EnSafe / Allen &
a joint venture for profession

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

32501.032
09.01.32.0016

N00204.AR.000644
NAS PENSACOLA
5090.3a

November 12, 1993

Florida Department of Environmental Protection
Federal Facilities Coordinator
Attn: Eric Nuzie
Twin Towers Office Building
2600 Stone Road
Tallahassee, Florida 32399-2400

Re: Draft Final Remedial Investigation Report,
Operable Unit 10 and Site 13,
NAS Pensacola, Contract # N62467-89-D-03 18/041

Dear Mr. Nuzie:

On behalf of the Navy, EnSafe/Allen & Hoshall is pleased to submit two copies of the Draft Final Remedial Investigation Report, for Operable Unit 10 and Site 13 at the Naval Air Station Pensacola in Pensacola, Florida.

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

Sincerely,

EnSafe/Allen & Hoshall

Henry H. Beiro
Task Order Manager

Enclosure

cc: Bill Hill, SOUTHNAVFACENGCOM without enclosure
EnSafe/Allen & Hoshall file without enclosure

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
TECHNICAL REVIEW AND COMMENTS
RESPONSES TO DRAFT REMEDIAL INVESTIGATION REPORT
FOR OPERABLE UNIT 10
PENSACOLA NAVAL AIR STATION
PENSACOLA, FLORIDA

GENERALCOMMENTS

The Department agrees with the conclusion for Sites 32, 22 and 35 and expects that the next version of the Document will have filled the data gaps needed to implement the Feasibility Study and subsequent Proposed Remediation Plan.

The proposed course of action for Site 13 is acceptable. The data available to date has proven that large portions of Site 13 do not need to be further assessed; furthermore, the areas of Site 13 that could have been impacted by disposal activities seem to have been addressed on a subsequent sampling episode and the Department will await the results of such to pursue a tripartite No Further Action agreement.

No explanation is given in the conclusion section of the report for the apparent discrepancy between the soil gas values obtained for Sites 32, 33 and 35 and the groundwater data. Could this indicate improper groundwater sampling techniques? or improper soil gas QA/QC protocols?

Response:

A Phase II field sampling event was conducted between April 12 and 23, 1993. Additional soil borings and one additional monitoring well were completed to address the data gaps identified in the Draft RI Report. The results of this work will be discussed in the Draft Final RI Report.

The Navy agrees no further action is appropriate for Site 13.

The purpose of soil-gas and groundwater screening is to determine locations most suitable for placement of soil borings and monitoring wells. The screening provided useful data for suspect areas of contamination and for boring/well placement. However, soil-gas and groundwater screening are not intended to be comparable to the Level IV analytical data collected from the groundwater/soil sampling and analysis for the following reasons:

- Groundwater samples collected for screening were retrieved via a tube inserted in a plunger-driven hole to water table. The plunger bar likely drove a small amount of vadose soil into the saturated zone. The plunger action greatly agitated and disturbed the small segment of the saturated zone it penetrated, causing extreme turbidity. Some cave-in of vadose soil occurred after the plunger bar was removed

but before the tube was inserted. No screen or filter pack was used for this screening procedure. Consequently the retrieved screening samples were muddy. In contrast, the CLP groundwater samples were taken from properly installed and developed monitoring wells. Groundwater samples were collected through a careful procedure of gentle purging and bailer retrieval without agitating the water column. Due to proper filter-packing and well development, the CLP samples were less turbid than the screening samples.

- Groundwater was screened on a portable gas chromatograph with limited calibration and analytical capabilities. The CLP groundwater samples were analyzed according to USEPA SOW 390 at a CLP-approved laboratory with CLP QA/QC controls. The CLP data were validated, as was discussed in Section 8 of the Draft RI Report, and were deemed very usable and reliable.

- A heated headspace method was used on the screened samples, whereas the USEPA-approved CLP extraction method was used on the CLP samples.

