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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 4  
ATLANTA FEDERAL CENTER  
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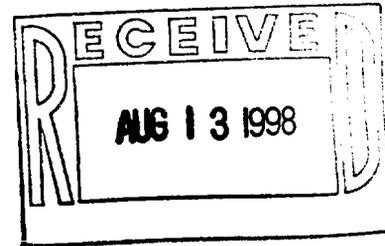
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July 31, 1998

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Commanding Officer,  
Southern Division, NAVFACENCOM  
Attn: Mr. Bill Hill (code 1851)  
P.O. Box 190010  
North Charleston, South Carolina 29419-9010



SUBJ: Draft Record Investigation  
Operable Unit 16, Site 41  
Naval Air Station Pensacola  
EPA Site ID No.: FL9170024567

Dear Mr. Hill:

The U. S. Environmental Protection Agency (EPA), has completed its review of the above subject document.

The ecological risk assessment (ERA) for Site 41 at Pensacola Bay NAS has many serious problems that need to be addressed. First, the way the information is presented in this document makes the review process very difficult. To improve readability and clarity of the document, the information currently in this volume should be divided into several smaller documents. For example, Site 40 divided areas of the Bay into assessment zones. The same process could be used for Site 41. This division into assessment zones would allow for a more complete review of wetlands associated with specific OUs and would provide information to the Base on landscape level concerns. Additionally, use of assessment zones would allow for the basis of analyzing impacts along the terrestrial/aquatic interface.

Second, it is unclear what rationale was used to select the reference wetlands. Considering the information provided in the document, it appears that at least one of the reference wetlands may not be appropriate for use as a reference site. Additionally, both reference wetlands were compared to wetlands of concern on an interchangeable basis, regardless of whether wetlands were palustrine or estuarine in nature. The comparisons between wetlands of concern versus reference wetlands was often inappropriate.

Third, surface water concentrations of iron were not appropriately dealt with in the ecological risk assessment. While issues of toxicity were addressed for iron, the other issue that needs to be addressed is that high concentration of iron in surface water may serve to make that wetland surface water undesirable for ecological development. The wetlands with elevated concentrations of iron should have appropriate biological diversity tests performed to determine if surface water iron is impacting the environment.

Fourth, the ecological risk assessment fails to address issues concerning wetlands that are either co-located or basically contiguous in nature. It would seem appropriate that these wetlands be examined together in order to address impacts to wetlands receiving inputs from other wetlands. Since this risk assessment did not analyze wetlands that are contiguous with other wetlands, a major uncertainty is added to the risk assessment. This uncertainty was not addressed in the document.

Additional comments are enclosed. If **you** have any questions or comments, I can be reached at **(404)562-8538**.

Sincerely,



Gena D. Townsend  
Senior Project Manager  
Federal Facilities Branch

Enclosure

cc: Ron Joyner, NAS Pensacola  
Brian Caldwell, Ensafe  
Allison Harris, Ensafe, Memphis  
John Mitchell, FDEP

## 1.0 GENERAL COMMENTS

1. Section 3.4, Page 3-5, Paragraph 3 lists the sites associated with OU2. Text should be added to this paragraph providing a description of the sites and contamination associated with each site.
2. Section 4.0, Page 4-1 presents the media that was sampled and the methods of sampling and analysis. However, groundwater contamination is not addressed in this report. It is acknowledged in this report that the wetland contamination is due to contaminant migration from OUs and other sites. The principal modes of contaminant transport are likely sediment transport, surface water transport, and groundwater transport. It was acknowledged that there was possible groundwater discharge into the wetlands. It would be difficult to evaluate future contamination of remediation of the wetlands without information about local groundwater contamination. Therefore, it is recommended that consideration be given to assessing groundwater contamination. In addition, this report has no discussion of background sample studies. The rationale for not collecting background samples should be presented in this section.
3. Section 4.1, Page 4-2, Paragraph 4 states that after sufficient biomass was collected, fish were bagged and transported to the laboratory. The text should be added to this paragraph stating the exact biomass of fish collected to be sufficient for analysis.
4. Section 5.0 of this report is part of a massive document with large amounts of data. However, there is very little effort to integrate the individual wetlands into to common transport pathways. After reviewing this document and a previous document of Site 40, it is the reviewer's opinion that a different approach is needed. In the Site 40 document, the area was split into 4 assessment areas which were not completely evaluated as individual areas. A much better picture could be formed if four documents (one for each assessment area) were produced (one for each assessment area) which would combine Site 40 data with Site 41 data. That way the relationship between the individual wetlands, transport pathways and the impact of the contaminant transport pathways on the off-shore sediments could be assessed.

