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UNITED STATES ENVIRONMENTAL PROTECTION

REGION 4

345 COURTLAND STREET, N.E.  
ATLANTA, GEORGIA 30365

N00204.AR.000962  
NAS PENSACOLA  
5090.3a

JUL 19 1995

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Commanding Officer  
Attn: Mr. Bill Hill - Code 1851  
Southern Division  
NAVFACENGCOM  
P.O. Box 190010  
North Charleston, South Carolina 29419-9010

Subj: Review of draft and draft final primary documents for  
Operable Units 1, 3, 11 and 16  
Naval Air Station (NAS) Pensacola, Florida  
EPA Site ID No.: FL 9170024567

Dear Mr. Hill;

The Environmental Protection Agency (EPA) has completed its review of the Draft Remedial Investigation (RI) Reports which were submitted for the following sites:

Operable Unit 1 (Site 1: Sanitary Landfill)  
Operable Unit 3 (Site 2: Waterfront Sediments)  
Operable Unit 11 (Site 38: Building 71 & Associated IW Line)

and the Draft Final RI Work Plan and associated Draft Sampling and Analysis Plan which were submitted for Operable Unit 16 (Site 41: NASP Wetlands). EPA looks forward to receiving revised versions of these documents which adequately incorporate our attached comments, as discussed and agreed to by the Tier 1 team during the May and June 1995 Partnering Meetings.

During the March 1995 Partnering Meeting, the Tier 1 team agreed to adopt a new procedure for reviewing, revising and finalizing all primary documents. A modified version of this procedure was implemented during the review and comment response periods for the above-listed primary documents. Consequently, the submittal dates for the forthcoming draft final primary documents, as presented in the FY95 Site Management Plan (SMP) and Section VIII. of the Federal Facilities Agreement (FFA) are no longer applicable. Therefore, in order to ensure that the Tier 1 team continues to meet its mutual goal of finalizing quality documents as expeditiously and cost-effectively as possible, it is imperative that the Tier 1 team establish appropriate schedules for resubmitting and finalizing these documents at an upcoming partnering meeting.

Also, in order to ensure that any newly-adopted procedures and deadlines are not in direct conflict with the FFA and the FY95 SMP, the Tier 1 team should revisit and revise these documents, as needed, as soon as possible.

Please contact me at (404) 347-3555, x6441 if you have any questions or wish to discuss these issues further.

Sincerely Yours,



Allison D. Humphris  
Remedial Project Manager  
Department of Defense Remedial Section  
Federal Facilities Branch

Enclosures

cc: Ron Joyner, NAS Pensacola  
David Clowes, FDEP  
Henry Beiro, Ensafe/Allen & Hoshall

**ATTACHMENT 1**

U.S. ENVIRONMENTAL PROTECTION AGENCY REGION IV  
TECHNICAL REVIEW AND COMMENTS '  
DRAFT REMEDIAL INVESTIGATION REPORT  
OPERABLE UNIT 1 (SITE 1: SANITARY LANDFILL)  
NAVAL AIR STATION (NAS) PENSACOLA, FLORIDA

**1. Abstract and Executive Summary:**

**A.** "...previously installed deep wells, which were not double-cased, should be abandoned to avoid cross-contamination...". The findings of the well inventory survey (particularly recommendations for well plugging and abandonment) should be discussed by the team and acted upon by the Navy in the near future.

**B.** The text should be rewritten to resolve conflicting statements regarding the remediation of soil hot-spots identified in the RI (i.e. 7th and final paragraphs). It should also be made clear that the recommendations for remedial action are those of the Navy, not the contractor.

**2. Page 2-10, Site Reconnaissance Survey:**

"Various discolored water/leachate seeps and areas of soil and/or vegetation staining were located in site wetland areas..". Expand the text to include specific locations. For example, the ~~Contractor~~ Assessment/Remedial Activities Investigation Report for this site mentioned orange flocculent matter found in the Vicinity of at least one nearby wetland (#3?). There was some indication that this flocculent matter might be related to the discharge of iron-rich ground water.

**3. Page 3-9, Section 3.3 (Ecologic Setting):**

This section should be revised to include a "site-specific" subsection, similar to that provided in Section 3.2 (Stratigraphy and Hydrogeology). Information on this subject is available from previous E&E documents.

**4. Page 48, Paragraph 3:**

clarify that this investigation included limited sampling of adjacent wetland areas for use in performing a preliminary assessment of the impacts of Site 1 on these water bodies and identifying affected pathways. This information was to be used to facilitate the selection of more appropriate response actions for Site 1 per se, and to aid the Navy in better focusing future investigations for Sites 41 and 42.

**5. Page 4-12, Section 4.3**

Include a list (table or appendix) of the area's threatened and endangered species and species of special concern.

**6. Page 6-2, Paragraph 2:**

"Sampling and investigation procedures were conducted in accordance with the Site 1 SAP, and the NAS Pensacola CSAP...except where site conditions and field decisions warranted changes." Were any of these changes significant? The text should specify where in the report these changes are described.

**7. Page 5-3, Table 5-1:**

This table should reference the source of the methods and include the appropriate document number for the CLP notation in the "Method" column.

**8. Page 5-7, Figure 5-1:**

It would be helpful to indicate, through use of a separate symbol, which of these planned borings were not actually installed, due to replacement with an exploratory trench. Currently, there is no one figure in the text which illustrates the location and type of all subsurface soil samples collected at Site 1.

9. Page 5-17, Table 5-4

Why **was** a TCL/TAL **analysis** not performed **on** the subsurface contents of **Trench 9**? **According** to the text on page 7-65, waste material **was** encountered several feet above the water table.

10. Page 5-35, Table 5-7

The preservation requirements for groundwater samples **collected** for cyanide analysis should **specify** the use of NaOH to adjust the pH to **> 12**, not **> 10**.

11. Page 7-1, Section 7.0:

**A** subsection which compares the detection limits achieved with the **standards** to which the **data** is compared for **each** media should be included. This would **facilitate** evaluation of the **effectiveness** of the comparison.

12. Page 8-2, Section 8.1.1:

Figure 4-4 (page 4-9) of the vegetation communities at Site 1 (originally generated by E&E) **shows** wetlands located at the southeastern portion of Site 1 and south of **Golf Course Pond**, but these areas are not **shown as** wetlands in Figure 8-1A (page 8-3). Include **an** explanation in the text.

**13. Page 8-19, section 8.3.1:**

Include a table showing the Geld parameter data (**i.e.** temperature, pH, etc.) for the **surface** water samples.

**14. Page 8-22 Table 8-7:**

**A.** The concentration **units** for the inorganics should be ppb (ug/L).

**B.** The freshwater Ambient Water Quality Criterion (chronic) for **aluminum** is **87 ug/L**; add it to the table.

**C.** Include the AWQC for both trivalent and hexavalent **chromium**. **Also**, include the saltwater criteria for **chromium**.

**D.** Include the freshwater criterion of **1000 ug/L** for **iron**.

**E.** Include the EPA **Region IV** Waste Division freshwater **screening** values for 1,4-dichlorobenzene, benzene, and chlorobenzene.

**F.** Indicate whether the freshwater criteria were adjusted for **site-specific hardness**, where appropriate, and include the site-specific hardness in a footnote.

**G.** The Florida Surface Water Quality **standards** should also be included in the table, since they **are** probably ARARs for this site.

**is. Pages 8-19 through 8-28, section 8.3.1:**

**A.** **Modify** the discussion of surface water and sediment results **as needed**, based upon the **comments** given **above on** the **data summary** tables.

