



**EnSafe / Allen &**  
a joint venture for profession

5720 Summer Trees Dr. Suite 8 Memphis, TN 38134  
(901) 383-9115 Fax (901) 383-1743

32501.002  
03.01.02.0016

N00204.AR.000533  
NAS PENSACOLA  
5090.3a

April 16, 1993

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

RE: Final Sampling and Analysis Plans, Category III: Sites 2, 11, 30, and 38,  
NAS-Pensacola, Florida  
Contract # N62467-89-D-0318/058

Dear Ms. Drew:

Enclosed please find five copies of each Final Sampling and Analysis Plan, Remedial Investigation/Feasibility Study, for Category III: Sites 2, 11, 30, and 38 for the Naval Air Station Pensacola in Pensacola, Florida.

If you should have any questions or need any additional information regarding the plan, please do not hesitate to call me.

Sincerely,  
EnSafe/Allen & Hoshall

Henry H. Beiro  
Task Order Manager

Enclosure  
Final Sampling and Analysis Plans

EPA REGION IV  
TECHNICAL REVIEW AND COMMENT  
DRAFT SAMPLING AND ANALYSIS PLANS  
FOR CATEGORY 3 (SITE 2 — WATERFRONT SEDIMENTS)  
NAVAL AIR STATION (NAS) PENSACOLA  
PENSACOLA, FLORIDA

GENERAL COMMENTS:

Comment 1:

The following statement appears in Section 1.0 of each SAP: "This investigation will delineate the nature, magnitude and extent of any contamination identified in work previously conducted by E&E as Phase I of the Work Plan." These SAPs must also include a brief statement of the provisions/investigative approach which will be followed in characterizing and delineating any additional contamination identified in the upcoming field event.

Response:

Any additional sources or contamination previously not detected will be investigated **by** the collection of additional samples from any given media, sampling of additional media not included in the site-specific **SAP**, installation of additional monitoring wells to delineate extent and depth of contaminants, and performance of aquifer response tests to characterize subsurface hydrologic conditions. Prior to the initiation of additional field activities, a field change request will be submitted to the Navy for approval, and the EPA and **FDER** will be notified.

Comment 2:

Section 1.0 of each *SAP* must include a statement indicating that the **RI** will provide the basis(/supporting data) for completion of an FS and a BRA. Currently, only some of the **SAPs** contain such a statement.

Response:

Agreed. Change made.

Comment 3:

As recommended by EPA in previous correspondence and agreed by the Navy, an inventory of all existing wells is planned for the entire base. In order to assure the accessibility and validity of the groundwater sampling locations proposed in these SAPs, this inventory must be completed prior to initiating any additional field work. This will allow the Navy to reserve adequate time and resources for the installation of any additional temporary or permanent wells needed to complete the planned investigations.

Response:

Agreed. A well inventory has been completed to assess the accessibility and validity of the groundwater sampling locations. Any monitoring wells that are found to be in disrepair will be repaired or abandoned in accordance with Florida regulations. The abandoned monitoring wells will be replaced with additional monitoring wells as necessary.

Comment 4:

Section 4.0 of the SAPs includes the following statement: "Sample locations are presented on Figures...and are not expected to vary as they have been based on data collected during Phase I activities." Please amend this statement to include a reference to the paragraph which was inserted in Section 14.2 of each RI/FS **Work** Plan describing plans to adjust (e.g. redirect or expand) Phase II sampling activities as needed.

Response:

Any additional sources or contamination previously not detected will be investigated after SOUTHDIIV has been notified. See Comment 1 of General Comments for a discussion of the provisions/investigative approach to be followed during the upcoming field investigation.

Comment 5:

The table entitled RI Sampling Analytical Requirements, which appears in Section 4.0 of each **SAP**, must be expanded to include a column entitled "DQO Level" which provides the DQO analytical level (I through V) to be used in analyzing of each sample or group or samples.

Response:

All sediment, surface water, groundwater and soil samples will be collected at Data Quality Objective Level IV protocol. A column has been added to the table entitled RI Sampling Analytical Requirements listing the DQO levels for the sample groups.

Comment 6:

According to Section 4.0 of each *SAP*, the Navy proposes to modify the surface soil sampling interval from 0-1' to 0-2'. As previously discussed and agreed to by the Parties, surface soil samples must be collected from 0-1' for risk assessment purposes.

Response:

Surface soil samples will be collected from 0-1' using a decontaminated hand auger or Xitech sampler prior to advancement of the soil boring. The remaining soil samples to be collected from the soil boring will be collected from 1-3', **3-5'**, etc. to reduce the risk of cross contamination by allocating one sample interval per 2-foot long split-barrel sampler.