Discrepancies between sets of data should be attributed to the differences between the two sampling and analytical methods. Overall, however, the CLP analytical data are not inconsistent with the soil-gas and groundwater Screening results. CLP soil data from the swale area indicate petroleum constituent contamination within a clayey material above the water table, in agreement with the soil-gas data. The absence of this contamination in the CLP groundwater data for ES-1 indicates the clayey material in which this contamination is found does not allow substantial percolation to the water table. Historical and recent data from wells GM-9 and GM-69, also located in the swale area near screening station B6/6 and well ES-1, likewise have shown no petroleum volatile organic compound (VOC) contamination in the local groundwater since at least 1989. The presence of petroleum constituents in the screening groundwater sample, on the other hand, is likely the result of the plunging process into the water table, cave-in into the saturated zone, or contamination of the tube intake while it was lowered through the contaminated clay down to the water table. As for chlorinated volatiles, the screening data indicate the presence of 1,1-DCE in a tightly restricted zone around the former ISDBs. However, 50 feet east of this zone at soil-gas station B6/6, the screening surveys did not detect any 1,1-DCE either in soil gas or in groundwater. Consistent with these results, monitoring well ES-1 had no detected concentrations of 1,1-DCE. Moreover, monitoring wells GM-8, GM-9 and GM-69, similarly located near and east of the former ISDBs, have had no detected concentrations of 1,1-DCE since at least 1990. Therefore, the CLP analytical data from this investigation are compatible with the screening surveys and historical trends.

RESPONSE TO SPECIFIC COMMENTS

Comment 1: Figure 2-4 and Page 2-23

Please include in the text a discussion on the degree of completion of the Contamination Assessment Report (CAR) for the waste oil spill at the Bilge Water Treatment Plant and how does it relate to the CERCLA effort. Also, show on appropriate figures the location of soil brings and temporary/permanent monitoring wells installed as part of the aforementioned CAR. Is the assessment at this location being conducted under a Departmental Consent Order? or a regular NAS Petroleum contract? Will Groundwater Technologies (the NAS Petroleum contract) or EnSafe/Allen Hoshall (SOUTHDIV's Navy CLEAN contractor) fill the data gaps at this location?

Response:

The bilge water treatment plant is not a part of OU 10. The investigation of the spill has been conducted under the jurisdiction of the FDEP UST Program. Therefore, an investigation of the nature and extent of contamination at the bilge water treatment plant is not appropriate in the OU 10 RI. Additional information on the spill may be found in the Groundwater Technology report entitled: *Contamination Assessment Report, Bilgewater Treatment Plant, Pensacola Naval Air Station, Pensacola, Florida,* Groundwater Technology Inc.: Pensacola, Florida, dated 1993.

Comment 2: Page 3-6

Please provide an accurate depth to groundwater. Refer to page 3-3 and clarify this discrepancy.

Response:

There is no discrepancy between the depth ranges to groundwater presented in Subsections 3.2.1, page 3-3, and in Subsection 3.2.2, page 3-6. The former depth range of 0 to 20 feet was presented under Regional Characterization, and therefore indicates the general depths to groundwater found across NAS Pensacola. The depth range of 0 to 4 feet was presented under Site Specific Stratigraphy and Hydrogeology, and therefore indicates the general depths to groundwater at OU 10 and Site 13.

Comment 3: Page 4-6

Please provide the location of the Drainage Swale and North-South Drainage Ditch on all figures.

Response:

The drainage swale and the north-south drainage ditch will be added to the figures.

Comment 4: Page 5-20

Why was a "One Way" PVC pump used? Since it could cause excessive agitation of the water column in the well while sampling, the VOC and inorganic data presented for groundwater might be suspect; it seems that a peristaltic low-flow pump could have been a much better instrument used for purging and sampling monitoring wells. It is expected that the upcoming monitoring well resampling event will correct this deficiency by using a SAP approved instrument.

Response:

The FDEP- and USEPA-approved SAP indicates a pump may be used for well purging, but it does not specify the type of pump. The SOP/QAM indicates pumps may be used for well purging, but it does not prohibit the use of a hand pump nor limit the types of pumps that may be used.