There is also no attempt at organizing the wetlands into groups of common locations and transport pathways. This organization would facilitate the understanding of the impact (nature and extent) of contamination of the wetlands. In addition, the relationships of the individual wetlands to the OUs and Sites in terms of spatial and common contaminants should be discussed.

5. Section 5.0 *Summary Tables* present the data *summary* for all data. However, the frequency of detection ratio does not reflect the number of rejected samples. It **is** customary to decrement the number of samples by the number of rejected samples. This includes the analytes for which the non-detects were rejected. This table should be corrected. This comment applies to all the *summary* tables. In addition, it is unclear why the average detected concentrations are presented in the tables. For the risk assessment, either 95% UCL or the maximum detected concentrations should be used. Therefore, the purpose of presenting the average detected concentrations in the tables should be discussed in this section.
6. Section 5.4.1, Page 5-99, Paragraph 2 provides information on chemicals detected in reference Wetland 25. The text should be amended to include the rationale used **to** select Wetland 25 as a reference wetland. Additionally, other information that should be provided on Wetland 25 includes location on base, size, **type** (palustrine versus estuarine versus brackish), and general habitat/vegetation. This comment also applies to the same issue for Wetland 27.
7. Section 6.0, Page 6-1 presents a very superficial discussion of the fate and transport of contaminants into and within Site 41. This discussion does not address the specific properties of the individual contaminants, does not discuss the biotransformation and bioaccumulation of the contaminants and does not discuss the sediment migration pathways. The above information is important since the major exposure pathways for both human and ecological concerns are via contaminated biota. In fact, this is the only exposure pathway for humans. Therefore, it is imperative that the pathways of contaminant transport be clearly stated in this report. This section should be re-written and specific comments on the subjects to be covered are in the following comments.
8. Section 6.2, Page 6-1 presents a general discussion of contaminant migration. However, biotransformation and bioaccumulation are not discussed. In particular, the biotransformation of inorganic mercury into methyl mercury is an important factor of fate and transport of mercury compounds in the coastal marine environment. Discussions on biotransformation and bioaccumulation should be added to this section.
9. Section 6.7, Page 6-10, Paragraph 3, Sentence 3 discusses the migration pathways for the Site 40 contaminants and this sentence briefly mentions the concept of sediment movement. However, the magnitude of sediment movement and direction of sediment movement is not presented and the conclusions of this sentence are not justified. This section should be expanded to include a discussion of the transport of Contaminants to Site 41 and the movement of sediment within Site 41. This discussion should be by

assessment area combining wetlands as the sediment transport is likely to be different within each assessment area.

10. Section 8.1, Page 8-1, Paragraph 2 states that sediment concentrations were screened by comparison to the Region 4 Sediment Screening Values and State of Florida Sediment Quality Assessment Guidelines. The text should be modified to include a discussion of the screening methods used for surface water concentrations of chemicals.
11. Section 8.2.2, Page 8-5, Paragraph 2 states that sediment data were chosen over surface water data because contaminants are more persistent in sediment and better correlate with long term effects and the development of remedial options. Surface water concentrations of contaminants are also important for consideration for the same issues that are stated for the sediments. By limiting selection of wetlands of concern solely to sediment concentrations, this risk assessment provides a major data gap. Although it is recognized that surface water data was analyzed on a wetland by wetland basis, the use of sediment data alone serves to bias the selection of wetlands of concern. Therefore, the wetlands of concern should be selected based on both surface water and sediment concentrations of contaminants. The text should be amended to include surface water contaminates concentrations in the selection of wetlands of concern.
12. Section 8.2.4, Page 8-169, Paragraph 2, Sentence 1 states that after review of contaminant distribution and other characteristics of all the red- and orange-coded wetlands, wetlands were grouped based on nature and extent of contamination. However, this methodology appears to be a questionable way to group wetlands. The text should be expanded to include a more complete discussion of how the review of contaminant distribution was performed and what other characteristic of wetlands was considered.
13. Section 8.2.5, Page 8-168, Paragraph 1 states that wetland groups D and E were removed from any further sampling and analysis. The rationale for excluding wetlands in groups D and E should be added to the text.
14. Section 8.2.5, Page 8-168, Paragraph 4 states that wetlands 64, SA, 3, 16, and 18 were chosen to represent Groups A, B, and C. The text should provide the rationale used to select the five wetlands from the various groups.
15. Table 8.2-141, Page 8-176 presents a list of wetlands, assessment endpoints, and measurement endpoints. However, there are several problems associated with the

