



# EnSafe / Allen 6

a joint venture for professional

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NAS PENSACOLA  
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September 24, 1993

U. S. Environmental Protection Agency  
Attn: **Ms. Allison** Drew  
345 Courtland Street, N.E.  
Atlanta, Georgia 30365

Re: Response to Comments  
Sites 40, 41 and 42 ~~Work~~ Plans  
NAS Pensacola  
Contract # N62467-89-D-0318/CTO-036

Dear **Ms.** Drew:

On behalf of the Navy, EnSafe/Allen & Hoshall is pleased to submit seven copies each of the Response to Comments for the **Sites 40 (Bayou Grande), 41 (NAS Pensacola Wetlands) and 42 (Pensacola Bay)** work plans at the Naval Air Station Pensacola in Pensacola, Florida. In accordance with the 1994 Site Management Plan, the draft final ~~work~~ plans **will** be submitted by November 28, 1993.

Please let us **know** if you have any questions or comments regarding the responses.

Sincerely,

EnSafe/Allen & Hoshall

Allison L. Dennen  
Project Geologist

Henry H. Beiro  
Task Order Manager

Enclosures

cc: EnSafe/Allen & Hoshall file  
**Linda Martin, SOUTHNAVFACENGCOM — 2 copies**  
Ron Joyner, NAS Pensacola - 13 copies  
Tom Moody, FDEP - 1 copy  
John Mitchell, FDEP - 1 copy  
Waynon Johnson, NOAA - 1 copy  
**Lynn Griffin, FDEP - 1 copy**

Technical Review and Comments  
Draft RI/FS Work Plans for  
Site 40 (Bayou Grande) and Site 42 (Pensacola Bay)  
U. S. Environmental Protection Agency  
Naval Air Station (NAS) Pensacola  
Pensacola, Florida

Common Site 40 and 42:

Comments Applicable to both work plans. (Note: page and paragraph numbers provided are for the "Bayou Grande" ~~Work~~ Plan. Identical text requiring revision in the "Pensacola Bay" ~~Work~~ Plan may occur at slightly different locations, although section numbers should be the same.)

Comment 1 — Page 1-1, Section 1.0, Paragraph 1:

The ~~Florida~~ Department of Environmental Protection (FDEP) is also a Party to the ~~Federal~~ Facilities Agreement. Please make the necessary correction.

Response:

**Agreed.** The Florida Department of Environmental Protection (FDEP) has been added.

Comment 2 — Page 1-1, Section 1.0, Paragraph 2:

This paragraph must **also** briefly summarize plans to conduct and ~~prepare~~ a **Baseline Risk Assessment** for the Operable Unit.

Response:

A Baseline **Risk** Assessment **will be** prepared for the sites.

Comment 3 — Pages 1-1 through 1-2, Section 1.0, Paragraph 3:

The components described in this paragraph (*i.e.* the ~~SAP~~ (including **FSAP** and **QAPP**) and the **HASP**) are essential components of the ~~RI/FS Work Plan~~. Consequently, **the RI/FS Work Plans**

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for the subject Operable **Units** cannot **be** considered for **approval until** these components are received **and** approved.

Response:

Site-specific SAPs will **be** submitted to the **Navy, USEPA, and FDEP.**

Comment 4 — Page 2-8, Section 2.3.4, Paragraph 3:

The **EPA** Groundwater Classification for the **surficial** aquifer must **be** provided **in** this description as well.

Response:

The FDEP classification of the **surficial** aquifer is G-1. The **EPA** Groundwater Classification for the **surficial** aquifer is **IIA**. However, it **should be noted** the shallow and intermediate **zones** of the **surficial** aquifer are not **used as** a water supply. The deep zone of the **surficial** Sand and Gravel Aquifer is overlaid by a **confining unit**.

Comment 5 — Pages 2-8 through 2-12. Section 2.3.4:

A map depicting the direction of groundwater flow for **NAS Pensacola** for each zone of the Sand-And-Gravel Aquifer should **be included in this section**. The **results of the forthcoming well** inventory, together with existing hydrogeologic **data** and **information which** has been collected during previous investigations (**E&E, Geraghty & Miller, etc.**) should **provide adequate** information on which to base such maps.

Response:

Maps estimating the direction of groundwater **flow** in the shallow, **intermediate**, and deep **zones** at **NAS Pensacola** will be included if **sufficient information has been obtained to construct** the maps (e.g., top of **casing** elevations, water levels). **If the** information cannot be obtained until after the submittal of the work plans, the maps **will be submitted** under separate cover.

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Comment 6 — Page 3-1, Section 3.1:

The text states that the **scope** of proposed work for the **RI/FS will be discussed** in **Sections 5** and **6**. However, Section 6 is a **list** of references and does not include such a discussion. **Please** clarify this point.

Response:

The **scope** of proposed work for the **RI/FS is discussed** in **Sections 4** and **5**; the **text has been** changed accordingly.

Comment 7 — Page 3-3, Figure 3-1:

The figure states that Site 36 is not shown. The **text should discuss** where **Site 36 is located** and its relationship to the contamination of the Bayou (/Bay).

Response:

Site **36** is the industrial waste sewer system. The **sewer line** is approximately **4.5** miles long and is located in an **area** approximately **1 mile wide** by **1.5 miles** long in the southeastern **portion** of **NAS** Pensacola. The contamination relationship to the Bayou (/Bay) **is not** known. A figure has been added illustrating the location of the sewer line.

Comment 8 — Pages 3-7 through 3-9, Section 3.3 (**Section 3.2** for "Pensacola Bay" Work Plan):

This **section** presents a reasonable **preliminary**, or conceptual, identification of **potential** contaminant migration pathways and potential **impacts** on public health and/or the environment. However, while comprehensive, the information presented is **too general to** be of extensive **use** in directing and refining sampling plans. **As a** result, **the** sampling schemes proposed in subsequent sections consist of numerous **sampling stations** positioned **at** regular intervals along the entire length of the **NAS** Pensacola coastline. While it **is recognized** that most of the available **data** is questionable due to the **use** of lower **DQO analytical** levels and less **than** rigorous QA/QC methods, some focusing of sampling efforts should still **be** possible through (i) and identification of likely contaminant pathways (GW, SW), (ii) the **use** of available survey results, site histories and (iii) conservative use of the available **chemical data**. In **addition**, given that higher **DQO** Level data for individual sites will **be forthcoming** prior to actual implementation of the "Bay" and "Bayou" work plans, **an** addendum to **this** work plan **aimed** at focusing the proposed sampling scheme should be submitted following **receipt** and evaluation of this new site-specific **data**.

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Response:

The sampling scheme **has** been revised into a three-phase approach, **as discussed in the meeting of May 12 and 13, 1993. A** brief outline of the phases **is** presented below.

### **Phase I**

For Pensacola Bay and Bayou Grande during **Phase I**, transects **will** be extended **300** feet perpendicular to the shore. Bathymetry **will be measured** along the length of the transect and sediment samples **will** be collected at **0** feet (shoreline), **150** feet and **300** feet along the transect. Sediment samples **will be** submitted for analysis of **grain size** and total organic carbon.

During Phase I at the **NAS** Pensacola Wetlands, **all listed** wetlands **and/or** potential wetlands **as** impacted by a **corresponding** site at **NAS Pensacola will be** investigated to identify basic biological characteristics of the wetland, **to delineate** the wetland **boundary** and to develop a sampling strategy for Phase **II**, **as** required. If **impact is suspected**, a grid will be established across the wetland. Bathymetry **will be measured** across the wetland, and sediment samples **will** be collected from **selected** locations for **grain size** and total organic carbon analysis.

A technical memorandum will be submitted **upon** completion of the **Phase I** activities. The memorandum will detail the results of **Phase I** sampling and **will** present the **Phase IIA** sampling locations. The technical memorandum **will also** present the rationale for additional sampling or the rationale for no further investigation.

### **Phase IIA**

Phase **IIA** **consists** of collecting sediment and surface water samples for Target Analyte List/Target Compound List (TAL/TCL) analysis **using** CLP protocol. **Phase II** sampling locations will be selected based on various criteria, **including** but not limited to:

- e storm water discharge points,
- areas hydraulically downgradient of other identified potential sources of contamination (PSCs),
- areas of surface water discharge,
- e areas of high total organic carbon,
- e areas of small grain size (e.g., high clay and silt content),
- background locations.

One sediment sample will be collected at **each** of **these** hot spot locations. **The** results of the analyses will initially be compared to background conditions. **Locations** where the detected concentrations of the **sediments** are **greater** than twice **background will be** further compared to the agreed trigger levels. At **locations** where the detected concentrations **exceed** the background or trigger levels, three additional sediment samples **will be collected**

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for analysis to delineate the extent. Surface water samples will be collected at locations where the detected concentrations of the sediments exceed the background or trigger levels in standing bodies of water (i.e., wetlands) and not in dynamic environments (i.e., Pensacola Bay and Bayou Grande). A technical memorandum will be written upon completion of Phase IIA detailing the analytical results and the comparison to background and the trigger levels. The technical memorandum will also present the rationale and locations for the subsequent Phase IIB sampling or the rationale for no further investigation.

#### Phase IIB

Phase IIB consists of diversity and toxicity tests of potentially impacted organisms. During this phase of the investigation, a known volume of sediment will be collected. The sample will be submitted to the selected laboratory and the diversity of the organisms within the sediment will be determined.

