UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Commanding Officer,
Southern Division, NAVFACENGCOM
Attn: Mr. Bill Hill (code 1851)
P.O. Box 190010
North Charleston, South Carolina 29419-9010

SUBJ: NAS Pensacola
Draft Remedial Investigation Report
Risk Assessment
Operable Unit 2, Sites 11, 12, 25, 26, 27, 30 & 36

Dear Mr. Hill:

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

If you have any questions or comments, please call me at (404) 562-8538.

Sincerely,

Gena D. Townsend
Senior Project Manager
Federal Facilities Branch

cc: Ron Joyner, NAS Pensacola
Henry Beiro/Brian Caldwell, Ensafe, Pensacola
Allison Dennon, Ensafe, Memphis
John Mitchell, FDEP

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1.0 GENERAL COMMENTS

1. The conclusions regarding risk in this risk assessment are not valid because of multiple procedure errors. First, not all COPCs appear to have been selected appropriately. Second, the calculation of the groundwater exposure point concentrations deviate from EPA guidance. Third, use of the FI/FC term to calculate fractional soil exposure is inappropriate. Fourth subsurface soils, sediments, and surface water exposures were not considered. Fifth, some potential receptors and exposure patinways were not considered. Sixth, this RI report contains numerous discrepancies and data gaps and appears to have been written by several different writers. The report should be revised accordingly.

2. Throughout this risk assessment the term BEQ is used to refer to the PAH equivalency factor estimates. However, it is unclear what a BEQ is and which PAHs are contributors to the risk. Either the term PAH equivalents or BAP equivalents should be used for clarity.

3. Section 10.1, Page 10-4, Paragraph 1, Sentence 1, addresses the organization of the risk assessment. However, the text does not explain in sufficient detail the organization of the risk assessment. It is unclear that Section 10.2 covers the general aspects of the development of the risk assessment and that Section 10.3 covers the specific elements for each site until the end of Section 10 Additional statements explaining the purposes of Sections 10.2 and 10.4 would be helpful at this point. Moreover, the ecological risk assessment should be placed in a section of its own, to allow for expansion of the numbering system.

4. Section 10.1, Page 10-5, Paragraph 1, Sentence 4, mentions collection of surface water samples. However, the surface water samples were not mentioned earlier in Section 7 (Nature and Extent of Contamination). There is no discussion as to why surface water is not considered as a media of exposure. This is true especially for Site 11 which is at the edge of the base and is described as a wetland area. Exposure to surface water is a potential route of exposure for workers and trespassers (recreational visitors), but this pathway is not addressed. The text should explain why the surface water exposure is not considered, and the discrepancy should be rectified.

5. Section 10.2.1, Page 10-5, Paragraph 1, Sentence 5, states: "results from surface soils, shallow and intermediate groundwater were used to assess possible human exposure to contaminants. However, subsurface soils were not considered in the risk assessment, and there is no explanation given for this omission. Although this is an active military base that is not targeted for closure, future plans may include construction of new buildings thereby exposing workers to subsurface contaminants. Other pathways of transport and exposure that should be considered for subsurface soils include transport of subsurface contaminants into the shallow groundwater and volatilization and transport of contaminants into buildings via foundation cracks. The screening procedure should include the soil leaching as referenced in EPA's "Soil Screening Levels Guidance" document in the selection of COPCs. If these pathways are not considered, then an adequate rationale must be presented to justify not including the subsurface soil exposure. The report should be revised accordingly.

6. Section 10.2.5, Page 10-8, addresses the selection of chemicals of potential concern (COPCs). However, the selection of COPCs from the detected compounds or chemicals present in site samples (CPSS) is usually performed in the risk assessment, not in the nature and extent section. The current organization of this report makes it difficult to determine what was selected. In addition, the organization of Section 7.0 is by compound group and not by site. In Section 7.0 it is unclear which compounds are selected as COPCs for which sites. The text should be revised accordingly.

7. Section 10.2.5, Page 10-8, Paragraph 2, Sentence 3, states that the nature and extent of CPSS at each site are discussed in detail in Section 7. However, the COPCs rather than the CPSS were discussed in detail in Section 7. (This applies to each of the sites in Section 10.3.) It is customary and preferred to perform the selection of COPCs in the Risk Assessment section (Section 10) and not in the Nature and Extent of Contamination section (Section 7). In addition, tables should usually be provided in the text which contain all detected compounds for each media, the frequency of detection, the maximum concentration, the screening value (and source of the screening value), the background concentration as applicable and whether or not the detected compound was selected as a COPC. The COPC screening value should usually be the lowest of the applicable RBCs or in the case of Florida, the lowest value of the RBCs or the FDER values. However, in the COPC selection discussed in this report, multiple screening values for each contaminant are presented. The text should be revised accordingly.

8. Section 10.2.7, Page 10-12, Paragraph 2, addresses potential exposed populations. However, there is no mention of potential trespasser or recreational receptor exposure to surface water and/or sediments for either current land use or future land use. The potential for trespasser or recreational user exposure is highest for Site 11 where it is at the edge of the base. Although the site is an active military base with security patrols so the trespasser exposure

for current land use may be minimal, it is possible that in the future that the base could be closed or the mission could be changed to make access likely. Also, the other receptor and pathway that are not considered are the future construction worker exposure to subsurface soils. This pathway should be considered.