Comment 7:

According to Section 4.0 of each *SAP*, soil samples collected from beneath the water table using Shelby tubes will not be analyzed for Full Scan Analysis (**FSA**). This is generally acceptable. However, FSA analyses should be run in cases where visual or other **field** evidence indicates that the sample collected could potentially serve as a contaminant source **for** the site. **In** such cases, the FSA analysis may prove useful in characterizing or delineating the source **material**.

Response:

If physical evidence of contamination is observed below the water table, a sample will be collected for FSA analyses for characterization and delineation of the source material.

Comment 8:

According to Section 4.5 of the *SAPs* for Category **3** sites, "A Portland cement grout will be used to construct all monitoring wells..". Available historical records for numerous hazardous waste sites indicate that use of a cement-based grout is highly likely to fully or partially compromise the integrity of PVC wells over time. In addition, a bentonite grout will better seal the annular space around the well casing, thereby reducing the potential for channelized downward contaminant migration. For these reasons, **EPA** strongly recommends the use of a bentonite grout during monitor well installation.

Response:

In accordance with Florida Administrative Code Chapter 40A-3, neat cement grout is required in **all** monitoring well installations. Although bentonite grout might provide a better seal in most areas, bentonite grout should be avoided in coastal areas such as **NAS** Pensacola where concentrations of total dissolved solids in groundwater are high. In addition, the neat cement grout provides additional protection from storm surge (hurricanes).

Comment 9:

A full scale aquifer test (minimum 48 hours) which is designed to evaluate the hydraulic properties of the aquifer and underlying aquitard, the leakage between the two more permeable zones of the Sand and Gravel Aquifer, and the radial influence of pumping and any boundary effects, must be performed for those sites where groundwater extraction and treatment is needed. A minimum of 48 hours of pumping will allow time to collect data which represents the instantaneous release of groundwater from the zone being tested and the effects of gravity drainage within the aquifer. The aquifer test must be preceded by the test needed to design **and** appropriate pumping test (i.e. (i) slug tests, to provide a rough estimate of aquifer characteristics, and (ii) specific capacity, or step-drawdown, tests to estimate the pumping rates which the aquifer can sustain for given levels of drawdown). The plans for all pumping tests must be provided to EPA for review and approval prior to commencement of these tests.

Pumping tests will be required for the site as soon as it is determined that groundwater remediation is needed at that site. Based on Phase I screening results, it appears highly likely that groundwater remediation will be required for several sites in Categories 2 and 3. However, positive confirmation of this need will be obtained only through the collection of high quality data as scoped for Phase II. The Navy may therefore choose to submit pumping test plans now, as part of the present **SAP**, or defer preparation of these plans until receipt of the Phase II **data**. If the latter option is selected, the current SAP must be revised to state that a Technical Memorandum detailing full-scale pumping test plans will be submitted as soon as the need for groundwater remediation is determined based on analytical results. In either case, the necessary data must be collected in a timely manner which will not delay submittal of the Feasibility Study.

Response:

In accordance with the site-specific SAPs and work plans, slug tests will be performed at selected monitoring wells. If groundwater remediation will be required, the results of the slug tests will be used to design the appropriate pumping tests. Pumping tests (up to **48** hours) will be performed at each site with the objective of evaluating the hydraulic properties of the aquifer and underlying aquitard, the leakage between the two more

permeable zones of the Sand and Gravel Aquifer, the radial influence of pumping, and any boundary effects. Pumping tests will continue until the above listed objectives are achieved. The EPA and FDER will be kept apprised of the investigation as it progresses, and will be notified prior to conducting pumping tests. The Navy will take technical responsibility for the design and implementation of these tests. Pumping tests will be performed in accordance with the procedures provided in Section 9.6.2 of the Comprehensive Sampling and Analysis Plan (CSAP).

SPECIFIC COMMENTS:

CATEGORY 3:

SITE 2 (Waterfront Sediments)

Comment 1: Page 3, Section 2.1

"Previous studies have described the bay sediments to be fine sands, silty sands, and fine muds, depending on water depth...". Is the distribution of these different sediment types across Site 2 known? If not, this information should be determined and used to select appropriate sampling locations, since the type of sediment will undoubtedly effect the magnitude of contamination.

A fairly thick flocculent layer above the sediments has been noted during previous investigations at Site 2. Since this layer may bind contaminants, it should also be sampled and analyzed **if** an appropriate sampling method can be determined.