Toxicity tests will also be performed during this phase. Selected species of organisms will be directly exposed in the laboratory to the site water and sediment. Acute (48 hour) toxicity will be tested on a portion of the selected organisms. Chronic (28 days) tests will be performed on all of the selected organisms.

A technical memorandum will be written upon completion of Phase IIB detailing the analytical results. The technical memorandum will also present the rationale and locations for the subsequent Phase III sampling or the rationale for no further investigation.

#### Phase III

Phase III consists of collection of selected organisms for studying the bioaccumulation of contaminants. Phase III tests may be performed if needed to further gauge the ecological impact of a site. This information must be weighed against time and expense to determine an agreement for clean up levels.

Comment 9 — Pages 3-8 through 3-9, Section 3.3 and Figure 3-2:

Estuarine systems can have high loads of suspended particulate matter (e.f., suspended silt or detritus) in the water column. Contaminants can adsorb onto this suspended particulate matter as well as being dissolved in the water. This could result in bioaccumulation by organisms such as filter-feeders. The following changes should therefore be made to the text and table to reflect these possibilities:

- A. In the 6th and 7th sentences of Paragraph 3, mention adsorption of contaminants onto suspended particulate matter in the water column.

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- B. In the **8th** sentence, change "accumulated contaminants" to "**adsorbed** contaminants".
- C. In Figure 3-2, under the second **occurrence** of "**Primary Sources**", either **add a third box** for adsorbed contaminants, or amend the **box** for "dissolved contaminants in surface water" to include a reference to contaminants **adsorbed onto** suspended particulate matter.
- D. **Also** in Figure 3-2, add suspended **particulate** matter to the **box** under "**Primary Release Mechanisms**".

(Note: The **proposed** measurement of **total** suspended solids, in **Section 5.2.1**, page **5-7**, should yield useful information on the amount of **suspended particulate** matter in the water column. It is **not** recommended **that** the **proposed surface** water samples **be filtered** for chemical analysis. If **chemical analysis** of the surface water samples indicates elevated concentrations of **contaminants** that might not **be expected to partition** into water, such **as** hydrophobic organic chemicals, analysis of **particulate** and dissolved fractions of surface water samples might **be appropriate** during a later phase of the investigation.)

Response:

- A. Agreed. Adsorption of contaminants **onto** suspended **particulate matter** in the water **has been** added to the paragraph.
- B. Agreed. "**Accumulated contaminants**" **has been** changed to "**adsorbed** contaminants."
- C. A **third box** for adsorbed contaminants has been **added**.
- D. Suspended particulate matter has **been added** to the **box** under "**Primary Release Mechanisms**."

Note: Surface water samples will not be **filtered** before chemical analysis.

Comment 10 — Page 3-9, Figure 3-2:

Please make the following **additional** changes to **this** figure:

- A. Delete "**Terrestrial biota**" from the "**Secondary Sources**" heading. **Contaminants** in Bayou Grande would **first** bioaccumulate in **aquatic organisms**, ingestion of these **organisms** by terrestrial biota could then lead to bioaccumulation in the **terrestrial biota**.

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- B. Draw a direct line from the "Bioaccumulation" box (Secondary Sources) to "Consumption of *Affected* Ecological Resources" (Pathways), since many benthic macroinvertebrates (e.g., infauna) **are** sessile and do not migrate.

Response:

- A. Agreed. "Terrestrial biota" **has** been deleted.
- B. Agreed. A line **has** been **drawn** from the "Bioaccumulation" box to the "Consumption of *Affected* Ecological Resources."

Comment 11 — Page 3-10, Table 3-2:

Please revise the format of **this** table to **more** clearly indicate that **any** of the "General Response Actions" **or** "Remedial Technology Types" may **be** used to achieve **either** human health **or** environmental/ecological "Remedial Action Objectives".

Response:

Table 3-2 has been amended **to** more clearly indicate the General Remedial **Actions** or Remedial Technology **Types will** be used **to** achieve either human health or environmental/ecological "Remedial Action Objectives."

Comment 12 — Page 4-1, Section 4.0:

- A. **"As** analytic **data** becomes available from other **site specific** investigations completed **at** **NAS** Pensacola, **this work plan will be re-evaluated.**" **In** order to assure meaningful and timely incorporation of **this forthcoming data** into the present, **more conceptual** plans, the logistics of this "re-evaluation" process must **be** clearly specified in some section of **the** present **RI/FS Work Plan**. For example, **will data-supported** modifications **to the present** sampling plans be submitted **as a work plan addendum, technical memo,** or in some other format? Would it **be** feasible (technically defensible, **cost** effective) to consider submitting any such addendums in pieces (e.g. west Bayou Grande, **east** Bayou Grande) **so that work can** commence on **at** least a portion of the Operable Unit? An adequate schedule for **this** "re-evaluation" process must **be provided so that** a realistic **start date** for implementing these **work plans can be** established. **This** schedule should include such information **as** (i) anticipated completion **dates** for "Phase II" **data** collection, validation, and evaluation efforts at each individual **PSC,** and (ii) proposed submittal **dates** for addendums to the "Bay" and "Bayou" **RI/FS Work Plans**. **Adequate** planning of this

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process up front will assure timely initiation and completion of an effectively designed RI/FS for these "ecological" Operable Units.

- B. Please delete the 4th and 5th sentences of this section, and **replace** them with more general terminology, such **as** the following:

"Biological effects will be investigated through the collection and taxonomic analysis of the benthic macroinvertebrate **community**."

The EMAP approach **as** contained in the document **Ecological Indicators (EPA/600/3-90/060)** is not appropriate, **per se**, for **this** site. The focus of the **EMAP** program is the ecological health of an **area**, while the **focus** of a Superfund investigation **is cause** and effect (i.e., determining whether ecological **effects** are related to site contaminants). Although some of the elements contained in **this** document **can** be applied to the investigation of Site 40, reference to the **EMAP** program, the **Ecological Indicators** document, and the EMAP terminology should be deleted to avoid confusion.

Response:

- A. A phased sampling approach **has** been developed for the investigation. **Upon** completion of each phase of **work**, a technical memorandum **will be** submitted detailing the activities and **results** of the completed phase and outlining the number of samples and sampling locations for the subsequent phase. **See** the response to USEPA Comment 8 for a brief outline of the **sampling** approach to be followed during the investigation.

The Navy **is** dedicated to **meeting** all proposed **schedules**. To meet the **schedules**, Sites 40, **41** and **42** will be investigated **simultaneously**. A **draft** field schedule is provided in the Site Management **Plan** (SMP).

- B. The 4th and 5th sentences of Section **4.0** have **been** replaced with "Biological **effects** **will** be investigated through the collection and taxonomic **analysis** of the benthic macroinvertebrate **community**." The **EMAP** approach **is** not applicable to the investigation. **See** the response to the USEPA Comment 8 for a brief outline of the sampling approach to be followed during the investigation.

Comment 13 — Pages 4-1 through 4-2, "Sediment Chemistry **DQOs**" and Table 4-1:

The term "chronic effects" usually refers to effects on biological **receptors**, **not** on sediment. **clarify** this point.

**Responses** in bold denote changes to first draft.

Response:

The term "chronic effects" has been deleted.

Comment 14 — Pages 4-2 through 4-3, "Surface ~~Water~~ DQOs" and Table 4-1:

The term "acute effects" usually refers to effects on biological receptors, not on surface water. Clarify this point.

Response:

The term "acute effects" has been deleted.

Comment 15 — Page 4-3, Section 4.1, "Biological Effects DQOs":

An investigation of the benthic macroinvertebrate community, with the subsequent determination of distribution and diversity, should provide valuable information about biological effects. However, it should be noted that additional biological investigations (e.f., sediment toxicity testing, bioaccumulation studies) may be needed at a later point in the investigation in order to provide sufficient information for the ecological risk assessment.

**Response:**

Bioaccumulation studies are outlined in Phase III of the ecological assessment as a contingency plan if further investigation is need to gauge ecological impact.

Comment 16 — Pages 4-4 through 4-8, Section 4.2:

As mentioned above, this investigation is being conducted under the Superfund program, not the EMAP program. Several of the "indicators" presented in this section and the following subsections are applicable to the proposed investigation, but the terminology is not applicable. Please delete Section 4.2 and the indicated subsections (pages 4-4 through 4-8, including tables) and incorporate applicable portions under Section 5.0 (RI/FS ~~Tasks~~) subheadings, as follows:

Section 4.2 — Delete

Subsection 4.2.1 — Delete. No detailed discussion is needed. Dissolved oxygen is already included among the general water quality parameters in Section 5.2.1, pages 5-7 through 5-9.

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Subsection 4.2.2 and Table 4-2 — Combine *this section* with Section 5.2.1 (page 5-10). However, in the text on page 4-6, change "Most benthic organisms are sessile" to Many benthic organisms.. .."

Subsection 4.2.3 — Either delete *this section*, or add a subsection on sediment toxicity testing to Section 5.2.1 (pages 5-6 through 5-10). (It appears that no toxicity testing was planned for the proposed investigation. It might be more appropriate to include sediment toxicity testing in a later investigation phase.)

Subsection 4.2.4 — Delete. Measurement of water clarity (e.g., Secchi disk visibility?) can be added to a subsection of Section 5.2.1 (pages 5-6 through 5-10).

**Response:**

The **EMAP approach** has been deleted. See the response to the USEPA Comment 8 for a brief outline of the sampling approach to be followed during the investigation.

Comment 17 — Pages 4-8 through 4-9, Section 4.3:

The information contained in *this section* is overly general. Please refer to comments 8 and 12A.

