U S NAVY RESPONSES TO TECHNICAL REVIEW COMMITTEE COMMENTS ON DRAFT REMEDIAL INVESTIGATION FEASIBILITY STUDY WORK PLAN NAS JACKSONVILLE FL
7/1/1991
NAVFAC SOUTHERN

NAVY'S FINAL RESPONSES TO TECHNICAL REVIEW COMMITTEE COMMENTS ON DRAFT NIRP AND OU1 RI/FS WORK PLANS

July 1991

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Navy's Final Responses to Comments From

U.S. Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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MAY 13 1991
4WD-RCRA & FFB

Mr. Joel Murphy
Southern Division
NAVFACENGCOM
Mailcode 18213
P.O. Box 10068
1255 Eagle Drive
Charleston, S.C. 29411-0068

RE: RI/FS Project Plans for OU1 at Naval Air Station
Jacksonville, Jacksonville, Florida

Dear Mr. Murphy:

The U.S. Environmental Protection Agency (EPA) has completed the review of the following documents dated March 1991, as required under the Federal Facility Agreement (FFA):

> Draft Remedial Investigation/Feasibility Study Work Plan for OU1, Oil and Solvents Disposal Pits Area, Navy Installation Restoration Program Plan, Naval Air Station, Jacksonville Florida.

Several issues need to be addressed before final approval of the above referenced document can be given. EPA comments related to this document are enclosed.

The above-referenced document in Draft Final form will be expected 60 days from receipt of the last set of comments as per the Federal Facility Agreement.

If you have any questions, please call me at (404) 347-3016.

Sincerely yours,

Carl R. Froede Jr

Carl R. Froede Jr.
Remedial Project Manager
Jacksonville Naval Air Station

Enclosure

cc: Eric Nuzie, FDER
James Malone, SOUTHNAVFACENGCOM
Kevin Gartland, NAS Jacksonville

GENERAL COMMENTS

1) All field work and laboratory procedures must follow EPA Region IV Standard Operating Procedure Quality Assurance Manuals (SOPQAM), copies of which can be obtained from Federal Facilities Section. Any deviation from EPA Region IV SOPQAM must be justified in writing, and be approved by EPA.

2) EPA recommends that the Navy consider treating PSC 27 (PCB Storage Area) as a removal or interim remedial action site. EPA bases this decision on the fact that a site characterization could be performed (by EPA if the Navy would prefer) to determine the concentrations and extent (vertical and lateral) of PCB contamination. With this information, the Navy (or EPA) could mobilize one of their "clean" contractors to perform a removal or remedial action to remove the PCB contamination and eliminate the soils from further remedial considerations. EPA will work with the Navy in determining a plan of action for PSC 27.

3) EPA fails to see the relevance in the construction of monitor wells within the boundaries of PSC 26 (Old Main Registered Disposal Area). Several wells are recommended for construction within the known boundary of floating free petroleum product. PSC 26 has undergone enough characterization to determine that significant contamination exists at the site. What needs to be determined at PSC 26 is the extent of contamination (lateral and vertical) and the determination of data requirements needed for remedial action. The proposed "confirmation" sampling is both redundant and potentially dangerous.

4) A variance for the expressed use of PVC monitor well casing should be requested for this investigation. EPA Region IV standard operating procedures quality assurance manual (SOPQAM) recommends that monitor wells are constructed from stainless steel (304 or 316 - first choice) or rigid PVC meeting NSF Standard 14 ("NSF WC" - second choice). Use of these well casing materials will depend upon obtaining the most representative groundwater sample. Below are EPA's minimum seven point information requirements to justify the use of PVC as the only well casing material for ground water monitoring wells.

A. The Data Quality Objective(s) (DQO) for the samples to be collected from wells with PVC casing per EPA/540/G-87/003, "Data Quality Objectives for Remedial Response Activities".

B. The anticipated compounds and their concentration ranges.

C. The anticipated residence time of the sample in the well and the aquifer's productivity.

D. The reasons for not using a hybrid well.

E. Literature on/or brief discussion of adsorption/desorption characteristics of the compounds and elements of interest for the type of PVC to be used.

F. If an anticipated increase in thickness of the monitor well wall will require a larger annular space.

G. The type of PVC to be used and, if available, the manufacturer's specifications. Additionally, assurance that the PVC to be used does not leach, mask, react or otherwise interfere with the contaminants being monitored within the limits of the DQO(s).

EPA acceptance does not constitute approval of PVC monitor well casing material, therefore, if PVC is accepted for use, the following conditions shall apply:

A. The Navy accepts the risks that the use of alternate materials for ground water monitoring may cause interferences or inaccuracies in the chemical analysis of samples from such wells. All compounds found in samples collected from the well will be considered to originate in the aquifer being monitored.

B. Any such acceptance applies to the implementation of the specified RFI Work Plan only, and any other use of alternate materials for ground water monitoring must be granted by EPA separately.

C. Any major amendments or revisions to the referenced RI/FS Work Plan or the intended DQO(s) of the work plan may require reassessment of the acceptance for use of alternate materials by EPA.

D. EPA reserves the right to refuse ground water monitoring data from ground water wells constructed of alternate materials from those specified in the Region IV SOP whenever such construction materials could cause the ground water monitoring data to fail to meet the necessary DQO(s).

All of the previously mentioned comments for the request of a variance for the use of PVC well casing could be included within a page of the workplan and be inclusive for all sites where PVC casing will be used. Other well materials could be recommended at each individual site, if contaminants in the subsurface are prone to leach chemicals or deteriorate PVC casing.

5) The concept of creating general/generic documents to reference standard operating procedures to be performed in the field and laboratory is good for planning the early stages of an operation. However, when preparing to perform the work at a specific operable unit(s), it is necessary to develop site specific field and laboratory procedures. The RI/FS Project Plans for OU1 should be a stand alone document containing relevant and appropriate field and laboratory procedures. References to background information (i.e. site description, environmental setting, PSC prioritization, regional geology/hydrogeology, treatability studies development, etc,) in separate documents is appropriate, however, work to be performed (i.e. Sampling and Analysis Plan, and the Operable Unit Work Plan) needs to be specific to these sites.

6) Throughout the OU1 Work Plan (RI/FS OU1) there are references and cross-references to various sections which contain more information about a particular method or procedure that will be used. Several of these methods or procedures are referenced by directing the reader to two or more locations. These "go to" references are to be located by a section number, appendix, or volume number. Many of these references are incorrectly referenced, are not where they were specified, or did not even exist! The Navy needs to insure that general reference volumes (when/where appropriate) will be easy to read and clearly referenced.

7) The Navy must realize that the general public will have complete access to the files through the Administrative Record, and as such, the files should be understandable and not confusing. The cross-referencing to other volumes must be eliminated. By including the site specific work/laboratory plans within the draft work plan/sampling analysis plan, a lot of confusion will be eliminated.

8) The Navy initiated a removal of radioactive paint from a portion of PSC 26 on May 11, 1974. The most recent radioactive survey performed by Geraghty & Miller, Inc. (February 1991) revealed a "hot spot" located somewhere at PSC 26. EPA requests that the Navy perform an extensive radioactive assessment of the site, taking into account the potential for soil and groundwater contamination by alpha, beta and gamma radiation. This work should be described in detail in the OU1 Project Plans.

9) Additional ground-water monitoring wells should be added to delineate the extent of contamination beyond the areas where contamination has already been documented. Details of well construction should be provided reflecting appropriate well materials and screen size. The screen slot and sand pack sizes should be selected based on site-specific sieve analysis. This should be presented within the OU1 Project Plans. It should be noted that several organic contaminants at PSC sites 26 & 27 can destroy PVC well casing by dissolution, resulting in the loss of the monitor well and additional subsurface contamination generated by the break-down products of the PVC.

10) The identification of potential environmental receptors is still biased toward human health concerns, instead of environmental receptors which may have been impacted in the past. The U.S. Fish & Wildlife Service can supply a list of natural resources for that area identifying environmental receptors (fish, shore and wading birds, rare or endangered species, etc.).

11) The RI/FS work plan must demonstrate the rationale for the determination or elimination of the contaminants' threat in much more detail than currently presented.

The Work Plan is required to define the nature and extent of contamination in all media at the site, define the potential and actual transport pathways and receptor populations, assess the potential and actual risks to human health and the environment and collect sufficient engineering data to develop and evaluate potential remedial alternatives. Specifically, the RI/FS Work Plan should present a statement of the problem(s) posed by the site and the objectives of the RI/FS. If any of this information cannot be presented then it should be identified as a "data gap" and specific means for its collection should be provided.

SPECIFIC COMMENTS

1) RI/FS Work Plan for OU1, page 2-6, second paragraph: A June 1986 report by Geraghty & Miller, Inc., is referenced, but with no results or data on which to base a decision. EPA recommends that the results are shown, perhaps in a table, in this section.

2) RI/FS Work Plan for OU1, Figures 2-2/3, pages 2-7/8: Several wells located on the maps are not identified (no legend). Also should include some sort of well inventory (depth, screened interval, diameter, etc.) shown in this section.

3) RI/FS Work Plan for OU1, Section 2.3 Historical Response, pages 2-4/11: If it is the intent of the Navy to provide information regarding the January/February 1991 field work performed at PSC 26 & 27, then more detailed and specific information must be provided in this section. This information must be included in the next revision.

4) RI/FS Work Plan for OU1, page 2-9, fourth paragraph: Why was sampling (gross alpha, gross beta) not performed on groundwater in the area of the hot spot? This would provide information relative to radioactive contamination in the subsurface.

5) RI/FS Work Plan for OU1, Figure 2-4, page 2-10: Where were the "Background" soil samples obtained? These should be shown on the base map. Also should include the soil boring number and/or base map, with a corresponding table to identify sample location, depth, etc.

6) RI/FS Work Plan for OU1, Table 2-1, page 2-12: Wells SW-2, SW-3, BM1, H-7, and BM2 are not noted in Figures 2-2 and 2-3. If these wells could not be located during site analysis, an appropriate superscript should be added to the Table.

7) RI/FS Work Plan for OU1, page 2-13, second paragraph: Is the mapped location of the oil plume the current projected location or the location identified in 1979? What investigative efforts have been conducted to track the movement of the oil plume? Does the Navy have any plans for an Interim Remedial Action to remove the floating free product at PSC 26?

8) RI/FS Work Plan for OU1, Section 2.5 Presence of Contaminants, page 2-19: The data presented in Tables 2-2 and 2-3 do not indicate that volatile organic compound (VOC) contamination is not present in the shallow groundwater beneath the housing areas east of OU1, as stated in the report. Table 2-2 lists concentrations of only seven VOCs, at locations which are not shown on any of the figures. Trichloroethene (TCE) was detected in 10 of the listed 15 locations and was at concentrations exceeding the maximum contamination level (MCL) in 5 of these locations.

Table 2-3 shows the concentrations of seven VOCs at six locations, only one of which (DPW-2) is located between the solvent pits and the housing area. This well shows VOC concentrations (TCE at 62 ug/l) at up to six times the MCL (MCL's for TCE, 5 ppb). No analytical data is presented illustrating VOC concentrations in the "H" wells, which would qualify the "No VOCs in shallow aquifer beneath" statement.

9) RI/FS Work Plan for OU1, Section 2.5.1, Figure 2-6, page 2-22: Surface Water sample sites SW-6 and SW-7 are missing from the figure. Please add these.

10) RI/FS Work Plan for OU1, 3.1 Physiography, page 3-1: A topographic map of the site and surrounding area should be included in the discussion of site physiography.

11) RI/FS Work Plan for OU1, page 4-1: The objectives of the site characterization are incomplete as listed. The objectives of the site characterization should include:

1) Definition of the potential transport pathways and receptor populations.

2) Provision of sufficient engineering data for development and screening remedial action alternatives.

Chapter 3 of the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final (1988) summarizes the information required for a RI/FS investigation; Data Quality Objectives for Remedial Response Activities (1987) provides a discussion and examples of data quality objectives to be defined and achieved during the RI/FS process; and, Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites, Interim Final (1988) provides guidance for the investigation and assessment of physical parameters that need to be defined to properly evaluate and select remedial alternatives for sites with contaminated groundwater. The Navy and their contractors should obtain these documents and incorporate the guidance located therein into the RI/FS Work Plan.

12) RI/FS Work Plan for OU1, Section 4.1 Basic Considerations and Approach, page 4-2: The proposed Phase I and Phase II investigations should be combined into a single site characterization study. The site is known to have a free floating waste oil plume with solvent, waste oil and PCB contamination of the soils and groundwater beneath the site.

The proposed objective "...to identify and confirm the presence of contaminants of concern..." is too limited in scope based upon the current knowledge of waste disposal practices and extent of contamination in soils, groundwater and surface water. A full site characterization of all transport pathways should be implemented.

13) RI/FS Work Plan for OU1, 4.3 Soil Gas Survey in Residential Area, page 4-5: The soil gas survey should not be limited to the list of contaminants that were analyzed in the very limited 1980 analysis. Rather, the soil gas survey should also include volatile and semi-volatile hydrocarbons and halogenated organic solvents, in addition to the ketone and ester groups, to fully evaluate soil vapor migration in the vadose zone in the area west of the residential housing area.

14) RI/FS Work Plan for OU1, Section 4.4 Soil Borings, page 4-5: How will the drill crew prevent the downward migration of contaminants from the drilling mud as they take continuous cores and drill. There is no reference to telescoping casing or any other manner of preventing contamination from being transported downward.

15) RI/FS Work Plan for OU1, Section 4.5 Sediment and Surface Water Sampling, second paragraph, page 4-7: All field/analytical work referenced should be site specific with details stating the exact what-how-where these procedures will be implemented. The design of the drainage ditch/weir system and its inability to prevent contaminant migration (other than surficial oils) imparts the necessity for further sediment/surface water sampling from the southeast drainage ditch down to the outlet into the St. Johns River. Sediment and surface water samples for volatile organic compounds should not be composited.

16) RI/FS Work Plan for OU1, first paragraph, page 4-10: EPA concurs with the use of PVC as piezometer (1-1/2 inch) casing material, for this specific case.

17) RI/FS Work Plan for OU1, Section 4.6.2.1 Shallow Surficial Monitor Wells, pages 4-11/12: Need specific information as to the exact drilling method to be used. A variance for PVC well casing must be requested before it will be allowed (following previously stated guidelines). Specific monitor well construction methods should be stated within RI/FS Work Plan for OU1, it can then be referenced as necessary. The "general/generic" monitor well construction section referenced is not specific enough to determine its relevancy. A monitoring method should be proposed to insure that no radioactive contaminants are carried into subsurface groundwater during the construction of these monitor wells.

Soil samples are proposed to be collected at 2-foot intervals during the drilling of the shallow monitor well boreholes, but soil gas screening of these samples is proposed on 5-foot intervals. Soil gas screening should be performed on each 2-foot interval sample collected, since the borehole depth will be 15-feet or less.

18) RI/FS Work Plan for OU1, Section 4.6.2.2 Deep Surficial Monitor Wells, pages 4-12/14: Need more detail relevant to this site in regards to type of drilling method, well casing materials, and approximate total depth for the deep monitoring wells proposed. A section or paragraph should be included to explain the rationale used to arrive at the decision that 3 to 5 feet below the water table contamination would: a) not be present or, b) be present but in levels below any hazard to human health or the environment. No confining/semi-confining units exist within the surficial aquifer, hence the installation of surface casing does not serve the intended purpose. The use of "Black Steel" for monitor well casing cannot be approved, due to the black coating being released to the environment (the black coating flakes off the casing and can affect sampling results). If steel casing is the preferred casing material, EPA recommends the use of carbon steel. The proximity to radiological hot spots should be evaluated to insure that radioactive materials are not carried into groundwater. A variance for PVC must be granted as previously mentioned. EPA recommends that schedule 80 PVC be used for the outer casing if PVC well casing is approved and is selected for the site. All monitor well construction fluids and soils are to be disposed of in a manner protective of human health and the environment. This should be stated in the RI/FS Work Plan for OU1, along with the methods that will be used to dispose of the various materials. Drilling fluids should not be disposed of on the ground surface unless laboratory results indicate it is safe to do so.

19) RI/FS Work Plan for OU1, Section 4.6.3 Ground-Water Sampling, page 4-15: Groundwater sampling section referenced is incorrect. The groundwater sampling section should be in this report and should report specific methods that will be used at this operable unit. The target compound list and target analyte list should be stated in this report (perhaps stated in a table, and referenced). The section referencing laboratory methods is appropriate.

20) RI/FS Work Plan for OU1, Section 4.6.4 Hydraulic Testing, page 4-16: The reference for in-situ permeability testing is incorrect. This section should be included in this report and customized for this site (i.e., how many/which specific wells, how will it be performed, etc.). The in-situ permeability testing that is proposed will only measure the aquifer properties in a small portion of the aquifer in the immediate vicinity of the well that is tested, whereas a pumping test (three day test using a properly constructed pump and observation wells and the appropriate method of data interpretation) could measure the aquifer properties in a larger portion of the aquifer. A pump test will eventually be required to design any sort of groundwater pump and treat system.