The BK hand pump was used to purge only a few intermediate wells; all other wells were purged with Teflon bailers. The pump was used to facilitate removal of the large volumes of water in those intermediate wells within a reasonable time frame. The purging equipment was used correctly; extreme care was taken to avoid agitation of the water column and filter pack during purging with the hand pump or bailers. The wells were purged to stability of pH, conductivity and temperature in accordance with the FDEP- and USEPA-approved SAP. For wells purged using the hand pump, a final polishing volume was removed with Teflon bailers before sampling. Between three and five well volumes were removed from each well before sampling.

This purging procedure did not produce turbidity beyond natural conditions due to tannic acids or other discoloration.

Comment 5: Page 5-40

Please explain why the specific capacity of the shallow and intermediate monitoring wells was calculated while they were being developed. The specific capacity of a well should be computed after the fine sediments have been removed from the well bore and well screens via well development.

Response:

The Navy agrees the specific capacity of a well increases as development removes the fme sediments disturbed during drilling from the vicinity of the well borehole. However, the mechanics of conducting a specific capacity test are to determine the discharge available per foot of drawdown in the well. Thus, the specific capacity value for a well is based on the stabilized drawdown in the well for a given discharge rate; drawdown in a well will generally not reasonably stabilize until development is complete (i.e., the fmes have been removed from the well borehole). The specific capacity values used in the OU 10 assessment were based on reasonably stabilized drawdowns, and should represent the specific capacity of the well following removal of the fine sediments.

Two additional arguments supporting the validity of the specific capacity data are as follows: the Navy's contractor conducted field tests by collecting specific capacity data obtained during development and following development of wells at OU 10 drilled by mud rotary techniques. The results of these tests indicated there was no difference. Therefore, the collection of this data during development was a valid procedure. Secondly, the equations used to calculate T from specific capacity data (Bradbury and Rothschild, 1985) correct for well efficiency; a sensitivity analysis conducted by the Navy indicated no significant differences in transmissivities were calculated, given a wide range of well efficiency (i.e., 60 to 100 percent).

Comment 6: Page 5-42

The results of the aquifer tests and subsequent aquifer parameters have proven inconclusive due to the short amount of time the pump test was underway (6 hrs.). This is further proof of the long-standing Department position that a 72 hour pump test must be implemented.

The amount of well drawdown per pumpage time (0.04 to 0.15 feet) is insufficient to design an effective recovery system. Will this be the range of values used in the Draft FS and subsequent Proposed Plan? Please indicate the amount of time that the wells were pumped prior to the time the discrete drawdown measurements were made.

Does the Navy plan to calculate vertical conductivity (Kv) of the surficial and intermediate aquifer before the implementation of the Final FS? This is an important parameter needed in any pump and treat system.

Response:

The Navy is aware of groundwater hydraulics theory as it relates to the hydrogeological evaluation of a site for both site characterization and groundwater remediation. For a comprehensive summary relating the Navy's position regarding aquifer testing at NAS Pensacola, please see Attachment 1 to these responses to comments.

For OU 10, the Navy is cognizant groundwater remediation will likely be required. To effectively model this site for remediation purposes, full-scale long-term pumping test(s) will have to be conducted to confirm and refine T and S values calculated during site characterization. To conduct these tests, two options are available:

- Physical and/or chemical redevelopment of the existing recovery wells for testing purposes (a "swabbing" effort conducted by Ecology and Environment, Inc, in 1990 increased specific capacity by as much as 400 percent in these wells; however, the wells remained clear for only a matter of weeks); or

- Design and installation of specific production well(s) for testing.

  Importantly, either option does not provide an obstacle to issuance of the ROD, and should be implemented during RD/RA to show existing conditions at a time closer to RA.

Finally, it is not the amount of drawdown as much as the time distribution of drawdown in a given observation well for aquifer characterization; this is succinctly implicit in Theis' original publication and in heat-transfer equations (the basis for well hydraulics theory). The necessity to "stress" an aquifer during design is to simulate long-term pumping effects. The difficulty in using small amounts of drawdown lies in the ability of measuring devices to resolve these drawdowns.