**B.** The potential effects of future ground water **discharge** to **surface** water **must also** be addressed. EPA **has** previously recommended that this be done **by** comparing ground water **chemical** concentrations to surface water **standards**, **as** a worst-case scenario for ground water potentially **discharging** into a surface water body. Since the upper ground water zones apparently discharge into Bayou Grande **as well as** the nearby wetlands and smaller water bodies, **all** of these areas **must be** considered with respect to potential effects of ground water contaminant discharge.

**16. Page 8-54, Section 8.3.2.2:**

According to the text, twelve intermediate wells were **analyzed** for **the** full TAL/TCL in 1994. Yet **the** ensuing text includes no discussion for **chromium** or lead - **two** metals for **which significant** exceedences of regulatory **standards** were noted in 1993 intermediate zone samples. **Significant MCL** exceedences for **chromium** were **also** detected in **shallow** wells in 1994. Please **clarify** whether **1994 samples collected** for intermediate groundwater were analyzed for these metals.

**17. Page 9-8, Section 9.3:**

**As** mentioned above, the Site **38 RI Report** must address the potential for ground water contaminants to discharge into surface water at concentrations of ecological concern.

**18. Page 10-16, Paragraph 1**

It is stated that industrial screening values are used for combined **surface** and subsurface **soil** samples. For screening purposes Region IV promulgates the use of residential **soil values only**. Therefore, these screening values should **be** changed in the accompanying tables. The **rationale given** for use of industrial screening values is well taken, however, it is **also** understood that in **construction** of **many** residential neighborhoods subsurface **soils** become surface **soils** after construction and Vice-versa.

**19. Page 10-17, Paragraph 2:**

**As** stated previously, documents should not reference EPA personnel or Region IV by name. References should be to written documents only (e.g. guidance, policy, statutes). Please **make the necessary changes** both here and throughout the document.

**20. Page 10-23, Paragraph 3**

The first sentence **states** incorrectly that the twice background rule **can** be used to **screen organic** chemicals. The twice background rule **only applies to inorganic chemicals** and **may** not be used to screen organics, as it is **assumed** that **most** organic chemicals found at hazardous waste sites are produced through human activities. The second sentence **states** "...it is **assumed that organic chemicals** are not present in reference samples", **which** is true, but if they are, they **can not be used** for screening purposes as this sentence implies. Please make the appropriate **corrections** to the **text**.

**21. Pages 10-25 through 10-38, Tables 10-7 through 10-9:**

**A. A** column should be added to these tables to **show** the average concentration of **each** chemical.

**B.** Please recheck **all screening** values in these tables. Some of **the screening** values listed are **incorrect**. For example, manganese should be **39**, not **1092 mg/kg**, and **this change** results in the **inclusion** of manganese **as** a COPC.

**C. As** stated above, the residential screening values should be used in Table **8**.

**22. Page 10-62, Section 10.1.3.5:**

The toxicity equivalency factor for Chrysene is **0.001**.

**23. Page 10-66, Footnote 'F':**

The **skin** surface area **should** reflect inclusion of the exposed head **along** with the exposed forearms and **hands**. This will result in a **skin** surface area of **4100 cm<sup>2</sup>** (as derived **from** the 96th percentile values **from** Table 8-3, USEPA, 1992\*\*). Finally, **as** commented previously, it is inappropriate to list EPA personnel **as** references.

**24. Page 10-69, Figure 10-1:**

It should be made clear in this figure that the equations are being multiplied by either the **ingestion** factor or the cancer factor, but not both.

**26. Pages 10-83 through 10-84, Table 10-26:**

This table should include modifying factors where appropriate and a column for *listing* critical effects of *each* chemical. The oral uncertainty factors for chromium and trichloroethene are 500 and 3000 respectively.

**26. Pages 10-99 through 10-106, Tables 10-26 through 10-32:**

The CDIs for *each* of these chemicals should be included in these tables to facilitate the **reader's** calculation of the hazard quotients and cancer **risks**.

**27. Pages 10-135 through 10-157, Section 10.6:**

The Risk Uncertainty section should be used to comment **on** the uncertainties introduced in the **final** assessment of **risk**. There are **many** points in this section where **this** is not accomplished. This section should not be used **as** a "general comments" section but should stick to the **point**: what are the introduced uncertainties and do they tend to overestimate or underestimate the **risk** or hazard involved? **To illustrate** this point, on **pages 10-112 through 10-113**, the second two paragraphs have **nothing** to do with uncertainty in the **risk** assessment, and unless their purpose is made clear in this regard, they should be removed from the document altogether. (Also, **as** commented previously, it is inappropriate to list **EPA** personnel **as** references.) The last paragraph is simply unclear. For example it is stated that "...some uncertainty **exists** in the sum effect of exposures to numerous constituents near the screening values,". It must be **stated** how **an** uncertainty affects the **risk** assessment. It is not good enough simply to state that "**an** uncertainty exists". This section requires a thorough rewriting.

**28. Page 10-182, section 10.2:**

Include a conceptual site model, **showing** the affected media, contaminant **migration** pathways, and exposure pathways for ecological receptors (terrestrial and aquatic/wetland plants and **animals**).

**29. Page 10-134, Section 10.2.2:**

**A. Table 10-1** does not show a comparison of mean and **maximum** concentrations to ARARs. It **looks** like **this** should be Table 10-7.

**E.** Include a table **similar** to Table 10-7, replacing the human health **screening** values with **ecological** screening values, where available. The ecological Chemicals of **Potential** Concern **will not necessarily** be **the** same **as** those for human health. (Note: The **Florida** surface water quality standards and possibly the **AWQC** would be ARARs for surface water, but the sediment screening values would not be ARARs.) Also, see the comment given above concerning the evaluation of potential effects of ground water contaminant discharge.

**C.** Section 4.3, pages 4-10 to 4-11, **says** that the mixed hardwood/pine forest (Figure 4-4) "provides suitable gopher tortoise habitat." The gopher tortoise is a state species of concern that **digs** burrows. Therefore, even though the terrestrial **risk** assessment should focus on the **0-1 ft.** surface **soil** interval, subsurface **soil** contamination should be addressed with respect to potential **risk** to burrowers **such as** the gopher tortoise.

**30. Page 10-139, General Comments:**

**A.** In following the "Framework" document (mentioned in Section 10.2, page 10-132), the **Exposure** Assessment (here called "Exposure and Pathways") should be followed by the **Ecological** Effects Assessment, which in turn is followed by the **Risk** Characterization **As** recommended for previous ecological **risk** assessments for **NAS** Pensacola, **this** standard outline should be used in presenting the steps of the **risk** assessment. For example, the Ecological **Effects** Assessment should include the **toxic** effects information from the current Risk Characterization subsection called "**Predicted** Effects."

B. Since **risks** are evaluated for both **soil** and ground water contaminants, please divide the Risk Characterization section into those two subheadings.

**31. Page 10-139, Section 10.2.4:**

Also mention that food **chain** exposure will be evaluated (e.g. for pesticides), or provide **justification** for **not performing** this evaluation.

**32. Page 10-140, Paragraph 2:**

Explain what **is** meant by "measured field sampling **variability**" (i.e., **natural variability**?).

**33. Page 10-140, Paragraph 3:**

A. Explain what is meant by "**risk**...due to infrequency of detection and low concentrations" (i.e. **risk** is low?).

B. **Explain** what is considered to be the "level of **significant effect**" for **total PAHs** (i.e. based on the earthworm toxicity data presented in the preceding paragraph?).