21) RI/FS Work Plan for OU1, Section 4.6.5 Water Levels, page 4-16: "All measurements will be referenced to datum established in Section 4.8.5 to determine..." Section 4.8.5 of what? Why not make it simple by stating "All measurements will be referenced to within .1 ft, of the National Geodetic Vertical Datum of 1929, to determine...". This section of the report is a prime example of the poor and confusing use of references throughout this report (RI/FS Work Plan for OU1).

22) RI/FS Work Plan for OU1, Section 4.6.5 Water Levels, page 4-16: I was not able to locate the reference "Section 4.8 of the OU1 FSP (Appendix 5.4)". This method needs to be specified in this report and then referenced.

23) RI/FS Work Plan for OU1, Section 5.0 RISK ASSESSMENT, first paragraph, page 5-1: The reference "Section 5.0 of the General Site Work Plan (Volume 4) presents..." is incorrect . The location of this general overview of the risk assessment process in another volume is appropriate, however, it should be referenced correctly. In the RI/FS Work Plan for OU1 and specifically for this section, a detailed breakdown of the risk assessment methods and procedures must be included.

24) RI/FS Work Plan for OU1, Table 5-1, page 5-2 and Table 5-2, page 5-4: A sediment exposure pathway should be added as an "Environmental Media" and the resulting Human and Ecological pathways should be examined for the current use exposure assessment. The author should always separate this media from surface water.

25) RI/FS Work Plan for OU1, Table 5-2, page 5-4 and Table 5-1, page 5-2: The statement that "there is no direct hydraulic discharge of groundwater into the St. Johns River" is unsubstantiated and contrary to general hydrologic principles which state that surficial aquifers are in direct hydraulic interaction with surface water bodies, e.g., river baseflow.

26) RI/FS Work Plan for OU1, page 5-5: The migratory nature of fish and some benthic microbes as well as the mobility of surface waters and sediments (in the ditch) induce considerable uncertainty in Biolife impact conclusions drawn exclusively from surface water/sediment data. This is compounded by the fate tendency of PCBs towards bioaccumulation in aquatic systems. Accordingly, proposed Phase I sampling will not be an effective indicator of the necessity for Phase II fish sampling. Thus fish sampling or a Rapid Bioassessment should be implemented along any fishable, undammed, or representative section of the ditch down to the St. Johns River.

27) RI/FS Work Plan for OU1, third paragraph, page 5-5: The reference "(see Section 4.7 for more details..." could not be located. The section referenced concerning Phase I sediment and surface water sampling should be in the RI/FS Work Plan for OU1 and contain specific information regarding methods/procedures for this site.

28) RI/FS Work Plan for OU1, Table 5-3, page 5-8: The surface soil "Route of Exposure" should include soil ingestion.

29) RI/FS Work Plan for OU1, Section 6.0 TREATABILITY STUDIES, page 6-1/2: The proposed bench and pilot scale treatability studies should be expanded to include additional technologies. With a two-phase system as is found at this site, it would be difficult to extract the nonaqueous phase liquids. Work is now being conducted with surfactants which can, in certain instances, make constituents more mobile. The use of surfactants are but one example of additional technologies that should be considered at this site. All treatability study plans should be proposed as early in the RI/FS process as possible, to prevent any delay in starting a remedial action at the site(s).

30) RI/FS Work Plan for OU1, Section 7.1 Development of ARARs, page 7-1: Work performed by Geraghty & Miller on February 1991 fully characterized the soils at PSC-26 from three inches below the ground surface to the top of the water table. Why can't soil ARARs be developed from work already performed on the site? What's missing that will be added by Phase I sampling? Only chemical specific ARARs are discussed. Other ARARs needing to be developed include location specific and action specific ARARs. The chemical specific ARARs for groundwater are not all correct as shown in Table 7-1. Specifically, for cadmium, chromium and barium there are proposed MCLs of 5 ug/l, 100 ug/l, and 2 ug/l respectively. The proposed MCLs should be used for clean-up levels for these constituents so that they will be current when the new levels go into effect. For lead there is an action level of 15 ug/l (proposed) which is being used at CERCLA sites. The list of sampling parameters should be upgraded to ensure that practical quantitation levels (PQLs) are adequate so that detection limits are above the clean-up goals and that all potential parameters of concern are included in testing. Several of the Florida Drinking Water Standards for metals are sited incorrectly in Table 7-1.

31) RI/FS Work Plan for OU1, second paragraph, page 7-5: "...are discussed in Section 5.0 of the General Site..." This information does not exist at the referenced location.

32) RI/FS Work Plan for OU1, Section 8.0 DATA MANAGEMENT, page 8-1: Referencing a general/generic data management plan is acceptable, however, a data management plan specifically for PSCs 26 & 27 must be described in this section.

33) RI/FS Work Plan for OU1, Section 9.0 QUALITY ASSURANCE/QUALITY CONTROL, page 9-1: Referencing a general/generic quality assurance/quality control project/program plan is acceptable, however, a quality assurance/quality control project/program plan specifically for operable unit one is required under the Federal Facility Agreement.

34) RI/FS Work Plan for OU1, Section 11.0 SCHEDULE OF EVENTS, page 11-1: The Site Management Plan should specify a project start date (day-month-quarter-year) for work to be performed at this operable unit. A projected start timeframe could/should be presented in this section such that anyone reading the Administrative Record would have an idea when the RI/FS Work for OU1 would start.

35) RI/FS Work Plan for OU1, Appendix 5.3: Tables 1-1 and 3-1 listing parameters proposed for analysis at the site will need revision. First, there should be a full scan of groundwater to ensure an understanding of the exact contaminants of concern for Phase II of the investigation. Second, radioactive materials are indicated to be of concern at the site but are not included in the list of parameters for analysis or listed in the tables. The work plan has indicated that there were radioactive materials disposed of at the site in the past. Although the radioactive disposal area has reportedly been remediated, radium, a radioactive constituent of concern in the paint that was disposed of in the area, has one isotope (226) that has a half life of 1620 years. If this isotope is present in groundwater, its persistance makes it important that its extent be known. All groundwater monitoring wells at the site should be sampled for both alpha and beta radiation in the next sampling episode to ensure that radioactive groundwater is not a problem. Third, there are a number of constituents in Table 3-1 for which the practical quantitation levels (PQLs) are not adequate to ensure that concentrations of constituents near the groundwater clean-up goal are at or above the detection limit. The following table lists these constituents and the correct PQL.

Constituent	NAS PQL ug/l	Clean-up Goal ug/l source	EPA PQL ug/l method
Benzo(a)anthracene	10	0.1 pMCL	0.1 HPLC
Benzo(a)fluoranthene	10	0.2 pMCL	0.2 HPLC
Benzo(a)fluoranethene	10	0.2 pMCL	0.2 HPLC
Benzo(a)pyrene	10	0.2 pMCL	0.2 HPLC
Chrysene	10	0.2 pMCL	0.2 HPLC
Dibenz(a,h)anthracene	10	0.3 pMCL	0.2 HPLC
Indeno(1,2,3-cd)pyrene	10	0.4 pMCL	0.2 HPLC
Pentachlorophenol	50	1.0 pMCL	5.0 8040
Aldrin	0.5	0.0021 HBC	0.05 8040

pMCL is proposed MCL
HBC is health-based criteria
HPLC is High Pressure Liquid Chromatography

36) RI/FS Work Plan for OU1, Appendix 5.4, Part 1: All "Work Plans" specific to this operable unit should be included in this section.

37) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, first paragraph, Section 1.0, page 2 of 11: All field and laboratory methods and procedures must follow EPA Region IV Standard Operating Procedures and Quality Assurance Manual (SOPQAM), and should be referenced as such.

38) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, Section 1.1 Project Background, page 4 of 11: The assumption is proposed that because a remedial action was performed to remove all radioactive contamination in the past, there is no radioactive contamination at the site to be concerned about. This is an incorrect assumption! It was stated early in the report (RI/FS Work Plan for OU1, page 2-9) that "A surface radiological survey was conducted in February 1991...with a measurement of 21 micro R/hr at one location.". This reading is clearly above background levels for Jacksonville Naval Air Station, and reinforces EPAs position that the site is not as well defined/characterized as the Navy would like to believe. As previously mentioned, further radioactive characterization (soil, groundwater, alpha, beta, gamma) needs to be performed at this site.

39) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, Section 1.3 Summary of Designated Tasks, first paragraph, page 5 of 11: The statement "Data collection necessary to meet the objectives of Phase I RI work plan...is described in detail (emphasis added) in the following sections." All sections following this statement reference general/generic documents in other volumes! This entire section needs to be rewritten to encompasses for this operable unit.

40) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, Section 1.3.1 Geophysical Survey, page 5 of 11: EPA formally requests a copy of this document from the Navy, which covers the geophysical survey performed at PSC 26 & 27, by the U.S. Army Corps of Engineers.

41) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, Section 1.3.2 Soil Gas Survey, page 5 of 11: Reference to Section 4.2 of the OU1 FSP is incorrect. All FSP information for these specific sites must be included in this report.

42) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, Section 1.3.3 Environmental Sample Collection and Chemical Analysis, second paragraph, page 6 of 11: All sampling procedures must follow EPA Region IV SOPQAM protocols. If ASTM methods follow Region IV SOPQAM then it needs to be stated as such. Specific details in relation to sampling this site need to be stated in this report (RI/FS Work Plan for OU1).

43) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, Section 4.0 SAMPLING PROCEDURES, page 1 of 3: The statement "The specific methods of collection that will be used are described in the following sections." All sections following this statement reference general/generic documents in other volumes! This entire section needs to be rewritten to be all encompassing for this operable unit (PSC 26 & 27).

44) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, Section 4.2 Surface Water Sampling, page 2 of 3: EPA recommends against compositing the surface water samples due to the dilution effect that it could create in the results. EPA requests that discrete sampling and analysis be performed on the samples. If "filtering" is to be performed on the sample, then an un-filtered sample must also be analyzed per EPA Region IV Standard Operating Procedures Quality Assurance Laboratory Manual (SOPQALM).

45) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, Section 4.3 Ground-Water Sampling, page 3 of 3: The reference to Section 4.7 of the OU1 FSP is incorrect. All FSP information for these specific sites must be included in the RI/FS Work Plan for OU1.

46) RI/FS Work Plan for OU1, Appendix 5.4, Part 1, Section 5.0 SAMPLE CUSTODY, page 1 of 1: Too many references and cross-references. This section should include all site specific information necessary to perform this assignment, and be in this report (RI/FS Work Plan for OU1).

47) RI/FS Work Plan for OU1, Appendix 5.4, Part 2, Section 4.2 Soil Gas Survey, page 4-2: Explain the rationale for selecting the "6 to 10" feet depth interval for soil samples. How will the water table affect the data collected?

48) RI/FS Work Plan for OU1, Appendix 5.4, Part 2, Section 4.2 Soil Gas Survey, page 4-4: An "acceptable" deviation of up to 20 percent from calibration standard is inappropriate.

49) RI/FS Work Plan for OU1, Appendix 5.4, Part 2, Section 4.3 Deep Subsurface Soil Sampling, page 4-4: Specify:

A) The geotechnical analysis to be conducted on soil samples from the deep soil borings.

B) The rationale to be utilized in selecting the samples to be analyzed.

C) The type of "continuous formation sampling" is proposed.

D) How the intervals to collect shelby tubes will be selected and what rationale will be used in the selection.

This section should have specific information provided to understand the procedure/methodology recommended for the work proposed.

50) RI/FS Work Plan for OU1, Appendix 5.4, Part 2, Section 4.4 Sediment and Surface Water Sampling, page 4-6: Specify what equipment will be utilized in sediment and surface water sampling. Samples for volatile organic analysis should never be composited.

51) RI/FS Work Plan for OU1, Appendix 5.4, Part 2, Section 4.5 Ground Water Sampling, page 4-6: Well construction specifications are not presented in Section 4.8.2 of the RI/FS Work Plan. That information must be presented in this report.

(end of comments)

NAVY'S RESPONSES TO EPA COMMENTS

RESPONSES TO GENERAL COMMENTS

1. The Navy agrees that field work and laboratory procedures will be in accordance with guidance documents as provided for in the FFA. Any planned deviations from that guidance will be justified in writing.

2. The Navy is communicating with an EPA contact in Research and Development in Cincinnati. Existing data will be evaluated to determine whether or not it is appropriate to conduct removal or interim remedial action at PSC 27.

3. The drainage ditch does not define the boundaries of the contaminated area, rather it represents an area in which several sources of contamination are located. Monitor wells have been proposed within PSC 26 to evaluate the horizontal and vertical extent of soil and ground-water contamination within the surficial aquifer. In addition, shallow monitor wells are proposed within the oil and solvents pits and the oil plume to assist in determining the vertical extent of contamination and evaluate ground-water quality beneath the former disposal areas. This will provide data to develop a suitable Risk Assessment and provide possible remedial alternatives.

   Monitor wells also have been proposed outside the drainage ditch to provide data that will be used to evaluate the lateral extent of contamination.

4. Well-specific decisions will be made regarding the most appropriate well construction materials. With the variety of contaminants at PSC 26, there may be some cases where stainless steel monitor wells may be appropriate, and in others, PVC. The Navy shall provide the seven-point justification for selecting the well materials concurrent with submittal of the Final OU1 RI/FS Work Plan (see Attachment A for format).

5. More detailed, site-specific field procedures will be included in the OU1 FSP (Appendix 5.4, Part 2, of the OU1 RI/FS Work Plan, Volume 5) with less referencing to the General Field Sampling Plan (Appendix 4.4, Part 2, of the General Site Work Plan, Volume 4). Site-specific laboratory procedures are included in the OU1 Quality Assurance Project Plan (QAPjP) (Appendix 5.4, Volume 5) with limited referencing to the Quality Assurance Program Plan (QAPP) (Appendix 4.4, Part 1, Volume 4). (See Attachment B). Attachment C contains a table of contents which will be included in Volume 5 of the OU1 RI/FS Work Plan.

6. The Navy agrees that incorrect references are unacceptable and will insure that these problems will be corrected in the Final NIRP and OU1 RI/FS Work Plans.

7. The Navy understands that the general public will have complete access to files through the Administrative Record. Per agreement between the Navy, EPA, and FDER, more detailed, site-specific field procedures will be included in the OU1 FSP and site-specific laboratory procedures will be included in the OU1 QAPjP. However, references will be made to Volume 1, Organization and Planning, with regards to background information and data management. Reference will also be made to Volume 4, General Site Work Plan, for risk assessment and treatability studies development, and details on methodologies. To assist the reader, tabs and referencing to specific sections will be used.

8. The Navy will provide their Radiological Assessment Support Office (RASO) with the radiological survey conducted in February 1991. The Navy will evaluate RASO's recommendations regarding continued field investigations or interim remedial action at the location of the elevated radiological levels. RASO will perform any necessary field work in the vicinity of the radiological hot spot. In the interim, the area has been declared off limits from further field sampling. The Navy will keep all members of the TRC abreast of field activities at this location.

9. (a) The monitor wells situated around the perimeter of the drainage ditch are proposed for the purpose of helping to determine the horizontal and vertical extent of contamination beyond the areas identified in the 1980 report. However, the Navy agrees to reassess the adequacy of the number and location of monitor wells. The Navy intends to conduct a seismic survey of OU1 to evaluate stratigraphic relationships and to assist with well placement and depth.

   (b) The determination of the well materials to be used will be made on a well-specific basis (see response to EPA General Comment #4).

   (c) The details of the monitor well construction have been provided in the OU1 RI/FS Work Plan. Based upon previous lithologic data and common well construction practices in Jacksonville, 0.010-inch slotted screen and 20/30 sand pack will be used in monitor wells.

10. A list of the natural resources is contained in the Initial Assessment Study/ Preliminary Assessment (IAS/PA) included as Appendix 1.1 in Volume 1, Organization and Planning. Identification of potential environmental receptors will be included in the Final OU1 RI/FS Work Plan. The Navy will consult with the Florida Department of Natural Resources and the St. Johns River Water Management District to provide information to supplement the Ecological Inventory Plan that will be included in the OU1 RI/FS Work Plan.

11. The rationale for the determining or denying a contaminant's threat will be contained in the Navy's Baseline Risk Assessment.

The Draft Work Plan defines the nature and extent of contamination, defines the potential transport pathways and receptor population (Tables 5-3 and 5-4), provides ARARs to assess the potential risks to human health and the environment (Table 7-1), and presents potential remedial action alternatives (Tables 7-2 and 7-3). The Final Work Plan will be reorganized to present this information as part of the statement of the problem and the objectives of the RI/FS. The Work Plan will be revised to more clearly identify data gaps and the objectives of the field program.

RESPONSES TO SPECIFIC COMMENTS

1. The June 1986 report includes as-built specifications of the existing wells DW-1 and DW-2 at PSC 26. The results of the 1986 report will be summarized in a table or the report will be included in an appendix as a historical document.

2. (a) A legend will be included on all maps in the Final OU1 RI/FS Work Plans.

   (b) Well construction details for existing wells are presented on Table 2-1 of the OU1 RI/FS Work Plans. Figures 2-2 through 2-6 show the locations of the existing wells; the well identifications will be revised to match those in the tables.

3. The Navy will include results of the February 1991 soil sampling event in the Final OU1 RI/FS Work Plan.

4. The work performed in February 1991 was a soil sampling investigation. Ground-water sampling was not in the scope of work.

