 4-13, Section 4.2.2.1**. This section outlines the reasons for collecting additional samples of all media, except subsurface soil, at SWMU 7. This section should be modified to include the reason for collecting additional subsurface soil samples in 1996.

15. **Chapter 4, Page 4-13, Section 4.2.2.2, General**. Subsections within this section discuss and list analytical parameters for surface soil, surface water, sediment and groundwater samples. Subsurface soil samples were analyzed in previous investigations, however, no discussion of subsurface soil analytical parameters is included in Chapter 4. Chapter 4 should be revised to include a discussion of the subsurface soil analytical parameters used.

16. **Chapter 4, Page 4-14, Section 4.2.2.2.2**. This section states that neither surface water nor sediments related to SWMU 7 were previously sampled. However, Section 4.4.3 on Page 4-30 states that sediments were sampled during the 1993 IT Corporation RFI/RI. This discrepancy should be corrected.

17. **Chapter 4, Page 4-15, Section 4.3.1, Paragraph 2**. This paragraph states that the direction of groundwater flow, as indicated on Figure 4-5, is toward the southwest. However, the groundwater flow direction depicted in Figure 4-5 is toward the southeast. This discrepancy should be corrected.

18. **Section 4.3.1, Page 4-15 and Figure 4-5, Page 4-11**. The direction of groundwater flow seems to be away from the pond. If there is an explanation, please reference it.

19. **Figure 4-6, Page 4-19**. Samples taken from 0-1' should be considered surface soil samples for the purposes of risk assessment.

20. **Chapter 4, Section 4.4.3.2, Page 4-37, Paragraph 4**. The text states that:

> Endrin was selected as a COPC based on the fact that its hazard quotient was greater than one; however, endrin concentrations in sediment at SWMU 7 were less than twice the average background concentration which was selected for nature and extent screening.

It is not appropriate to screen organic compounds against a "two times background" value. Reference to screening endrin concentrations against a background-based screening value should be deleted.

21. **Chapter 4, Section 4.6.2.2, Page 4-63, Paragraph 1**. The text states that "no quantitative values are listed for those chemicals identified with an asterisk (*); therefore, they will be evaluated quantitatively in the uncertainty section. However, a qualitative evaluation is presented in the uncertainty section. The discrepancy should be corrected.

22. **Table 4-26, Page 4-86**. There is a typo on this page.

23. **Section 4.7.1.1, Page 4-93, Paragraph 5**. "...a small pond" in the second sentence should be replaced with "two small ponds."

24. **Section 4.7.1.1, Page 4-94, Paragraph 0 and Paragraph 1.** This section discusses the habitat types at site SWMU 7. Paragraph 0 states that surface water in the two ponds and ditch are not hydrologically connected to any other water bodies, and there are no other surface water resources at the site. However, the following paragraph states that water levels in the ponds and the ditch are probably maintained by other inputs and shallow groundwater. These statements contradict. If groundwater contributes to the water levels in the pond and ditch, it appears that the surface water in the ponds and ditch are hydrologically connected. This contradiction should be explained, or the statement in paragraph 0 should be deleted.

25. **Section 4.7.1.1, Page 4-96, Paragraph 2.** This paragraph discusses the use of habitat by ecological receptors at SWMU 7. The text states that water depth along the shoreline of the ponds of approximately 2 feet prevents foraging at the site by wading piscivorous birds. The basis for this reasoning is unclear. This statement should be justified by literature or this statement should be removed and the risk assessment should be revised to include the great blue heron or another piscivorous wading or diving bird as an ecological receptor at the site.

26. **Section 4.7.4.2, Page 4-116, Paragraph 3.** The text states that although the hazard quotient (HQ) of 130 for cyanide in sediments at SWMU 7 was indicative of high potential risk in one 1993 sediment sample, it was not detected in another 1993 sample. Cyanide was not detected in five 1996 samples because spike recoveries were below quality control limits. As a result, cyanide results can only be interpreted as inconclusive. Therefore, cyanide should remain as a potential ecological risk.