**34. Pan? 10-141:**

A. While the toxicity information presented is **good**, it is rather limited and should **be** expanded. Another **good** source of toxicity information is the **USFWS** series of Contaminant Hazard Reviews by Ronald Eider. (More information about these publications **can** be provided upon request.) Some information is **also** available in the IRIS database.

B. Expand the discussion of **risk** related to food chain exposure to pesticides and PCBs, in view of the potential for biomagnification, or provide **good** technical justification for not doing so. **Food chain exposure** (for pesticides/PCBs as well as other COPCs) should be modeled for **representative species**. Include a **table** comparing the calculated exposure doses (based upon **mean** and **maximum** chemical concentrations) to reference toxicity values obtained from the literature. Hazard Quotients and Hazard **Indices** should then be calculated. Some of the **COPCs** (such as pesticides) found at **elevated** concentrations **appear** to be localized, while others are more widespread but at lower concentrations. **This information should be included in the evaluation.**

C. In paragraph 1, explain whether the **poisoning** of robins at 60 ppm DDTR represents lethality and whether the effects on blackbirds and thrushes are lethal or sublethal.

D. Include information **on** the effects of metals (e.g. copper, **zinc**) on vegetation.

**35. Page 10-143. Potential for Species/Community Effects:**

**Modify** this section **as** needed, based upon the comments given above. It should **also** mention the **suitability** of onsite habitats for species of **special concern**. (See Section 4.3.)

**36. Pan? 10-143, Section 10.2.3, Ground Water Risks:**

A. Include **an** evaluation of **risk** related to potential discharge of ground water **contaminants** to Bayou Grande.

B. The purpose of this initial evaluation of wetland surface water and sediment contaminant **concentrations** was not to determine **risk** but to **check** for indications of possible past contaminant migration **from** Site 1 to those **areas**. Therefore, the discussion of **risk** here is not appropriate. **Exceedances** of **screening** values here may indicate a need for further evaluation of the wetlands.

C. In **discussing** the surface water and sediment **data** for the wetlands/ponds, **also** mention any correlation with the types of chemicals and their concentrations found in **soil** and ground water upgradient **from these**

wetlands. This would help in evaluating migration.

**37. Page 10-144, Section 10.2.3:**

In paragraph 2, the suggestion that "contaminants are immobilized in sediments with limited toxic effects" is unsupported and should be changed, with respect to toxic effects.

**38. Page 10-144, Section 10.2.5:**

Modify this section accordingly once the comments given above are addressed.

**39. Page 13-3, Paragraph 1:**

"No additional deep well installation is recommended for assessment purposes." The location of the three existing deep wells are inadequate for purposes of confirming the vertical extent of groundwater contamination at Site 1. At least two additional deep wells, adjacent to locations on the east and west sides of the landfill which exhibit the highest contaminant concentrations in the shallow and deep zones, must be installed during the FS or RD stage. The potential for downward contaminant migration clearly exists, given the strong downward hydraulic gradient observed between the shallow and intermediate zones (page 11-6). Yet given the southward (or possibly eastward) direction of groundwater flow in the deep zone, two of the three existing deep wells are actually upgradient of the areas of greatest surficial groundwater contamination, and none is located proximate to these areas. Finally, E&E detected low levels of mostly VOC and BNA TICs in deep groundwater samples in 1991. Although their data is admittedly suspect, more conclusive confirmation of the vertical extent of groundwater contamination at Site 1 is needed.

\* Comments headed with underlined bold text must be addressed in order for the document to be considered for approval. While EPA strongly recommends that all remaining comments be addressed to improve the quality and defensibility of the document, document approval is not contingent on incorporation of these comments.

\*\* USEPA, January, 1992. EPA/600/8-91/011B Dermal Exposure Assessment: Principles and Applications, Interim Report

**ATTACHMENT 2**

U.S. ENVIRONMENTAL PROTECTION AGENCY REGION IV  
TECHNICAL REVIEW AND **COMMENTS** '  
DRAFT REMEDIAL INVESTIGATION REPORT  
OPERABLE **UNIT 11 (SITE 38: BUILDING 71 & ASSOCIATED IW SEWER LINE)**  
NAVAL AIR STATION (**NAS**) PENSACOLA, FLORIDA

1. Abstract and Executive Summary:

**As** recommended in several previous reviews, the term "receptors" should be used **only** to refer to human or ecological receptors, not **impacted** media, in order to avoid confusion. **Please** revise the text accordingly, both here and throughout the document.

**2. Page 2-7. Paragraph 4:**

"Analytical results of **soil** samples from beneath the concrete floor indicated cyanide, methyl ethyl ketone, toluene, xylenes, trichloroethane, TCE and PCBs." Please provide the locations of these **samples/bays** on a figure.

**3. Page 4-4, Section 4.2.3:**

What **was** the condition of the sump? Were any **soil** samples collected in the vicinity of the sump? **If not, this** should be done during remedial design.

**4. Page 4-7, Section 4.3.3:**

Please provide the location of the subject **UST** on a figure.

**5. Page 4-7, Section 4.4**

Since Site **38** **contains** little suitable habitat for terrestrial biota (i.e., mostly asphalt and concrete **surfaces**), **soil** contaminants should present little **risk** to terrestrial biota. The **Remedial** Investigation for Site **2 (Waterfront Sediments)** will address any contaminants **which** have **already migrated** from Site **38** into the Site **2** area in Pensacola Bay. However, since a ground water contaminant plume **from Site 38** has already reached **Pensacola Bay (Section 9.2.3, page 9-61, the Draft RI Report for Site 38** must **evaluate** the **potential** for the remaining ground water **contaminants** from Site **38** to discharge into the Bay at concentrations that might **adversely impact aquatic** receptors. Specifically, ground water **analytical** data must be compared to the Florida **Surface Water Quality Standards** and the USEPA Region **IV** Waste Division surface water **screening** values as a **worst-case** scenario for a ground water plume **discharging** to a **surface water body**. If there are **exceedances**, then possible modifying factors should be evaluated (e.g. calculation of a dilution factor).

**6. Pages 410 through 417. Section 4.5.4:**

It is unclear why the results of the **soil** gas survey were not used to modify plans for **collecting** subsequent, higher DQO level **soil** and groundwater samples. Specifically:

**A.** A groundwater sample must be collected at "hot spot" location SG651, particularly since subsequent **soil** analytical results for **boring 38S16** yielded high results for both **VOCs (231ppb)** and **SVOCs (1676ppb total PAH, including 210 ppb benzo(a)pyrene**, which exceeds the **screening** value of 88 ppb).

**B.** A groundwater sample must be collected at or near location **SG636**, since the groundwater field **screening** sample collected here had "the highest detected concentrations [of four VOCs]", and sample **SG638** collected approximately **100'** to the west "**had** the greatest frequency of chlorinated compounds detections".

**7. Page 5-1, Section 5.0:**

"**Soil** and groundwater media were sampled in accordance with...the Site **38 SAP** and the addendum **SAP**...except where site conditions and field decisions warranted changes." Were any of these changes significant? The text should **specify** where in the report these changes are described.

8. Page 5-16, Table 5-3:

The preservation requirements for groundwater samples collected for cyanide analysis should specify the use of NaOH to adjust the pH to > 12, not > 10.