assessment endpoints and selected measurement endpoints provided in this list. The assessment endpoints listed below are not valid based on the criteria set forth in the EPA Process Document (EPA, 1997). The four criteria in the document include: **1)** contaminants present and their concentrations, **2)** mechanisms of toxicity of the contaminants to different groups of organisms, **3)** ecologically relevant receptor groups that are potentially sensitive or highly exposed to the contaminant and attributes of their natural history, and **4)** potentially exposed pathways. For example, a better assessment endpoint to replace survival, growth, and reproduction of macroinvertebrates associated with the benthic environment would be “maintaining a healthy aquatic community composition and structure” (EPA, 1997). **An** additional problem with this table is the list of measurement endpoints provided for some of the assessment endpoints. While toxicity tests provide answers regarding the potential effects of contaminants, they are not in and of themselves, appropriate measurement endpoints. The EPA Process Document (EPA, 1997) states: “a measurement endpoint is defined as a measurable ecological characteristic that is related to the valued characteristic chosen **as** the assessment endpoint and is a measure of biological effects (i.e., mortality, reproduction, growth).” Therefore, one of the assessment endpoint currently listed is of “survival, growth, and reproduction of macroinvertebrates associated with the benthic environment.” This assessment endpoint should, in fact, be the measurement endpoint. The list below specifically addresses the assessment endpoints that should be modified:

- Group A (Wetland **64**) has the second assessment endpoint of “survival, growth, and reproduction of macroinvertebrates associated with the benthic environment.” This endpoint should become the measurement endpoint and a new assessment endpoint should be generated. The current measurement endpoints B1, B2, and **B3** should be included as testing methods used to determine effects for the measurement endpoint.
- Group A (Wetland **64**) has the third assessment endpoint of “protection of fish viability.” This assessment endpoint is too broad and a more focused endpoint should be developed. The C2 measurement endpoint is inappropriate and should be revised.
- Group B (Wetlands **5A** and **3**) **has** the first assessment endpoint of “survival, growth, and reproduction of macroinvertebrates associated with the benthic environment.” This endpoint should become the measurement endpoint and a new assessment endpoint should be generated. The current measurement endpoints **A** and A1 should be included as testing methods used to determine effects for the measurement endpoint.
- Group B (Wetlands **5A** and **3**) has the second assessment endpoint stated as “protection of **fish** viability.” This assessment endpoint is too broad and

a more focused endpoint should be developed.

- Group C (Wetlands **16** and **18**) has the first assessment endpoint of “survival, growth, and reproduction of macroinvertebrates associated with the benthic environment.” This endpoint should become the measurement endpoint and a new assessment endpoint should be generated. The current measurement endpoints A1, **A2**, and A3 should be included as testing methods used to determine effects for the measurement endpoint.
  - Group C (Wetlands **16** and **18**) has the second assessment endpoint of “health of birds and terrestrial fauna.” This assessment endpoint is too broad and a more focused endpoint should be developed.
16. Section **8.2.6**, Page **8-179**, Paragraph **3** states that wetlands **18** and **64** had significantly higher concentrations of biomagnifying pesticides. The text should be edited to include the range of concentrations of pesticides detected at these wetlands.
  17. Section **8.2.6**, Page **8-179**, Paragraph **4** and its associated bullets state that samples for sediment toxicity analysis, sediment chemistry, TOC, grain size, and benthic diversity were collected for the selected wetlands. A table should be included in the text listing these sample data for each wetland.
  18. Section **8.2.6**, Page **8-186**, Paragraph **1** states that samples for chemical, toxicity, biodiversity, and bioaccumulation analysis were collected for the reference wetlands, where appropriate. A table should be included in the text listing the sample data for the reference wetlands.
  19. Section **8.2.7**, Page **8-227**, Fish Community Section presents a summary of potential effects to fish based on surface water concentrations of some contaminants. However, it is unclear why the actual fish data collected and summarized in Table **8.2-180** are not discussed in the text. Additionally, the text fails to discuss potential impacts of sediment concentrations of contaminants on fish. The text should be edited to include a discussion of sediment and fish tissue data for each wetland.
  20. Section **8.2.7**, Page **8-227**, Fish Community Section presents a summary of potential effects to fish based on surface water concentrations of some contaminants. One apparent data gap that should be identified in this section is that fish were not sampled in any of the freshwater wetlands. This data gap

presents a major uncertainty into the risk assessment and the text should be edited to **discuss** the lack of fish data for freshwater wetlands.