   Ground-water and soil samples collected from each monitor well during the RI field investigations will be analyzed for Radium 226 and 228 and gross alpha and beta. At present, no drilling will be done in the immediate vicinity of the soil samples where elevated radiological concentrations were reported.

5. (a) There were no background samples collected. The soil sampling event was conducted to establish health and safety levels within OU1. The data collected during the soil sampling event will be used to develop the RI soil investigation.

(b) A table with the soil sample numbers and a corresponding map were developed as part of the sampling events report and will be included in the Final OU1 RI/FS Work Plan.

6. The Navy will identify SW-2, SW-3, BM-1, H-7, and BM-2 on the appropriate maps. (The title of Table 2-1 is misleading and will be revised. BM-1 and BM-2 are not wells, but benchmarks. SW-2 and SW-3 are not wells, but surface water sampling sites).

7. (a) The oil plume identified in the map is the current projected location based on the U.S. Army Corps of Engineers Cone Penetrometer survey conducted in August 1990.

(b) There have been no recent investigations to track the movement of the oil plume.

(c) The Navy is communicating with EPA's Research and Development Office in Cincinnati to identify remedial techniques appropriate for the oil plume. Treatability studies will be conducted to try and identify potential interim actions to remediate the free product at PSC 26.

8. (a) During the 1980 study, VOCs were analyzed in ground-water samples collected from five of the "H" wells in the housing area. No VOCs were detected in the samples (see Appendix 5.2, p. 44, of the OU1 RI/FS Work Plan, Volume 5).

(b) The figures will be revised to properly identify well locations which correspond with the wells listed in Table 2-2.

9. Surface water sampling locations SW-6 and SW-7 will be included in Figure 2-6.

10. The Navy supplied a USGS topographic map in Volume 1 of the Draft NIRP Work Plans submitted in September 1990. Currently, the Navy is contracting with Southern Resources to produce a topographic map of the area of OU1 at a scale of 1" = 50'. When the map is available, it will be provided for inclusion into the OU1 RI/FS Work Plan (Volume 5).

11. (a) The list of the objectives of the site characterization section will be revised as suggested. The OU1 RI/FS Work Plan will be reorganized so that the sections discussing the potential receptors and routes of migration and remedial action alternatives will be included in the site characterization section.

(b) The Navy has the stated guidance documents and will evaluate the contents of the OU1 RI/FS Work Plan with respect to the guidance documents and requirements under the FFA.

12. The data available regarding the contamination at OU1 is over 10 years old. The Navy will attempt to identify and confirm the presence of constituents of concern as well as the extent of contamination as much as possible during this phase of the RI. Upon completion of this phase of the RI, the data will be evaluated and the need for additional efforts will be determined. During this phase, a site investigation will be implemented to evaluate all transport pathways, including surface soils, subsurface soils, sediments, surface water, ground water, and air.

13. The list of volatile constituents (including halogenated solvents) to be analyzed in the soil gas samples will be re-evaluated and updated based on the results of the February 1991 soil sampling. The soil gas survey will be conducted to evaluate soil gas as a transport pathway, not necessarily as a screening tool for soil or ground-water contamination. The Final OU1 RI/FS Work Plan will contain a list of the constituents to be analyzed during the soil gas survey.

14. Soil borings will be performed with hollow stem augers, and temporary surface casing will be used in the surficial aquifer to prevent the downward migration of contamination from surface sources. If it is found during drilling that hydrogeologic conditions will not allow for use of hollow-stem augers, drilling mud will be used. If drilling mud is used, it will be changed out between drilling the upper and lower surficial aquifer zones and again prior to drilling in the Hawthorn.

15. (a) The field and analytical techniques for the sediment and surface water sampling are presently included in the OU1 FSP and QAPjP, respectively (Appendix 5.4, Part 2, and Appendix 5.4, Part 1, respectively, of the OU1 RI/FS Work Plan, Volume 5). The OU1 FSP will be revised to include more site-specific details of the sampling.

(b) Additional sediment and surface water samples along the drainage ditch from OU1 down to the St. Johns River will be included in the Final OU1 RI/FS Work Plan.

(c) The substations will be deleted from the sediment and surface water sampling sites.

16. No comment necessary.

17. (a) The Navy will include more detail regarding the type of drilling, well casing material, and approximate depth of the shallow surficial monitor wells.

(b) See response to EPA General Comment #4.

(c) No drilling will be done in the vicinity of the soil samples where elevated radiological concentrations were reported. (See response to EPA General Comment #8).

(d) The text will be revised to reflect that OVA screening will be conducted on the samples collected at the 2-foot intervals.

18. (a) The Navy will include more detail regarding the type of drilling, well casing material, and approximate depth of the deep surficial monitor wells.

(b) The depth at which the surface casing will be installed will be based in part on the results of the cone penetrometer survey conducted by the US Army Corps of Engineers. The survey results will be evaluated and the surface casing will be installed 3 to 5 feet below the vertical extent of contamination as indicated by the survey. The depth of the surface casing will also be determined in the field based on visual observations and OVA measurements.

(c) The original sources of contamination at PSC 26 were shallow surface pits. The purpose for installing surface casing through the upper portion of the surficial aquifer is to prevent downward migration of contaminants from significantly impacted surface and shallow subsurface soils. Although there may be no confining or semi-confining unit within the surficial aquifer, surface casing may be installed to a depth below the upper surficial contamination in order to isolate a lower surficial zone from contaminated surface sources and prevent-cross contamination between the upper and lower surficial aquifer during drilling. Casing of the upper surficial aquifer and screening just the lower portion will enable the Navy to collect a representative ground-water sample of the lower portion of the surficial aquifer to establish the vertical extent of contamination.

(d) The Navy will use carbon steel surface casing.

(e) The Navy will contact RASO to evaluate radiological "hot spots" identified during the February 1991 soil sampling event. RASO will perform any necessary field work in the vicinity of the radiological hot spot. In the interim, the area has been declared off limits from further drilling or field sampling. The TRC will be notified in advance before any field work is conducted.

(f) The well construction materials to be used at each location will be determined on a well by well basis. Justification will be made for the selected well materials. (See response to EPA General Comment #4.)

(g) The Navy shall dispose of drilling fluids and cuttings in a manner that is protective to human health and the environment. PCBs are of particular concern. The Navy proposes the use of a lined pit to dispose of drill cuttings and fluids. The pit dimensions are estimated to be 50' x 50' x 5' (deep). The pit will be lined and covered with visquene™. Results of laboratory analyses on samples from the pit will be used to determine the ultimate disposition of the drill cuttings and fluids.

19. (a) The ground-water sampling section is referenced correctly as Section 4.5 of the OU1 FSP (Appendix 5.4, Part 2,, page 4-6, of the OU1 RI/FS Work Plan, Volume 5).

(b) The target compound list and target analyte list are contained in Tables 3-1, and 3-2 of the OU1 QAPjP (Appendix 5.4, Part 1, Section 3.0, Pages 2 of 9 through 9 of 9 of the OU1 RI/FS Work Plan, Volume 5).

20. (a) The reference for in-situ permeability testing will be corrected.

(b) A pumping test was performed by Geraghty & Miller in 1980 at existing well DPW-2, and the results are included in Appendix 5.2 of the OU1 RI/FS Work Plan (Volume 5). The results will be reevaluated for validity. At this time, however, in-situ permeability testing will be conducted on all proposed wells. Any pumping tests will be deferred until an appropriate location can be determined from the current RI efforts.

21. The Navy agrees. The OU1 RI/FS Work Plan will be revised to keep referencing to a minimum.

22. To help locate sections in the OU1 FSP, references to OU1 FSP will include "(Appendix 5.4, Part 2,)."

23. The Risk Assessment methods and procedures will be the same for all of the operable units and will be as described in "Risk Assessment," Volume 4, Section 4.0, of the General Site Work Plan.

24. A sediment exposure pathway will be separated from the surface-water media and included as an "environmental media" on Tables 5-1 and 5-2. Human and ecological pathways will be evaluated for the current and future use exposure assessments.

25. The statement in Table 5-1 will be revised to read "Yes (pathway is complete). There is potentially direct hydraulic discharge of ground water into the St. Johns River."

26. The Navy shall develop an Ecological Inventory Plan for the Final OU1 RI/FS Work Plan. The plan will identify and characterize the biological communities within OU1 and within the downstream wetlands to the St. Johns River. Additional sediment and surface water sampling will also be proposed for the drainage ditch down to the St. Johns. Until the biological populations are identified and characterized, chemical analysis of the biota is unwarranted.

27. The reference was to the OU1 FSP located in Appendix 5.4, Part 2,, of the OU1 RI/FS Work Plan (Volume 5). However, the correct reference is Section 4.5, not 4.7, of the OU1 FSP.

28. The surface soil "Route of Exposure" on Table 5-3 will include soil ingestion.

29. The screening of remedial technologies commences with a literature survey. Nonapplicable technologies may be eliminated based on available OU1 data and the results of the literature survey, while potentially applicable technologies are retained for further consideration. Treatability studies may be needed to evaluate the effectiveness of potentially applicable technologies for which there is limited performance information in the literature with regard to the waste types and site conditions of concern.

    A preliminary list of technologies potentially applicable for source control at OU1, which may be evaluated via treatability studies, includes incineration, vapor extraction, solidification/stabilization, bioremediation, soil flushing, glassification, vitrification, and radio frequency heating. A preliminary list of technologies potentially applicable for plume management at OU1, which may be evaluated via treatability studies, includes air stripping, biological treatment, carbon adsorption, chemical oxidation, ion exchange, ultrafiltration, reverse osmosis, and flocculation/ precipitation/sedimentation.

30. (a) The ARARs listed in Table 7-1 were based on data from previous studies and did not include the data from the February 1991 event as it was not available at the time. Based on the February 1991 data, Table 7-1 will be revised to include all analytes which have ARARs. Additional changes will also likely be made to Table 7-1 following the RI. In all cases, the analytical method and associated PQLs will be selected to address data needs relevant to data goals. However, it must be understood that in some areas, such as the oil

disposal area, matrix interferences may prevent attaining the desired PQL. In these events, a footnote will be referenced in the RI Report to identify samples which could not meet the desired PQL.

(b) The MCLs for cadmium, chromium, and lead in Table 7-1 will be changed to 5 μg/L, 100 μg/L, and 15 μg/L, respectively. The Florida Drinking Water Standards listed in 7-1 for cadmium, chromium, and lead will be changed to 10 μg/L, 50 μg/L, and 50 μg/L, respectively.

31. The reference should have been "Section 7.0", instead of "Section 5.0"; it will be corrected.

32. The Navy disagrees. The Data Management Plan is sufficiently described in Volume 1. At this time, the Navy foresees no site-specific changes.

33. The specific quality assurance/quality control project/program plan for OU1 is the Quality Assurance Project Plan (QAPjP) located in Appendix 5.4, Part 1, of the OU1 RI/FS Work Plan (Volume 5).

34. The schedule of events will be consistent with the Site Management Plan and will include a project start date based on the June 18, 1991 receipt of Draft NIRP and OU1 RI/FS Work Plan review comments.

35. Tables 1-1, 3-1, and 3-2 of the QAPjP (Appendix 5.4, Part 1) include proposed parameters to be analyzed. The Navy will add Radium 226, Radium 228, gross alpha, and gross beta to the list of constituents to be analyzed.

One of the objectives of the RI is to locate contaminants at concentrations which may constitute a source of ground-water and/or soil contamination at OU1. The PQLs selected in Table 3-1 were based on this objective. The PQLs suggested by EPA are appropriately based on the clean-up goals provided. However, the PQLs most likely would not be attainable in numerous areas of OU1 based on the high levels on contaminants found during the February 1991 soil sampling event which would result in samples being diluted in order to accurately quantify detected analytes. The PQLs suggested may be appropriate during future investigations, and the Navy will evaluate their use at that time.

36. Site-specific laboratory procedures are included in the OU1 QAPjP (Volume 5, Appendix 5.4, Part 1) with some references to the General QAPP (Volume 4, Appendix 4.4, Part 1). The Navy wants to convey that even though Volume 5 provides details about OU1 attributes and efforts, the RI/FS for OU1 includes the full contents of Volumes 1, 4, and 5.

37. Field and laboratory methods and procedures will follow the guidance documents as provided for in the FFA with deviations being justified in writing.

38. RASO will evaluate the data from the February 1991 soil sampling event at PSC 26 and PSC 27 and will respond. RASO will perform any future necessary field work in the vicinity of the radiological hot spot. In the interim, the area has been declared off limits from further field sampling.

39. See response to Specific Comment #36.

40. The Navy has provided the TRC a draft copy of the cone penetrometer and geophysical surveys.

41. The reference to Section 4.2 of the OU1 FSP is correct. To assist the reader in the future in locating the reference, "(Appendix 5.4, Part 2,)" will be added to all references to the OU1 FSP.

42. (a) Field and laboratory methods and procedures will be in accordance with guidance documents identified in the FFA. Any deviations will be justified in writing.

(b) The Navy has reviewed Appendix 5.4, Part 1, Section 1.3.3, and cannot find any reference to ASTM methods.

(c) See response to EPA General Comment #5.

43. See response to EPA General Comment #5.

44. Proposed sampling from surface water substations will be deleted; therefore, surface water samples will not be composited. Filtered and unfiltered samples will be collected for analysis of dissolved and total metals, respectively, as described in the QAPjP, Appendix 5.4, Part 1.

45. (a) The reference to Section 4.7 will be corrected to reference Section 4.5.

(b) See response to EPA General Comment #5.

46. See response to EPA General Comment #5.

47. Samples will be collected just above the water table, which is an estimated depth of 6 to 10 feet bls. This is the best location for collection of volatile constituents diffusing from ground water into the soils of the vadose zone.

48. Deviation of up to 20 percent from calibration is acceptable and is less than the 25% difference allowed by EPA for continuous calibration standards during the analysis of volatile organics under SOW OLM01.0.

49. Specifics of the deep subsurface soil sampling will be included in the Final OU1 RI/FS Work Plans.

    (a) The geotechnical analyses to be performed include dry/wet bulk density, porosity, coefficient of permeability, grain-size distribution, moisture content, and Atterberg Limits. Specifics of the deep subsurface soil sampling will be included in the Final OU1 RI/FS Work Plans.

    (b) Clays or sandy clays which may be capable of being a confining/semi-confining layer will be sampled for geotechnical analyses.

    (c) Continuous formation sampling will be conducted using split spoons and Shelby tubes.

    (d) Shelby tubes will be used to collect clays/sandy clays.

    (e) Specific information for the methodologies for the various geotechnical analyses are included in Volume 4, Section 3.2.3.5. This information has been extracted from the EPA Superfund Compendium.

50. (a) Specific equipment to be used for the collection of surface water and sediment will be determined in the field based on the site conditions at the time of sampling. Equipment alternatives are included in the OU1 FSP (Appendix 5.4, Part 2,). More detail as to the sampling methodologies will be added to the OU1 FSP.

    (b) As the surface water and sediment substations have been eliminated, there is no longer any need to composite samples.

51. Well construction specifications are presented in Section 4.6.2 of the OU1 RI/FS Work Plan.

ATTACHMENT A

OUTLINE FOR JUSTIFICATION FOR THE USE OF SCHEDULE 40 PVC AS THE CASING MATERIAL FOR MONITOR WELLS TO BE INSTALLED AT OU1 NAVAL AIR STATION, JACKSONVILLE, FLORIDA

I Data Quality Objectives

Decisions Types

Determining the presence or absence of contamination

Determining the risk posed to public health and the environment

Determining the most appropriate remedial alternative for the OU

Data Uses

Identify the constituents of concern present in the ground water.

Establish the areal and vertical extent of any detected contamination in ground water.

Calculate a statistical upper bound on the average concentrations of contaminants found at the OU.

Characterize the physical and chemical properties, range of concentrations of constituents of concern, and the volume of impacted ground water.

Establish Appropriate Levels of Data Quality for Each Use

Level III data will be developed to characterize the general chemical constituents present and physical properties of the ground water.

Level IV data will be used to identify the constituents of concern, identify the areal and vertical extent of any detected contamination, provide data to calculate the upper bound on the average concentration of constituents, and the total volume of impacted ground water.

Level V data may be collected to identify the vertical and areal extent of contamination for constituents whose concentrations of concern are below the detection limit of standard Level IV analyses.