**Response:**

The sampling approach has been revised to focus on hot spot locations as was discussed during the meeting of May 12 and 13, 1993. See the response to the USEPA Comment 8 for a brief outline of the sampling approach to be followed during the investigation.

Comment 18 — Page 4-9, Section 4.4:

Whenever possible, detection limits **used** in the chemical analysis of sediment samples should be sufficiently low that the **data** can be compared to the **N O M Effects Range-Low** and **Effects Range-Median** values used as ecological sediment screening values by the **USEPA Region IV** Waste Management Division. Likewise, detection **limits** used in the chemical analysis of **surface** water samples should be sufficiently **low** that the **data** can be compared to the **Florida** Surface Water **Standards** and the ecological surface water screening values (including the **Ambient Water Quality Criteria**) used by the **USEPA Region IV** Waste Management Division.

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**Response:**

The Navy **will be submitting trigger level values for joint approval and subsequent use.** If needed, the detection limits of the chemical **analysis will be lowered to be commensurate with the trigger levels.** However, **the added cost should be weighed against the usefulness of the analytical data in determining ecological risk.**

Comment 19 — Pages 5-2 through 5-10, Section 5.2:

A. The proposed extensive **transect** sampling design appears to be very thorough with respect to determining the extent of contamination in the Bayou (/Bay) sediments. However, EPA is concerned that the **planned full scan chemical analyses and the infaunal benthic macroinvertebrate analyses represent a major effort in terms of time and cost.** The following comments are provided **as recommended ways of decreasing the number of samples while still obtaining sufficient data for the site characterization and risk assessment:**

- (i) Collect information on the **nature of the bottom** sediment (e.g., sand, silty sand, silt, etc.) and the water column **depth prior to** choosing sediment sampling locations. Sediment sampling should then **be focused on** depositional areas with fine sediments, **since many types of contaminants tend to adsorb onto** such sediments. (However, some samples would still **be needed from coarser-grained sediment** locations.)
- (ii) Collect sediment samples along **all of the proposed sampling transects, but only analyze samples from every second or third transect, or transects near areas likely to have received contaminants from land-based source areas.** Depending upon the holding time for chemical analyses, the remaining samples could **be held (or extracted and held) until the results of the first sample batch were available.** **Analyzing benthic macroinvertebrate samples from every other transect (as mentioned in Section 5.2.1, page 5-10) is also a good approach.**

If a change is made in the proposed **transect** design, include an **explanation/rationale** for the sampling design.

B. Despite the extensiveness of the proposed sampling **scheme, this approach provides no guarantee that any detected contamination will be adequately delineated.** In **particular,** the work plan should include contingency plans to **address the delineation of any contamination associated with an NAS Pensacola source which is found to extend greater than 300 feet offshore.**

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- C. Indicate which sampling stations will be used as background/control **sampling** stations for sediment, surface water, and biota.

**Response:**

- A. See the response to the USEPA Comment 8 for a **brief** outline of the sampling approach to **be** followed during the **investigation**.
- B. **The** three-phased sampling approach **allows** for adequate delineation of any detected contamination associated with **NAS Pensacola**. **This includes** contamination associated with an **NAS Pensacola PSC** which is found to extend greater than 300 feet offshore. However, **if** no evidence **links offshore** contamination to **NAS Pensacola** and approved by all **parties** during the **May 12 and 13, 1993 meeting**, further delineation of contamination is **not within** the **scope** of the **investigation**.
- C. Because of the variability in **currents** during high and low tide events, background/control sampling locations **will be determined statistically**. A discussion of the equation and the assumptions to **be used** have been added to the work plan.

Comment 20 — Page 5-5, Paragraph 2:

The text states that temporary monitoring wells will **be installed** along the coast **to** determine the quality of groundwater being discharged **to** the **Bayou (/Bay)**. The **proposed** locations for the temporary monitoring wells will **be** useful, but **an** insufficient number of groundwater sampling locations **are** proposed. The proposed locations should be supplemented with additional temporary well points and through the sampling of existing monitoring wells. **Also**, in order to increase the **likelihood** of locating groundwater hot **spots** along the coast that **are** discharging to surface water, additional groundwater **sampling locations** should be concentrated in areas of known or **suspected** contamination. Delineating groundwater hot **spot areas** along the **coast early** in the process will help **focus** surface water/sediment sampling locations for **any** additional rounds **of** sampling which may **be** needed. Specifically, once hot **spot areas are** identified in the Bayou (/Bay), sediment **core** samples extending several feet below the bottom of the **Bayou (/Bay)** should be collected to **determine** the **vertical** extent of contamination. The pore water from core samples could **also** be **analyzed** for contaminants of **concern**.

For further, OU-specific recommendations on the placement of additional temporary groundwater sampling locations, please refer **to** the comments provided for the **Bay and Bayou** in the following sections.

**Response:**

The revised sampling approach addresses the issue of hot spot sampling locations. **All** specific PSCs adjacent to the Bay/Bayou **will** have adequate groundwater monitoring

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systems to determine migration to the Bay/Bayou. Surface water samples **will be** collected at locations where the detected concentrations of the **sediments exceed** the background or trigger levels in standing bodies of water (i.e., wetlands) and not in **dynamic environments** (i.e., Pensacola Bay and Bayou Grande). **As agreed by all parties during the meeting of May 12 and 13, 1993,** sediment samples will be collected from **0 to 6 inches** depth at all locations. If areas of significant **contamination** are encountered, additional samples will be collected from **0.5 to 2 feet**.

Comment 21 — Page 5-5, Paragraph 3:

The number of staff gauges which will be **installed in the** Bayou (/Bay) should be **adequate** for acquiring **data** that will allow for the calculation of groundwater flow velocity, once compared with groundwater level measurements from wells located adjacent to the Bayou (/Bay). However, this **data** should also be used to **calculate** the volume of groundwater discharge/recharge to the Bayou (/Bay) over a complete **tidal** cycle.

Response:

Agreed. The volume of **discharge/recharge** to the Bayou (/Bay) will be calculated over a complete **tidal** cycle.

Comment 22 — Page 5-5, Paragraph 4:

- A. Why will surge blocks and bailers **be used** to develop monitoring wells, when peristaltic pumps will be **used to** purge wells prior to sampling?
- B. According to the text, development will be considered complete "when the water **has** become **as** clear as possible given the subsurface lithology." This **final phrase** would appear unnecessary, "Given the predominantly sandy lithology of **the area.**" Please delete.

Response:

- A. Monitoring wells **will** be developed by bailing, **surging** and bailing or **surging** and pumping. Purging will **be performed with** a **Teflon bailer** or a decontaminated peristaltic pump. If the peristaltic pump **is used** for purging, at least one "polish" volume will be removed **with** a Teflon bailer. **The text has been revised accordingly.** This issue will be addressed in **more** detail in a technical **letter.**
- B. **Agreed.** The **unnecessary text** has **been** deleted.

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Comment 23 — Page 5-7, Paragraph 1:

- A. Surface water samples for determination of total suspended solids should **be collected** at the same time and locations **as the surface** water samples **collected** for water quality analyses.
- B. Sediment samples for chemical analysis must **be collected at** both the 0-0.5 ft. interval and the **0.5-2.0 ft** interval. **Most benthic infaunal organisms live in** the upper part of the sediment, which is the interval that will **be sampled** using a Ponar grab. Therefore, sampling the upper interval is recommended **for correlation** with the benthic macroinvertebrate **study**. The lower interval should **also be** sampled, to check for historic deposition of contaminants.

Response:

- A. Surface water samples will **be collected** at locations **where the** detected concentrations of the sediments **exceed** the background or **trigger levels in standing** bodies of water (i.e., wetlands) and not in dynamic environments (Le., Pensacola Bay and Bayou Grande). Total suspended **solids** analysis **will be** collected at the same time and locations **as the** surface water samples collected for water quality analyses.
- B. **As** agreed by all parties **during** the **meeting** of May 12 and 13, 1993, sediment samples **will** be collected from **0 to 6 inches** depth. **If areas** of significant contamination are encountered, additional samples **will** be collected from **0.5 to 2** feet.

Comment 24 — Pages 5-7 through 5-8:

Please provide the rationale for the locations of the total water quality **stations**.

Response:

The total water quality stations were located at regular intervals along the **NAS** Pensacola shoreline. The **distance** offshore was selected **to** minimize the **impact** of point and non-point source discharges.

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Comment 25 — Pages 5-7 through 5-8, "Surface Water Sampling":

The following depths should be used in the collection of (i) surface water quality parameters at sediment sampling stations (i.e., temperature, pH, etc.) and (ii) surface water samples and the concurrent water quality parameters at total water quality stations:

<u>Water Column Depth</u>	<u>SW Parameter Measurement Depth</u>
3 feet or less	Mid-depth
<b>3-10 feet</b>	<b>1 foot below water surface</b> <b>1 foot above bottom</b>
<del>More</del> <b>more</b> than <b>10</b> feet	<b>1 foot below water surface</b> Mid-depth <b>1 foot above bottom</b>

This sampling regime is similar to that recommended in the EPA Environmental Services Division's Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual for surface water sampling in estuarine waters having a halocline (salinity stratification). The bottom measurements are especially important in conjunction with the benthic macroinvertebrate study.