21. Section **8.2.7**, Page **8-228**, Paragraph **2** states that **HQs** for the great blue heron are based on oral ingestion of total DDT and total **PCB** in contaminated fish tissue. However, the text fails to address the effects of other contaminants that bioaccumulate, such as mercury. The text should be expanded to include a discussion of other bioaccumulating contaminants and provide the rationale for why these other contaminants were not examined.
22. Section **8.2.7**, Page **8-228**, Piscivorous Birds Section discusses the results of the data presented in Table **8.2-180**. However, the number of fish sampled per wetland should also be discussed as it appears that in some wetlands only one fish was sampled and in other wetlands only **2** fish were sampled. The number of fish sampled should be added to the text with a discussion of the limits of drawing conclusions based on such a limited fish sample.
23. Table **8.2-183**, Page **8-233** presents the exposure estimates and hazard prediction of pesticides and PCBs to blue heron at Site **41**. However, it is unclear why reference wetland **75** is included in this table as the rest of the wetlands and reference wetland **33** are estuarine in nature. The table should be separated into estuarine and palustrine wetlands so that more appropriate conclusions can be developed from review of the data.
24. Section **8.2.7**, Page **8-235**, Paragraph **3** provides a list of uncertainties associated with this risk assessment. However, several uncertainties that should be added to this list deal with 1) reference wetlands and their selection process, 2) fish tissue data limitations due to small sampling size, and 3) issues concerning wetlands that are either co-located or basically contiguous in nature. It would seem appropriate that these wetlands be examined together in order to address impacts to wetlands receiving inputs from other wetlands. The three uncertainties listed here should be added to the text and appropriate discussion of their impacts should be added to the uncertainty section.
25. Section **8.2.7**, Page **8-235** does not present a summary and conclusion. This is a very important section that should not be omitted from the document. The text should be revised accordingly.
26. Section **8.3**, Page **8-237** presents what is called a screening human health risk assessment. However, a CERCLA format risk assessment is required for military facilities, and this

**risk** assessment does not follow the outline, format and procedures of a CERCLA **risk** assessment. The outline should be **as** follows:

- Introduction: Organization **of** wetlands and site setting
- Selection of COPCs according to the Region **IV** procedures
- Development **of** a conceptual site model for each group of wetlands
- Development of exposure equations and parameters
- Development of toxicological parameters
- Calculation of exposure does and risks
- Presenting Uncertainty Information
- Calculation of RGOs

The development of modified RBCs for screening purposes and the subsequent use of ratios to calculate risks is not acceptable. This risk assessment should be re-written. In addition, the text states that this report was written in accordance with EPA guidance documents including GRAS Volume 1, Part D issued in **1998**. However, according to the review, this report was not written in accordance with Part D.

27. Section 8.3.1, Page **8-237**, Paragraph **2**, Sentences **2** and **3** discuss the general scope of the risk assessment. Sentence **2** states that the HHRA is limited to a screening assessment because exposure would not be expected to occur at these wetlands under chronic conditions. Sentence **3** then states that the Region IV guidelines ***Preliminary Risk Evaluation for Finding Suitability for Lease*** (FOSL) would be used for the risk assessment. However, it is not clear what is meant by “under chronic conditions.” In addition, the appropriate guidance for conducting a risk assessment at a military facility **is** the Region IV ***Supplemental Guidance for RAGS***. The FOSL guidance was specifically targeted for BRAC sites with land under consideration for lease and addresses soils and groundwater. It does not address human exposure to surface water and sediment.
28. Section **8.3.1**, Page **8-238**, Paragraph **2** presents the wetlands that were selected to be evaluated by the risk assessment. However, there is no rationale as to why these wetlands were selected.
29. Section **8.3.3.1**, Page **8-244**, Paragraph **1**, Sentence **3** presents the exposure setting for Site **41** and this sentence states that the exposure pathways are summarized in Table **8.3-2** in accordance with RAGS Part D. However, the format of Table **8.3-2** **is** not in accordance with RAGS Part D. One of the requirements of RAGS Part D is that the columns of the tables cannot be modified, which includes formatting. This table should be re-formatted according to the instructions in RAGS Part D. In addition, Exhibit 3-1 displays the Interim Deliverables for each site. All tables required by RAGS Part D must

be included in this **risk** assessment.