II Anticipated Compounds and Concentration Ranges

Ground-Water Quality Determined During Previous Investigations

Acetone	19,000 ug/l
Chlorobenzene	11 to 150 ug/l
1,2-Dichlorobenzene	17 to 3,700 ug/l
1,4-Dichlorobenzene	520 ug/l
1,1-Dichloroethane	2 to 1,400 ug/l
Trans-1,2-Dichloroethene	3,500 ug/l
Ethylbenzene	160 to 350 ug/l
2-Hexanone	120 to 1,000 ug/l
Methylene Chloride	12 to 91,000 ug/l
Methylethyl Ketone	trace to 14,000 ug/l
Methylisobutyl Ketone	trace to 44,000 ug/l
Toluene	26 to 9,100 ug/l
1,1,1-Trichloroethane	1,300 ug/l
Trichloroethene	trace to 5,000 ug/l
Xylenes (total)	trace to 2,000 ug/l
Vinyl Chloride	700 ug/l
PCBs	1 to 18 ug/l
Fluoranthene	21 ug/l
Bis(2-ethylhexyl)phthalate	51 to 790 ug/l
Butylbenzylphthalate	47 ug/l
Di-n-Octylphthalate	64 ug/l
2,4-Dimethylphenol	2,500 ug/l
Phenanthrene	60 ug/l
Phenol	41 to 58,000 ug/l
Pyrene	28 ug/l
Antimony	7.8 ug/l
Arsenic	5.8 to 43 ug/l
Barium	300 to 2000 ug/l
Cadmium	4.1 to 67 ug/l
Chromium	6.5 to 588 ug/l
Copper	9.3 to 1,930 ug/l
Iron	40 to 349,000 ug/l
Iron (dissolved)	40 to 15,800 ug/l
Lead	39 to 1,324 ug/l
Mercury	0.66 to 7.2 ug/l
Nickel	23 to 71 ug/l
Silver	0.51 to 0.62 ug/l
Zinc	6.8 to 6,400 ug/l

pH	5.9 to 7.1
Saturation Index	0.2 to -2.6
Chloride	45 to 140 ug/l
Sulfate	20 to 275 ug/l
Hydrogen Sulfide	0.3 to 0.8 ug/l

III Sample Residence Time and Aquifer Productivity

Samples will be collected within 2 hours of purging.
Samples are typically collected immediately after purging.

At this time it is anticipated that the aquifer will produce sufficient water to properly develop at least three well volumes of standing water from each monitor well. Data is currently under review that will allow an estimate of the productivity of the aquifer to be developed.

IV Hybrid Well Construction

Shallow wells (15 feet or less) minimize the utility of this option as a cost saving measure. However, stainless steel monitor well casing and screen may be utilized in locations where nonaqueous phase liquids are detected in the ground water. At these locations, the concentration of constituents of concern is anticipated to be extremely high and will be used in the selection of the remedy and the risk assessment. Since the difference in concentrations between free product monitor wells and monitoring wells located at the perimeter of the ground-water plume is very great, the minor data deviations that potentially could occur will not impact the utility or comparability of the data.

V Literature Review

The following is a listing of documents that may be cited:

"RCRA Ground-Water Monitoring Technical Enforcement Guidance Document", USEPA Office of Solid Waste and Emergency Response, OSWER-9950.1, September 1986.

"Handbook of Suggested Practices for the Design and Installation of Ground Water Monitoring Wells", USEPA 600/4-89/034, April 1989.

"Practical Guide for Ground Water Sampling", USEPA 600/2-85/014, February 1986.

"Guide to the Selection of Materials for Monitoring Well Construction and Ground Water Sampling", USEPA 600/S2-84-024, Barcelona, Gibb and Miller, 1983.

"Review of Studies Concerning Effects of Well Casing Materials on Trace Measurements of Organic Compounds", Waste Management Inc., January 1987.

"Laboratory and Field Studies of Well-Casing Material Effects", Barcelona and Helfrich, undated.

"Sorbtion of Organics by Monitoring Well Construction Materials", Sykes, McAllister and Homolyu, Ground Water Monitoring Review, Fall 1986.

"Well Construction and Purging Effects on Ground-Water Samples", Barcelona and Helfrich, Environmental Science and Technology, Volume 20, 1986.

"Leaching of Metal Pollutants From Four Well Casing Used for Ground-Water Monitoring", Hewitt, U.S. Army Cold Regions Research and Engineering Laboratory, September 1989.

"Influence of Well Casing Composition on Trace Metals in Ground Water", Hewitt, U.S. Army Cold Regions Research and Engineering Laboratory, Special Report 89-9, April 1989

"Evaluation of Four Well Casing Materials for Monitoring Selected Trace Level Organics in Ground Water", Parker, Jenkins and Black, U.S. Army Cold Regions Research and Engineering Laboratory, October 1989.

"Influence of Casing Materials on Trace-Level Chemicals in Well Water", Parker, Hewitt and Jenkins, Ground Water Monitoring Review, Spring 1990.

"Sampling Bias Caused by Materials Used to Monitor Halocarbons in Groundwater", Reynolds, Hoff and Gillman, Environmental Science and Technology, Volume 24, 1990.

VI Well Construction Modifications

The O.D. of Schedule 40 PVC is equal to the O.D. of stainless steel casing. Therefore, modifications to the monitor well installation protocols will not be required.

VII PVC Specifications

The supplier of the PVC well casing has not been selected. The PVC selected will conform to ASTM F480 and ASTM D1785 for schedule 40 flush threaded well casing.

ATTACHMENT B

Note:

At the Project Manager's Meeting held on July 10, 1991 and at subsequent meetings, it was decided that the following revisions will be made to the NIRP Documents:

The "General Site Work Plan" (Volume 4) in the Draft Work Plans will be renamed "Basic Site Work Plan" in the Final.

The "General Field Sampling Plan" (Appendix 4.4, Part 2) in the Draft Work Plans will be renamed "Basic Field Sampling Plan" in the Final.

In Volume 4, the Basic Site Work Plan, Appendix 4.4 (BSAP) will have two parts:

- Appendix 4.4.1 (formerly "Part 1") - Quality Assurance Program Plan (QAPP)
- Appendix 4.4.2 (formerly "Part 2") - Basic Field Sampling Plan (BFSP)

In Volume 5, the OU1 RI/FS Work Plan, Appendix 5.4 will have two parts:

- Appendix 5.4.1 (formerly "Part 1") - Quality Assurance Project Plan (QAPjP)
- Appendix 5.4.2 (formerly "Part 2") - OU1 Field Sampling Plan (OU1 FSP)

ATTACHMENT C

OUTLINE FOR OU1 RI/FS WORK PLAN

1.0 Introduction
2.0 Problem Summary: Existing Data, Site Description, and History
3.0 Environmental Setting
4.0 Pathways, Potential Receptors
5.0 Preliminary Remedial Action Objectives and Alternatives and Identification of Preliminary ARARs
6.0 Treatability
7.0 Data Needs, DQOs
8.0 RI Field Tasks
9.0 QA/QC
10.0 Health and Safety Plan
11.0 Schedule of Events

APPENDICES

5.1 RASO Document

5.2 Contamination of Soil and Ground Water from the Disposal of Oil and Volatile Products into Pits at the NAS Jacksonville, Florida, May 1980.

5.3 Summary of Additional Water-Quality Analyses of Ground Water and Surface Water at the Pits Site

5.4 OU1 Sampling and Analysis Plan
5.4.1 Part 1 Quality Assurance Project Plan (QAPjP)
5.4.2 Part 2 OU1 Field Sampling Plan (OU1 FSP)

5.5 OU1 Health & Safety Checklist

Navy's Final Responses to Comments From

Florida Department of Environmental Regulation

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

TO: Eric Nuzie, Federal Facilities Coordinator, Bureau of Waste Cleanup

FROM: Dr. James J. Crane, Environmental Administrator
Technical Review Section
Bureau of Waste Cleanup

Mark A. Canfield, Technical Review Section
Bureau of Waste Cleanup

DATE: June 4, 1991

SUBJECT: Navy Installation Restoration Program Plan
Naval Air Station
Jacksonville, Florida
Draft (March 1991)

Volume 1 (Organization And Planning)
Volume 4 (General Site Work Plan) Parts 1 & 2 of 2
Volume 5 (Remedial Investigation/ Feasibility Study Work Plan for OU1, Oil & Solvents Disposal Pits Area)

We have reviewed the above listed documents and our comments are listed below.

A. Volume 1 (Organization And Planning)

We have not noted any changes addressing the comments listed in the DER letter (with attached comments) from Eric Nuzie dated (December 5, 1990). However, we have noted that it appears the justification for the No Further Action and Site Screening Group will be provided in Volume 2. We therefore will make no further comments until we receive our copy of volume 2.

B. Volume 4 (General Site Work Plan) Parts 1 & 2 of 2

Reviewed in the context of references listed in Volume 5.

C. Volume 5 (Remedial Investigation/ Feasibility Study Work Plan for OU1, Oil & Solvents Disposal Pits Area

We have reviewed Volume 5 and also received and reviewed the EPA draft comments addressing this volume. In order to avoid duplication of efforts we will list the EPA comments that we feel should be addressed. The comments include:

General Comments

3,4,5,6,8, and 9

Specific Comments

1,3,4,5,6,8,9,10,11,12,13,14,15,16,19,20,21,22,23,24,25,26,27, 28,29,31,32,33,34,35,36,38,39,41,43,44,45,47,48,49,50, and 51.

In addition to the above listed EPA comments, we agree with the following EPA comments with the exception of those portions of the comments that address the issue of PVC well casing. Excluding the sections on PVC well casing, the comments are:

General Comments

7

Specific Comments

17, and 18.

The Florida Department of Environmental Regulation feels the following additional comments need to be addressed:

1. pp. 2-6 In section 2.3, soil samples were taken at 49 locations across OU1 to a depth of three inches and were also collected at the same locations at depths from 4 to 24 inches. Please identify the sampling methods.

2. pp. 2-11 In section 2.4 (Historical Response) the statement is made " A majority of the monitor wells that were installed at the Oil and Solvents Disposal Pits Area during previous assessments have been either destroyed or abandoned". Please identify which wells are operable.

3. pp. 2-13 In section 2.5.1 (Ground Water) the statement is made "Figures 2-2 and 2-3 show the locations of borings and of the monitor wells from which samples have been collected for analyses; Tables 2-2, 2-3, 2-4, and 2-5 summarize water quality data". Please explain why:

   a. From Table 2-2 only the location of DPW-2 is indicated on Figure 2-2 or 2-3. None of the other soil borings/ wells are indicated on either Figure 2-2 or Figure 2-3.

   b. From Table 2-3 only DPW-2 is indicated on Figure 2-2 or Figure 2-3.

   c. From Table 2-4 none of the sampling points are indicated on Figures 2-2 or 2-3.

4. pp. 5-3 In section 5-1 (Preliminary Risk Assessment Analysis-Current Use Conditions) the statement is made "Currently there are no identified users of shallow ground water within or near the Oil and Solvents Disposal Area". Please provide the source for this information.

5. pp 7-3 Section 7.2 (Development of Remedial Action Objectives and Alternatives) Table 7-1. Several of the Florida Drinking Water Standards for metals are cited incorrectly in Table 7-1.

Constituent	-	Cited (ug/l)	-	Actual (ug/l)
PCB's	-	0.5	-	None Given
Cadmium	-	5	-	10
Chromium	-	100	-	50

6. pp. 54 Appendix 5.2, In the section Ground-Water And Surface-Water Contamination sub-heading Polychlorinated Biphenyls, the statement is made "Although the residential area east of well S-14 is not serviced by individual shallow water wells, the public-supply well (which taps the Floridan Aquifer) downgradient from S-14 (Figure 2) could be adversely impacted if contaminated ground water from the shallow aquifer was able to enter the well via leaks in the casing. A current water sample from this well should be sampled and analyzed for all constituents of concern at this site.

7. Appendix 5.4, Part 1, Section 1.3.1 (Geophysical Survey) page 5 of 11. The DER formally requests a copy of this document from the Navy, which covers the geophysical survey performed at PSC 26 & 27, by the U.S. Army Corps of Engineers.

NAVY'S RESPONSES TO FDER COMMENTS ON THE NIRP AND OU1 RI/FS WORK PLANS

A. No comment necessary.

B. No comment necessary.

C. General Comments

See responses to EPA General Comments #5, 6, 7, 8, 9, 10, and 11.

Specific Comments

See responses to EPA Specific Comments #1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 38, 39, 41, 43, 44, 45, 47, 48, 49, 50, and 51.

General Comments

See response to EPA General Comment #9.

Specific Comments

See response to EPA Specific Comments #17 and 18.

Responses to Additional Specific Comments

1. Soil samples were collected using a stainless steel hand auger. Details of the sampling methods are described in Technical Memorandum 3 and the OU1 FSP (Appendix 5.4, Part 2). The results of the February 1991 field soil sampling event will be summarized in a table in the OU1 RI/FS Work Plan or included in an appendix as a historical document.

2. A table identifying each existing monitor well and whether it is operable will be included in the Final OU1 RI/FS Work Plan. Those wells which have not already been abandoned may be used as piezometers for water-level measurement purposes. At this time, the Navy does not anticipate using any of the existing wells for sampling purposes. Some of the existing wells may be abandoned at the time of the OU1 field investigations.

NAVY'S RESPONSES TO FDER COMMENTS (Continued)

3. Figures 2-2 and 2-3 and Tables 2-2 and 2-3 will be cross-checked to ensure that all monitor well and soil boring locations shown on the tables are included on the figures and vice versa. An appropriate and consistent well identification system will be devised to make these figures and tables less confusing and more comparable.

4. A water well survey identifying and locating wells within a one-mile radius surrounding OU1 will be included as part of the OU1 RI/FS Work Plans.

5. The Florida drinking water standards will be corrected in Table 7-1.

6. The Navy will verify construction records for the production well as well as the well use and any analytical testing that has been performed on samples from the well.

7. The Navy has provided FDER with a copy of the USACE geophysical survey.

Note: See Attachment A

ATTACHMENT A

Note:

At the Project Manager's Meeting held on July 10, 1991 and at subsequent meetings, it was decided that the following revisions will be made to the NIRP Documents:

The "General Site Work Plan" (Volume 4) in the Draft Work Plans will be renamed "Basic Site Work Plan" in the Final.

The "General Field Sampling Plan" (Appendix 4.4, Part 2) in the Draft Work Plans will be renamed "Basic Field Sampling Plan" in the Final.

In Volume 4, the Basic Site Work Plan, Appendix 4.4 (BSAP) will have two parts:

- Appendix 4.4.1 (formerly "Part 1") - Quality Assurance Program Plan (QAPP)
- Appendix 4.4.2 (formerly "Part 2") - Basic Field Sampling Plan (BFSP)

In Volume 5, the OU1 RI/FS Work Plan, Appendix 5.4 will have two parts:

- Appendix 5.4.1 (formerly "Part 1") - Quality Assurance Project Plan (QAPjP)
- Appendix 5.4.2 (formerly "Part 2") - OU1 Field Sampling Plan (OU1 FSP)

Navy's Final Responses to Comments From

St. Johns River Water Management District

John R. Wehle, Assistant Executive Director

WATER MANAGEMENT DISTRICT

POST OFFICE BOX 1429 PALATKA, FLORIDA 32178-1429
TELEPHONE 904/329-4500 SUNCOM 904/860-4500
FAX (EXECUTIVE/LEGAL) 329-4125 (PERMITTING) 329-4315 (ADMINISTRATION/FINANCE) 329-4508

FIELD STATIONS

618 E. South Street, Orlando, Florida 32801, 407/894-5425
7775 Baymeadows Way, Suite 102, Jacksonville, Florida 32256, 904/730-6270
PERMITTING: 305 East Drive, Melbourne, Florida 32904, 407/984-4940
OPERATIONS: 2133 N. Wickham Road, Melbourne, Florida 32935-8109, 407/254-1762

May 31, 1991

Kevin F. Delaney
Captain, U. S. Navy
Commanding Officer
Naval Air Station
Jacksonville, FL 32212

Dear Captain Delaney:

Enclosed are comments regarding the draft of the Navy Installation Restoration (IR) Program. Pursuant to the Technical Review Committee Charter, each committee member shall provide comments on the submittals for IR programs.

At the present time, my comments and questions specifically address Volume 5, "Remedial Investigation/Feasibility Study Work Plan for OUI, Oil and Solvents Disposal Pits Area". I hope that this imput serves to be useful and not a hindrance to the long awaited implementation of the remedial measures at OUI. Many man-hours and dollars have been spent towards this cause and if there is any other way I can be of assistance to help expediate the process, please call me at (904) 329-4219.

Sincerely,

Janis Nepshinsky

Janis Nepshinsky, Engineer
Department of Resource Management

JN/jn

CC: Hal Wilkening
Records

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 3
To Felicia Boyd(?)	From Nepshinsky
Co.	Co. SJWMD
Dept. Geraghty & Miller	Phone # 904 329-4219
Fax # (813) 961-2599	Fax # 904 329-4315

Navy Installation Restoration Program
Draft Report

May 31, 1991
Comments/Questions:

Item 1: Section 2.3 Historical Response

This section still does not include a summary regarding the evaluation of the effectiveness of the abatement system implemented back in 1983. It would beneficial to tie in the experience and information acquired through the previous remedial measures performed at the site with the future installation restoration tasks.

Item 2: Section 2.3 Historical Response

The report states that water quality samples were taken of the two deep surficial monitor wells (DW-1 and DW-2) in June 1986 Please include the test results along the an interpreatation of the results since the purpose of these wells was to determine whether contaminants in the shallow ground water had migrated vertically downward into the deeper surficial aquifer.

Will these two wells be used for future assessment? It wasn't clear to me if they were to be automatically abandoned and capped.

Just for your information, Jones Edmund and Associates did not collect the surface water samples back in 1983 and 1984.

Item 3: Section 4.6.2.1 Shallow Surficial Monitor Wells

Regarding the "PVC versus Stainless Steel" issue, did you mean to say that "no chlorinated hydrocarbons, the principal constituents aggresssive to PVC, were detected in samples from OU1? If so, please explain?