**9. Page 7-1, Section 7.1**

In order to ensure appropriate evaluation of the data in this section, and appropriate use of the data in subsequent decision-making processes, the text should specify how each of these "data assessment values" will be used. For example:

**A. Clarify** the use of reference concentrations in the data evaluation process. After screening the maximum concentrations of chemicals in all media against the current EPA Region III risk-based screening values (Hazard Index: 0.1, Carcinogenic Risk:  $10^{-6}$ ), "Chemicals of Potential Concern" (COPCs) should be selected as follows:

- i) Compare the detected concentrations of inorganic chemicals which exceed the risk-based screening levels to their respective background concentrations. An inorganic chemical should be selected as a COPC only if its maximum concentration exceeds twice the average background level for that medium.
- ii) Organic chemicals are **not** eliminated based on the background criterion. In the absence of data indicating otherwise, background concentrations of organics are assumed to be zero or very low.

**B. Specify** that for purposes of screening soil contaminant concentrations, only the residential screening values listed in the current Region III RBC table will be used. Also, since the purpose of this screening process is to eliminate minor contaminants and exposure routes early in the risk assessment process (thereby streamlining the risk assessment) all values must be from the current Region III RBC table. (If the most recent table includes screening values generated using a hazard index of 1, these values should be converted to values which reflect a hazard index of 0.1.) It is inappropriate to use other values, such as the recommended cleanup goal for lead of 400 ppb, in this screening process.

**C. Specify** the values which will be used to evaluate whether soil contaminant concentrations present a threat to groundwater. As noted in previous EPA comments, soil contaminants must be evaluated for this potential threat regardless of whether the contaminant is detected in groundwater at the site.

**D.** A subsection which compares the detection limits achieved with these "data assessment values" should be included, so that the appropriateness of the comparison can be evaluated.

**10. Pages 7-6 through 7-12 Table 7-1**

The "D" qualifier flag applied to some of the data in this table is typically used by a laboratory and removed during data validation. Since the data was reportedly validated using the criteria in the National Functional Guidelines, why was the "D" qualifier flag retained?

**11. Pages 7-17 through 7-21. Table 7-2:**

Please define the asterisk applied to some of the data in this table.

**12. Pages 7-29 through Page 7-92:**

The following discrepancies were noted in the units presented in this section. Please correct as needed.

**A. Table 7-4 (Pages 7-29 through 7-34):**

Conflicting information is presented with regards to units: the top of the table indicates mg/kg and the notes indicate ug/kg. Also, the units given at the top of the table are incomplete.

**B. Page 7-61:**

The units shown on this page should match the units shown in Table 7-8 of ug/L.

C. Table 7-12 (Page 7-92):

The **notes** incorrectly list that **all** values are in **ug/kg** when the **inorganics** are clearly **mg/kg**. The note should be *changed* to indicate that the reference indicated **organics** only.

13. Page 7-49, Paragraph 2

Given the criteria used to evaluate inorganic data for **soils**, preparation of a *single figure illustrating all detected soil inorganics concentrations exceeding the risk-based screening concentrations would greatly facilitate the data evaluation process.*

14. Page 7-55, Table 7-7:

Include the **MCL** of **6 ug/L** for the chemical bis(2-ethylhexyl)phthalate. **Also**, this chemical is **misspelled**.

15. Page 7-72, Section 7.3.5:

The data clearly supports the need for groundwater remediation in the **vicinity** of **Building 71**. However, **significant work remains** to be done to adequately delineate the horizontal and vertical extent of the plume. The following wells must be installed and sampled **so as** to permit inclusion and **evaluation** of the **data** in the **Draft Feasibility Study**:

A. Several **shallow wells** are needed to delineate the extent of **metals** contamination. Better **presentation** and **discussion** of analytical **results** for **inorganics** relative to the groundwater ARARs would facilitate the selection of appropriate monitoring locations.

B. The vertical extent of groundwater contamination, and the **direction** and magnitude of the **vertical** hydraulic gradient, **beneath** the **Building 71** are **unknown** and must be determined through the **installation** of **at least one** intermediate, and possibly one deep, monitoring well.

16. Page 7-102, Paragraph 2

Comparison of inorganic **analytical results** for **soils** with screening values **indicates that the distribution of elevated metals levels across the site is similar to the pattern observed for VOCs and SVOCs: concentrations above the screening levels tend to be concentrated in 'the eastern portion of the parking lot, and a second boarder area south of Building 604'**. Revise the text **as appropriate**.

17. Page 7-108, Paragraph 3

The Building 604 **area** must **be** investigated and remediated with the remainder of Site 38, **unless good** justification for the delay is provided. The **need** to **expeditiously** complete the **investigation** of **this area is increased**, given the **high** contaminant levels detected in groundwater (i.e. **1,2 DCE** and vinyl chloride concentrations exceeding **1,000 ppb**) and consensus by the **Tier 1 team that existing information is insufficient** to permit design and implementation of interim remedial action(s) for groundwater. **Also**, given the proximity of Building **604** to the "TWTP Sewer Line Study Area" and the potential **association** of some of the **soil** and groundwater contamination detected in the "TWTP Sewer Line Study Area" with Building 604, it would seem inefficient to divide these areas for purposes of investigation and remediation

18. Page 7-124, Section 7.6

**As** indicated previously, all contaminants detected in **soils** must be evaluated for potential **threat** to groundwater, regardless of whether or not the contaminant is detected in groundwater at the site.

19. Page 9-8, Section 9.3:

**As** mentioned above, the Site **38 RI Report** must address the potential for ground water contaminants to discharge into surface water at concentrations of ecological concern.

20. Page 10-1, Section 10.1:

Mention the Ecological **Risk** Assessment, since ecological **risks** are addressed in **Section 10.9**, page 10-160.

**21. Page 10-6, Section 10.2.1:**

The second to last sentence of the second paragraph states that the 0-1 foot interval of the paved areas are to be used for the future site resident scenarios. However, later in the BRA **only data from the unpaved areas** are used for future resident scenarios. The rationale **as to what data** was used for what **scenario** should be **stated** early and **clearly** in the **BRA**. Also a reference is made to the first foot of **soil as "exposed soil"**, this should be changed to surface **soil**.

**22. Page 10-18 Paragraph 2:**

The last sentence of this paragraph states that **only soil** that is not paved over **was** used for the residential scenarios but the rationale is given on the next page and it should be moved **so that** it appears **directly below this** statement. The very next paragraph defines the areas that were divided for screening purposes, **again** however, the rationale is provided on the next page and should be provided right below these statements for **clarity**.

**23. Page 10-19, Paragraph 1**

It **is** stated that industrial screening values are used for combined **soil** and subsurface **soil** samples. **As stated** previously, only residential values from the Region III table may be used for purposes of **soil screening**. Please modify the screening values in the accompanying tables accordingly. The rationale given for **use** of industrial screening values is well taken, however, it is **also** understood that in construction of **many** residential neighborhoods **subsurface soils** become surface **soils** after construction and vice-versa.

**24. Page 10-23, Paragraph 2:**

The first sentence states incorrectly that the twice background rule **can be used** to screen **organic chemicals**. The twice background rule **only applies to inorganic chemicals** and may not be used to screen **organics**, **as** it is assumed that most organic chemicals found at hazardous waste sites are produced through human activities. Please make the appropriate corrections to the text.

**25. Page 10-23, Paragraph 4**

The **last** sentence states that the essential nutrients identified do "**not significantly exceed**" the U.S. RDA for those nutrients. Clarify **this** statement.

**26. Pages 10-25 through 10-27, Table 10-8:**

The residential screening values must be used in this table. A  **cursory examination reveals that aluminum, beryllium, manganese, aroclor 1260, and benzo(a)pyrene,** need to be added as COPCs. Also, a **column** should be added to this table showing the average concentration of each chemical.