30. Section **8.3.3.2**, Page **8-244**, Paragraph **2** describes the potential exposed populations and states that the only exposed population would be trespassers and recreational users. Part of the justification is that there are no anticipated changes for the next five years. This is an inadequate period of time. However, it is a basic principle that residential land use be considered for all risk assessments. In addition, there is a possibility that maintenance workers could visit these wetlands for general upkeep. This is more likely for the wetlands close to the developed areas. It is to be noted that in Section **8.3.5.6.3** that it was stated that occasional workers could be exposed to contaminants at Wetland 19. This risk assessment should be revised to include residential use and maintenance workers.
31. Section **8.3.4.2**, Page **8-262** presents the toxicity profiles for the COPCs. However, it was observed that the IRIS references are not up-to-date. For example, chlordane and PCBs are not updated. This section needs to be updated with the most recent IRIS references.
32. Section **8.3.5.1**, Page **8-274**, Paragraph **3** presents wetland specific site descriptions. However, it is unclear why this information is presented solely in the human health section of the risk assessment instead of in either Section **2** (Environmental Setting) or in the introduction portion of Section **8** (Baseline Risk Assessment). Placing this information solely in the human health risk assessment section of the document limits review of important wetland specific characteristics from many reviewers who normally do not review human health risk assessments. The text on the wetland specific site descriptions should be moved to either of the two recommended sections.
33. Section **8.3.5.7.2**, Page **8-322** shows that Wetland **33** had two samples from fish tissue, two from sediment, and two from surface water. However, there is no explanation why there are only two samples from each medium. Such low numbers of samples collection can also be found in other sites (Wetlands **4D**, **13** and **19**). The **issue** of low numbers of sampling and the impact on the results and conclusions should be addressed.
34. Section **8.3.5.9.1**, Page **8-333**, Paragraph **2** states that Wetland 75 begins as a palustrine emergent wetland and changes to an estuarine emergent wetland **as** it enters either Pensacola Bay or Bayou Grande. However, this description is misleading and should be revised. Considering the information presented in Figure 2-1, Wetland **75** appears to flow into Wetland 52B/52C that then flow into Wetland 55. The text should be edited to more appropriately describe the flow characteristics for Wetland **75**.

35. Section 8.3.6, Page 8-375 presents an uncertainty discussion of Site 41 in general. However, it does not discuss the wetland specific issues such as the adequacy of sampling, applicability of exposure scenarios and the data validation results. These items should be added to the uncertainty section.
36. Section 8.3.7, Page 8-381, Paragraph 0 indicates that **risk** managers could consider game fish data at Wetlands 18, 19, and 64 to be a potential data gap due to unavailable game fish tissue data and great uncertainty. However, the text does not mention Wetlands 33 and 75 where the fish tissue COPCs are also identified. The text needs to explain why Wetlands 33 and 75 are not considered to be potential data gap.

## 2.0 SPECIFIC COMMENTS

1. For Section 2.0, a table should be developed listing each wetland with any associated OUs or sites that may contribute COPCs to that wetland.
2. **Section 3.4, Page 3-3, Paragraph 1.**

This section describes the site investigation update and this paragraph discusses potential sources of contamination from sites. It is implied that since a site is designated for remediation under the state petroleum program, there will be no further action at that site or that contamination from this site will not impact the wetlands. Once contamination has migrated from a site to another area it is immaterial to the **risk** assessment whether or not it is a petroleum related contaminant. This paragraph should be re-phrased to distinguish clearly between sites where there is no further action under any program and the sites where cleanup is to occur under any program.

3. **Section 4.0, Page 4-6, Paragraph 2.**

This section presents the field investigation methods **for** the report and this paragraph presents the analytical methods. However, it was noted in the data validation section (Section 7) that some of the sediment samples were digested for metals analyses using a specialized technique with hydrofluoric acid. This method of digestion **is** not discussed here and the purpose of the specialized digestion is not presented. The rationale for this digestion should be presented.