Item 4: Section 4.6.2.3 Monitor Well objectives:

Will you be installing any monitor wells in the Floridan? There was no mention of this, specifically the justification for not requiring any. I am not at this time suggesting that well(s) to be place in the Floridan since it's my understanding that the "standards" (which have a zone of discharge) need to be met at the base of the surficial, but I do recommend adequately addressing the said justification.

Item 5: Section 5. Risk Assessment

While I realize the development of applicable or relevant and appropriate requirements (ARARS) can be an extensive task, I do want to point out that the surface water will (to my understanding) need to meet the minimum criteria in addition to the Class II standard which is listed in Chapter 17-302.

NAVY'S RESPONSE TO ST. JOHNS WATER MANAGEMENT DISTRICT COMMENTS TO NIRP AND OU1 RI/FS WORK PLANS

1. An evaluation of the effectiveness of the 1983 abatement system will be made prior to the development of any interim remedial measures or future installation restoration tasks. The Navy sees no need to discuss the abatement system in more detail at this time.

2. (a) A summary of the June 1986 report and the results of sampling will be included in the OU1 RI/FS Work Plan.

   (b) These existing wells are going to be used as piezometers for water level measurement purposes.

   (c) The reference to Jones Edmund and Associates will be deleted.

3. Chlorinated hydrocarbons have been detected at OU1. Well-specific decisions will be made regarding the most appropriate well construction materials. With the variety of contaminants at PSC 26, there may be some cases where stainless steel monitor wells may be appropriate, and in others, PVC. Justification for selecting the well materials will be provided concurrent with submittal of the Final OU1 RI/FS Work Plan.

4. The Navy will not be installing wells into the Floridan aquifer at this time. There is no evidence that justifies the need for a Floridan well.

5. Chapter 17-302 of the Florida Administrative Code will be reviewed to determine the potential surface water ARARs for the OU1 RI/FS Work Plans.

Navy's Final Responses to Comments From

Florida Department of Natural Resources

RCVD 5/5/91 JGM

Tom Gardner, Executive Director

FLORIDA DEPARTMENT OF NATURAL RESOURCES

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

April 30, 1991

Mr. Joel G. Murphy
Code 18213
Department of the Navy
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
P.O. Box 10068
Charleston, South Carolina 29411-0068

Dear Mr. Murphy,

1. We have had a chance to review the draft of the *Navy Installation Restoration Program Plan, Naval Air Station, Jacksonville, Florida (Volumes 1, 4, and 5)*. This plan appears to be well thought out and thorough, and addresses the natural resource environment issues at N.A.S. Jacksonville. However, we would like to have further surface water and sediment investigation performed in the Ortega River, St. Johns River, and other areas adjacent to the site (N.A.S.) for possible environmental contamination, if pollutants are found to be outside safe limits for human health or the environment on-site. Possible contamination may have traveled beyond the site boundaries.

2. We would also like to have a representative from our agency included on the Technical Review Committee to be able to respond more rapidly to any changes or further developmental plans for the site. This could eliminate any delay or possible disagreements about natural resource damages or concerns.

We appreciate the ability to review the plans for N.A.S. Jacksonville. Should you have any problems or concerns with our comments and requests, please contact me at (904) 922-6067.

Sincerely,

John Mitchell
Project Manager, Office of Marine Programs and Planning

cc: Ernie Barnett, FDNR
Ed Conklin, FDNR
Lynne Griffin, FDER
Eric Nuzie, FDER

NAVY'S RESPONSES TO THE FLORIDA DEPARTMENT OF NATURAL RESOURCES COMMENTS ON THE NIRP AND OU1 RI/FS WORK PLANS

1. Paragraph 1.

   Additional surface water and sediment locations will be included along the drainage ditch from OU1 to the St. Johns River.

2. Paragraph 2.

   The Navy has invited FDNR to provide a representative for the Technical Review Committee.

Navy's Final Responses to Comments From

Navy - HASP Comments

DESIGN COORDINATION AND REVIEW - COMMENTS
SOUTHNAVFACENGCOM 11012-24 (8/78)

JOB ORDER NUMBER

COMMENTS BY	CODE	PHONE	DATE
CONNIE MERTING	18229	0386	20 MAY 91

PROJECT TITLE AND LOCATION
HEALTH + SAFETY PLAN FOR IRP WORK ON NAS JACKSONVILLE

TYPE OF REVIEW
- 30%
- 100%
- FINAL
- OTHER

DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
	APPENDIX 1.5 VOLUME 1	
1.	FIGURE 3-4 - (3) SHOULD READ OUTER GLOVE REMOVAL	
2.	PAGE 33 PARAGRAPH 2), PAGE 34 SECOND PARAGRAPH 3), and 3.19 - PHOTOVAC TIP RESULTS ARE NOT RECOGNIZED BY STATE OF FLORIDA.	
	APPENDIX 5.5 VOLUME 5	
3.	E. HAZARD EVALUATION - Is IT TRICHLOROETHENE OR TRICHLOROETHYLENE?	
4.	5. EMERGENCY PLANNING 3. ENVIRONMENTAL MONITORING -> FLORIDA DOES NOT RECOGNIZE RESULTS OF PHOTOVAC TIP.	

DESIGN COORDINATION AND REVIEW - COMMENTS
SOUTHNAVFACENGCOM 11012-24 (8/78)

JOB ORDER NUMBER

COMMENTS BY	CODE	PHONE	DATE
C. E. Barley	09K	743-0568	6/7/91

PROJECT TITLE AND LOCATION
HASP NIRP Jax

TYPE OF REVIEW
30%
100% ?
FINAL
OTHER

DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
Genl	Throughout HASP, references are made	
5.	that "The Navy shall..." or "The Navy and its subcontractor shall..." etc. Some of these references are listed on the next ~~attached~~ page. Recommend substituting in each of the cases a phrase such as, "The contractor shall..." We really need to remove references to "The Navy shall..." Let's discuss.	
	E.G.	
6.	page 1 section 1.0 first para. Change first sentence to read, "This Site ~~HASP~~ Health and Safety Plan (HASP) has been prepared to be used for the Navy Installation Restoration Program at the..."	
Page 3	Recommend delete any reference	
7.	to Joel Murphy and Kevin Gartland. The people mentioned in this HASP should be strictly A/E/Contractor people	
8.		
Page 4 fig 1-2	same as comment above	

DESIGN COORDINATION AND REVIEW - COMMENTS
SOUTHNAVFACENGCOM 11012-24 (8/78)

JOB ORDER NUMBER

COMMENTS BY: CEB | CODE | PHONE | DATE

PROJECT TITLE AND LOCATION
HASP NIRP JAX

List of references to "The Navy"

TYPE OF REVIEW: 30% | 100% | FINAL | OTHER

	DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
9.	p. 1	1.0 first sentence, delete "the Navy"	
10.		1.1 First sentence, delete "the Navy and its subcontractors" Substitute "the Contractor"	
11.	p. 6	top para "the Navy and its subs"	
12.	p. 8	first sentence change to, "An ~~2nd~~ orientation meeting for all contractors, service personnel, etc."	
13.	p. 9	2.3 first sentence. "The Navy and its subs"	
14.	p. 11	2.6 "The Navy"	
15.	p. 13	2.9 "The Navy"	
16.		3.1 "The Navy" Second sentence "The Navy" OK ~~Recommend a medical qualification voucher provided by physician that employee is qualified and fit to wear specific PPE.~~	
17.	p. 14	3rd para "The Navy will"	
18.	p. 17	3.3 "The Navy has established and will..."	
19.	p. 32	3.12 "The Navy"	
20.	p. 35	bottom 1/3 of page, "The Navy and its subs..."	
21.	p. 39	last para "The Navy"	
22.	p. 43	3.17 "The Navy"	
23.	p. 45	3.18 "The Navy"	

DESIGN COORDINATION AND REVIEW - COMMENTS
SOUTHNAVFACENGCOM 11012-24 (8/78)

JOB ORDER NUMBER

COMMENTS BY	CODE	PHONE	DATE
CEB			

PROJECT TITLE AND LOCATION
HASP NIRP JAX

TYPE OF REVIEW
30%
100%
FINAL
OTHER

DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
24. P. 46	No equipment will be provided by Navy — all by contractor.	
25. P. 47	4.3 " The Navy. . . "	

DESIGN COORDINATION AND REVIEW - COMMENTS
SOUTHNAVFACENGCOM 11012-24 (8/78)

JOB ORDER NUMBER

COMMENTS BY: CEB | CODE | PHONE | DATE

PROJECT TITLE AND LOCATION: HASP NIRP JAX

TYPE OF REVIEW: 30% | 100% | FINAL | OTHER

	DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
26.	Page 6	last sentence is "8-hour PM training" the same as the "8-hour OSHA Supervisors course?"	
27.	Page 8	item 8) e) add "wearing of contact lenses"	
28.		Genl - we do not want the Navy orienting or providing direction for PPE, etc. Totally a contractor responsibility.	
29.	Page 9	Recommend a verification voucher that employee has received orientation and has been advised of specific hazards. Signed by employee and supervisor. Also that employee has reviewed and understands HASP.	
30.		Para 2.3 Delete "The Navy and its subs", substitute "The contractor." Do we need a full time I.H.? Would like to discuss.	
31.		Para 2.7 Please discuss engineering controls vs. PPE, etc.	

DESIGN COORDINATION AND REVIEW - COMMENTS
SOUTHNAVFACENGCOM 11012-24 (8/78)

JOB ORDER NUMBER

COMMENTS BY	CODE	PHONE	DATE
CEB			

PROJECT TITLE AND LOCATION

HASP NIRP JAX

TYPE OF REVIEW
- 30%
- 100%
- FINAL
- OTHER

	DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (In response where significant)
32.	Page 12	Can this form be turned into a combination Complaint Form Accident Report Form Or We may need a separate Accident/Incident report Form	
33.	Page 13	3.1 Recommend a medical qualification voucher provided by a physician that employee is qualified and fit to wear specific PPE.	
34.	Page 16	Are there situations anticipated where showers, elaborate decon, may be required?	
35.	Page 38	(b) Are sirens or audible alarms necessary?	
36.	Page 43	3.16 Alcohol, drugs, etc not allowed for any person on base, not just visitors.	
37.		No smoking, eating, drinking chewing allowed at all in exclusion zone or CRZ	
	Page 47	4.3 Recommend the following wording:	

DESIGN COORDINATION AND REVIEW - COMMENTS
SOUTHNAVFACENGCOM 11012-24 (8/78)

JOB ORDER NUMBER

COMMENTS BY: CEB | CODE | PHONE | DATE

PROJECT TITLE AND LOCATION: HASP NIRP JAX

TYPE OF REVIEW: 30% | 100% | FINAL | OTHER

DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
38.	Page 4-1 4.3 cont. "An explosimeter will be used during drilling and at regularly scheduled times during field activities and additionally at the discretion of the ..."	
39.	Respiratory Protection Plan p.5 contact lenses not allowed spectacle kits must be used taping glasses to facepiece not sat.	
40.	Other: Recommend notifying local emergency services of operations and potential hazards for each O.U. before work begins. Also, recommend having a phone available at all job sites, mobile if necessary.	

NAVY'S RESPONSES TO NAVY COMMENTS ON THE HASP

Appendix 1.5, Volume 1

1. Figure 3-4 will be revised to read "outer" instead of "inner" glove removal.

2. Reference to the Photo Vac TIP will be deleted. Health and Safety monitoring will be conducted with an Organic Vapor Analyzer (OVA) only.

Appendix 5.5

3. Trichloroethene and Trichloroethylene are the same constituent.

4. See response to Navy Comment #2.

5. References reading "The Navy shall...." will be changed to "The Contractor shall...", where appropriate.

6. Page 1, Section 1, first paragraph will be revised to read "This Site Health and Safety Plan (HASP) has been prepared for the Navy Installation Restoration Program...".

7. Reference to Mr. Joel Murphy and Mr. Kevin Gartland will be deleted. References to individual A/E contractor personnel will be included.

8. See response to Navy Comment #7.

9 through 25. See response to Navy Comment #5.

26. The 8-hour project manager's OSHA training is the same as 8-hour Supervisor course.

27. "Wearing of contact lenses" will be included as a "Prohibition in Contaminated Areas".

28. See response to Navy Comment #5.

29. All field personnel are required to participate in a field orientation meeting prior to the onset of field investigation. Reference to signing a verification voucher of the orientation attendance and understanding the HASP will be included in the HASP.

NAVY'S RESPONSES TO NAVY COMMENTS ON THE HASP (Continued)

30 (a) See response to Navy Comment #5.

(b) Will discuss.

31. Engineering controls will be used whenever possible to minimize the use of personal protective equipment.

32. See Table 3-2 of the HASP for an example of the accident incident report form.

33. Medical qualification documentation will be available for all field personnel on site.

34. Situations warranting elaborate decontamination procedures are not anticipated at this time. However, should the Health and Safety levels increase, appropriate upgraded decontamination procedures will be implemented.

35. Sirens are not anticipated to be necessary at this time.

36. The Navy understands that alcohol, drugs, etc. are not allowed for any person onsite; the text will be clarified to reflect this.

37. A sentence will be added that no smoking, eating, or drinking will be allowed in the exclusion or contamination reduction zone.

38. The recommended sentence regarding regularly scheduled explosimeter use will be added to the HASP.

39. The Navy agrees and will revise the section to state that spectacle kits must be used and that contact lenses are not allowed. The reference to taping glasses to facepiece will be deleted.

40. The Navy agrees. It is standard practice to notify local emergency services of operations and potential hazards before work begins. Mobile phones will be available to the field personnel. Notification letters will be sent to the Naval Hospital, Orange Park Hospital, and the local law enforcement department informing them of the field investigation activities and potential emergency situations.

Navy's Final Responses to Comments From

Navy - Captain Ronald Hoenstine

1/5
WSP
18
182

8 MAY 91

From: Captain Ronald W. Hoenstine
To: Commanding Officer, Naval Air Station, Jacksonville (code 184)

Subj: REVIEW OF DRAFT OF REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN FOR OU1, OIL AND SOLVENTS DISPOSAL PITS AREA MARCH, 1991

1. This most recent draft of the RI/FS study work plan for (PSC)26 and (PSC)27, which together comprise "The Oil and Solvents Disposal Pits Area" adequately addresses many of the concerns expressed by the TRC during the last meeting. The proposed field investigation procedures should provide an acceptable framework in which to initially characterize the hydrogeology of the OU1. As the study progresses , the program can be modified if necessary to include an investigation of a potential Intermediate aquifer system within the Hawthorn.

2. I interpreted the five deep soil borings to be continuous cores. This should establish at least in the study area the stratigraphic relationships of the individual sediment facies (in terms of continuity/ discontinuity) of the Hawthorn and the overlying Undifferentiated Sand and Clay unit. I would like to look at the cores if time permits.

3. A major concern to the drilling program is the presence of buried containers. The use of a ground penetrating radar unit (GPR) would supplement the existing cone penetrometer tests and would be especially helpful in identifying areas of buried waste (ie. drums). Additionally, this instrument would be useful as a stratigraphic tool in determining areal distribution and continuity of specific clay units. The United States Soil Conservation Service (Gainesville) and the United States Geological Survey have several units.

R.W. Hoenstine

NAVY'S RESPONSES TO CAPTAIN RONALD W. HOENSTINE'S COMMENTS TO THE OU1 RI/FS WORK PLANS

1. Paragraph 1

   As the RI/FS study progresses, the field program may be modified to investigate the potential intermediate aquifer system if available data indicate the investigation is necessary.

2. Paragraph 2

   The cores will be available for observation during the drilling program.

3. Paragraph 3

   NAS/Jacksonville is not aware of any buried drums. An EM-31 survey has already been conducted and the survey results do not indicate the presence of any large buried metal objects. However, prior to drilling, the monitor well location area will be scanned with a magnetometer. In addition, the monitor well borehole will be hand augered to 2 ft. bls and then slowly advanced with hollow stem augers to 5 ft bls.

Navy's Final Responses to Comments From

Navy - NADEP

DEPARTMENT OF THE NAVY
NAVAL AVIATION DEPOT
NAVAL AIR STATION
JACKSONVILLE, FLORIDA 32212-0016

IN REPLY REFER TO:
6280
Code 0015

JUN 3 1991

From: Commanding Officer, Naval Aviation Depot, Jacksonville
To: Commanding Officer, Naval Air Station, Jacksonville
(Code 184)

Subj: REVIEW OF NAVY INSTALLATION RESTORATION PROGRAM REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) DRAFT WORK PLANS

Ref: (a) NAS JAX ltr 6280 code 184 of 29 Mar 91
(b) NADEP JAX ltr 6280 code 0015 of 14 Jan 91
(c) Draft Work Plans (Volume 1)

1. 1. In response to reference (a) we compared our comments in reference (b) with reference (c) to verify that the requested changes were made. The items not changed are noted.

NOTE: In Volume 1 the Master Index has been revised, therefore, all chapter numbers are increased by 1.

a. 2.0 Program Management (was 1.0 in 1st draft)
2.4.1 Field Log Books and Records
This paragraph <u>was not changed</u> to reflect who will secure field log books and records or where they will be secured at the end of each day.

b. 3.0 Site Description (was 2.0 in 1st draft)
3.2.2.10 NADEP
Page 3-15. The word "repainted" <u>was not replaced</u> with "electroplated", following the phrase "and if necessary".

c. 3.2.5.12 PSC # 12 Old Test Cells
The text of this paragraph has been re-written so as not to confuse the issue of the storm drains. Figure 3-12, however, <u>was not changed</u> and still shows building 101K as a test cell.