The aquifer test data presented in the OU 10 RI report has been re-evaluated using only unconfiied analytical methods; previous data were presented for comparative analysis only and not intended to confuse the reviewer.

The execution time of pumping when the drawdown measurements were made has been added to the revised report.

Vertical conductivity during remediation is important when (a) the plume to be retrieved exhibits a unique vertical distribution, and the proposed design is required to retrieve a minimum of unaffected groundwater, and/or (b) contaminant migration across aquifer boundaries may be induced by incurring large pressure differentials between units during extraction. Given the aquifer thickness of the surficial zone is approximately 40 feet, and flow between the surficial and intermediate is only inhibited by the contrast in permeabilities, it is anticipated the surficial (i.e., shallow and intermediate) zone will be remediated without separation (i.e., the system will be designed to treat water from 40 feet of aquifer). Additionally, the ability to collect in situ samples for vertical permeability is severely limited by the granular nature of the surficial aquifer media. In the second case, vertical permeability values through the low permeability zone have been collected by geotechnical analysis of Shelby tubes of the confining unit collected during drilling.

Comment 7: Page 6-29

Please use unconfiied aquifer methodology to calculate surficial non-confined aquifer parameters as is the case at NAS Pensacola. Correct the text and figures as needed.

Response:

The RI report has been revised to include only unconfined solutions for surficial aquifer parameters. Please see the response to USEPA comment 35.

Baseline Risk Assessment

Comment 8: Page 10-3 Tables 10-2 and 10-2

Please explain the configuration of these tables. How was 95% UCL obtained for 1,2,4-Trichlorobenzene if only one hit out of 100 samples is reported in the table? It seems that the maximum concentration should have been used. In order to avoid confusion to persons that might be interested in reading these documents but lack enough technical and/or statistical expertise; i.e., some TRC Members, all tables should be adequately explained in the text.

Have non-detection values been used in the sample population and subsequent calculation of the UCL?

Response:

Exposure concentrations are the lesser of 95 percent UCL mean or maximum concentration. Use of the maximum concentration for 1,2,4-Trichlorobenzene would not be appropriate because the potential for chronic exposure to an infinitesimally small hot spot is low. Non-detects were assigned the lesser of half the CRQL or half the lowest reported hit in computing 95 percent UCL.

Comment 9: Page 10-11

The Department questions the Navy's opinion that Operable Unit 10 does not provide suitable locations to determine site-specific background conditions. Due to the size of Site 13, there are areas that have not been impacted by any disposal activity or have not had the soils reworked; therefore, Site 13 could be used to determine background conditions. It is expected that background results will be established by the time the supplemental sampling results are provided to the Department.

Response:

Site 13 is not a part of OU 10; it is being reported with OU 10 due to its close proximity. The Navy will re-evaluate the existing data set in an attempt to identify representative background sample locations on or near OU 10.

Comment 10: Page 10-17

It seems that the Navy has unilaterally decided on an industrial scenario to determine soil and groundwater Remedial Cleanup goals. This is unacceptable. Although highly unlikely at this Operable Unit, the Exposure Assessment must include a future residential scenario unless the Navy has a deed restriction on this area recorded with Escambia County. Furthermore, the determination of Remedial Cleanup Goals at Operable Unit 10 to actual industrial or potential Residential levels has to be done by a consensus of all three parties to the FFA. Please see FFA Section VIII (F) Consultation with U.S. EPA and FDEP (see FDEP).

Sediment values should also be compared to the Florida Sediment Criteria, that unlike NOAA's, which have been defined for sediments present throughout the country, are more applicable to Florida's sedimentary facies which are unique.

Table 10-15 should only indicate soil remediation goals (SRGs) as compared to current Federal and State SRGs. All the other information should go in another table.

Response:

The Navy will consider both industrial and residential scenarios to determine soil and groundwater Remedial Cleanup goals. Cleanup goals will be to present use; if at a later date land use should change (although unlikely) the Navy will reassess cleanup criteria.