4. **Section 4.3, Page 4-6, Paragraph 2.**

This section discusses the analytical parameters used in this investigation and this

paragraph states that biota, sediment and surface water samples were analyzed for the full TCL and TAL. However, there are several problems with this approach. First, it is not clear why aluminum, calcium, magnesium, potassium, and sodium were analyzed on the marine surface water, biota, and marine sediment. These parameters are very likely to be elevated and produce little additional information.

Secondly, there has been past detections of mercury in sediments and since mercury is biotransformed to methylmercury in marine environments, there should have been analyses for methylmercury. It is suggested that re-sampling be performed in the areas of high mercury levels for methylmercury. If elevated levels of methylmercury are found in the surface water or sediments, then consideration should be given to analyzing biota for methylmercury.

Thirdly, in Section 7.0, Page 7-2, Paragraph 2, it is stated that fish samples were analyzed for PAHs, pesticides/PCBs and lead. This is a deviation from what was stated in this section. The rationale for the restricted list of analytes should be presented and these analyses should be discussed in this section.

**5. Section 6.2.1, Page 6-1, Paragraph 3, Sentence 3.**

This section presents the physical and chemical properties that affect fate and transport and this sentence states that the chemical and physical properties used to evaluate fate and transport are found in Table 6-1. However, the actual physical and chemical parameters for each contaminant are not displayed. A table should be added which includes the fate and transport properties for each contaminant.

**6. Section 6.2.2, Page 6-2.**

This section presents a general discussion of the media properties affecting fate and transport. However, it does not address the specific effects these properties will have on the fate and transport of the contaminants. This section should be expanded to discuss in detail the effects that the media properties have on the major contaminants.

**7. Section 7.0, Page 7-2, Paragraph 2, Sentence 6.**

This section and paragraph discuss the analytical methods used in this investigation. This sentence states that six fish samples were collected for the entire investigation. This seems to be an inadequate number for the number of wetlands investigated and the overall size of Site 41. It is doubted that is a representative sample. Consideration should be given to collecting additional fish and shellfish samples.

8. **Section 7.1.3, Page 7-6, Paragraph 0, Sentence 2.**

This section is a discussion of the results of the data validation review of the calibration data. This sentence states that these QC deficiencies represented common laboratory practices. However, it would be thought that laboratories routinely practice to have QC deficiencies. Rather, it should be stated that the QC deficiencies are within the normal fluctuations of laboratory function. This sentence should be revised with an equivalent statement.

9. **Section 7.1.4, Page 7-8, Paragraph 1.**

This section is a discussion of the blank contamination and this paragraph discusses the common laboratory blank contaminants. However, there is not a summary table of the blank contamination and the samples affected by blank contamination. Such a table should be added.

10. **Section 7.2.3, Page 7-18, Paragraph 0.**

This section is a discussion of the metal data validation and this paragraph discusses the metal blank contaminants. However, there is not a summary table of the blank contamination and the samples affected by blank contamination. This table should be added.

11. **Section 7.2.7, Page 7-19, Paragraph in text table.**

This section is a discussion of the matrix spikes and duplicates for the metal analyses. This table displays the QC exceedances and the samples affected. Apparently many of the antimony results are rejected. However, there is no discussion of this point. These laboratory discrepancies should be discussed further and a summation of how many antimony results are rejected should be included. In addition, this is a point for the uncertainty discussion.

12. **Section 7.3.1, Page 8-22, Paragraph 2.**

This section presents a data completeness summary and this paragraph states that there was a 98% completeness of all data. In addition, it states that no positive results were

rejected. However, the presentation of percentage completeness in **this** manner does not describe the complete picture. The percentage completeness should be based on individual analytes or analytical fractions (VOCs, SVOCs, etc.). For example, there were some pesticide non-detects which were rejected. The percentage completeness of the pesticides should then be expressed. Another issue is if the rejections were concentrated in one wetland, then this is an important fact. The percentage completeness for each wetland should be stated.

It is important that no positive results were rejected, but the fact that a number of non-detects was rejected is also important because this lowers the confidence that all important analytes were detected. Some qualifying statement about this should also be made.