2. NADEP Jacksonville point of contact is A. Mackey, code 0015, telephone number 772-2200.

G. R. McKINNEY
By direction

NAVY'S RESPONSES TO THE NADEP COMMENTS ON THE NIRP WORK PLANS

1. Note:

   (a) 2.4.1 Field Log Books and Records

   The Field Coordinator will be responsible for ensuring that individual field personnel maintain their log books.

   (b) NADEP, Page 3-15

   The word "repainted" will be replaced with "electroplated".

   (c) 3.2.5.12 PSC #12 Old Test Cells

   Figure 3-12 will be corrected.

2. No comment necessary.

Navy's Final Responses to Comments From

Navy - J. Robinson

DESIGN COORDINATION AND REVIEW - COMMENTS
SOUTHNAVFACENGCOM 11012-24 (6/78)

JOB ORDER NUMBER

COMMENTS BY: J Robinson | CODE: 18226 | PHONE:

DATE: 5/3/91

PROJECT TITLE AND LOCATION
Navy IR Program Plan, NAS Jacksonville
Vol 4 General Site Work Plan

TYPE OF REVIEW
- 30%
- 100%
- FINAL
- ✓ OTHER Draft

	DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
1.	pg 2-1 para 1	Word precess should be process	
2.	pg 3-26 (c)	Refers to a non-aqueous solution + give leachate as an example. Leachate could be aqueous or non-aqueous.	
3.	pg 3-65 last para	2nd sentence says grass beta should be gross beta.	
4.	pg 4-11/12	Interchanging Environmental Assessment & Ecological Assessment - should use one or the other to avoid confusion	
5.	pg 7-1	Paragraph 4 is confusing - remove word "compliance".	
6.	Appendix 4.2 pg B-5	Title cut off of 1st paragraph	

DESIGN COORDINATION AND REVIEW - COMMENTS
SOUTHNAVFACENGCOM 11012-24 (8/78)

JOB ORDER NUMBER

COMMENTS BY	CODE	PHONE	DATE
J Robinson	18226		5/3/91

PROJECT TITLE AND LOCATION
Navy IR Program Plan NAS Jax
Vol 4 General Site Work Plan.

TYPE OF REVIEW
- 30%
- 100%
- FINAL
- OTHER

	DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
7.	Sec 4 para 4.1.4.3	States QC Procedures for cleaning equipment blanks is 1 per 20 samples Requirement is 1 per day every day samples are collected.	
8.	Part 2 of Attachment pg 4-21 Sec 4.4.2.1	First paragraph last sentence has field blanks repeated.	
9.	Part 2 of Attachment pg 4-22 Sec 4.4.2.2	First paragraph last sentence states that 2 composite samplers will be used when duplicate composite samples are collected. This will need to be confirmed on site.	
10.	Part 2 Attachment B pg B-3	Paragraph 5, 6 + 7 require using vermiculite for packing material in coolers. This will result in uneven cooling + insulate contents from ice or "blue ice" + prevent sample temp from reaching 4°C goal.	

NAVY'S RESPONSES TO J. ROBINSON'S COMMENTS TO THE NIRP WORK PLANS

1. The word "precess" will be changed to "process".

2. Noted

3. The phrase "grass beta" will be changed to "gross beta".

4. Will be changed everywhere to read "Ecological Assessment".

5. The word compliance has been deleted.

6. Noted and corrected.

7. EPA Region IV SOPQAM will be reviewed.

8. The 2nd reference to field blanks will be deleted.

9. Agreed

10. The Navy agrees that the use of vermiculite is not necessary and that adequate packing and insulation can be accomplished with other materials.

INSTALLATION RESTORATION PROGRAM PLAN
NAVAL AIR STATION
JACKSONVILLE, FLORIDA

VOLUME 4
BASIC SITE WORK PLAN (BOOK 1 OF 2)

RECORD OF DOCUMENT CHANGES

SECTION	REMOVE PAGE(S)	REPLACE WITH PAGE(S)
Investigative Field Tasks 3.0	Pages 3–35 thru 3–38	Pages 3–35 thru 3–38
Modeling Programs 8.0	Pages 8–1 thru 8–2	Pages 8–1 thru 8–2
Appendix 4.2 Data Analysis Plan		
Data Validation Process & Org 1.0	Pages 1–2 thru 1–5	Pages 1–2 thru 1–5
Materials for Validation 2.0	Pages 2–1 thru 2–2	Pages 2–1 thru 2–2
Field Data Validation 3.0	Pages 3–1 thru 3–4	Pages 3–1 thru 3–4
Resolving Problems 6.0	Pages 6–1 thru 6–2	Pages 6–1 thru 6–2
Appendix 4.4.1 QAPP		
Title Page		Insert behind Geraghty & Miller's
Table of Contents	Pages i thru iv	Pages i thru v
Project Description 1.0	Pages 5 of 13 thru 6 of 13	Pages 5 of 13 thru 6 of 13
	Pages 11 of 13 thru 13 of 13	Pages 11 of 13 thru 13 of 13
Project Org & Responsibilities 2.0	Pages 1 of 13 thru 13 of 13	Pages 1 of 9 thru 9 of 9
Appendix 4.4.1		
Sampling Procedures 4.0	Pages 9 of 18 thru 12 of 18	Pages 9 of 18 thru 12 of 18
Analytical Procedures 7.0	Pages 1 of 1	Pages 1 of 1
Internal Quality Control Checks 8.0	Pages 1 of 12 thru 5 of 12	Pages 1 of 12 thru 5 of 12
	Pages 12 of 12	Pages 12 of 12
Data Reduction Validation & Rptg 9.0	Page 1 of 12	Page 1 of 12
	Pages 10 of 12 thru 12 of 12	Pages 10 of 12 thru 12 of 12
Performance & System Audits 10.0	Pages 1 of 3 thru 3 of 3	Pages 1 of 3 thru 3 of 3
Preventive Maintenance 11.0	Pages 1 of 2 thru 2 of 2	Pages 1 of 2 thru 2 of 2
Assessment of Data Precision, Accuracy & Completeness 12.0	Pages 1 of 11 thru 2 of 11	Pages 1 of 11 thru 2 of 11
Corrective Action 13.0	Page 4 of 4	Page 4 of 4
Quality Assurance Reports to to Management 14.0	Pages 1 of 3 thru 3 of 3	Pages 1 of 3 thru 3 of 3
Resumes 15.0	Entire section 15.0	New Section 15.0
Appendix 4.4.2 Basic Field Sampling Plan		
Title Page		Insert behind Geraghty & Miller's
Sampling Procedures 4.0	Page 4–84	Page 4–84
Sample handling & Field Analysis 5.0	Pages 5–7 thru 5–8	Pages 5–7 thru 5–8

and cement seal. Centralizers will be used when necessary to assist in plumbness and alignment of the wells; centralizers will not be installed on the screened portion of any well.

The field crew will take care during the drilling and well construction to prevent the entry of foreign material into the well. Whenever the field crew is offsite (i.e., at night), the borehole/monitor well will be covered and secured to prevent vandalism. Upon completion of the well, the well casing will extend to 2 to 3 ft above grade and will be surrounded by a larger diameter steel casing set into a concrete pad. The steel casing will have a lockable cap. The concrete pad will be a minimum 3 ft x 3 ft x 4 inches, sloped away from the well. Four 2-inch or larger diameter steel posts will be equally spaced around the concrete pad and cemented into the ground to a depth of at least 3 ft bls.

After the completion of each monitor well, but no sooner than 48 hours after grouting is completed, the field crew will develop the wells by alternately swabbing (with a surge block) and pumping or bailing. The wells will be developed until pH, conductivity and temperature have stabilized. The field crew will not use acids, dispersing agents, or explosives in the well. Development will continue until it is determined that further development will not provide significant improvement of the turbidity. If the well yield is too low to permit continuous pumping or bailing, the well will be alternatively swabbed, pumped, or bailed dry, and allowed to recharge.

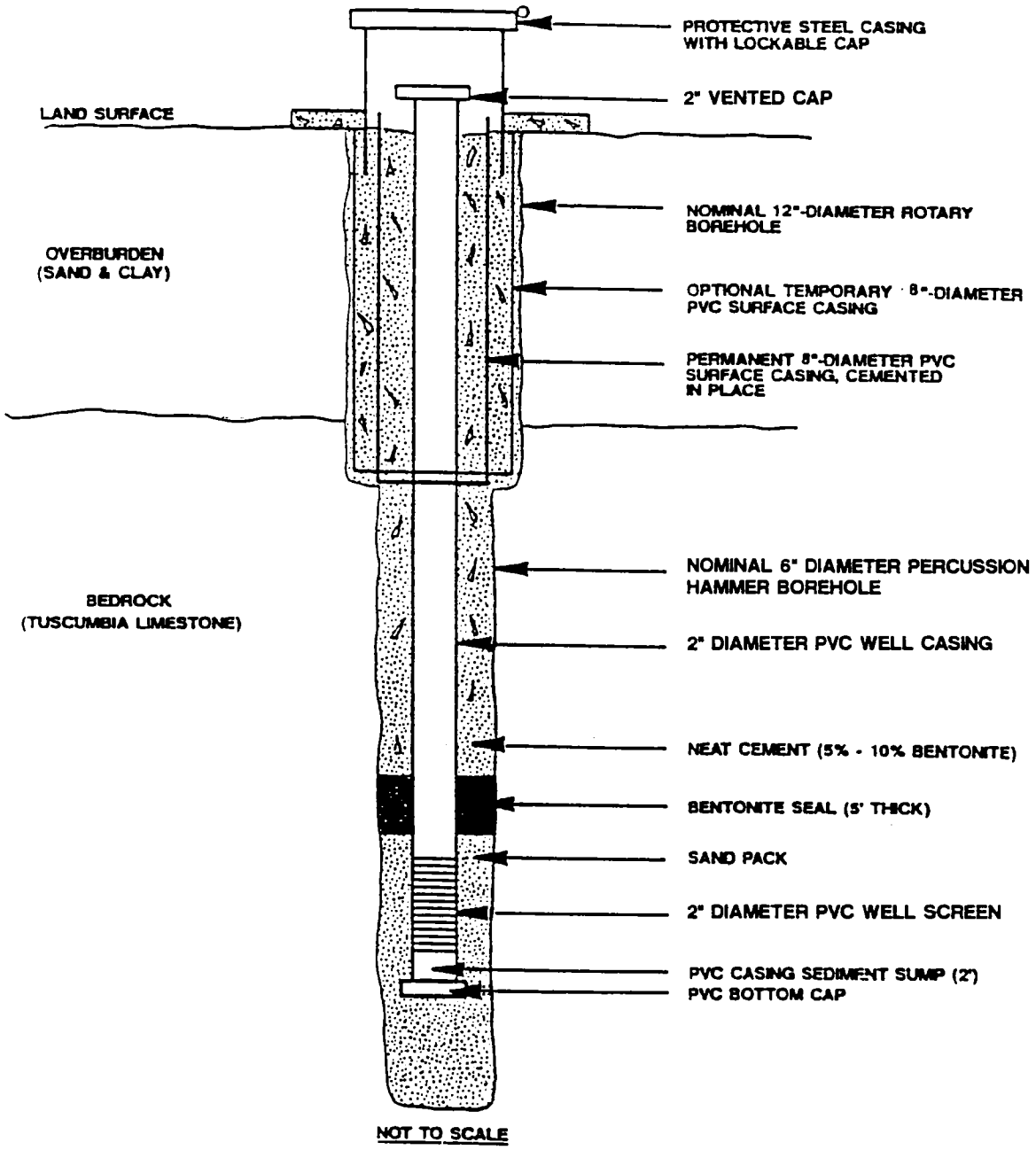
3.2.4.3 Monitor Wells with Surface Casings. The Navy and its contractor will drill boreholes for monitor wells requiring surface casings installation using the previously described drilling methods. The field crew will drill a pilot hole through the surficial sediments to the expected depth of surface casings

installation (estimated to be approximately 30 feet or less). The field crew will collect split-spoon formation samples, in the manner previously described, continuously from land surface to 10 ft bls and at 5 ft intervals thereafter until reaching the desired surface casing depth. The Navy and its contractors will store samples in labeled, air-tight plastic or glass containers. The field personnel will describe the physical characteristics of the samples obtained in detailed lithologic logs using the USCS. The Navy and its contractors will conduct geotechnical laboratory analyses as described previously.

After removal of the drill bit, the field crew will install a 10-inch diameter PVC surface casing to the total depth of the borehole. The field crew will then seal the annular space with cement grout by pressure grouting from the bottom of the hole to land surface. The grout used in these wells will meet the same specifications described for surficial monitor wells.

After allowing the surface casing grout to set for at least 24 hours, the field crew will drill a nominal 8-inch diameter borehole inside the surface casing by hydraulic rotary drilling. The field crew will use clean water as the circulating media during drilling to clear the borehole of cuttings. The field crew will complete the monitor wells at varying depths depending on the lithology and ground water encountered.

The Navy and its contractors will construct the monitor wells using 5 ft or more of new, 2-inch diameter, factory-slotted or continuous wrap, Type I, PVC well screen with Schedule 40, threaded, flush joint, PVC casing extending to three ft above land surface. Figure 3-2 shows a schematic diagram of a typical surface-cased monitor well. The PVC casings will conform to the requirements of ASTM-D 1785 and will carry the seal of the National Sanitation Foundation. The field crew may attach a minimum 2-ft



TYPICAL DEEP MONITOR WELL CONSTRUCTION DIAGRAM

FIGURE 3-2

REVISION 1

REMEDIAL INVESTIGATION/ FEASIBILITY STUDY WORK AND PROJECT MANAGEMENT PLAN NAS JACKSONVILLE SEPTEMBER 1991

section of closed-end, Schedule 40 PVC casing to the bottom of each screen to provide a sump for sediments. The field crew will fit each well with a vented PVC cap.

The Navy and its contractors will select the screen length, screen size, and screened interval of the well so that completed monitor well yields quantities of water and samples that are representative of the selected zone of interest. The field crew will fill the annular space between the borehole and the screen with uniformly graded silica sand (appropriately sized for the selected well screen) from the bottom of the hole to approximately 2 ft above the well screen using the tremie method. The Navy and/or Contractor will complete the remaining well construction and preparation of drilling logs as previously described for shallow monitor wells.

3.2.4.4 Location and Elevation Survey. Location coordinates and elevations shall be established for each monitor well by a registered professional surveyor. Location coordinates and elevations for soil borings and soil/sediment sampling points will be surveyed by the field crew. The horizontal coordinates shall be to the closest 1.0 foot and referenced to the State Plane Coorindate System. Elevations to the closest 0.01 foot shall be established for the top of the casing (measuring point) at each monitor well, piezometer, and staff gauge. Elevations to the closest 0.1 foot shall be established on the ground surface for each boring and soil/sediment sampling site. These elevations shall be referenced to the National Geodetic Vertical Datum of 1929.

3.2.4.5 Aquifer Testing. The Navy and its contractors may design an aquifer test program to test the hydraulic characteristics of various aquifers beneath the PSC site. The Navy and its contractors will identify hydrologic parameters such as

8.0 MODELING PROGRAMS

8.1 Objective

Geraghty & Miller, Inc., previous consultant to the Navy, conducted a survey of existing ground-water computer codes to facilitate an analysis of the capabilities of these codes and to provide a basis for their evaluation. The survey affords assessment of their capabilities with regard to its application to site conditions, general input requirements, documentation, availability, and usability. The evaluation also provides recommendations for the selection of modeling application programs for use during the RI/FS process.

8.2 Ground-Water Models

A ground-water model is a simplified representation of a real ground-water system. The term model, for the purposes of this report, is defined as a ground-water flow or transport computer code executed with PSC specific data. The model expresses relationships among components of the system in terms of mathematics, thus simulating system behavior under various conditions. The simulations provide for the prediction of system responses assuming the system parameters and stresses are known. The solution of the mathematical model can be either continuous (analytical) or discrete (numerical) in space and time.

Analytical solutions are those found completely by mathematical analysis. Semi-analytical solutions require numerical techniques for their evaluation, such as integral equations and successive approximation techniques. Approximate analytical solutions do not precisely satisfy the differential equation but the error is assumed to be insignificant. There are several advantages of analytical solutions:

- they are fast, because they are usually exact solutions to the differential equation and there is no iterative procedure for convergence;

- there are no numerical dissipation or damping coefficients required, and there is no numerical dispersion; and

- they are simple and efficient enough to easily run on most microcomputers.

Some of the disadvantages are that the boundary conditions must be regular, and permeability may vary spatially only with strict limitations.

Modelers base numerical solutions on differential equations describing flow or transport. The use of numerical techniques allows for less constraint of application and more flexibility. The survey considered two types of numerical methods of solution: finite difference methods (FD) and finite element methods (FE). For steady-state problems, both methods result in identical difference equations. In either case, a system of nodal points is superimposed over the problem domain and aquifer parameters are assumed to be constant within each node. FD nodes are square or rectangular and can be defined as block-centered or grid-centered. FE nodes can have other geometries, but are usually triangular or quadrilateral. Regardless of the geometric representation, an equation is written for each nodal point and an iterative procedure yields a solution for each node.