Response:

Surface water samples will be collected at locations where the detected concentrations of the sediments exceed the background or trigger levels in standing bodies of water (i.e., wetlands) and not in dynamic environments (Le., Pensacola Bay and Bayou Grande). The surface water samples would then be collected at the following intervals in accordance with the USEPA SOP/QAM and the CSAP:

<u>Water Column Depth</u>	<u>SW Parameter Measurement Depth</u>
3 feet or less	Mid-depth
<b>3-10 feet</b>	<b>1 foot below water surface</b> <b>1 foot above bottom</b>
More than <b>10</b> feet	<b>1 foot below water surface</b> Mid-depth <b>1 foot above bottom</b>

**Responses in bold denote changes to first draft.**

Comment 26 — Page 5-8, Paragraph 3:

- A. "and during **periods** when the groundwater level exceeds the adjacent **surface** water level of Bayou Grande...". How will this **determination** be made? Will water level measurements be **recorded on** some regular basis?
- B. "...surface water samples will be collected...to determine the **quality** of Bayou (/Bay) surface water.. ". **Will** surface water samples be analyzed for TCL/TAL parameters or only for water **quality** parameters?

**Response:**

- A. Electronic pressure **transducers** and dataloggers **will be** deployed **at** the temporary monitoring well and **staff** gauge locations for a 24-hour **period**. The dataloggers will be **used** to collect water level measurements at **regular intervals** (every **10 minutes**). **Data** will then **be used** to determine when the groundwater level exceeds the adjacent surface water level of Pensacola Bay or Bayou **Grande**.
- B. Surface water samples will be collected at locations where the detected concentrations of the **sediments** exceed the **background** or **trigger levels in standing bodies of water (i.e., wetlands)** and not in dynamic environments (i.e., Pensacola Bay and Bayou Grande). Surface water samples will be analyzed for **TAL/TCL** parameters.

Comment 27 — Page 5-13

Although the Bayou (/Bay) *can* be considered a possible receptor of contaminants that have migrated from land-based **source areas**, an area of such **contaminants** present in the Bayou (e.f. in sediments) could act **as a source of contaminants** having the **potential to migrate** elsewhere (e.f. via surface water movement, food **chains**). The Feasibility Study for the land-based **sites** will **focus on** potential remedial alternatives for those **sources** and their contaminant transport mechanisms. The **FS** for Bayou Grande should focus on **potential remedial** alternatives for the Bayou itself.

**Response:**

**Agreed.** The **FS** for Bayou Grande will focus on potential remedial alternatives for the Bayou itself.

**Responses in bold denote changes to first draft.**

**Comments applicable only to OU 40 (Bayou Grande) Work Plan:**

**Comment 1 — Page 2-1, Section 2.2:**

In the first sentence, change "estaurian" to "estuarine." In the fourth sentence, clarify that the net flow in Bayou Grande is apparently eastward, but tidal flow reversals also occur in the bayou.

Response:

**Agreed.** "Estaurian" has been changed to "estuarine." The fourth sentence has been revised to state the net flow in Bayou Grande is to the east, but tidal flow reversals may also occur.

**Comment 2 — Pages 2-3 through 2-6, Section 2.2:**

Much of the information contained in these pages pertains to Pensacola Bay as a whole, yet the section is titled "Site - Bayou Grande". The text should either be modified and/or expanded to illustrate the relevance of the information presented to the Bayou RI/FS, or deleted.

Response:

Although much of the discussion in Section 2.2 pertains to Pensacola Bay, it is specific to the Bayou Grande investigation. Tidal flow reversals may cause contaminants in Pensacola Bay near Bayou Grande to migrate into Bayou Grande. This statement will be included in the text.

**Comment 3 — Page 2-7, Section 2.3.2:**

"Some intermittent streams do flow north into Bayou Grande...". These streams should be clearly identified in some figure, along with the potential contaminant sources which may impact them.

Response:

**Agreed.** The intermittent streams have been added to Figures 2-1 and 3-1.

**Comment 4 — Pages 2-12 through 2-16, Section 2.4:**

This section should be limited to a review of previous studies which are directly applicable to Bayou Grande and its interaction with Pensacola Bay.

**Responses in bold denote changes to first draft.**

Response:

Agreed. Previous studies not directly **related** to Bayou **Grande** or its **interaction** with **Pensacola Bay** have been deleted.

Comment 5 — Page 2-16, Section 2.5:

**This** section states that the average **depth** of the **bayou** is **6** feet, but Section 2.2, page 2-1, states that the average depth is **9** feet. **Clarify** this point.

Response:

The average depth of Bayou Grande is **6** feet. Section 2.2, page 2-1 has **been corrected**.

Comment 6 — Page 3-7, Section 3.2, "Minimal Impacting Sites":

**Please** check the results of previous studies **conducted** by **Geraghty & Miller (1984 & 1986)** for additional information on **some** of these sites. Several wells may have **been installed** to **monitor** a groundwater plume which **originated** at Site **31** and was believed to be **migrating** towards Sites **25** and **27** and the **small arm** of Bayou Grande.

Response:

The Navy agrees "**minimal potential to impact**" is vague. The **sites** potential to **impact** Bayou Grande **will** be evaluated during Phase I.

Comment 7 — Pages 3-11 through 3-12, Table 3-2:

The contents of these two pages appear identical. Please check and **correct** as needed.

Response:

Page **3-12** has been deleted.

**Responses in bold denote changes  
to first draft.**

Comment 8 — Pages 5-3 through 5-4, Figures 5-1A and 5-1B:

- A. In conjunction with comment 19. In the **first** group of comments (applicable to both the Bayou and Bay), **use** data from the USEPA Region IV Environmental Services Division, Environmental Compliance Branch's July 1992 **field** investigation at NAS Pensacola to help focus the sampling investigation in the Bayou.
- B. **According** to these figures, **10 total** water quality stations **are planned**. Since water quality measurements will be taken at these **stations** during the **8** surface water sample collection events, the proposed deployment of **continuous** water quality monitoring instruments at **all 10** stations may not be **necessary**. **EPA recommends** that these instruments be deployed at a subset of the **total** water quality **stations**, to obtain information about water **quality** fluctuations over time.

Response:

- A. **Since** the Navy was not allowed to take split samples during the July 1992 **ESD** Field Investigation, the data is not acceptable to the Navy for RI work. Additionally, the results of the RI will be **used** to perform a baseline **risk** assessment for human and ecological health purposes **as recommended** in the 1992 **ESD** investigation.
- B. **Total** Water **Quality** stations will be deployed at a subset of the **originally** proposed locations. The locations are illustrated in Figures 5-1A and 5-1B.

Comment 9 — Page 5-5, Paragraph 2:

The most contaminated ground water that discharges into Bayou Grande appears to be located in the vicinity of Sites 1 and 11. The following additional groundwater sampling locations proximate to **these** sites **are** therefore recommended:

- Site 1: Sample existing wells **GM42, GM41, GM43, GM04** and GM40. **Surface** water samples should be collected from the Bayou adjacent **to** these well locations.
- Site 11: Sample existing well **GM26** and proposed **Phase II** wells **15, 10, 6, 2** and 1. **To** determine if groundwater discharging **from OU10 is** adversely **impacting** the Bayou, temporary well points should be **installed** near proposed intermediate well **12** and **north** of **this** location opposite proposed well **6** (downgradient of the former sludge drying beds at **OU10**).

**Responses in bold denote changes to first draft.**

Response:

The monitoring wells at Site 1 and 11 will be sampled **as part** of the site-specific investigation. The **data obtained from** those investigations will be used to **assess groundwater quality** as it discharges into Bayou Grande.

Comment 10 — Page 5-9, Paragraph 3:

In the 4th sentence, add the word "months" before the phrase "of the year". **Also**, "data sonde" should be capitalized, since it is a trade name.

Response:

Agreed. The word "months" **has** been added to the phrase "of the year." **Data Sonde** **has** been capitalized.

Comment 11 — Page 5-10, Section 5.2.1, "Biota Sampling":

**This section should be similar to the corresponding section in the Site 42 (Pensacola Bay) Work Plan. For example, sediment lithology data should also be used in evaluating the benthic macroinvertebrate data. In addition to the identification of contaminant indicator species, benthic macroinvertebrate community diversity and distribution should also be determined. Include the diversity and similarity indices and the biotic indices mentioned in the Bay Work Plan.**

Response:

**Biota samples will be collected for determination of diversity and similarity indices and biotic indices. See the response to USEPA Comment 8.**

**Comments Applicable Only to OU 42 (Pensacola Bay) Work Plan:**

Comment 1 — Page 2-5, Paragraph 2:

Discuss the deposition of the sediments that were **dredged** from Pensacola Bay during the latest **dredging** event and whether the sediments were **tested to determine** if they were **hazardous** waste.

Response:

The sediments dredged from Pensacola Bay were **deposited** at Site 14. **Analytical** results were summarized in the Thompson Engineering Testing report entitled "**A Report of the Collection and Analysis of Sediment, Water, and Elutriate Samples NAS Turning Basin**" Thompson Engineering Testing, Inc. (1984). The sediments were not **classified as** hazardous waste. Additionally, **screening** analyses of samples **from Site 14 (E&E 1991)** did not indicate **significant soil** or groundwater contamination.

Comment 2 — Pages 2-13 through 2-15, **Section 2.4, Facility-Specific Studies:**

The locations of these previous sampling events relative to the locations of the 42 currently-known potential **sources** of contamination should **be shown on some figure**. Such a **summary** map would facilitate the identification of **potential** problem **areas**. It would **also** highlight **areas** for which little or **no data** exists, thereby **aiding** the investigator's efforts **to** focus and direct future sampling events.

Response:

A figure will **be** included presenting the **potential sources** of contamination and the **locations** of previous Pensacola Bay sampling events.