The Navy is currently reviewing available sediment quality criteria to determine which values are appropriate comparison to onsite sediment results. These trigger levels, when jointly agreed upon by the USEPA and FDEP will be included.

Table 10-15 will be revised accordingly.

Appendices K, N, O, and P

Comment 11:

Please provide an explanation of the J qualifier at the end of each appendix and indicate so at the end of each table.

Response:

The J qualifiers indicate the compound was positively detected, however, the reported concentration is considered to approximate the concentration within the sample. This **will be clarified in the appendices and tables.**

ATTACHMENT 1

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 190010
NORTH CHARLESTON, S.C. 29419-9010

PLEASE ADDRESS REPLY TO THE COMMANDING OFFICER, NOT TO THE SIGNER OF THIS LETTER.
REFER TO:
5090/13
Code 1851
29 Sep 93

RECEIVED
OCT 4 1993

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Allison Drew
U.S. EPA, Region IV
4WD/FFB
345 Courtland Street, NE
Atlanta, GA 30365

AQUIFER TEST DATA USED IN SITE CHARACTERIZATION AND REMEDIAL DESIGN, NAS PENSACOLA, FL

Dear Ms. Drew,

During the course of RI Work Plan generation, subsequent Response to Comments, and now regulatory comments on the RI field investigation at Operable Unit 10 (OU-10) there have been continued references to the completion of constant rate aquifer tests at the subject RI sites. In an effort to mitigate further comment the Navy would like to clarify their position for all remedial activities at NAS Pensacola including 1) the collection and use of hydrogeologic parameters for site characterization, 2) the use of these parameters for groundwater remediation design, and 3) the necessity for and execution of long-term, full scale pumping tests for remedial design. This letter also serves to clarify and summarize our position at NASP on monitoring well development and purging to address supplemental concerns expressed by the FDEP and US EPA in comments on OU-10.

Constant Rate Aquifer Tests

Site characterization requires aquifer permeability data necessary to illustrate aquifer homogeneity (or inhomogeneity) and the nature of groundwater occurrence in the aquifer; This information also provides some measure of groundwater velocity which is important to the advective transport of potential contamination; and, in some cases, the degree of connection between aquifer units. Site characterization *does not* necessarily provide the data required for site remedial design, but it *does* provide data which can be used to design long-term, full-scale pumping tests (which are required for proper remedial design). These types of tests are required *only* when site characterization data indicate groundwater extraction will be necessary to site remediation. Conducting these types of pumping tests prior to confirmation of their necessity, and their proper design based on a conceptual site model, can lead to tremendous unnecessary execution and disposal costs and can significantly reconfigure plume distribution in the host and adjacent aquifers (and can, in fact, induce contaminant migration across aquifer boundaries).

The Navy believes aquifer parameters estimated by using slug tests and/or specific capacity tests are adequate for site characterization. It has been shown, specific capacity tests (along with their recovery data), in particular, provide realistic estimates of aquifer transmissivity and the nature of groundwater occurrence, compare favorably to those calculated using pumping test data (Bradbury and Rothschild, 1985; Bradbury and Muldoon, 1990: full references attached to this letter).

AQUIFER TEST DATA USED IN SITE CHARACTERIZATION AND REMEDIAL DESIGN, NAS PENSACOLA, FL

The question concerning the procedure of collecting specific capacity data during well development is reasonable. The equations used to analyze specific capacity data are presented in Bradbury and Rothschild (1985), and offer correction factors for well efficiency. The proper application of these equations, therefore, allows data to be used for the calculation of representative aquifer characteristics. Furthermore, field testing at NAS Pensacola by the Navy's contractor on wells drilled by mud rotary indicates little to no change in the specific capacity of wells prior to development and after development (well development procedure were conducted in accordance with SOP/QAM procedures). The Navy contends slug test and/or specific capacity test data fulfill the requirements for site characterization, and can be used to anticipate, plan, and design test well locations, discharge volumes, and execution times for full-scale, long-term pumping tests where groundwater extraction is necessary. This approach will prevent the unnecessary duplication (i.e., change in aquifer conditions, or liability to the Remedial Action Contractor) of aquifer tests and provide real time data for RD/RA.