**27. Pages 10-30 through 10-49, Tables 10-10, 10-12 and 10-16:**

Please recheck the screening values in these tables. Some of the screening values **listed** are **incorrect**. For example, manganese should be **39** not **1100 mg/kg**, and this change results in the inclusion of manganese **as** a COPC. For Table 10-12, aluminum, chromium and aroclor **1260** should **all** be included in the COPC list.

**28. Page 10-74, Section 10.3.4**

The toxicity equivalency factor for Chrysene is 0.001.

**29. Page 10-76, Table 10-26:**

The skin surface area should reflect inclusion of the exposed head along with the exposed forearms and **hands**. This will result in a **skin surface area** of **4100 cm<sup>2</sup>** (as derived from the 95th percentile values **from** Table 8-3, USEPA, 1992\*). This rationale **also** applies to Table 10-27, with the exception of the resident child **scenario** where the value **can** be decreased to 2000 cm<sup>2</sup> from the current **4180 cm<sup>2</sup>**. Finally, **as commented** previously, it is inappropriate to list EPA personnel **as** references. Please make **this** change throughout the text where appropriate.

30. Page 10-81, Figure 10-1:

It should be clarified in **this** figure that the equations are being multiplied by either the ingestion factor **or** the cancer factor, but not **both**.

31. Pages 10-102 through 10-103, Table 10-40.

This table should include **modifying** factors where appropriate and a column for **listing critical** effects of **each** chemical. Also, the first chemical listed **should** be spelled: 1,1,1-Trichloroethane. The **oral** uncertainty factors for chromium and trichloroethene are 500 and 3000 respectively.

32. Pages 10-119 through 10-124, Tables 10-41 through 10-46

The CDIs for **each** of these chemicals should be included in this table to facilitate the reader's calculation of the hazard quotients and cancer **risks**.

**33. Pages 10-135 through 10-157, Section 10.6:**

The **Risk** Uncertainty section should be used to comment on the uncertainties introduced in the **final** assessment of risk. There are many points in **this** section where this is simply not **accomplished**. This **section** should not be used **as a** "general comments" section but should stick to the point: what are the introduced uncertainties and do they tend to overestimate or underestimate the **risk** or hazard involved? To **illustrate this** point, **on page** 10-139, the first two paragraphs have **nothing** whatsoever to do with **uncertainty** in the **risk** assessment, and **unless** their purpose is made clear in **this** regard, they should be removed from the document altogether. (**Also, as** commented in previous reviews, it is inappropriate to list EPA personnel as references.) The last paragraph is simply unclear, for example it is stated that "...some uncertainty **exists** in the **sum** effect of exposures to numerous constituents near the screening values,". It must be stated how an **uncertainty affects the risk** assessment. It is not good enough simply to state that "an uncertainty exists". This **section requires** a thorough rewriting.

**34. Page 10-160, Section 10.9:**

**A.** In sentence **2**, explain what is meant by "**minimal**" soil contamination (e.g. compared to background concentrations, frequency of detection, etc.).

**B.** EPA disagrees with the assessment of the **preliminary data** for Site **2** as stated in **sentence 6**. Sediment screening values were exceeded in the northeastern portion of Site **2**, indicating a potential for **adverse ecological** effects. Further ecological investigation of that area is therefore **needed**. Please revise the **text accordingly**.

**C.** Once ground water contaminants are evaluated for potential ecological effects, **revise** the last **sentence as** needed.

**35. Page 11-2 Section 11.0:**

Once ecological **risk** is reevaluated (**i.e.** potential impacts related to the discharge of ground water contaminants), include a **summary** of ecological **risk** (both terrestrial and potential aquatic) in this **conclusions section**.

**\*\*** Comments headed with bold, underlined text must be addressed in order for the document to **be** considered for approval. While EPA strongly recommends that **all** remaining comments **be addressed** to improve the quality and defensibility of the document, document approval is not contingent on **incorporation** of these comments.

\*USEPA, January, 1992. EPA/600/8-91/011B Dermal **Exposure Assessment: Principles and Applications, Interim Report**

ATTACHMENT 3

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IV  
TECHNICAL REVIEW AND COMMENTS  
DRAFT REMEDIAL INVESTIGATION REPORT  
OPERABLE UNIT 3 (SITE 2 WATERFRONT SEDIMENTS)  
NAVAL AIR STATION (NAS) PENSACOLA, FLORIDA

**1. Abstract:**

The text must be revised to include a more quantitative presentation of data findings in order to adequately support the proposed "No Further Action" recommendation.

**2. Pam? 1-1, Section 1.0**

Clarify the role of ground water contamination at Site 2.

**3. Page 2-1, Section 2.1:**

Indicate whether Allegheny Pier is the same as Pier 303, shown in Figure 4 3 and subsequent Site 2 figures.

**4. Pages 2-1 through 2-4, Section 2.2:**

This section should also include reference to the contamination assessment and associated report which was completed by Ecology & Environment.

**5. Page 3-13, Section 3.6:**

A. While this section presents a good general discussion of the biota of Pensacola Bay, it does not present site-specific information. One of the Contamination Assessment reports for Site 2, written by Ecology & Environment (Section 12, page 12-2), contained some information about the biota found at Site 2. **Check** the reports and include any pertinent information.

B. Ctenophores are planktonic animals and, therefore, should not be included in the *listing* of benthic macroinvertebrates in paragraph 3.

**6. Page 4-5, Figure 4-1:**

This figure should be revised to include outfall locations, as discussed in Section 4.3.2 of the text.

**7. Pam? 413, Paragraph 2**

**Specify** the location of outfall 1 in a figure.

**8. Page 5-1, Paragraph 2:**

**Specify** whether any of the field changes were significant.

**9. Page 5-6, Section 5.1:**

Paragraph 1 states that "Offshore sampling along transects was accomplished by visual alignment of shore-based pylons, and distance to sampling points was subjectively determined." Section 6.4, pages 5-23 to 5-24, states that a Global Positioning System was later used in determining the position (latitude and longitude?) of the sampling locations as marked with buoys. If possible, indicate approximately how far off the actual surface water and sediment sampling locations were from the map grid locations (Figures 5-2 and 5-3).

**10. Pages 5-7 through 5-9, Section 5.2.1 and Fig. 5-2:**

Based upon the locations of the outfalls and the ground water contaminant plume associated with Site 38, future sampling at this site must include surface water sampling closer to the shoreline (e.g., 100-foot distance) in the vicinity of Site 38.

11. Page 5-9, Section 5.2.2:

This section states that the split-spoon/corer sediment sampling method was abandoned for the sediment contaminant assessment because of problems in sediment retrieval, yet Section 5.1 (page 5-6) states that the split-spoon sampler was used to obtain sediment samples for TOC and grain size analysis. Please explain.

12. Page 5-10, Fig. 5-3:

Since the reference stations were designated by X, rather than by transect letter, include the station numbers for the reference stations in this figure.

13. Page 5-11, Section 5.2.3:

A. For comparison with ground water contaminant data, surface water should be sampled close to the well locations. Currently, the surface water sampling station closest to monitoring well 38GS02 is 500 feet offshore (Figure 5-2).

B. Provide the rationale for installing and sampling the well at the southwest corner of Building 76.

14. Page 5-17, Paragraph 2:

At the May 1995 Partnering meeting, it was stated that the low-flow purging method was not used to sample wells at Site 38. Why were different groundwater sampling methods used for these two sites, when field work was conducted at about the same time?