Modelers classify ground-water models generally by the physical and chemical processes they describe. Two major processes are ground-water flow or solute transport. Ground-water flow characterize the movement of water in soil or in porous or

quality control summary report; and, (4) procedures for resolving problems with data and applying penalties to the laboratory.

A fundamental aspect of any data validation program is the established relationship with the laboratory. The use of laboratories will be accomplished by a laboratory services agreement (contract) between the Contractor and the laboratory. The contract must specify the scope of services to be performed by the laboratory, the specific analytical quality assurance requirements to be met, and the information to be developed and reported. Quality assurance levels (Level D and Level C) adopted by the Navy and described in the Quality Assurance Program Plan (QAPP) and the NEESA 20.2-047B document will be adhered to.

1.1 Data Package Deliverables

As analyses are completed, the digital, electronic, or physical data will be reduced and converted into readily usable form by the laboratory in measurement units appropriate for the analysis. All measurements will be reported in appropriate significant figures. Table 7 of the QAPP presents the significant figures to be used in reporting analytical data. The following discussion describes the information to be provided by the contracted laboratories in each data package submittal.

1.1.1 Level D

For Level D, Quality Control (QC), a CLP data package shall be delivered for all the CLP parameters (volatiles, semi-volatiles, pesticides/PCBs, metals, and cyanide). This package shall include the summary package and the remainder of the package, which includes but is not limited to initial and continuing calibration, matrix spikes, matrix spike duplicates, method blanks (water

blanks, extraction blanks, digestion blanks), duplicates, laboratory control samples, surrogate spike recoveries, chromatograms, mass spectra, and absorbance data. The full description of the required deliverables is contained in the EPA, CLP Statement of Work (most current version) referenced in Attachment A.

Methods not defined by CLP also must be reported. These methods include the calibration information, method blanks, reagent water (blank) spikes, laboratory control samples matrix spikes, matrix spike duplicates, chromatograms, and absorbances. Control chart plots of associated blank spike recovery data must also be presented with the data.

1.1.2 Level C

For Level C QC, reportable data includes the method blanks, blank spikes, surrogates, matrix spikes, matrix spike duplicates, laboratory (sample) duplicates, and initial and continuing calibration data. These deliverables and their required forms are summarized and explained in detail in Table 8 of the QAPP. A copy of these requirements is presented in Attachment A of the this plan. The forms referred to in this table are from the current CLP statement of work for organics, metals, and cyanide.

1.2 Data Validation

Following completion of sample analysis, the contract laboratories will utilize precision and accuracy criteria presented in their respective generic QAPs as guidance for internal laboratory data validation prior to submittal of data packages.

The data validation procedures employed by the Contractor will include an evaluation of the field data package and an evaluation of the laboratory analytical data package. The criteria for data validation will be in accordance with the requirements established by the Navy in the NEESA 20.2-047B, document. This document specifies the validation requirements for both Level D and Level C data packages. These requirements are listed below.

1.2.1 Level D Validation

The data validation procedures that will be used to evaluate data for Level D data will be in accordance with the CLP criteria as outlined in the following documents:

- EPA, Hazardous Site Evaluation Division, Laboratory Data Validation Functional Guidelines for Evaluating Pesticides/PCB's Analyses, February 1, 1988 (most current revision);

- EPA, Hazardous Site Evaluation Division, Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, February 1, 1988 (most current revision);

- EPA, Hazardous Site Evaluation Division, Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, July 1, 1988 (most current revision);

These documents are presented in Attachments B and C, respectively. The pesticide criteria is a separate section of the organics criteria (Attachment B).

1.2.2 Level C Validation

The validation criteria to be followed for Level C data packages also has been defined in the NEESA 20.2-047B document and is presented in Attachment D. In addition, the criteria defined in the EPA documents presented in Attachments B and C also will be used in validation of Level C data.

1.2.3 Laboratory Services Agreement (Contract)

The validation procedures described in this manual have been tailored to interface with the ABB Environmental Data Station (EDS). The EDS requirements and the compliance screening validation process are compatible with Navy requirements. The laboratory services agreement, between the Contractor and the Laboratory, plays a significant role in establishing laboratory accountability for analytical performance and an efficient system of communicating required scopes of work to the laboratory.

The data validation process for both Level D and Level C data packages will be guided by the use of Data Validation Report Sheets (DVRS) forms, presented in Attachment E. These forms have been adopted from the EPA CLP Sample Management Office. These DVRS forms are the QC specific forms used to evaluate each QC parameter submitted in the laboratory data package. A separate form has been designed for each QC parameter. Separate form sets have been prepared for organics analyses, (volatiles, semi-volatiles, pesticides and PCBs) and inorganics analyses (metals and cyanide). A special checklist form has been prepared for Wet Chemistry QC to complete the DVRS forms. These forms contain the following kinds of information:

- QC parameter type

2.0 MATERIALS FOR VALIDATION

In order to conduct data validation properly, certain documents and forms are required. A list of these various documents along with a brief explanation of each is provided below.

2.1 BSAP/SAP

The BSAP, composed of the Quality Assurance Program Plan (QAPP) and the Basic Field Sampling Plan (BFSP), provides the foundation for the OU-specific plans and hence the foundation for the validation process. OU-Specific Sampling and Analysis Plans (SAPs) are composed of a Quality Assurance Project Plan (QAPjP) and an OU Field Sampling Plan (OU FSP). The QAPjP and the OU FSP are the fundamental documents for enabling data validation of data from a specific OU. The OU FSP defines the OU-specific field sampling activities and procedures and the QAPjP defines the required OU-specific data quality objectives (DQOs) and the appropriate sampling and analysis procedures to be employed. All of these documents provide a standard against which data quality may be compared and assessed.

2.2 Laboratory Task Order

The Laboratory Task Order (LTO) (Figure 1) is used to communicate to the laboratory the required scope of work and the DQOs for specific projects. The DQOs specified on the LTO include: matrix type, parameters (analytes) of interest, methods of analysis, detection limits, and holding times. Within these DQOs are defined the required container types, preservation methods, and sample volumes. These requirements also are defined in the QAPP and QAPjP. Other DQOs for precision, accuracy, and completeness are specified by the laboratory within their generic QAPs presented

FIGURE 1

LABORATORY TASK ORDER

Task Order No.: 281b

Office: _____ Phone: _____ Date: _____

Address: _____ Project Number: _____

_____ Laboratory Reporting Level: ☐ I ☐ II ☐ III ☐ IV

Project Name: _____ Location: _____

Laboratory: _____ Phone: _____ Contact: _____

Lab Provides Sample Containers? ☐ Yes ☐ No Date Required: _____ Ship To: _____

Estimated Date Of Sample Receipt By Laboratory: _____ Report Due: _____

Reports Delivered To: _____ Number Of Reports: _____

Work Description: _____

Send Invoice To: _____

PHYSICAL PROPERTIES	# Water	Method	Det. Limit	# Soil	Method	Det. Limit	NON-METALLICS	# Water	Method	Det. Limit	# Soil	Method	Det. Limit
pH							Acidity						
Spec. Cond.							Alkalinity (Total)						
Hardness (total)							Carbonate						
TDS							Bicarbonate						
TSS							Bromide						
Temperature							Chloride						
Turbidity							Cyanide						
Ignitability							Fluoride						
Corrosivity							Ammonia						
Reactivity							Nitrate						
E.P. Tox. Extraction							TKN						
TCLP Extraction							Nitrite						
E.P. Tox. Complete							Phosphorus						
TCLP Complete							Silica						
METALS*							Sulfate						
Aluminum							Sulfide						
Antimony							Surfactant (MBAS)						
Arsenic							ORGANICS						
Barium							BOD						
Beryllium							COD						
Cadmium							Oil & Grease						
Calcium							TOC						
Chromium							TOX						
Hex Chromium							TRPH						
Copper							Purg. Halocarbons#						
Iron							Non-Halogenated VOCs#						
Lead							Purgeable Arom.#						
Magnesium							Phenols#						
Manganese							Pesticides/PCBs#						
Mercury							PNAs#						
Nickel							Org. Phos. Pest.#						
Potassium							Dioxins						
Selenium							Other Hers.#						
Silver							Volatile Organics#						
Sodium							Semi Volatile Organics#						
Thallium							APPENDIX IX#						
Tin							RADIONUCLIDES						
Vanadium							Gross Alpha						
Zinc							Gross Beta						
Priority Pollutant Metals#							Radium 226						
TCL (HSL) Metals#							Radium 228						

* Metals are Total Metals Unless Specified as Dissolved Under Special Instructions. # Attach Table of Elements or Compounds to be Analyzed. # Includes All Organic and Inorganic Compounds.

Special Instructions Or Other: _____

Project Manager Signature: _____ Date: _____ QA Officer Signature: _____ Date: _____

Laboratory Acceptance: _____ Date: _____

Color Form 2

LABORATORY TASK ORDER AMENDMENTS

☐ No Changes

Required Change: _____

Representative Signature: _____ Date: _____

3.0 FIELD DATA VALIDATION

The following discussion is a "step by step" procedure for conducting data validation of Field Data Packages.

3.1 Purpose

By the definition of the EPA, environmental samples are chemical or physical evidence collected from a site or facility that may be used in a court of law. Therefore, it is incumbent on data users to ensure that collected samples are valid. The purposes of validating the field data include:

- to determine adherence to the work plan(s), OU-specific FSPs, and the OU-specific QAPjP;
- ensure required documentation has been developed;
- verify validity and legal defensibility of the samples collected;
- identify any errors in documentation that may be corrected; and
- determine if the performed field sampling procedures will jeopardize the analytical outcome so that corrective actions may be taken to stop the analysis, if not begun or completed, and implement procedures to repeat the sampling correctly.

3.2 Changes in the Field Program

If a change in the field program occurs that is outside the planned scope of work or if procedures specified in the OU FSP are modified, a field change request form should have been completed and included in the field data package. The Sampling Alteration form is provided in the BFSP. A review of this form should be conducted to ensure the following:

- o The form is completed in ink;
- o filled out completely;
- o appropriate signatures indicating approval of the modification has been affixed

3.3 Procedure for Field Data Package Review

The required materials for validating Field Data Packages include: the FDVC, MSL, COC forms, the QAPjP, OU FSP, QAPP, and BFSP.

3.3.1 FDVC

All requested information should be written on the checklist header. Note that only one checklist is required for the entire field data package. Consult the QAPjP and/or LTO to determine the required QC Level.

3.3.2 MSL

Using the MSL and the COC forms, prepare a master list of the samples collected. For each analytical parameter, list the samples down the left hand side (column 1, Sample ID) of the form. This list has three uses: (1) identify each sample submitted to the

laboratory; (2) evaluate the completeness of the analytical data package (analyzed samples); and (3) evaluate holding times.

3.3.3 Sampling/Drilling Records Inspection

Review drilling and sampling logs to ensure the following:

- A log exists for each sample;
- The log is completed in ink;
- The information listed on the checklist is documented on each sampling log; and
- Logs are signed and dated.

Make a check mark on the checklist in the appropriate column for each item. If any errors on logs are detected, correct the error and initial the correction. Corrections are made by drawing a line through the error and initialing. Do not use liquid paper (white out) to correct an error. Omissions or missing logs also may be corrected by filling in the required information or filling out a new form, and indicating that the record was created "after the fact". This may only be done after verifying the accuracy of the information and obtaining the signature of the sampling personnel. Note any errors identified on sampling logs that are not correctable in the comments section of the checklist. Data developed from samples collected without having acceptable documentation or where it is determined not to have been collected in accordance with the QAPjP/OU FSP may be classified as either unusable or qualitative. Reviewers must use judgement in making this determination.

3.3.4 Daily Quality Control Report (DQCR)

This form must be completed daily during each sampling event as defined in the QAPP. Review each document and ensure the following:

- o A DQCR form exists for each day of activity;
- o The form is completed in ink;
- o The information listed is complete and accurate;
- o The form is signed and dated.

3.3.5 Corrective Actions Report

During the work activities, problems that arise in the field requiring corrective actions must be documented. A Corrective Actions Form will be prepared containing the following information:

- o Nature of problem is described clearly;
- o An evaluation of the cause is provided, if known;
- o The location of the incident (PSC, OU, etc.) is stated;
- o When the problem occurred;
- o Who discovered the problem;
- o Corrective action taken to correct the problem;
- o Who performed the corrective action;
- o An evaluation of whether the corrective action will prevent the problem from re-occurring.

The document must be completed in ink, signed, and dated.

3.3.6 Organizing/Binding Field Records

Attach all logs and forms to the back of their respective COCs, arrange COCs in chronological order according to sample

6.0 RESOLVING PROBLEMS

The Laboratory Services Agreement/Subcontract should contain certain stipulated financial penalties and financial loss recovery procedures that may be applied for laboratory failures based on the results of the data validation. The laboratory failures typically provided for in the contract are described below.

6.1 10 Percent Penalties. See Section 1, paragraph 5 of the Laboratory Services Agreement (Appendix 5.2 of Volume 5.0). Applied to the following laboratory failures:

(1) Late delivery of laboratory data packages (LDPs); i.e., delivery of the data package after the agreed-upon due date.

(2) Delivery of incomplete LDP;

(a) If the LDP is delivered exactly on time or late, the report is considered to be late because the LDP cannot be completed on time;

(b) If the LDP is delivered early, the laboratory should be notified of the incompletion and be allowed to correct the submittal.

(3) Delivery of Incompetent (Inaccurate) LDPs;

(a) LDPs must be free from inaccuracies; if not, LDPs may be classified as incompetent (inaccurate); inaccuracies that may result in a report being classified as incompetent are:

1. Substantive typographical errors and misspellings;

2. Substantive misstatements of methods, parameters, dates of preparation or analysis, sample ID code, data or absence of concentration units, or misstatements of concentration units or detection limits;

3. QA data is not applicable to the analyses requested;

4. Report format is so disorganized as to be incomprehensible.

(b) If any of the above situations exist and the LDP submittal has been delivered early, contact the laboratory, describe the deficiency, and allow the lab time to correct the error. The resubmittal must be received by the required due data.

(c) If any of the above situations exist and the LDP has been delivered exactly on time or late, apply a penalty and request the lab correct the errors and submit a new report.

(4) Delivery of Irresponsible LDPs;

(a) LDPs must not contain unrequested data or unrequested interpretations of the requested data; if so, LDPs may be classified as irresponsible.

Revision 1

BASIC SAMPLING AND ANALYSIS PLAN
QUALITY ASSURANCE PROGRAM PLAN
AT THE NAVAL AIR STATION
JACKSONVILLE, FLORIDA

Prepared for

SOUTHERN DIVISION
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA

February 1992

Revised by

ABB ENVIRONMENTAL SERVICES, INC.
2590 EXECUTIVE CENTER CIRCLE EAST
BERKELEY BUILDING
TALLAHASSEE, FLORIDA 32301

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TABLES

TABLES (Continued)

FIGURES

ATTACHMENTS (BOOK 2 OF VOLUME 4)

A. CH2M Hill. Comprehensive Quality Assurance Manual.

B. Environmental Science & Engineering, Inc. Quality Assurance/Quality Control Manual.

C. ENESCO - California Analytical Laboratory. QAPP for Analysis of Polychlorinated Dioxins/Furans by Low Resolution GC/MS.

D. (Reserved)

E. (Reserved)

F. (Reserved)

G. ABB-ES Calibration Procedures and Frequencies.

H. Engineering Compliance Branch, Standard Operating Procedures and Quality Assurance Manual, U.S. Environmental Protection Agency, Environmental Services Division, Athens, Ga., February 1991.

I. Aqueous Preservation Protocol for Cyanide.

J. ABB-ES Preventive Maintenance Procedures for Field Equipment.

K. Resumes of Key ABB-ES Personnel.

investigations, was used in developing the scope of work presented in the Work Plan.

1.2 Documents

The Basic Sampling and Analysis Plan (BSAP) has been prepared to describe procedures used to obtain quality field and laboratory data during the implementation of the RI/FS. The BSAP consists of two documents: a Quality Assurance Program Plan (QAPP) and a Basic Field Sampling Plan (BFSP). The QAPP has been prepared according to the guidelines set forth by the U.S. Environmental Protection Agency (EPA) in "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans", (QAMS-005/80), EPA. The QAPP also meets the requirements specified by the Naval Energy and Environmental Support Activity in the document entitled "Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program", NEESA 20.2-047B, June 1988. The QAPP has been structured as a generic document to provide general guidance to the field and laboratory personnel concerning methodologies of data collection, proper record keeping protocols, data quality objectives, and procedures for data review.

The BFSP has been prepared to define the specific sampling procedures and techniques to be employed in the collection of soil, sediment, solid waste, sludge, surface water, ground water, and air samples during the investigation. The procedures specified in this document also meet the requirements specified in the NEESA 20.2-047B, June 1988 document.