It may be informative to bias sampling efforts towards areas of softer, less consolidated bottom sediments (if this determination can be made), since these characteristics would indicate more recent deposition.

Response:

A sediment analysis will be made at each of the sediment sampling stations based on visual inspection of a bottom grab sample using the Unified Soil Classification System. The density of the proposed sampling stations should be sufficient to characterize the different sediment types across Site 2. A sediment map will be constructed for Site 2 based on the bottom grabs. This will aid in identifying areas of soft (muddy) bottom versus hard (sandy) bottom. A correlation between sediment type, water depth, contaminant levels, and benthic macroinvertebrates can then be determined.

The presence of a flocculent layer depends on tidal currents, wind/wave intensity, stratification, and bottom topography. It would be difficult to determine whether or not the layer is present at the time of sampling without having a visual verification by a diver. An appropriate sample bottle could be used to check the presence of the layer and possibly sample it depending on the thickness of the layer. However, it should be noted that contaminants found in this layer would most likely be detected in associated sediment and/or water samples also.

Sediment collected in the upper 2 feet at Site 2 should be unconsolidated. Softer sediment typically indicates the presence of silt and clay and may or may not indicate "more recent" deposition. Rather than correlative to recency of deposition, sediment size (softness) is more indicative of water depth. The proposed sampling plan will be sufficient to sample both soft (muddy) bottoms and hard (sandy) bottoms.

Comment 2: Pages 8-9, Table 4-1/Physical Parameters, Sediment

Ten "PPS" samples will probably not be sufficient to characterize particle size and total organic carbon (TOC) for the sediment. Samples for these two parameters should be collected along selected transects, since particle size is likely to vary with distance from shoreline, water depth and flow patterns. The TOC and particle size measurements can then be used to generate maps illustrating the distribution of sediments with similar TOC content and particle size. This information is particularly important, since sediment particle size significantly affects the type of benthic macroinvertebrate community that can live in a particular area.

Response:

Based on the visual sediment analysis of bottom grabs at Site **2**, PPS samples will be collected that are representative of the area and different sediment types across Site**2**. The PPS samples will be used to support the visual sediment analysis and correlate the PPS parameters with sediment type. Ten samples were chosen for planning purposes; however, if sediment types vary greatly across the area, additional samples will be collected.

Comment 3: Page 10, Physical Parameters, Biota

According to this section, biota samples will be collected at locations that "generally represent the general biotic condition of sediments at the site,"targeting "areas of likely contamination." Yet Table 4-1 shows that biota samples will be collected at all 80 sampling stations. Please clarify.

Response:

Biota samples will be collected along every other proposed sampling transect to yield a total of **40** samples. The sentence mentioned on page 10 will be changed to read "samples **will** be chosen to represent the biotic condition of sediments at the site."

Comment **4**: Pages 10-12, Rationale for Sampling Approach

- A. At least one or two control transects must be included in the proposed sampling. Ideally, control transects should be located on either side of Site 2, given the tidal nature of the system. However, this may be difficult given the location of the site at the southeastern corner of the peninsula.
- B. "...the northern, eastern and westernmost extents of Site 2 have been omitted from the sampling approach...". More justification is needed for this omission. The goal of the Site 2 investigation should be to characterize and delineate the contamination associated with all potential contaminant sources (e.g. outfalls) at Site 2 using high quality data.

This approach will ensure that the information needed to appropriately direct and refine sampling efforts for OU 42: Pensacola Bay (e.g. identification of potential contaminant pathways to the bay) is available as early as possible.

Response:

- A. The westernmost proposed transects are located in areas where there **is** a low density of outfalls and where previous investigations indicated contamination was relatively low (E&E Interim Data Report, 1991). Any one of the last three to four transects could serve as a control transect; perhaps the most western one. To the east, the proposed study area is bounded by the turning basin and docking facilities for the U.S.S. Forrestal. Due to the impact of dredging and activities associated with these facilities, a control transect would not be representative of background conditions in this part of the bay.
- B. Page 7 of the **SAP** lists the justification for modifying the original area of Site 2. Based on previous investigations, the area proposed in the **SAP** was chosen to focus sampling efforts on the area identified as having the most significant contaminant levels. Although this area does not address all of the outfalls in the area, the Navy plans to address potential contamination associated with these outfalls in OU 42. The proposed sampling approach was also chosen to determine if the sampling strategy would be appropriate for delineating the contamination in this area. **Based** on the results of Site 2, sampling density can be modified (increased or decreased) for specific areas in OU 42. OU 42 does include the northern and western portions of the original site 2 area (i.e. those areas omitted for this investigation); sampling strategies will be designed to characterize and delineate contamination in these areas. The proposed study area for Site 2 also provides some overlap with OU 42.