15. Page 5-25, Section 5.5:

In view of the migratory behavior of blue crabs in relation to mating, spawning, development/maturation, and seasonal environmental factors (such as water temperature), it is uncertain whether analytical data for edible tissues from blue crabs caught in and near Site 2 (for the human health risk assessment) would represent contaminant uptake from Site 2.

16. Page 5-26, Figure 5-7:

This figure shows the locations of crab samples taken during the RI. The underlying assumption was made that a crab roughly a mile away would never enter Site 2, and therefore would be a candidate for being a "reference crab" against which crab samples within Site 2 could be compared. This reasoning excludes the migratory nature of crab feeding and the broad extent of its habitat within Pensacola bay. Therefore, it seems unreasonable to use a "reference crab". This screening tool should be removed from the baseline risk assessment and all the contaminants found should be screened only against the fish ingestion risk based screening values.

17. Page 6-12, Section 6.2:

A. Since the sediment reference samples (Figure 5-3) were collected at the 1200-foot distance, add a statement about the nature of the sediments at or near these reference locations. Based upon Table 6-1 (pages 6-3 through 6-10), these sediments change from sand in the west to sand/shell in the central part to sandy clay or clay in the eastern part of the sampling grid. More specific information is also given later in Table 7-3 (page 7-9).

B. Include information on the total organic carbon content of the reference station sediments.

18. Page 7-1, Section 7.1:

Contrary to the first sentence in this section, metals (e.g. silver, zinc) were detected in surface water samples, per Appendix A. Please check this and revise the text as needed.

19. Pages 7-1 through 7-18, section 7.2:

This section tends to discuss elevated levels of contaminants in relation to factors such as stormwater

runoff and boat maintenance, while including little mention of **past discharges of industrial wastes** and potential inputs via ground water discharge of contaminants from land-based sites. Expand **this** section to address these points.

**20. Page 7-16, Section 7.2**

The quantitation **limits** for many of the PAH analyses for sediments greatly exceeded the sediment screening values for **PAHs**, which **are based** upon the contract **required** quantitation limits. Address this point. **Also**, evaluate how this problem may **impact** Tier 1's **ability** to make remedial decisions using this **data**.

**21. Page 7-18 Section 7.2:**

In view of the elevated levels of contaminants found along **transect H** (particularly station **H1**), additional sediment samples must be collected from transects **I** and **J** for chemical analysis to **fill** in the **data** gap between transects **H** and **K**. **Transects I** and **J**, like transect **H**, are located near Site **38**.

**22. Pages 4.1 through 9-7, section 9**

This section tends to make statements and draw conclusions about Site **2** based on general scientific knowledge and principles (e.g. **page 9-6**, paragraphs **2** and **3**). Greater support for the applicability of these conclusions and statements to Site **2**, in the form of **site-specific data** and **information**, is needed.

**23. Page 9-7, Paragraph 1**

The Section mentions petroleum contaminants, yet petroleum **data** are not **discussed** in Section **7.2**, pages **7-16** to **7-17**. **Clarify** this point.

**24. Page 10-4, Paragraph 2**

The text **states** that the USEPA's Framework document (for ecological **risk** assessment) **was** the basis for the outline, yet this **risk** assessment is **missing sections** on the selection of ecological Chemicals of Potential **Concern** (including a table showing the chemicals detected, **frequency** of detection, **range** of concentrations, mean reference/background concentrations, etc.), **Exposure Assessment**, and **Risk Characterization**. The text must be modified to include these **sections**.

**25. Page 10-4, Section 10.2.1:**

Include a figure showing the conceptual site model (**i.e.** sources, migration **pathways** into the different media, exposure pathways and ecological receptors).

**26. Page 10-5, Section 10.2.2:**

Delete the word "proposed" in reference to the USEPA Region IV Waste Division sediment **screening** values.

**27. Page 10-6, Section 10.2.2:**

The potential for ground water contaminants (e.g., from Site **38**) to **discharge** to the Bay **at** Site **2** at levels of ecological concern must also be evaluated. This **can** be done through a comparison of the ground water contaminant concentrations to surface water **standards/screening** numbers, **as** a worst-case scenario.

**28. Page 10-7, Section 10.2.2.2:**

**A**. The locations of the sediment samples from the NOAA-FDEP Pensacola Bay study are not given, so it is not known whether they represent background conditions or conditions related to particular sources (e.g. point sources). The **data** should not be used for comparison with Site **2** data unless this information is **also** presented. Additionally, the purpose of **sampling** reference stations for Site **2** was to provide information on background conditions in the vicinity of Site **2**.

B. Check with FDEP on the appropriate **use** of the FDEP metal-to-aluminum ratio for **this** site.

**29. Page 10-8, section 10.2.2.2:**

**A.** Include a figure showing the location of **NOAA** station **1** in relation to **Site 2**. If **available**, include information on water column depth and particle size distribution at **NOAA** station **1**.

**B.** The screening level approach based upon the USEPA Region **III** Interim Ecological Risk Assessment Guidelines is basically **similar** to the **USEPA** Region **IV** **Waste Division** approach. **Region IV compares** the maximum concentration or the 95% UCL (whichever is lower) to the **available screening** value. (This follows the approach used for human health, **as** described in **Section 10.3.4.4** of **this** RI (pp. 10-45 and 10-48).) Exceedance of a screening value indicates a potential for **ecological** effects and **a** need for further evaluation (e.g. spatial distribution of detections, number of contaminants exceeding **screening** values, magnitude of the exceedances, etc.) and possibly site-specific ecological investigations or tests, **as** planned for Phase **II B**.

**C.** See **Section 10.3.4.4**, pages 10-48 and 10-50, concerning the approach for nondetect values.

**30. Pages 10-13 through 10-15, Section 10.2.2.3:**

The discussion of "natural" concentrations of metals in sediments is **valid** yet somewhat **misleading**. It is possible that some natural levels of metals could have an adverse effect on ecological receptors. However, background levels of chemicals in the present study were to be addressed through sampling appropriate background or reference locations. **Site 2** data should be compared to the **Site 2** reference **data**, prior to comparison with any other Pensacola Bay **data**

**31. Page 10-20, Section 10.2.2.3:**

The statement concerning "The extremely limited use of portions of the **bay near** and within **Site 2** by sensitive estuarine life **stages**" is unsupported. Give the **basis** for the statement.

**32. Page 10-27, Section 10.2.2.4:**

**As** mentioned above, the quantitation **limits** for many of the PAHs in **sediment samples greatly exceed** the contract required quantitation **limits** (Appendix **A**), which are **also** the **Region IV** sediment screening values. **This can** be addressed through following the procedure for non-detects mentioned above, or possibly **by** modifying laboratory procedures to obtain lower quantitation **limits**.

**33. Pages 10-27 through 10-30, Section 10.2.2.4:**

Discuss organic **contaminants** in relation to past operations at **Site 38** and other land-based sites with surface water or ground water discharges to **Site 2**.

**34. Page 10-30, section 10.2.2.4:**

This section questions the usefulness of "sandy reference locations" for comparison with **Site 2** sediment pesticides **data**, yet the station (**M2**) having the **highest total DDT** concentration **has** sandy sediment. Clarify **this** point.

**35. Page 10-31, Section 10.2.3:**

**A.** Once the comments given above are addressed, modify this **section** accordingly.

**B.** Based upon the comments given above, **risk** to ecological receptors at **Site 2 has** not yet been determined. Based upon the exceedances of sediment screening values for multiple contaminants at many **Site 2** sampling locations (particularly in the northeast portion), the magnitude of the exceedances, and the uncertainty concerning potentially **affected** receptors, Phase **II B** (benthic macroinvertebrate analysis and toxicity testing) must be conducted.