27. **Chapter 5, Page 5-15, Section 5.4.1, Paragraph 1**. It is unclear as to whether or not subsurface soil samples, collected from the "border" of an area which has since been excavated, were collected within this area. The text states that "all subsurface samples were taken near the southwest corner of the area that was later excavated." Figure 5-6 on Page 5-19 indicates that several of the subsurface soil sample locations were on the border of the area that was excavated. Given these facts, additional text is needed in Section 5.4.1 to explain why sample results from the border of the excavated area will be used in the risk assessment when the soil from which the samples were collected may have been removed from the site during the excavation. The text also states that the "samples were taken at a depth of 1 foot." The last paragraph in Section 5.2.1 on Page 5-3 states that soil was excavated to a depth of 3 to 18 inches. This depth discrepancy should be clarified.

28. **Chapter 5, Section 5.4.5.5, Page 5-74, Paragraph 2**. The text states that "only four inorganic parameters (antimony, iron, lead, manganese, and selenium) exceeded screening values", which are five chemicals. The discrepancy should be corrected.

29. **Chapter 5, Section 5.5.1, Page 5-79, Paragraph 3**. The text states that "testing for VOCs/SVOCs was performed only on a limited number of samples, if at all, in the other media at IR1". The adequacy of the available data should be addressed in the text.

30. **Section 5.7.4.2, Pages 5-152 through 5-165**. This section presents a discussion of the results of the ecological risk characterization. Hazard indices (HI) are not presented for site IR 1, although TRVs and HQs were calculated for ecological receptors. HI tables for each ecological receptor at the site should be presented in the document.

31. **Chapter 6, Section 6.3.1, Page 6-10, Paragraph 2**. The text states that the depth to groundwater "ranged from approximately 3.6 feet to 4.7 feet bls". This is inconsistent with the groundwater depths presented in Figure 6-3. Appropriate changes should be made.

32. **Chapter 6, Section 6.5.1, Page 6-35, Paragraph 2**. The text states that "although pesticide contamination was expected due to the site's previous use as a DDT mixing area, an inorganic contaminant source cannot be identified based on known site activities". Many insecticides have historically contained metals, such as arsenic and cadmium. It seems reasonable that insecticides that were mixed at the site may be a potential source of at least some of the inorganic contaminants present. Past pesticide use should be evaluated as a potential source of inorganic contamination.

33. **Chapter 6, Section 6.6.2.1, Page 6-38, Paragraph 3**. The text states that "no subsurface soil samples were collected at IR3". This statement raises doubt as to the adequacy of the site characterization. Additional information regarding the decision to not collect subsurface soil samples should be provided so that the characterization of the site can be evaluated.

34. **Chapter 6, Section 6.6.4, Page 6-43**. This section presents the potential receptors evaluated at this site. According to this paragraph, the future resident scenario was not evaluated.

35. **Chapter 6, Section 6.6.5.1, Page 6-44**. In this section, the phrase "greater than the EPA 'target risk range' of 1E-04 and 1E-06" is used to describe a range of values (2E-05 to 3E-06) that does not exceed the target risk range. The text should be changed to indicate that these values are not "greater" than the target risk range.

36. **Chapter 7, Page 7-17, Figure 7-6**. The figure includes both subsurface and surface soil sample data. However, the surface data which exceeds screening values is not designated clearly. Figure 7-6 should clearly identify the surface soil data which exceeds the screening values.

37. **Chapter 7, Page 7-31, Section 7.4.3.2, Paragraph 2**. A brief discussion indicating the source of semi-volatile organic compounds (SVOCs) in sediment samples should be provided to more accurately depict the nature and extent of contamination.

38. **Chapter 7, Page 7-57, Section 7.4.5.2, Paragraph 2**. The text states that "SVOCs were not tested in groundwater in 1996." However, although SVOCs were previously detected (1990 and 1993 sampling events), there is no explanation as to why they were not tested in groundwater in 1996. It appears that these previously detected SVOCs and their respective concentrations (from 1990 and 1993 sampling events) do not present a risk to human health and the environment. If this is true, then it needs to be further explained.

39. **Chapter 7, Section 7.8, Page 7-154.** The conclusion should include a reference to the need for land use restrictions.

40. **Chapter 8, Page 8-20, Section 8.4.2, Paragraph 1**. This paragraph states that "surface-soil metals were found near the center of the site, west of the ammunition storage area." However, as depicted in Figure 8-6 on Page 8-17, the only surface soil samples collected

were from an area in the center of the site. This would not appear to provide a complete representation of contamination over the entire site. An explanation of the rationale used in determining surface soil sampling locations should be included in this section.