**13. Section 8.1, Page 8-1, Paragraph 2, Sentence 3.**

This section and paragraph discuss the screening that was performed on the Phase **IIA** data to prepare for the Phase IIB/III data collection. This sentence states that the screening was performed using ecological criteria. However, there is no mention of screening for human health. It is quite possible that the ecological criteria may be lower than human health criteria, but there is no mention of this fact. A discussion should be added on the potential impact of not comparing media concentrations with human health criteria.

**14. Section 8.2.3, Page 8-160.**

This section (Contaminant Results and Effect Characteristics) needs to have a discussion of iron toxicity and water quality issues added to the text.

**15. Figures 8-29 through 8-33, Page 8-171.**

The figures present the conceptual model for Wetlands **64, 5A, 3, 16, and 18**. The title of these figures should be modified to state that which group each respective wetland is from (such as Group A, B or C).

**16. Table 8.2-141, Page 8-176.**

The table should be modified to include a column listing the generic receptors selected for each assessment endpoint.

**17. Table 8.2-157, Page 8-206.**

The table lists Wetland 5A SVOC contaminants compared to sediment benchmark levels. The calculated HQs for benzo(a)anthracene, benzo(a)pyrene, and chrysene appear to be incorrect. The appropriate HQs should be added to the text.

18. **Section 8.3.1, Page 8-239, Paragraph 2, Sentence 1.**

This section is the introduction to the risk assessment and this sentence states that this limited in scope and does not address groundwater because as contaminant sinks, the exposure routes for human and ecological risk are via the sediment and surface water. However, a more important reason for not addressing groundwater is that no groundwater samples were collected. In addition, the term “contaminant sinks” for exposure routes is not exactly appropriate. The rationale for selecting surface water and sediment as the exposure media is that these media represent the most likely point of exposure. It is suggested that this sentence be re-phrased.

19. **Section 8.3.3.1, Page 8-244, Paragraph 1, Sentence 1.**

This section describes the exposure setting in one paragraph and this sentence states that the site setting and land use is detailed in Section. However, Section 2 only describes the site in two broad settings, western and eastern. It is not stated which wetlands are in these subdivisions. Therefore, it is hard to judge which wetlands are likely to be used for recreational purposes. Additional detail should be provided for site settings of each wetland, including proximity to developed areas.

20. **Table 8.3-2, Page 8-246.**

This column only lists adolescent trespassers as the exposed population. However, given that this is a military base with some form of restricted site access, it seems likely that the trespassers or recreational users would be adults not adolescents for the current land use. In the future, the adolescent may be a more frequent user if base restrictions ease. Therefore, the adult recreational user should be added for current land use. As noted in other comments and in the text of the report, the use of the individual wetlands varies from location to location and the receptors may change. Additional text is needed to explain the rationale for selecting the receptors.

21. **Table 8.3-2, Page 8-246.**

Groundwater exposure is eliminated from this risk assessment because groundwater is below the aquitard in Bayou Grande. However, it is customary to perform risk

evaluations on the shallow groundwater and not just on the deep aquifers. This is not a valid reason to exclude the shallow site groundwater.

**22. Section 8.3, Page 8-248, Paragraph 1.**

This section discusses the identification of the COPC and states that most chemicals pose little **risk** and would greatly increase the level of effort without adding much value for the **risk** management decision. However, such an approach does not follow the guidelines of the Region 4 guidance. The selection of COPCs must be performed according to Region 4 guidance. It is customary to use residential RBCs for sediment screening and to use Aquatic Water Quality Criteria (water consumption and fish consumption) for screening surface water. This is especially important for these wetlands as there is a wide range of possible exposure estimates. This selection of COPCs must be re-performed.

**23. Section 8.3.3.4.1, Page 8-249, Paragraph 2, Sentence 2.**

This section presents the methods of screening comparisons and this paragraph presents the methods for development of the screening comparisons for surface water and sediment data. This sentence states that the RBCs were converted to reflect an adolescent trespasser who is exposed to sediment and surface water. However, this application of the RBCs and the RBC equations goes beyond the intended application of the RBCs. Rather, what is happening at this point is the development of site specific screening levels. If the COPCs had been selected according to the Region 4 guidance, then at this point, the exposure assessment equations should be presented. It is acknowledged that the equations are the same, but the objective at this point is to calculate **risks** not screening concentrations.