Comment 5: Page 11, Figure 4-1

- A. The proposed transect sampling is very thorough. However, the planned analyses for full scans and infaunal benthic macroinvertebrates may prove very costly and time-consuming. One possible means of focusing this effort would be to perform an initial evaluation of sediment type (e.g. estimated grain size analyses, TOC content) and a water column depth profile (e.g. strip chart recording) at each of the 80 sampling stations, and use this information to select a subset of stations on which to perform subsequent sediment and biota sampling and high quality analyses. The preliminary evaluation could be conducted 1 to 2 weeks prior to sampling the sediment and biota.
- B. This figure does not show the locations of the temporary monitoring wells proposed in Table 4-1. Please revise accordingly.

Response:

- A. A preliminary reconnaissance of depth, sediment type, and macroinvertebrates will be performed at several stations at Site 2 to identify variation in each of these parameters. Based on this preliminary study, subsequent sampling efforts will focus on collecting representative samples from the various sediment types. Depth and sediment type will also be recorded at each of the sampling stations during the subsequent sampling effort. The sampling strategy to collect biota samples has been modified. At a minimum, biota samples will be collected at each station along every other transect to yield a total of **40** samples; additional samples will be collected, if necessary, to represent the different substrates at Site **2**. The FSA sampling effort has been modified to collect samples representative of sediment type and depth and also provide adequate coverage of the study area. FSA samples will be collected at a minimum of **40** stations (i.e. each station along every other transect). The decision to take an FSA or biota sample will be determined in the field based on bottom sediment type, depth, and location.
  
- B. One of the shallow monitoring wells will be installed near Building **71** (Site 38). This well will be used in association with the wells at Site 38. The second well will be located at the western end of the site near Building **75**. A staff gauge will be installed in a N-S transect offshore from each of the monitoring wells. The locations of these wells and gauges have been added to Figure **4-1**.

Comment 6: Page 17, Section **4.5.3**

Change the wording in the second sentence of this section to be consistent with that of Section 4.0 (page 10) as follows: "The survey will focus on analysis of benthic grab samples to determine the distribution and diversity of macroinfauna, as well as the presence or absence of the pollution indicator species...".

Response:

The requested change has been made.

Comment 7: Appendix **A**

Calibration - Please include the frequency of calibration of the Hydrolab Data Sonde units during field deployment (e.g. calibrated during the weekly instrument checks?).

Deployment - How will the instrument be marked? What precautions will be taken against vandalism, boat traffic, etc.?

Dissolved Oxygen - Since it is stated that the DO membrane may require changing after only a few days, indicate whether any field testing will be done to determine whether the DO membrane will need to be changed more frequently than the weekly instrument check interval.

Response:

Each week the existing Hydrolab unit and current meter will be replaced **by** another unit that has been calibrated. The instrument, along with the current meter, will be attached to a stand and marked by a buoy and anchored. Because the area **is** close to shore (**i.e.** not in the main traffic channel) it should not be affected by much boat traffic. NAS shore patrol and the U. S. Coast Guard will be **informed** of the location of the TWQ stations.

The unit will be checked during the first week of deployment to discover any problems of biofouling and to determine if the membranes require more frequent changing.

Comment 8: Appendix B

Surface Water Sampling with Depth - The following sampling regime is strongly recommended by ETAG:

<u>Water Column Depth</u>	<u>Sampling Depths</u>
1. 0-3 feet	mid-depth
2. 3-10 feet	1 foot below surface 1 foot above bottom
3. 10 feet	1 foot below surface mid-depth 1 foot above bottom

Response:

This sampling regime will be followed; the **SAP** has been changed accordingly.

Comment 9: Appendix C, Sediment Sample Collection Procedures

The TCL/TAL full scan parameters should not be split between two depths.

Response:

FSA analyses will be run on a composite sample from the **0-1 ft.** interval and the **1-2 ft** interval at each of the FSA sampling stations.

Comment 10: Appendix D, Biota Sampling Procedures

- A. Clarify the statement that the "volume" of the grab's contents **will** be weighed."
- B. **A** sieve mesh size of 0.5 mm is preferable to a mesh size of 1.0 mm.

Response:

- A. The sentence should read the "the volume of the grab's contents will be measured." The volume will be measured in liters or cubic centimeters depending on the volume needed.
- B. A nest of 2-3 sieves may be used with the **0.5** mm sieve at the bottom to speed up processing time; the use of a **0.5** mm sieve has been added to the work plan.