Comment 3 — Pages 2-15 through 2-18, **Section 2.5:**

Please provide the **distance** and **direction from NAS** Pensacola to the City of Pensacola **Main** Street sewage treatment plant.

Response:

The City of Pensacola Main Street sewage treatment plant is **approximately** 3 miles northeast of **NAS** Pensacola. Other NPDES permittees will **also be** located **as the data** becomes available.

**Responses in bold denote changes  
to first draft.**

Comment 4 — Page 3-4, "Southeast Waterfront":

Clarify the boundaries of Site 2 with respect to Site 42 (e.g. **distance along** shoreline and distance into Bay). This is particularly important since the **Sampling and Analysis Plan** for Site 2 states that the western and easternmost **portions** of Site 2 will be incorporated into the Site 42 sampling investigations.

Response:

**Agreed.** A figure will be added to clarify the boundaries of Site 2.

Comment 5 — Page 3-7, "**NAS Pensacola's Eastern** Shore of Pensacola Bay":

Since the groundwater **contaminants at** OU 10 may discharge into the Bay, it would be more helpful (from an ecological **perspective**) to **compare** the groundwater **contaminant** concentrations found at OU 10 with **Florida** Surface Water Quality **Standards** for aquatic life (FAC, chapter 17-302).

Response:

**Although comparing** contaminant concentrations detected in groundwater with the **Florida** Surface Water Quality Standards (**FAC, Chapter 17-302**) may be helpful, it would be technically incorrect.

Comment 6 — Page 3-8, Paragraph 2:

Change "Sherman Filed.. ." to "Sherman Field.. ."

Response:

**Agreed.** "Sherman Filed" has been changed to "Sherman Field."

Comment 7 — Page 3-10, Figure 3-2:

Under "**Primary** Release **Mechanisms**" related to the 18 sites, "Fuel Pipeline/AST" should **apparently** read "Fuel Pipeline/UST".

**Responses in bold denote changes to first draft.**

Response:

Agreed. "Fuel **Pipeline/AST**" has been changed to "Fuel **Pipeline/UST**."

Comment 8 — Pages 5-3 through 5-5, Figures 5-1A, 5-1B and 5-1C:

- A. In conjunction with comment 19, in **the first group of comments** (applicable to both the Bayou and the Bay), the attached copies of **Figures 5-1A and 5-1B** show **two areas** where the number of **transects** might be able to be halved (**i.e.** sample every other transect), **based** upon the locations of the land-based sources (figure 3-1) and the probable migration pathways into Pensacola Bay.
- B. According to these figures, **16 total** water quality stations **are** planned. Since water **quality** measurements will be taken at these **stations** during the **8** surface water sample collection events, the proposed deployment of **continuous** water quality monitoring instruments at all **16** stations may not be **necessary**. **EPA** recommends that these instruments be deployed at a subset of the **total** water quality stations, to obtain information about water quality fluctuations over time.
- C. Also with regards to the proposed water quality **stations**, it is recommended that the stations be positioned close to permanent monitoring wells which have been **installed** near the coast whenever possible. **This** would allow comparisons of groundwater samples collected near the stations with the chemical and physical surface water **conditions** in the Bay. For example, the proposed water quality **station north** of OU10 could be repositioned to a location which is more proximate to **nearby** well GM83.

Response:

- A. **The sampling approach has been revised to better address migration pathways as discussed in the May 12 and 13, 1993 meeting. See the response to Comment 8 in the Common Site 40 and 42 USEPA comments.**
- B. The total water quality stations **will** be deployed at a **subset** of the previously proposed locations. Figures 5-1A, 5-1B, and 5-1C have **been revised** accordingly.
- C. The total water **quality** stations were located **at** regular intervals **along** the **NAS Pensacola** shoreline. The **distance** offshore was selected to **minimize** the **impact** of point and non-point source discharges.

**Responses in bold denote changes to first draft.**

Comment 9 — Page 5-6, Paragraph 2:

The most **contaminated** groundwater that **discharges** into **Pensacola Bay** **appears** to be located in the vicinity of Operable Unit **10** and Sites **14, 20, 38, 2 and 21**. **The** following additional groundwater sampling locations proximate to these sites **are therefore recommended** in order to better establish the degree of communication **between** groundwater and Bay surface water.

**OU 10 (Sites 32, 33 & 35):** Sample existing wells **GM71, GM72, GM73, GM14** and **GM83** and **collect** surface water samples from the Bay proximate to **these well** locations. If possible, relocate the proposed water **quality** station just **south** of **OU10** so that it is adjacent to either existing well **GM14** or proposed well 11 (for Site **14**).

**Site 14:** Sample proposed wells 11 and 18 and **compare** the **results** to adjacent surface water samples from the Bay.

**Site 20:** If a permanent well exists or is proposed **for this** site, it should **be** sampled and compared to the results for a **surface** water sample collected **from** an adjacent **area** of the Bay. If **no** permanent well exists, a temporary well should be **installed** and sampled at the site.

**Site 38:** Sample the two shallow proposed wells located on the south **side** of the site and compare the results to adjacent **surface** water samples from the Bay.

**Site 2:** **Install** and sample a temporary well at or near **this** site to provide a baseline of the groundwater **quality** discharging into the Bay.

**Site 21:** Sample proposed shallow monitoring wells **20** and **41** and compare the **results** to adjacent surface water samples from the Bay.

**Response:**

**The wells at OU 10, Site 14, Site 2, Site 21 and Site 38 will not be resampled as part of the Site 42 investigation. The analytical data obtained from each of the site-specific investigations will be used to assess the groundwater quality as it discharges into the Bay. A temporary monitoring well will be installed and sampled at Site 20.**

Comment 10 — Page 5-9, Paragraph 3:

**Clarify** what is meant by "**nearshore**" (i.e. distance from shoreline, **surface water** column depth).

**Response:**

Surface water samples will be collected at locations where the detected concentrations of the sediments exceed the background or trigger levels in standing **bodies** of water (i.e., wetlands) and not in dynamic environments (i.e., **Pensacola** Bay and Bayou Grande). Surface water samples will be analyzed for **TAL/TCL** parameters.

**Comment 11 — Page 5-10, Paragraph 3:**

"data sonde" should be capitalized, since it is a trade name.

**Response:**

**Agreed. "Data Sonde" has been capitalized.**

**Comment 12 — Page 5-11, Paragraph 1:**

Change "pollution diversity" to "community diversity".

**Response:**

**Agreed. "Pollution diversity" has been changed to "community diversity."**

**Responses in bold denote changes  
to first draft.**

**Technical Review and Comments  
Draft RI/FS Work Plans for  
Site 41 (NAS Pensacola Wetlands)  
Environmental Protection Agency  
Naval Air Station (NAS) Pensacola  
Pensacola Florida**

Comment 1. Page 1-1, Section 1.0, Paragraph 2:

The **Florida** Department of Environmental Protection (FDEP) is **also** a Party to the **Federal** Facilities Agreement. Please make the **necessary** correction.

Response

Agreed. The **Florida** Department of Environmental Protection (FDEP) **has been added**.

Comment 2. Page 1-1, Section 1.0, Paragraph 3:

This **paragraph** must **also** briefly summarize **plans to conduct and prepare** a Baseline Risk Assessment for the Operable Unit.

Response

A Baseline **Risk** Assessment **will be** performed for Site 41.

Comment 3. Pages 1-1 through 1-2, Section 1.0, Paragraph 4:

The components described in this **paragraph (i.e. the SAP (including FSAP and QAPP) and the HASP) are** essential components of the **RI/FS Work Plan**. Consequently, the **RI/FS Work Plans** for the subject Operable Units cannot **be considered** for approval until these components **are** received and approved.

Response

**Site-specific SAPs will be submitted** to the **Navy, USEPA, and FDEP**.

**Responses in bold denote changes  
to first draft.**

Comment 4. Page 2-2, **Figure 2-1**:

This figure is good for presenting **all** existing wetlands **at** the facility. However, the following **information must also** be provided on **this**, or some other **figure**:

- a. Complete the outline of **NAS Pensacola**, and make any other necessary **corrections**, in the inset location map
- b. **Indicate** which wetlands, or portions thereof, **are** planned for investigation
- c. Illustrate the sampling locations planned for each **wetland**

Response

A. Agreed. The outline of **NAS Pensacola** has been **added** to the inset location **map**.

B. and C. The OU-specific **SAPs** will be completed **before** **Phase I** and **will** focus on sampling procedures and **protocols**. Sampling locations for **TAL/TCL** analysis will be based on **Phase I** sampling **results** and **will** be presented in a technical memorandum before **Phase II** **sampling is** initiated. The approach has also been altered to state if site history and a site visit do not indicate the likelihood of site **specific** contamination, **then it will** not be **studied** further. **Phase I** does not have to **be** completed in **its** entirety to show **this**. The only exception would be reference **areas**. **See** the **response** to Comment 8 in the **Common Site 40** and **42** USEPA comments.

Comment 5. Pages 2-11 through 2-15. Section **2.3.5**:

A map depicting the direction of groundwater **flow** for **NAS Pensacola** for each zone of the Sand-and-Gravel aquifer **must be** included in this Section. The **results** of the forthcoming well inventory, together with existing hydrogeologic **data** and **information** which **has been** collected during previous investigations (**E&E**, Geraghty & Miller, etc.) should provide **adequate** information on which **to base** such maps.