**C.** The text predicts a decline in contaminant levels once contaminant sources are removed from the Base. However, much of the contaminant migration into Site 2 took place while the land-based facilities were actively discharging wastes into the Bay. Those discharges apparently stopped in 1973 (Section 2.2, page 2-1), yet Site 2 still contains related contaminants at levels of ecological concern. Please revise the text as needed. Historic levels could be traced by chemically analyzing sediment core intervals in the depositional areas, though this would not necessarily add to the evaluation of ecological risk.

**D.** While it is true that "physical variability of the system" can reconfigure the bottom sediments, it has still been over 20 years since the discharges stopped. Based upon the brief description of surface water hydrological conditions at Site 2 (Section 6.2, page 6-12), it appears that the depositional areas within Site 2 will remain depositional, lower-energy areas unless the shoreline configuration changes.

**36. Pages 10-32 through 10-34, Section 102.5:**

Once the comments given above have been addressed, revise this section accordingly.

**37. Page 10-39, Paragraph 3**

Specify that the twice background rule *only applies to inorganic chemicals* and may not be used to screen organics, as it is assumed that most organic chemicals found at hazardous waste sites are produced through human activities.

**38. Page 10-40, Section 10.3.3.5:**

The reference to "tissue ingestion RBCs" should be changed to reflect that the values used from the Region III RBC table are *fish ingestion RBCs*. This change will facilitate the reader's identification of the appropriate screening values.

**39. Page 10-41, Table 10-4:**

The fish ingestion screening value for mercury is 0.041, not 0.41. Also, Aldrin should not be screened based on comparison with screening concentrations, since organic chemicals are *only* appropriately screened against risk based screening values, not background concentrations.

**40. Pages 10-52 through 10-53, Figure 10-9:**

All of the equations need to be reformatted so as to appear in the correct place on the page.

**41. Page 10-55, Paragraph 4:**

The USEPA Region III RBC Tables should not be used as a source of toxicological values. IRIS, HEAST, and ECAO are the *only* sources that should be referenced for toxicity values.

**42. Page 10-56, Paragraph 1**

"USEPA Region IV" should not be used as rationale for inclusion of toxicological profiles. RAGS part A Section 7.7.1 (not Region IV guidance) indicates that a short description of the toxic effects of each chemical *carried* through the risk assessment should be presented in the main body of the text in non-technical language.

**43. Page 10-57, Table 10-8:**

This table should include modifying factors where appropriate and a column for listing critical effects of each chemical, as specified in RAGS part A section 7.7.1.

**44. Pages 10-62 through 10-71, Section 10.3.7:**

The Risk Uncertainty section should not be used as "general comments" sections but should stick to the point, answering such questions as: "What are the uncertainties introduced in the final assessment of risk?", and "Do they tend to overestimate or underestimate the risk or hazard involved?".

45. Page 10-63, Table 10-9:

The chronic daily intakes for each chemical should be included in these tables to aid the reader in calculating hazard quotients and cancer risks.

\* Comments headed with underlined bold text must be addressed in order for the document to be considered for approval. While EPA strongly recommends that all other comments be addressed to improve the quality and defensibility of the document, document approval is not contingent on incorporation of these comments.

**ATTACHMENT 4**

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IV  
TECHNICAL REVIEW AND COMMENTS\*  
DRAFT FINAL RI/FS WORK PLAN  
DRAFT SAMPLING AND ANALYSIS PLAN  
OPERABLE UNIT 16 (SITE 41: NASP WETLANDS)  
NAVAL AIR STATION (NAS) PENSACOLA, FLORIDA

DRAFT FINAL WORK PLAN

1. Page 2-1, Paragraph 2

While all wetlands may have been "considered", the work plan should clearly identify "up front" (i.e. either in Section 1, or early in Section 2) which wetlands were targeted for remedial investigation and explain/justify the selection process. For example, include a figure which illustrates only those wetlands targeted for investigation.

2. Page 2-17, Paragraph 3:

As commented previously, the 1987 edition of the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* should be used.

3. Page 3-1, Paragraph 3:

Is the Florida Administrative Code listed for surface water the most current version?

4. Page 3-10, Paragraph 2

Given the Tier 1 team's recent decision to transfer Site 3 to the state UST program, the full ecological assessment of wetlands W1, 39, 72 and 52 should be completed under this program (re: page 3-4, paragraph 3, final sentence).

6. Page 4-4, Paragraph 4:

With the exception of the E&E studies, data from these investigations may be used to replace data planned to be collected as part of the RI..." Clarify that this statement refers only to the chemical data, not the habitat and biota survey data, collected by E&E.

6. Page 4-11, Paragraph 4:

If benchmark values do not exist for a contaminant, it may also be helpful to conduct a literature search on the nature of the chemical and its possible ecological effects (e.g. based on known effects of similar contaminants). One possible source of information for surface water is the AQUIRE database.

7. Page 4-15, Paragraph 2:

Clarify how the FDEP (1988) approach to evaluating metals in estuarine sediments will be used at Site 41, in view of the different digestion procedures used in the FDEP approach and the U.S.EPA Contract Laboratory Program.

8. Page 4-16, Paragraph 1:

Revise the final phrase of the first sentence to read "it must be determined whether they are causing, or can potentially cause, an adverse effect."

9. Page 4-17, Paragraph 2 (Data Gaps):

Use of mathematical models for predicting contaminant bioaccumulation in the food chain is acceptable. However, depending upon the assumptions and degree of uncertainty associated with the models, it may be necessary to follow up with chemical analysis of tissues (particularly for lower trophic level organisms) as a measure of bioaccumulation.

**10. Page 418, Paragraph 1:**

"Once expanded **sampling** has better characterized the extent of **contamination** and **shown** which areas have potential for adverse **impacts**, the investigation may move into Phase **II**B." In some cases, particularly where **analytical** results for wetland samples are already available, it may **be** possible to perform Phase **II**B simultaneously with Phase **II**A. This could serve to expedite the investigatory process for some **high** priority wetlands.

**11. Pages 4-19 through 4-20, Section 4.3.4:**

The diversity studies and toxicity tests planned for Phase **II**B should **also** be considered for wetland vegetation where appropriate.

**12. Page 4-24, Paragraph 2:**

**All** but the first two sentences of this paragraph deal with **risk** management and remedial action decisions. While valid, these issues are not **part** of the **risk** assessment proper, and therefore should be presented in a separate section of the **SAP**.

**13. Page 5-4, Paragraph 3:**

Clarify why a two-step reporting process will be used for the FS for Site **41**, while previous **RI/FS** work plans for other sites have specified preparation of only a single FS Report.

**DRAFT! SAMPLING AND ANALYSIS PLAN**

**1. Page 1-3, Paragraph 2**

"Those wetlands which do not require a complete investigation will be addressed through a **preliminary** site characterization (PSC) instead of a **risk** assessment." This approach appears acceptable. **However**, specify what is meant by "a complete investigation".

**2. Page 2-8, Section 2.3:**

Specify **that** assessment endpoints must be chosen **first**, then measurement endpoints *can* be selected accordingly.