41. **Chapter 9, Page 9-42, Section 9.4.4, Paragraph 3**. The grab samples collected from a borehole in 1993 exhibited numerous metals above the screening values, while the monitoring well samples collected at the same site in 1996 indicated thallium as the only inorganic contaminant above screening levels. The text should examine the possible link between the groundwater sample collection techniques employed in 1993 and 1996 and the differences in inorganic concentrations instead of stating only that "Groundwater contamination beneath the site is predominantly attributable to metals."

42. **Section 9.7.1.4, Page 9-108.** This section discusses the selection of COPCs for site AOC B. The text states that iron was excluded in all media but surface water because it is an essential nutrient that is toxic in extremely high concentrations. While this may be true, iron concentrations (116,000 milligrams per kilogram (mg/kg)) were found in sediment well in excess of ecological threshold values for sediment (20,000 mg/kg, Hull and Suter 1994). Iron should be included as a sediment COPC and the risk assessment should be revised.

43. **Section 9.7.4.2, Page 9-129, Paragraph 2.** This paragraph discusses metal concentrations in fish collected from AOC B. The text states that arsenic, manganese, and zinc were detected in tarpon at the site, but the average concentration of zinc in tarpon at AOC B was approximately half the average concentration in background minnows. Although this statement is true, this comparison should not be made. The zinc concentrations in site minnows are two times that of the zinc concentrations in tarpon. Based on this, minnows and tarpon may not accumulate zinc at the same rate. Therefore, a comparison of tarpons to background minnows is not justified. Site tarpon zinc concentrations should not be compared to background minnow concentrations.

44. **Section 9.8, Page 9-133, Paragraph 4.** This paragraph discusses the potential ecological risk to ecological receptors at site AOC B. The text states that surface water and sediment contaminants have not accumulated in fish and crabs. According to the data presented in Tables 9-28 and 9-29, chlorobenzilate, an organochlorine compound, was detected in fish and crab tissue at concentrations as high as 74 and 140 micrograms per liter (µg/L), respectively. Other organochlorine compounds were detected in tissue as well. This statement is incorrect and should not be used to justify lack of potential ecological risk. This statement should be omitted from the text.

45. **Chapter 9.8, Section 9.8, Page 9-133.** The conclusion should include a reference to the need for land use restrictions.

46. **Appendix B, Part 4.** Appendix B of the document contains TRV, HQ, and HI calculations for SWMU 4 only. Although the text of the ecological risk assessment sections for each site states that calculations for each site were provided in Appendix B, only SWMU 4 calculations were provided. All calculations for each site should be provided in Appendix B.

The TRV column in the HQ/HI tables is labeled "NOAEL." This column should be labeled "TRV."

Units are not provided in the "Predicted concentration" column in the dose calculations tables. Units should be provided for this column.

BAF calculations are not provided, although the text discusses BAF calculations for raccoon food chain modeling. All calculations should be referenced in the text and provided in Appendix B with the other food chain modeling calculations.

47. **Appendix C, Section 3.3.1.1.5, Pages C-127 through C-128.** This section discusses the selection of assessment and measurement endpoints identified for the ecological risk assessment. A table identifying ecological receptors, ecological niche, and assessment and measurement endpoints for each site should be included in this section.

48. **Appendix C, Section 3.3.1.2.1, Page C-129, Paragraph 2.** This section describes the selection of surface water thresholds. The text states that there is no surface freshwater at sites other than SWMU 4. The text does not mention the two freshwater ponds at SWMU 7. The text should include the ponds at SWMU 7 in this section.

49. **Appendix C, Table C.3-20, Sediment Threshold Values, Page C-133.** This table provides sediment benchmark values used in the ecological risk assessment. The sediment benchmark values for 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT are reported in the document as 3.3 µg/kg (EPA Region IV Screening Value), 1.22 µg/kg (FDEP 1995), and 2.07 µg/kg (FDEP 1994), respectively. The 4,4'-DDE and 4,4'-DDT values are incorrect, and should be replaced with 2.07 µg/kg (FDEP 1994) and 1.19 µg/kg (FDEP 1994), respectively. All the values in the table should be verified, and those that are incorrect.