In addition, volatilization of VOCs in the subsurface soils through foundations into buildings is a pathway that needs to be addressed. Since subsurface soils were not summarized or screened, it is difficult to determine if VOCs are in the subsurface soils.

9. Section 10.3.1.3, Page 10-43, Paragraph 2 and 3, discusses exposure point concentrations used in the investigation. However, it is unclear why the average of the detects was used for some COPCs and the UCL used for other COPCs. The calculations suggest that the UCL was calculated over all wells. Similarly, the average of all detects was not used for the Phase II samples. Use of a different statistical basis for the exposure point concentrations invalidates any risk comparison between the two phases. Therefore, groundwater data from the two phases may need to be re-examined.

10. Section 10.3.1.5, Page 10-44, Paragraph 3, mentions that Tables H-16 and H-17 present the computed carcinogenic risks and/or HQs associated with the incidental ingestion of and dermal contact with site surface soil, respectively. However, these tables containing the summary of the risk calculations should be included in Section 10 instead of Appendix H.

In addition, the risks and HQs were not summarized across all soil pathways. The report should be revised accordingly.

This comment applies to all the sites.

11. Section 10.3.1.5, Page 10-45, Paragraph 3, Sentences 4 and 5, mention the risk and hazard for the Central Tendency (CT) assessment. However, there is no discussion of how the CT parameters are derived other than a brief discussion of the exposure point concentration derivation. These exposure parameters for the CT analysis need to be presented and discussed in this section but are discussed later in the Uncertainty Section.

The CT assessment should usse the same exposure point concentration as the RME (reasonable maximum exposure) concentration used in the BRA. Confirm that the RME was used in the CT assessment, if not, correct the document.

This comment applies to all the sites.

12. Section 10.3.1.6, Page 10-52, Paragraph 1, Sentence 6, indicates that a FI/FC term of 0.4 based on frequency of detection (7 of 19) was used to adjust the exposure estimates. However, the use of frequency of detection to derive a fractional exposure point factor is not appropriate. Although this term was used to derive the risk estimates for all sites for different compounds, this term was not presented in the risk result section or discussed fully in the EPC derivation section, For example, in the Site 11 risk calculations, only the PAH BEQ has a FI/FC factor applied. The factor is 0.4 which resulted in a total risk estimate of 1.1×10^{-5} for the worker exposure to soil. The RME risk without the factor is 2.8×10^{-5}. Throughout the risk calculations, factors as low as 0.1 are observed. Using the FI/FC factor has resulted in lower risk estimates. Therefore, all risk estimates that use this FI/FC factor should be recalculated.

13. Section 10.3.1.7, Page 10-57, Paragraph 1, Sentence 4, states that Table H-30 presents risk summaries for each pathway/receptor group evaluated for Site 11. However, the tables for the risk summaries should be presented in this section instead of Appendix H.

2.0 SPECIFIC COMMENTS

1. Section 10.1, Page 10-2, Paragraph 0.

The text list guidance documents (see bullets). However, the FDER guidance document "Soil Cleanup Goals for the Military Sites" is not included in this list of guidance documents. This source should be added to the list.

2. Section 10.2.4, Page 10-6 to 10-7, Paragraph 2.

The text discusses the quantitation limit. However, this term is not adequately defined. In data evaluation, there are Practical Quantitation Limits (PQL), Method Detection Limits (MDL), Contract Required Detection Limits (CRDL), and Sample Quantitation Limits (SQL). Typically, what is reported with lab results is the CRDL, or if the sample is diluted then the CRDL is multiplied by the dilution factor. Thus, it suggests that a nondetect may be less than the PQL not the CRDL. This is an important issue because the texts states that the lesser of one-half the detection limit or one-half of the lowest detected value (less than the detection limit) was used as the best estimate of the concentration for that analyte and sample in this investigation. This approach is not commonly used in risk assessments. For example, if the detection limit was 10 ug/kg and there was a sample which had a value of 8 ug/kg, then 4 ug/kg would be used as the "best estimate". But, if a sample was diluted 10X and had a detection limit then of 100 ug/kg for the undetected analytes, it is unclear if a value of 4 ug/kg be used as the "best estimate" or if a value of 40 ug/kg would be used instead of the usual 50 ug/kg. There were samples which were highly diluted as can be seen in Table H-1. Some of the analytes had reported maximum detection limits greater than the detected maximum, but the text does not discuss how these values were handled. The text should present a discussion or references to how samples with grossly elevated detection limits were handled in the data evaluation.

3. Section 10.2.5, Page 10-9, Paragraph 4, Sentence 2.

The text states that screening values based on surrogate compounds were used if no screening values (RBC or toxicology values) were available. However, the text does not discuss what compounds are applied to this method. The text should present a discussion accordingly.