Response

Maps estimating the direction of groundwater **flow** in the shallow, **intermediate**, and deep zones at **NAS Pensacola** will be included if sufficient information has **been** obtained **to construct** the maps (**e.g.**, top of **casing** elevations, water levels). **If the information cannot** be obtained until after the **submittal** of the work plans, the maps **will be** submitted under separate cover.

Responses in **bold** denote *changes*  
to first draft.

Comment 6. Page 2-12 through 2-15. Section 2.3.5:

The **EPA** Groundwater Classification for the Sand-and-Gravel aquifer must be provided **in this** description **as** well.

Response

**The Florida Department of Environmental Protection classification of the surficial aquifer is G-1. The EPA Groundwater Classification for the surficial aquifer is IIA. However, it should be noted the shallow and intermediated zones are not used as a water supply. The deep zone of the surficial Sand and Gravel Aquifer is overlaid by a confining unit.**

Comment 7. Page 2-16, Section 2.4, Paragraph 2:

**As** of January 4, 1993, **USEPA** reverted **back** to use of the 1987 manual for the identification and delineation of jurisdictional wetlands, **pending Congressional review of the 1989 manual.** Therefore, the 1987 manual must be used in place of **the 1989** manual.

Response

The 1987 manual for the identification and delineation of jurisdictional wetlands will be **used.**

Comment 8. Page 2-18, Paragraphs 3 through 4 and Appendix C:

For the purposes of **this** investigation, a better presentation of the **detected contamination** having the potential to impact **NAS** Pensacola wetlands is **needed.** **Specifically, a figure should be prepared for each** wetland illustrating the **location** and nature of **all contamination (i.e. that detected for each PSC)** which **has** the potential to **impact** that wetland. Individual PSC locations and potential pathway (e.g. groundwater and surface water flow) should **also** be illustrated **on** a wetland-specific basis. Such a presentation should form the **basis** for development of **a** conceptual model for each wetland, and facilitate the identification of data gaps **and** justification of planned sampling locations. If the Navy **feels** that development of such **a** presentation could be better accomplished upon collection of additional **data from** individual PSCs, **this** approach may be presented to **EPA** for consideration. However, **any** such plans, including justification, proposed means (e.g. submittal format) and schedules for completion, must be clearly **stated** in the **work** plan text.

**Responses in bold denote changes to first draft.**

## Response

Based on the limited knowledge of NAS Pensacola wetlands, the location and nature of contamination within specific wetlands is not known. The phased approach outlined in response to USEPA Comment 8 on the Common Site 40 and 42 work plans will allow for development of a conceptual model to guide sampling locations. The approach has also been altered to state if site history and a site visit do not indicate the likelihood of site specific Contamination, then it will not be studied further. Phase I does not have to be completed in its entirety to show this. The only exception would be reference areas.

### Comment 9. Pages 2-18 through 2-26, Section 2.5:

- A. Paragraph 1 - The originally-designated wetland 14 is actually a non-wetland sand pit. Since the originally-designated wetland 59 (now a ball field) is shown on Figure 2-1, wetland 14 should also be shown on this figure.
- B. The wetland inhabitants noted in this section are primarily vertebrates, or, in general, higher trophic level organisms. During the planned field investigation, information should also be obtained on invertebrates/lower trophic level organisms, as potential ecological receptors for both palustrine and estuarine wetlands.
- C. Please provide information on the current status of the following wetlands:

Wetland 15: Has the extent or shape of this wetland been altered by golf course construction activities? If so, this should be shown in Figure 2-1.

Wetland 13(?): During a recent EPA overview at OU 10, it was noted that a wetland area adjacent to the wastewater treatment plant received waste (bilge water) from a drain pipe when an overflow pipe to the waste storage tank was mistakenly left open. The vegetation in the immediate area of the waste storage tank was highly stressed. Have appropriate steps (e.g. soil, surface water sampling; appropriate remedial measures) been taken to address this situation?

## Response

- A. Wetland 14 has been added to the Figure 2-1.
- B. **Agreed.** Toxicity testing to be performed in Phase IIB will be conducted on lower trophic organisms. See the response to Comment 8 in the Common Site 40 and 42 USEPA comments.

Responses in bold denote changes  
to first draft.

C. The impact to Wetland 15 from golf course construction activities will be investigated as part of the RI. The extent and change of shape of the wetland will be detailed in the technical memorandum to be submitted upon completion of Phase I activities.

The impact to Wetland 13 from the bilge water was assessed by the soil, surface water, sediment and groundwater sampling results in the report entitled "Contamination Assessment Report Bilge Water Treatment Plan, Pensacola Naval Air Station, Pensacola, Florida (1/11/93)" completed by Groundwater Technology, Inc. This report will not eliminate Wetland 13 from future study, but the final, accepted results of the investigation will be evaluated for their applicability to the investigation.

Comment 10. Page 3-1, Section 3.1:

The text states that the scope of proposed work for the RI/FS will be discussed in Sections 5 and 6. However, Section 6 is a list of references and does not include such a discussion. Please clarify this point.

Response

The proposed scope of work is discussed in Sections 4 and 5. The text has been revised accordingly.

Comment 11. Page 3-2 through 3-10, Section 3.2 and Table 3-1:

- A. The statement is made that Phase I contamination assessments have not been performed for several sites which could potentially affect the NAS Pensacola wetlands. EPA's Environmental Services Division (ESD) conducted a field investigation at NAS Pensacola in July of 1992 to help to help fill data gaps for some of these sites and wetland areas. This data should be viewed as a valuable resource and must be utilized in the revision and resubmittal of this work plan.
- B. The text and table discuss/list sites which have a minimal potential to impact some NAS Pensacola wetlands. The following sites should be added to this discussion unless adequate documentation for their omission can be provided:

Site	Potentially Impacted Wetlands
7 (Firefighting School Training Area)	79
25 (Radium Spill Area)	6, 7, 8 & 64
26 (Supply Dept. Storage Area)	7, 8 & 64
27 (Radium Dial Shop Sewer)	6, 7, 8 & 64

Responses in bold denote changes to first draft.

Response

- A. Since the Navy was not allowed to ~~take~~ split samples during the July 1992 ESD Field Investigation, the data is not acceptable by ~~the~~ Navy for RI work. Additionally, the results of the RI will **be** used to **perform a** baseline risk assessment for human and ecological health purposes **as recommended** in the 1992 ESD investigation.
- B. **The Navy agrees "minimal potential to impact" is vague. The sites potential to impact the NAS Pensacola wetlands will be evaluated during Phase I. See the response to Comment 8 in the Common Site 40 and 42 USEPA comments.**

Comment 12. Page 3-3, Figure 3-1:

- A. Although Site 36 is an extensive site, it must **be included in** this figure (perhaps as a blown-up insert)
- B. **To clarify** the relationship between NAS Pensacola ~~wetlands~~ and individual PSCs ~~at~~ NAS Pensacola, the information contained in Figures 2-1 and 3-1 must either **be combined** into a single figure or overlain **as two separate figures**. It would **also be** helpful to enlarge these maps. Perhaps a **separate map could be prepared** for each of the ~~three~~ general contaminant discharge **areas** mentioned in ~~Section~~ 3.2 (page 3-2)

Response

- A. Site 36 **has** been added to Figure 3-1.
- B. Figures 2-1 and 3-1 have been combined to show the NAS Pensacola wetlands and the individual PSCs.

Comment 13. Page 3-7, Paragraph 1:

- A. The probable contaminant source in wetland 5 which was **identified** by EPA's Environmental Services Division during the **field effort performed** during July 1992 must be evaluated to determine whether a removal action is **appropriate before** initiating further field investigations.
- B. The Chevalier Field **Pipe Leak Area** (Site 23) **is** one of several **UST** sites ~~at~~ NAS Pensacola. The **UST** sites fall under **state** (FDEP) jurisdiction and **are not part of EPA's** Superfund program. A determination should **be made as to** how **the impacts** of these **UST** sites on the wetlands, and other ecological **areas** of concern (e.g. the Bay and

Responses in bold denote changes  
to first draft.

Bayou), will be addressed. EPA recommends **that** the **impacts** of all sites (UST and non-UST) on ecological **areas** be addressed **in** a single investigation. Such **an** investigation will require the coordination of programmatic issues, schedules and **data** collection efforts in order to ensure that the requirements of both programs are adequately addressed.

### Response

- A. **The contaminant source identified by the USEPA's Environmental Services Division is currently being evaluated. The USEPA and FDEP will be notified if a removal action is appropriate.**
- B. **Impact on ecological areas will be assessed as part of the Sites 40, 41 and 42 investigations. Investigation of UST sites is being conducted under the jurisdiction of the FDEP UST program.**

Comments 14. Pages 3-10 through 3-13, Section 3.3:

This section presents a reasonable **preliminary, or conceptual, identification** of potential contaminant migration pathways and potential impacts on public health and/or the environment. However, while comprehensive, the information presented is **too general** to be of extensive use in directing and refining sampling plans. **W** e it is **recognized** that **most** of the available **data** is questionable due to the use of lower **DQO analytical** levels and less **than** rigorous QA/QC methods, some focusing of sampling efforts should still be possible through (i) an identification of likely contaminant pathways (GW, SW), (ii) the **use** of available survey **results**, site histories and (iii) conservative use of the available chemical **data**. In addition, given **that** higher DQO Level **data** for individual sites will be forthcoming prior to actual implementation of the "Wetlands" work plan, an addendum to **this work** plan aimed at focusing the proposed sampling scheme should be submitted following receipt and evaluation of **this** new site-specific **data**.