At sites where groundwater remediation is required (as determined by RI analytical data), full-scale, long-term pumping tests will be conducted. If existing wells onsite will sustain discharge rates necessary to adequately stress the aquifer, then these wells will be used. If not, then specific aquifer test wells may have to be installed; these can, however, be designed to double as extraction wells once the extraction system is in place. In addition to production wells, specifically located piezometers may also need to be installed. In order to simulate long-term effects of pumping, discharge rates for these tests (designed using site characterization data) should, as a rule be approximately twice the anticipated extraction rate to be employed in the remediation system or, at a minimum, at the maximum discharge rate that the well will practically sustain. For tests involving unconfined aquifers, execution times will be a minimum of 72 hours (48 hours production, 24 hours recovery), and for confined aquifers will be a minimum of 48 hours (24 hours production, 24 hours recovery).

Importantly, site characterization data (slug and/or specific capacity tests) can be used to effectively evaluate the feasibility of groundwater extraction. This evaluation can be conducted using the information provided in the RI/FS reports. Therefore, it is also the Navy's position that long-term, full-scale pumping test data is not necessary until actual design of an extraction system. This data is a luxury and not a necessity to issuance of a Record of Decision, and can be collected as an integral part of Remedial Design/Remedial Action (RD/RA) or in a predesign phase of RD/RA.

Monitoring Well Development

Monitoring well development will be performed in accordance with Appendix E.7 of the USEPA SOP/QAM. Development can be performed using a variety of techniques, both individually and in combination. Techniques which may be used include:

- Pumping
- Compressed Air (with the appropriate organic filter system)
- Bailing
- Surging
- Backwashing
- Jetting

AQUIFER TEST DATA USED IN SITE CHARACTERIZATION AND REMEDIAL DESIGN, NAS PENSACOLA, FL

The objectives during monitoring well development are to remove any residual materials from monitoring well installation and to re-establish the natural hydraulic flow conditions. Monitoring wells are to be developed until free of visible sediment given the geology of the area, and until Ph, temperature, and specific conductivity have stabilized.

Monitoring Well Purging

Monitoring well purging has and will continue to be performed in accordance with Section 4.9.3 of the USEPA SOP/QAM. The objective of monitoring well purging is to remove stagnant water from the monitoring well which is not representative of aquifer conditions. Well purging completed during groundwater sampling for Operable Unit 10 was implemented utilizing either pumping or bailing techniques. A hand pump was used to initiate well purging on three intermediate wells. From these wells approximately 2 well volumes or water were removed and subsequent purging was completed by bailing. All wells were purged of a minimum of 3 to 5 well volumes and until pH temperature and conductivity had stabilized. The Navy feels all samples collected during the RI for OU-10 are representative of groundwater and deemed useable.

In order to mitigate regulatory concern, all future well purging will be achieved by using a peristaltic pump, bailer, bladder pump, or Grundfos pump. Purging will continue until Ph, temperature, and specific conductivity have stabilized. At least three but no more than five well volumes will be removed during purging. The CSAP will be revised to specify which types of pumps may be used during monitoring well purging.

In closing, the Navy wishes to point out, it is imperative to maintain a proactive role in the investigation and remediation of sites at NAS Pensacola. However, it is also imperative these activities be conducted with a mind towards not only timeliness, but also technical efficiency and correctness, proper sequencing of events, and cost effectiveness.

If you have any questions or comments concerning this position summary, please contact Ms. Linda Martin at (803) 743-0574.

Sincerely,

Linda A. Martin

LINDA A. MARTIN
Environmental Engineer
Installation Restoration I Division

copy to:
NAS Pensacola (Mr. Ron Joyner, Code 18520)
E/AH (Mr. Paul Stoddard)