4. **Section 10.2.5, Page 10-10, Paragraph 1.**

The text indicates that screening levels for groundwater include federal MCLs. However, generally, MCLs should not to be used as screening values in risk assessments because many of the MCLs are technology based and not entirely risk based. The text should be revised accordingly.

5. **Section 10.2.5, Page 10-10. Paragraph 2, Sentence 2.**

The text indicates that soil and groundwater background concentrations were determined using results from two background sampling locations. However, two samples are not an adequate number for background samples especially for a base wide background set. This report should address this issue accordingly.

6. **Section 10.2.7, Page 10-15, Paragraph 1, Sentence 4.**

The text indicates that the groundwater EPC was established as the greater of the 95% UCL or the arithmetic mean of the detected concentration. However, EPA Region 4 guidance states that the groundwater EPC should be the arithmetic average of the wells in the highly contaminated area of the plume. In Table H-8 (groundwater at Site 11, Phase I), EPCs include the 95% UCL, arithmetic average, and maximum detected concentrations which could mean that the set of wells was different for each COPC. The text should present a discussion regarding the groundwater EPCs used in the risk assessment.

7. **Section 10.2.7, Page 10-16, Table 10-1.**

The text shows that dermal contact area for an adult is 4,100 cm^2. However, a more typical value of exposed skin surface area from the dermal exposure assessment guidance is 25% of the adult surface area or 5,300 cm^2. The text should be corrected accordingly.

8. **Section 10.2.7, Page 10-21, Figure 10-2.**

The text presents formulas for calculating CDI for groundwater. However, dermal exposure to semivolatiles and metals while bathing is not considered. Such a consideration should be included.

9. **Section 10.2.8, Page 10-24, Paragraph 2, Sentence 4.**

The text states that Table H-1 summarizes toxicological data for each COPC identified at OU2. However, Table H-1 should be presented in this section not in Appendix H. The report should be rearranged accordingly.

10. **Section 10.2.8, Page 10-24, Paragraph 3, Sentence 4.**

The text indicates that toxicological profiles are provided in Section 10.4. However, the toxicology profiles should be placed in Appendix H. The report should be rearranged accordingly.

11. **Section 10.2.9, Page 10-29, Paragraph 3, Sentence 2.**

The text indicates that a more conservative risk level (10^{-6}) is used to identify COCs in this investigation. However, the text does not explain why 10^{-6} was used as the cumulative risk threshold instead of 10^{-4}. The text should give the explanation accordingly.

12. **Section 10.2.10, Page 10-32, Paragraph 0, Sentence 4.**

The text indicates that inhalation and dermal exposure are not incorporated into the soil screening values calculated by EPA. However, since October 1995, the RBC Table has included an RBC for inhalation exposure. The text should be corrected accordingly.

13. **Section 10.2.10, Page 10-36, Paragraph 2, Sentence 5.**

The text states: "Phase I groundwater data was collected using techniques amenable to the entrainment of sediments in the groundwater samples." However, it is unclear if the Phase I groundwater data includes the trench samples as part of the groundwater data set. If so, Phase I samples should be removed from the groundwater data set and discussed separately. Two sets of groundwater risk calculations may be confusing. The text should be revised accordingly.

14. **Section 10.3.1.1, Page 10-39, Paragraph 3, Sentence 4,**

The text indicates that trench water samples were not considered appropriate for consideration in the human health risk assessment since the sampling technique resulted in turbidity uncharacteristic of monitoring well samples. However, this is the first mention of trench water samples. There was a reference to trench water samples in Section 7 but in the context of groundwater samples. It is unclear whether the samples were the water from trenches dug during the field investigation or the water from permanent trenches or canals. The text should present a clear description of the trench water samples.

15. **Section 103 ——e— 10-39, Paragraph 3, Sentence 8.**

The text references Tables H-1 and H-2. However, the text should refer to Tables H-2 and H-3.

16. **Section 10.3.1.2, Page 10-40, Paragraph 1, Sentence 1.**

The text presents soil COPCs indicating that they are listed in Table H-4. However, the text does not show PAHs as the COPC which can be found in Tables H-4 and H-6 in the risk calculations. The text should explain the discrepancy.

17. **Section 10.3.3.6, Page 10-86, Paragraphs 1 and 2.**

The text contains two subsections **10.3.1.7** and **10.3.1.8** that are numbered incorrectly. The text should be corrected.

This comment also applies to Section **10.3.4.7** *(see* page **10-96).**

18. **Section 10.3.3.6, Page 10-86, Paragraphs 3 and 4**.

The text mentions Phases I and II groundwater **RGOs** (also *see* Tables **H-88** through **H-91).** However, definitions **of** Phases I and II groundwater **RGOs** are not presented. In this report, Phases I and 11 are only referred to **as** sampling phases. Therefore, **the** text should present clear descriptions of Phases I **and** II groundwater **RGOs.**

This comment applies to Sections **10.3.5.8** and **10.3.6.8.**

19. **Appendix H, Table H-151**.

The text presents statistical analysis of COPC groundwater at Site 30. However, this table is not well presented due to incomplete and missing subtitles for each column. The table should be revised accordingly.