### Response

**The sampling scheme has been revised into a three phased approach, as discussed in the meeting on May 12 and 13, 1993. See the response to Comment 8 in the Common Site 40 and 42 USEPA comments.**

Comments 15. Pages 3-11 through 3-12, **Section 3.3** and **Figure 3-2**:

If applicable to the estuarine wetlands, **also** mention adsorption of contaminants onto suspended particulate matter (e.g., suspended organic matter, such as **detritus**), and include **this** in the conceptual Model (Figure 3-2).

**Responses in bold denote changes to first draft.**

Response

**Agreed.** Adsorption of contaminants onto suspended **particulate** matter in **estuarine** wetlands has been added.

Comment 16. Page 3-12, Figure 3-2:

Please make the following additional changes to this figure:

- A. Under **Primary** Release **Mechanisms**, change "AST" to "**UST**"
- B. Delete "terrestrial biota" from the "Secondary Sources" heading. Contaminants in **NAS** Pensacola Wetland would first **bioaccumulate in** aquatic organisms, ingestion of these organisms by **terrestrial biota** could **then lead to bioaccumulation** in the **terrestrial biota**.
- C. Draw a direct **line** from the "Bioaccumulation" **box** (Secondary Sources) to "Consumption of Affected **Ecological** Resources" (Pathways), **since wetland** plants and many macroinvertebrates (e.g., infauna) **are** sessile and **do not migrate**.

Response

- A. Agreed. "**AST**" has been changed to "**UST**".
- B. Agreed. "**Terrestrial** biota" has been deleted.
- C. Agreed. A line has been drawn from the "Bioaccumulation" **box** to "Consumption of Affected Ecological Resources."

Comment 17. Page 3-13, Section 3.4:

Although the wetlands **can be** considered as **possible receptors** of **contaminants that** have migrated from other source areas, an **area** of such **contaminants** present in **the wetlands** (e.g., in sediments) could act **as** a source of contaminants having **the potential** to **migrate** elsewhere (e.g., **via** water movement, food chains, etc.). **This** is shown in **the conceptual** model (Figure 3-2). Therefore, where applicable, **remedial** alternatives should be proposed for **the** wetlands. (**The** statement that "Remediation may cause **as** much damage to biota **as the** contamination" is valid and should **be retained**.)

Responses in bold denote changes  
to first draft.

Response

Remedial alternatives will **be** included for the **NAS** Pensacola wetlands.

Comment 18. Page 4-1, **Section 4.0, Paragraph 3:**

Please delete the first **two** sentences of **this** paragraph and **replace** them with more general terminology **regarding** the biological effects, such as **the** following:

"Biological effects **will** be investigated **through the collection** and taxonomic analysis of the benthic macroinvertebrate **community**."

The EMAP approach **as** contained in the document ***Ecological Indicators (EPA/600/3-90/060)*** is not appropriate, *per se*, for **this** site. The **focus** of the **EMAP** program is the ecological health of **an area**, while the focus of a Superfund investigation is **cause and effect** (i.e., **determining** whether ecological effects are **related** to site **contaminants**). Although some of the elements **contained** in **this** document **can** be applied to the investigation of OU 16, **reference** to the EMAP program, the *Ecological Indicators* document, and the EMAP terminology should be deleted to avoid confusion.

Response

The **first** two sentences of the paragraph will be replaced with "Biological effects will be investigated through the collection and taxonomic analysis of the benthic macroinvertebrate community."

**Agreed**, the EMAP approach is not applicable to this investigation. See the response to Comment 8 in the Common Site 40 and 42 USEPA comments.

Comment 19. Pages 4-2 through 4-3, Table 4-1 and Section 4-1:

Change the objectives for Sediment/Soil Chemistry and Surface ~~Water~~ Chemistry in Table 4-1 to be consistent with those given in the text.

Response

**Agreed**. The objectives for the Sediment/Soil Chemistry and **Surface** Water Chemistry have been changed to **be** consistent with the text.

Comment 20. Page 4-3, Section 4.1 :

- A. "Given the limitations of the previous investigations completed for the **NAS** Pensacola wetlands, the objectives of **this RI/FS** are comprehensive." **This general** field sampling objective must be accompanied by, and **supported** with, figures and tables illustrating approximate sample locations, numbers of **samples/analyses**, etc. Without **this** information, **EPA** cannot complete an **adequate** review of **this** work plan, or consider it for approval. **Specifically**, the available information (**as discussed** in comments **8** and **14**) must **be** used to formulate sampling plans, including a statement of, and justification for:
1. Which wetlands **require** sampling, and
  2. **Specific** sampling plans for each wetland

Response

With the limited knowledge currently available about the ~~wetlands~~, it **is not** possible to outline which wetlands will be sampled and the ~~sampling~~ locations. **These** will be **outlined** after each Phase of the ecological assessment in a technical memorandum. **See** the **response** to Comment **8** in the Common Site **40** and **42 USEPA** comments.

Comment 21. Page 4-3, Section 4.1, *Sediment Chemistry Data Quality Objectives*"

- A. The term "chronic effects" usually refers to effects on biological **receptors**, **not** on sediment/soil. Clarify **this** point.
- B. Although sediment standards **are** currently being developed by the *state* of **Florida** and U.S. EPA, they might not yet **be** available. **Therefore**, analytical results for sediment samples should be **compared** to the sediment screening values **used** by the **USEPA** Region IV Waste Management Division and to any ecological toxicity information available in the literature. (Please **see** comment 26B).

Response

- A. The term "chronic effects" **has been** deleted.
- B. The Navy **will** be submitting trigger level values for joint approval and subsequent use. **If needed**, the detection limits of the **chemical analysis will** be lowered to be commensurate with the trigger levels. However, the added **cost** should **be weighed** against the usefulness of the analytical **data in determining** ecological **risk**.

**Responses in bold denote changes  
to first draft.**

Comment 22. Page 4-3, Section 4.1, *Surface Water Chemistry Data Quality Objectives:*

- A. The term "acute effects" usually refers to effects on biological receptors, not on surface water. Clarify this point.
- B. **Since** surface water bodies **also** have a vertical dimension, the vertical extent of contamination **must** be determined.

**Response**

- A. The term "acute effects" **has** been deleted.
- B. **See the response to Comment 25 in the Common Site 40 and 42 USEPA comments for the surface water sampling approach.**

Comment 23. Page 4-4, Section 4.1 Biological *Effects Data Quality Objectives:*

- A. Some of the activities planned **for this portion of** the investigation **must** be performed during a particular season or time of day **in order to be accomplished successfully** (i.g., the observation of migratory birds). **An adequate** field investigation schedule must be included in the final work plan **in order to assure that** the planned objectives **are** met.
- B. **This** section should **also** note **that** additional biological investigations (e.g., sediment toxicity testing, bioaccumulation studies) may **be needed at** a later point in the investigation in order to provide sufficient information **for** the ecological **risk** assessment.

**Response**

- A. Migratory birds **will** no longer **be** considered during **this** investigation. However, diversity studies are sensitive to a particular time of year and every effort **will be made** to perform the studies in the appropriate time frame.
- B. **Agreed.** Additional biological investigations may be **necessary** to provide sufficient information for the ecological **risk** assessment and **will** be performed as **necessary** during Phase III. **See the response to comment 8 in the Common Site 40 and 42 USEPA comments.**

**Responses in bold denote changes to first draft.**

Comment 24. Pages 4 4 through 4-8, Section 4.2:

As mentioned above, this investigation is being conducted under the Superfund program, not the EMAP program. Several of the "indicators" presented in this section and the following subsections are applicable to the proposed investigation, but the terminology is not applicable. Please delete Section 4.2 and the indicated subsections and incorporate applicable portions under Section 5.0 (RI/FS Tasks) subheadings as follows:

Section 4.2 - Delete

Subsection 4.2.1 - As indicated by the final paragraph of this subsection, this task is inappropriate for use in characterizing and delineating wetland contamination. However, given the potential for natural attenuation of contaminants, information on sedimentation and subsidence rates may be retained for use in the evaluation of remedial alternatives. Regarding data collection for purposes of completing the RI, analyses for sediment total organic carbon and grain size should be added to Section 5.2.1. The collection of sediment samples from more than one depth may also be appropriate.

Subsection 4.2.2 - Combine this section with Section 5.2.1 (page 5-10). Also while data on the dominant animal species is important, relative abundance information (e.g. common, infrequently, rare) should be collected for the other animal species observed. Finally, clarify the difference between "relative abundance" and "abundance and diversity" (Section 5.2.1: page 5-4). Under which circumstances will each of these sampling methods be performed.

Section 4.2.3 - "changes in vegetative patterns and species composition to denote ecological impact on a wetland" can be obtained within the scope of this investigation by examining historical aerial photographs (particularly infra-red) in conjunction with current information (species composition, abundance, diversity) collected during this study. Combine appropriate portions of this section with Section 5.2.1.

Section 4.2.4 - Combine appropriate portions of this section with Section 5.2.1 (page 5-4)

Section 4.2.5 - Combine appropriate portions of this section with Sections 5.1.2 or 5.2.1. Also, the use of staff gauges and piezometers to groundwater discharge/recharge to wetlands during tidal cycles and seasons is good. However, specific locations for collecting this data must be proposed. Rain gauges should also be installed near wetlands, since precipitation data are necessary to determine the extent of recharge to ground water and wetlands.

Section 4.2.6 - Combine appropriate portions of this section with Section 5.2.1 (pages 5-2 through 5-3).

Responses in bold denote changes  
to first draft.