**3. Page 2-8, Reference and Screening values:**

In general, the comparison of contaminant concentrations to two times the mean reference concentration is used only **as** a screen for **naturally-occurring** inorganics. However, while most organic contaminants are not **naturally occurring**, instances of widespread organic contaminants (e.g. sprayed pesticides) are sometimes observed. Possible approaches for dealing with **such** detections include: (i) **carrying** these contaminants through the **risk** assessment, in order to properly assess their contribution to overall site **risk**, or (ii) making an early determination to deal with such organic contaminants via a separate investigatory and remediation process, provided the **data** indicates that these **contaminants** are clearly not attributable to the site/source under investigation and that separate consideration of these contaminants will not significantly affect conclusions/decisions reached for the site.

**4. Page 2-9, Paragraph 1:**

Note that the Florida Sediment Quality Assessment Guidelines were taken into account in developing the EPA Region IV Sediment Screening Values.

**5. Page 2-9, Paragraph 3:**

Clarify in the text what is meant by the expression "weight of evidence". This approach typically refers to the use of multiple test results (e.g. chemical analyses, toxicity tests, diversity studies, bioaccumulation, etc.) to characterize **risk**. With respect to the evaluation of sediment contamination

being considered here, factors such as frequency of detections, number and magnitude of SSVs exceedences, particle size distribution, etc. are being evaluated. **Thus, a different** terminology may be more appropriate.

**6. Page 2-10, Table 2-2:**

For marine sediments, a polychaete, such as Neanthes sp., might **also** be considered for **toxicity** tests.

**7. Page 2-10, Section 2.3.2:**

The assessment endpoints should be stated more clearly. **From** the text, it is **unclear** whether the endpoints are **survival** and well-being of the benthic **macroinvertebrate** community and **terrestrial** invertebrates, survival and well-being of white shrimp and the **great** blue heron, or what.

**Also**, any endangered and threatened species and wetland **plants should** be considered in selecting assessment endpoints. The measurement endpoint would likely involve surrogate species. Similarly, given the importance of vegetation in a wetland system, assessment endpoints related to vegetation may be appropriate.

**8. Page 2-12, Paragraph 3:**

**Clarify** that this publication applies to food *chain* exposure rather than **impacts** from direct toxicity.

**9. Page 2-13, Figure 2-2:**

Plants and **animals** should be shown **as** separate columns under **aquatic** and terrestrial receptors, since some of the exposure pathways would differ.

**10. Page 3-7, Paragraph 2**

**Specify** how the RBCs were adjusted to account for the **assumed** lower **exposure** frequencies.

**11. Page 3-9, Paragraph 2:**

**Specify** that the twice background rule applies only to inorganic **chemicals** and may not be used to **screen** organics, since it is assumed **that** most organic **chemicals** found **at hazardous** waste sites are produced **through** human activities.

**12. Page 3-10, Paragraph 2:**

"Including outliers will increase the overall uncertainty of the **calculated risks** and increase the **estimate** of the **risk** in a conservative manner." This statement is incorrect and should be deleted from the text due to the rationale given in the preceding sentence.

**13. Page 3-14, Figure 3-1:**

The skin surface area for ages 7-31 should be **20,000cm<sup>2</sup>/day**, to reflect **total body** immersion

**14. Page 3-15, Figure 3-1:**

The Absorption Factor for metals should be **0.001**.

**15. Page 3-19, Paragraph 2:**

The U.S.EPA Region III RBC tables should not be used **as** a source of toxicological values. IRIS, HEAST and ECAO (phone: **(513) 569-7300**) are the **only sources** that should be referenced for **toxicity** values.

**16. Page 4-1, Paragraph 1:**

What is the current status of the EPA ERL - **Gulf Breeze data**, particularly for the Yacht Basin area? Is it available? **If so**, it should be included and considered where appropriate.

**17. Page 4-6, Paragraph 1:**

Whenever freshwater surface water **data** are compared to the **AWQC**, the hardness-dependent **criteria** for metals (e.g. lead, zinc) must be adjusted for site-specific hardness. If hardness **was** not measured, it *can* be calculated based upon the measured concentrations of **calcium** and magnesium. Also, the reference to "**risk**" with respect to hardness does not seem appropriate, since hardness is used in the surface water contaminant screening process rather than in a **risk** determination.

**18. Page 410, Figure 4-1:**

In general, **surface** water samples should **be** paired with sediment samples whenever possible. **This** comment *is* applicable to **all** of Section 4. Provide the rationale for any proposed separate surface water samples.

**19. Page 4-12, Table 4-3:**

Specify the source of the marine chronic water quality criteria for aluminum and **iron**. Since there are no **AWQC** for these metals for aquatic life, are these criteria based upon human health? (It may be clearer to have criteria for aquatic receptors and human health listed in **separate** columns)

**20. Page 4-18, Figure 4-2**

A sediment/surface water **pair** should **also** be collected from what appears to be a **small** pool (based on topographic contours) west of **SW/SD-003-05**.

**21. Page 4-23, Figure 4-3:**

Was an effort made to bias sampling **points** towards any "hot spots" detected **at** the adjacent **terrestrial** sites?

**22. Page 4-35, Figure 4-6:**

**A.** Include the location of **EPA SW/SD-002-04**. If an **exact** location is not **possible**, indicate **this** in the text and provide **an** approximate location.

**B.** In general, it would be helpful to **show** the monitoring well locations **mentioned** in the **text** on the individual wetland maps, **along** with **all** detected chemicals. Also, **indicate** if there were any problems with detection limits. These comments are applicable to **all** of Section 4.

**23. Pam?4-39, Figure 4-7:**

Based on the text (page 4-42, paragraph 1) it appears that one of the proposed sediment samples **in** the southeastern portion of this wetland should be moved to the southwestern **corner**, to be **closer** to Site 1. Please verify the proposed locations.

**24. Pam?4-43, Figure 4-8:**

Illustrate the three proposed sediment sampling locations.

**25. Page 4-53, Figure 4-11:**

**Clarify** why no samples are proposed for Wetlands 11 and 13.

**26. Pages 4-60 through 4-61, Figures 4-12 and 4 1 3**

If significant contamination *is* detected in the proposed samples, additional sediment/surface water samples should be collected at or near any outlets to Pensacola **Bay**.

**27. Page 4-63, Section 4.7:**

Given the Tier 1 team's recent decision to transfer Site 3 to the state **UST** program, the **full** ecological **risk** assessment of wetlands W1, 39, 72 and 52 should be completed under this program.

**28. Page 4-69, Section 4.7.1:**

Were the sundew plants found at Site 3, near the channel, located in **an area** considered to be a wetland?

**29. Pas? 4-72 through 4-74, section 4.7.4:**

Five culverts were mentioned, but only one was designated for sampling. Do the other four culverts drain Sherman Field, or are they the pipes that drain into the one culvert?

**30. Page 476. Figure 4-18:**

An additional sediment/surface water **pair** should **also** be collected in the southeastern corner of Wetland 19B, closer to Site 16.

**31. Pas? 477. Figure 4 1 9**

Add a SW/SD sample in the southern arm of Wetland W-2.

**32. Pages 4-74 through 4-80, Sections 4.8 through 4.10:**

The **SAP** presents a good attempt to devise appropriate sampling plans for these wetlands, despite the **fact** that no **data** currently exists for the associated terrestrial sites. In the absence of **this data**, EPA recommends delaying investigation of these wetlands until the associated terrestrial site investigations are completed. Once the investigations are complete, the **SAP** should be revisited and revised **as** needed prior to implementation.

\* Comments headed with underlined bold text must be addressed in order for the document to **be** considered for approval. While EPA strongly recommends that **all** other comments **be** addressed to improve the quality and defensibility of the document, document approval is not contingent on incorporation of these comments.