**24. Table 8.3-3, Page 8-251.**

This table presents the parameters used to estimate the CDI. The footnote "j" states that the fish ingestion rate of 54,000 mg/day is for a subsistence fisherman. However, this is incorrect. The rate is the 95<sup>th</sup> percentile national rate. This footnote and all discussion relating to this rate should be corrected.

**25. Table 8.3-3, Page 2-51, Row: Skin Surface Area.**

This table presents the parameters used to estimate the **CDI** and this row presents the skin surface area. However, these values are not the recommended default values. The Dermal Guidance (EPA 1992) recommends using 25% of the 95<sup>th</sup> percentile skin surface

area. For adults, **this** value is 5,100 cm<sup>2</sup>. These values should be checked.

**26. Section 8.3.3.4.1, Page 8-253, Paragraph 1.**

This section presents the exposure equations for the trespasser and this paragraph presents the modifications to the RBCs for surface water. However, the surface water dermal exposure is not presented. The dermal guidance (EPA, 1992) should be consulted and the dermal exposure added to the surface water exposure.

**27. Section 8.3.3.4.2, Page 8-254, Paragraph 2.**

This section presents a summary of the COPC selection and this paragraph states that the individual wetlands are discussed in Section 8.3.5. However, it is preferable to present the discussion of the individual wetlands first and then the COPC *summary*. This report should be re-organized.

**28. Section 8.3.5.1.8, Page 8-277, Paragraph 2, Sentence 3.**

This section presents the RGOs for Wetland 3 and this sentence states that only cancer hazard-based RGOs were developed. However, according to the Region 4 policy, both carcinogenic and non-carcinogenic RGOs should be developed even though the cancer risk may be the controlling RGO. This comment applies to all RGOs.

**29. Section 8.3.5.5.3, Page 8-307, Paragraph 1, Sentence 1.**

This section describes the current and future land use for Wetland 18. This sentence states that the wetland is near a Boy Scout and Family Recreation Area. However, the same exposure parameters are used **as** for the other wetlands. It is likely that exposure frequency and the amount of skin exposed will be greater at this site. It is suggested that a separate exposure scenario be developed for this wetland.

**30. Section 8.3.5.8.3, Page 8-327, Paragraph 6, Sentence 2.**

This section describes the current and future land use of Wetland 64 and this sentence states that Navy and civilian recreational users could be exposed. However, the previous paragraph states that no surface water samples were collected. This is an area where large numbers **of** people could be exposed to the surface water and yet no surface water samples were collected. This represents a large data gap and should be rectified.

31. **Section 8.3.6.1.2, Page 8-376, Paragraph 1, Sentence 3.**

This section discusses the uncertainty relating to the risk estimates due to sediment exposure and this sentence states that soil ingestion rates are riddled with uncertainties. However, this is an inappropriate statement. It is acknowledged that there is a high degree of uncertainty in soil and sediment ingestion, but the use of the term riddled is inappropriate. This sentence should be deleted.

3.0 **SPECIFIC COMMENTS - RESPONSE NOT REQUIRED**

1. **Section 8.3, Tables.**

The tables in this section show that concentration units for some metal are ug/kg and some are mg/kg. Normally, concentration of all metals in soil and sediment samples is given as mg/kg. The same concentration unit for metals should be presented in the tables for review.

2. **Section 8.3.3.4.1, Page 8-249, Paragraph 2, Sentences 4 and 5.**

The text mentions tables but does not reference specifically. The text should specify these tables.

3. **Section 8.3.4.2.14, Page 8-273, Paragraph 2, Sentence 5.**

This section presents the toxicity profile for PCBs and this sentence states that the IRIS search data was in 1995. However, the IRIS information on PCBs was updated in 1997. This section should be revised to reflect the most recent information.

4. **Table 8.3.3.**

This table presents values of skin surface area (SSA) for adult, child, and trespassing adolescent. However, there is no reference to the values of SSA. The table should give the reference accordingly.

5. **Table 8.3.8.**

This table displays the COPC selection for Wetland 3 sediment. However, it is very difficult to see the name of the wetland due to the small print. It is suggested that the wetland name be included in the title. This comment applies to all tables. In addition, the original format of the RAGS Part D tables should not be changed.

6. **Table 8.3.15.**

The table shows a few blanks at the column of site trespasser screening toxicity value. It is unclear whether the blanks mean "Not Established" or "Not Applicable". The table should clarify the blanks accordingly.