Section 4.2.7- Delete. The **same** basic information is contained **in Sections 4.1** (page 4-3) and 5.2.1 (pages 5-2 and 5-3).

Section 4.2.8 - Combine *this* section with Section 5.2.1 (page 5-1).

Section 4.2.9 - Delete

### Response

The EMAP approach has been deleted. See the response to comment 8 in the Common Site 40 and 42 USEPA comments.

Comment 25. Page 4-11, Section 4.3:

The information contained in *this section* is overly **general**. **Please provide** wetland-specific sampling plans and/or strategies.

### Response

With the limited knowledge currently available about the wetlands, **it is not possible to outline which wetlands will be sampled and the sampling locations. These will be outlined after each phase of the ecological assessment in a technical memorandum. See the response to comment 8 in the Common Site 40 and 42 USEPA comments.**

Comments 26. Page 4-11, Section 4.4:

- A. **DQO Level IV TCUTAL** analyses must also be performed for surface water samples.
- B. Whenever possible, detection **limits used in** the chemical analysis **of sediment samples** should be sufficiently low that the **data can** be compared to the **NOAA Effects Range-Low and Effects Range-Median values used as ecological sediment screening** values by the **USEPA Region N Waste Management Division**. Likewise, **detection limits used** in the chemical analysis of surface water **samples** should be sufficiently **low that the data can** be compared to the **Florida Surface Water Standards and the ecological surface water screening values (including the Ambient Water Quality Criteria)** used by the **USEPA Region IV Waste Management Division**.

Responses in bold denote changes  
to first draft.

Response

- A. DQO Level IV TAL/TCL analyses will be **performed on** surface water samples collected at locations where the detected concentrations of the **sediments exceed** the background or trigger levels in **standing** bodies of water (i.e., **wetlands**) and not in dynamic environments (i.e., Pensacola Bay and Bayou Grande). **See** the responses to comments **8** and **25** in the **Common Site 40** and **42** USEPA comments.
- B. The Navy will be submitting trigger level values for joint approval and subsequent **use**. If needed, the **detection** limits of the chemical analysis **will** be lowered to be commensurate with the trigger levels. However, the added **cost** should be weighed against the usefulness of the analytical data in **determining ecological risk**.

Comment 27. Pages 4-12 through 4-13, **Data Gaps**:

The Navy should contact the authors of the **USEPA/ESD wetland** study to **see** if any of the missing information **listed** here is available in the **form** of a more extensive **wetlands report**, field notes, etc.

Response

**Parsons** and **Pruitt**, the authors of the **USEPA/ESD wetland** study have been contacted. All information provided by them **is** included in this work plan. **According** to the **authors**, the study was not for jurisdictional wetland delineation, **and** was **not** intended for specific application to an RI/FS investigation.

Comment 28. Page 4-13, Section 4.5.1:

- A. Please **see** Comment 7.
- B. The reassessment must focus on validating existing **data** and filling the **remaining data** gaps, rather **than** redoing the complete inventory from scratch. **Also**, before beginning this reassessment, the **Navy** must prepare a list of the wetlands which **are** potentially affected by contaminants from the individual **PSCs at NAS** Pensacola (e.g., only **32 of the 81** wetlands **may** be affected by individual PSCs (p. 2-18, paragraph 2). Only those wetlands which **are** potentially **impacted** by a **PSC** should be reassessed. This will ensure that available **resources are concentrated most** effectively, and permit **EPA review and** approval of the Navy's proposal **to** delete any wetland from further consideration.

Responses in bold denote changes  
to first draft.

## Response

- A. The 1987 manual for the identification and delineation of jurisdictional wetlands will be used.
- B. The reassessment of the **existing data and filling of the data gaps** will be performed as part of Phase I of the ecological assessment. See the response to comment 8 in the Common Site 40 and 42 USEPA comments.

Comment 29. Page 4-13, Section 4.5.2, Paragraph 1:

**As** stated in Section 4.5.2, the **first goal of "Step 2" is to perform** "extensive **soil** and water chemistry analysis, to establish background...and to identify the nature and magnitude of contamination...". **Step 3 appears to repeat** (and expand upon) this **task**. **Step 3** must therefore be combined with this first goal of **Step 2**. The **second goal of Step 2**, (i.e., "to ascertain overall biological **quality**"), should be broken out into **Step 3**, to be performed only upon the identification of contamination. **Step 3**, however, should be performed in conjunction with the determination of contaminant pathways and extent.

## Response

The sampling scheme has been revised into a three phased approach, as discussed in the meeting on May 12 and 13, 1993. See the response to comment 8 in the Common Site 40 and 42 USEPA comments.

Comment 30. Pages 4-14 through 4-15, Section 4.5.4:

- A. While it is true that wetlands *can* act as a sink for contaminants, and that wetland vegetation *can* bioaccumulate some contaminants, **not all** dead wetland vegetation becomes buried in the wetland sediments. For example, in an **estuarine** wetland, **dead** vegetation in the form of **detritus** can be transported out of the wetland **into** the **estuary** via tidal action, serving as a potential food source for estuarine animals. **Clarify** this point.
- B. The last paragraph contains a **good** observation regarding **evaluation** of the pros and cons of wetland remediation.

## Response

- A. Agreed. Dead wetland vegetation may be transported from the wetland by **tidal action**. The vegetation could act as a potential **food** source.

Responses in bold denote change  
to first draft.

B. **Agreed.**

Comment 31. Page 5-1, Paragraph 1:

- A. While it is understood that the "methods and procedures for.. **site characterization** tasks **(will be)** described in the **SAP**", this **work** plan must include more information on the proposed sampling design. **For** instance, **although detailed** field sampling methods and procedures **will be contained** in the **SAP**, the appropriate **sections** of the **work** plan (e.g. 5.2.1) must **still** include such **information as**:
1. the **type** of sampling equipment to be used
  2. the timing of sampling events (e.g. relative to tides, **etc.**)
  3. the coordination of soil/sediment, surface water and biota sampling for individual wetlands
- B. **Towards** the end of this paragraph, please **revise** the phrase "**health risk** assessment" to read "human health **risk** assessment".

Response

- A. **Agreed.** See the response to Comment 8 in the Common **Site 40 and 42** USEPA comments for more detailed **information** on sample collection procedures, timing, and protocols.
- B. **Agreed.** "Health risk assessment" **has been** changed to "human health **risk** assessment."

Comment 32. Page 5-2, Paragraph 1:

Please **see** comment 7.

Response

The **1987** manual for the identification and delineation of **jurisdictional** wetlands **will** be used.

**Responses in bold denote changes to first draft.**

Comment 33. Page 5-2, Section 5.1.3:

- A. Please check the **dictionary** definition of "**cadastral**". Its use in **this context** appears inappropriate.
- B. The establishment of **sampling grids** or **transects** must be based upon known migration pathways from source **areas** into **wetlands**.

Response

- A. Cadastral is defined for the purpose of **this work plan** as establishment of boundaries. The survey **will be used** to delineate the boundaries of the **wetland** and to accurately identify sample locations.
- B. The **revised** three phases sampling approach **bases** the sampling **locations** on **known** or highly **suspect** migration **pathways** from **source areas**. **See the response to comment 8 in the Common Site 40 and 42 USEPA comments.**

Comment 34. Page 5-2, Section 5.2.1:

- A. TCUTAL analyses must also be **performed** for any **soil** samples **collected**.
- B. Total organic carbon and grain **size** analyses must be **performed** for sediment samples.
- C. **EPA** recommends that sediment samples for chemical **analysis** be **collected** at both the 0-0.5 ft. interval and the **0.5-2.0** ft. interval.

Response

- A. **Agreed. TAL/TCL** analyses **will be performed on soil** samples **collected during** Phase II. **See the response to comment 8 in the Common Site 40 and 42 USEPA comments.**
- B. Physical parameter analysis for **grain size** and total **organic carbon** **will be performed during** Phase I of the investigation. **See the response to comment 8 in the Common Site 40 and 42 USEPA comments.**
- C. **As agreed** by all parties during **the** meeting of **May 12 and 13, 1993**, sediment samples **will be collected from 0 to 6 inches** depth at **all** locations. **If areas** of significant contamination are encountered, additional samples **will be collected from 0.5 to 2 feet.**

**Responses in bold denote changes to first draft.**

Comment 35. Page 5-4, Paragraph 2:

- A. The first line of this paragraph should be revised to read "benthic macroinvertebrate abundance and diversity".
- B. How will the presence of "juvenile and adult commercially/recreationally important fish species" be determined? Shellfish species should be noted along with these fish species.
- C. Include more information on how the abundance and diversity of plants and aquatic animals will be determined.

Response

- A. **Agreed.** The first line has been revised to read "benthic macroinvertebrate abundance and diversity."
- B. **This is no longer planned as part of the investigation.**
- C. **Abundance and diversity of plants and aquatic animals will be determined in Phase IIB. See the response to comment 8 in the Common Site 40 and 42 USEPA comments.**

Comment 36. Page 5-6, final paragraph:

**As discussed previously in this work plan (pages 3-11 through 3-12 the wetlands can serve not only as receptors of contaminants from source areas, but as actual contaminant sources. It is understood that the Feasibility Studies for the individual PSCs will focus on potential remedial alternatives for those sources and their contaminant transport mechanisms. However, please clarify that the FS for NAS Pensacola wetlands should focus on potential remedial alternatives for the wetlands themselves.**

Response

**The FS for the NAS Pensacola wetlands will focus on potential remedial alternatives for the wetlands themselves.**

**Responses in bold denote changes to first draft.**