One primary analytical laboratory has been selected to perform the bulk of the laboratory analyses along with two additional

laboratories to conduct selected specialty analyses. Operating information and a generic Laboratory Quality Assurance Plan (QAP) concerning all three laboratories has been included in this QAPP in Attachments A, B, and C. Accuracy, precision, and completeness criteria for the potential chemical constituents and radionuclides to be evaluated is presented for each laboratory in Table 1-1 and in Section 3.0. Prior to investigation of each OU, an OU-Specific Field Sampling Plan (OU FSP), and an OU-Specific Quality Assurance Project Plan (QAPjP) will be prepared. The QAPjP will specify the specific target compounds to be evaluated and which of the primary analytical laboratory and specialty laboratories, if required, will conduct the analyses pertinent to the investigation.

In addition, a wide variety of investigatory techniques have been included in the BFSP and QAPP. However, not all of the techniques are anticipated to be used at each PSC. Selection of specific data gathering methodologies will be made for each OU during preparation of the OU FSP and the QAPjP.

Each QAPjP will contain the same sections as the QAPP and will be organized in the same format. In general, the methodologies used for each OU's investigation will be selected from the options presented in the QAPP, the BFSP, and selected remedial investigation field task investigation plans, and will be incorporated by reference into the site specific plans. When OU conditions require modifications to techniques documented in the QAPP and BFSP, or require the use of specialized procedures not presented in these documents, the OU-specific plans (QAPjP and

All samples collected for laboratory analysis will be properly preserved and packed by field sampling personnel according to the procedures specified in Section 4.0 and shipped under appropriate chain-of-custody procedures found in Section 5.0. As discussed earlier, a primary analytical laboratory has been designated for use during implementation of the Site Work Plan. They are CH2M Hill Laboratories of Montgomery, Alabama. Samples of ground water, surface water, soil, sediments, and solid waste for analysis of volatile organic compounds (VOCs), pesticides, base neutral, and acid extractable organic compounds (BNAs), metals, geotechnical samples, and other standard chemical water quality parameters will be shipped to the primary analytical laboratory designated in the QAPjP. A Generic Quality Assurance Plan for the primary laboratory is presented in Attachment A.

Samples requiring analysis of radionuclides and air toxics will be shipped to Environmental Science & Engineering, Inc. of Gainesville, Florida (ESE). Soil and water samples for analysis of dioxins and furans will be sent to ENESCO - California Analytical Laboratories, West Sacramento, California. Generic QAPs, or standard operating procedures for these laboratories, are presented in Attachments B, and C, respectively.

The analytical, geotechnical, and geophysical methods to be used during the course of the site investigation are presented in Tables 1-1, 3-1, and 3-2. References for the methods are contained in each table. All methods are approved and published in various EPA Documents and Manuals, the ASTM Manuals, Standard Methods (Seventeenth Edition) or The Federal Register.

The overall QC requirements to be observed by the contracted laboratories are described in Table 3-3. The EPA, through the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) has defined five general levels of analytical options to support collection of measurement data in terms of documenting achievement of specified data quality objectives (DQOs). For this program, the Navy has adopted two analytical levels as quality control requirements for attaining DQOs. These levels are referred to as Level D and Level C; they correlate with EPA Levels 3 and 4 described in the EPA document entitled Data Quality Objectives for Remedial Response Activities-Development Process (EPA 5401G-871003). These levels are based on the type of site to be investigated, the level of accuracy and precision required, and the intended end use of the data.

Level D QC is to be used for PSCs that are on or about to be on the National Priorities List (NPL). These PSCs, classified as Naval Installation Restoration Program (NIRP)-CERCLA sites, are typically near populated areas and are likely to undergo litigation. For Level D, the EPA Contract Laboratory Program (CLP) methods are used and the CLP data package generated. A laboratory capable of performing CLP approved procedures is used for this purpose.

Level C QC is used for all remaining Navy PSCs. For Level C, the laboratory that is used must have been qualified under CLP, but does not need to be a contracted CLP laboratory. Level C allows

the use of non-CLP methods, but requires that the methods used be EPA methods (Table 1-1 included at the end of this report). The specific QC performance requirements for each level and the required data package deliverables are described in Section 8.0 and 9.0, respectively.

1.5 Field Quality Assurance Sampling

During implementation of the field sampling program at each OU, the Contractor will collect field quality control samples to assess the reproducibility of the field collection techniques, the quality of preservation reagents and sample bottles, and the adequacy of field decontamination procedures. Field QC samples for both levels of QC (Levels D and C) will include the collection and analysis of equipment rinsate blanks, field blanks, trip blanks, field replicates (duplicates), and field (referee) split (duplicate) samples. Specific procedures and frequencies of preparation are summarized in Table 8-1 and discussed in Section 8.0.

1.6. Data Analysis and Report Preparation

After the completion of each sampling and analysis program, the field and analytical data will be reviewed, validated, and analyzed using appropriate checklists. All data will be classified for usability as described in Section 9.0 and summarized into appropriate tables, charts, and figures.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

This section provides a description of the organizational structure of personnel to be used on this project. This description illustrates the lines of authority and identifies the key personnel assigned to various activities for the project. A proposed organizational structure chart for the investigation is shown in Figure 2-1.

2.1 Authority and Responsibilities

The responsibilities of the individual positions for this project are described in the following sections.

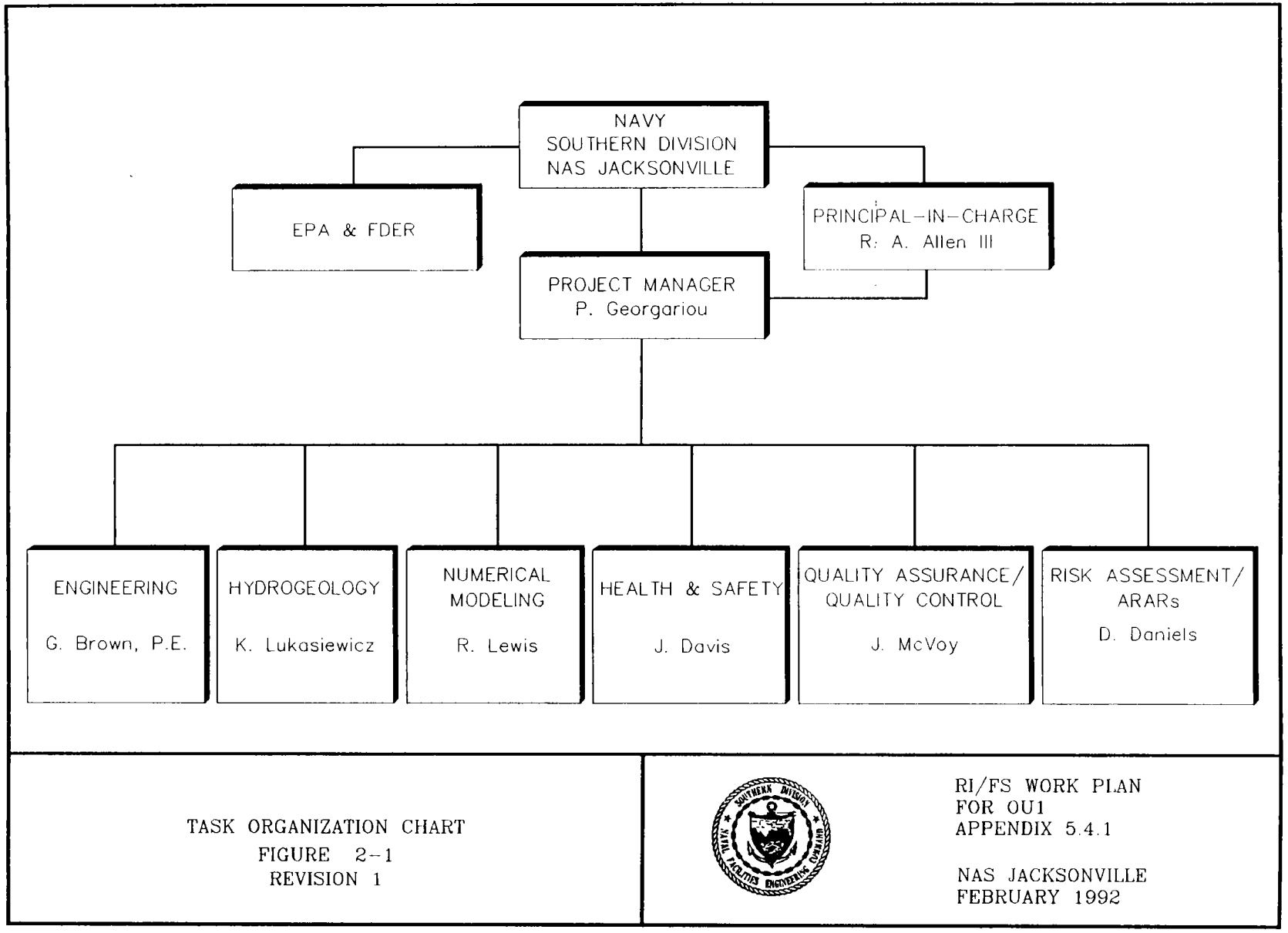
2.1.1 U.S. Navy Project Manager

Mr. Joel Murphy
Southern Division [Code 11512], Naval Facilities Engineering Command
2155 Eagle Drive, P.O. Box 10068
Charleston, SC 89411-0068

The U.S. Navy Project Manager will review and approve the work plans and work activities for the duration of the project and direct the coordination of U.S. Navy policy and environmental objectives.

2.1.2 Facility On-Site IR Manager

Mr. Kevin Gartland
Naval Air Station
Public Works Department, Engineering Division
Box 5, Code 184, 1841R Building 902
Jacksonville, Florida 32212-5000



TASK ORGANIZATION CHART
FIGURE 2-1
REVISION 1

RI/FS WORK PLAN
FOR OU1
APPENDIX 5.4.1

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The Facility On-Site IR Manager will be the primary contact at the Site. He will be responsible for Navy coordination of on-site activities described in the Work Plan. He will assure that all site activities conducted by the Contractor and its subcontractors are in agreement with the policies of the Navy and the NAS - Jacksonville.

2.1.3 A-E Program Manager

Mr. William Lawrence
ABB Environmental Services, Inc.
2590 Executive Center Circle East
Berkeley Building
Tallahassee, Florida 32301

The Program Manager is responsible for ABB-ES overall implementation of the project. As an officer of the firm, he has the authority to commit the necessary resources to ensure timely completion of project tasks. Other duties, as required, may include:

1) Coordination with the Project Manager concerning scheduling equipment and manpower.

2) Review of project progress.

3) Final review of all documents, plans, and drawings.

2.1.4 A-E Task Order Manager

Mr. Philip Georgariou
ABB Environmental Services, Inc.
2590 Executive Center Circle East
Berkeley Building
Tallahassee, Florida 32301

The Task Order Manager will serve as the primary ABB-ES contact for U.S. Navy personnel and subcontractors. Other duties, as required, may include:

1) Approval of project-specific procedures and internally prepared plans, drawings, and reports;

2) Ensuring that the technical, schedule, and control requirements established by the QA Officer are enforced on the project;

3) Serving as the "collection point" for the project staff reporting any changes or deviations from the project work plan; and

4) Determining the significance of these changes or deviations to the work plan, and the appropriateness for reporting such items to the appropriate regulatory and Navy representative.

5) Arranging subcontractor services;

6) Assigning duties to the project staff and orientation of the staff to the requirements of the project; and

7) Preparation of status update reports and revisions to the project work plan.

2.1.5 A-E Field Coordinator

Mrs. Kathy Lukasiewicz
ABB Environmental Services, Inc.
2590 Executive Center Circle East
Berkeley Building
Tallahassee, Florida 32301

The A-E Field Coordinator (Field Operations Leader (FOL)) principally is responsible for interacting with the Facility On-Site IR Manager to schedule the day-to-day field activities. Other duties required may include:

1) Review of on-site activities for compliance with the Site Work Plan.

2) Preparation of daily/weekly status report.

3) Resolution of on-site scheduling conflicts.

4) Monitoring of staff and subcontractor progress.

2.1.6 A-E Quality Assurance Officer

Mr. John C. McVoy
ABB Environmental Services, Inc.
2590 Executive Center Circle East
Berkeley Building
Tallahassee, Florida 32301

The Quality Assurance Officer (QA Officer) will be the liaison between the laboratories, ABB-ES, and the U.S. Navy. The QA

Officer will ensure the accuracy of the collected data through the performance of the following tasks:

1) Field and laboratory systems and performance audits;

2) Field sample collection and analytical QA program design;

3) Field and analytical data validation;

4) Selection of the analytical laboratory; and

5) Preparation of laboratory contracts.

2.1.7 Support Staff

In addition to the individuals previously mentioned, senior staff from ABB-ES office located in Tallahassee will be responsible for coordinating their specialized functions, respectively, during the implementation of the Site Work Plans. The resumes for the senior ABB-ES staff responsible for data collection and review are presented in Attachment K of the QAPP.

2.2 Primary Analytical Laboratory

A full service environmental laboratory has been selected to act as the primary analytical laboratories for this project. The laboratory is CH2M Hill of Montgomery, Alabama.

CH2M Hill
2567 Fairlane Drive
Montgomery, Alabama 36116-0548
(205) 271-1444
Attn: Spencer Hamil

2.2.1 CH2M Hill Laboratories

CH2M Hill Quality Analytical Laboratories specialize in performing trace organic and inorganic analyzes, operating three laboratories in Montgomery, Alabama; Gainesville, Florida; and Redding, California. CH2M Hill Quality Analytical Laboratories have been previously audited and certified by HAZWRAP, NEESA, Air Force IRP, EPA CLP PE Program, among others.

C. Vinson is the laboratory manager of CH2M Hill's Montgomery laboratory and is responsible for the overall operations of the laboratory facilities. T. Emenhiser will be the project manager and will be the primary coordinator between CH2M Hill and ABB-ES. M. Wisdom is the Laboratory Quality Assurance Coordinator and will be responsible for monitoring the accuracy, validity, and reliability of the data by implementing the laboratory's quality assurance program. Resumes of CH2M Hill's key personnel at their Montgomery facility are included in Attachment A.

2.3 Special Service Laboratories

In addition to the primary analytical laboratories presented in Section 2.2, two special services laboratories will be required to analyze samples for specific constituents that are not routinely evaluated by the primary laboratories. The laboratories selected to conduct these analyses include Environmental Science & Engineering, Inc. of Gainesville, Florida for the analysis of radionuclides.

2.3.1 Environmental Science & Engineering, Inc.

Environmental Science & Engineering, Inc. (ESE) is a full service environmental laboratory with capabilities in the area of radiological analyses. ESE has been approved and/or certified to conduct analyses for the U.S. Navy under the auspices of NEESA/NACIP. In addition, ESE has participated in certification/ approval programs for a number of states, including Florida.

ESE's Laboratory Director is Mr. John Mousa. The Laboratory Project Manager assigned to this project by ESE is Mr. Jeff Shamis. ESE's Quality Assurance Officer for this project will be Portia Pisigan. The personnel qualifications of ESE's staff and their organization is presented in Attachment D of this QAPP.

Mr. Shamis will act as the primary contact for CH2M Hill and ABB-ES during implementation of this work plan and he will be responsible for review of analytical data as well as review of the final analytical report submitted for this project. Mr. Shamis also will be involved with scheduling of sample receipt, sample handling practices, and assuring that analyses are completed and reported in a timely manner.

Ms. Pisigan will be responsible for implementation of ESE's quality assurance program as well as assuring adherence to the QAPP. She will be responsible for review of all quality control data generated during the analysis of samples from this project to assure that all analyses meet the data quality objectives established in this QAPP.

2.3.2 ENSECO - California Analytical Laboratory

ENSECO-California Analytical Laboratory, West Sacramento, California is a full service analytical laboratory which will provide services for analysis of dioxins and furans.

M. Miille is the general manager of ENSECO's West Sacramento laboratory and is responsible for the overall operations of the laboratory facilities. S. Eyraud is the Manager of the Low Resolution Dioxin Section and will be the project manager responsible for coordinating with CH2M Hill and ABB-ES. G. Celashi is the manager of Quality Assurance and will be responsible for monitoring the accuracy, validity, and reliability of the data by implementing the laboratory's quality assurance program. Resumes of ENSECO's key personnel at their California facility are included in Attachment C.

detergent or solvent must be approved by the ABB-ES QA Officer and the U.S. Navy, and its use must be documented in the field log books.

(b) Cleaning Water. Tap water from any municipal water supply may be used for initial equipment rinses and steam cleaning prior to decontamination. The use of an untreated potable water supply is not an acceptable substitute for tap water (EPA, Region IV, 1991).

Deionized/organic-free, (ASTM Type II) water will be used during cleaning procedures for field equipment after tap water rinses. Deionized/organic-free water is defined as tap water that has been treated with activated carbon and deionizing units. Deionized/ organic-free water should contain no metals, inorganics, pesticides, herbicides, extractable organic compounds, and less than detection units of purgeable organic compounds as measured by appropriate analysis of field and equipment blanks submitted with samples.

Deionized/organic free water will be used to prepare soap solutions and for final rinses during field equipment cleaning. The solvents, laboratory detergent, and rinse waters used to clean equipment shall not be reused.

(c) Location of Decontamination Process. When possible, equipment will be decontaminated in batches at a central staging area. Solutions, rinse solvents, and deionized water will be disposed in the Facility sanitary sewer system. Decontamination of soil and sediment sampling equipment as well as water sampling equipment will be conducted at a designated location within each

PSC. Small volumes of waste solutions, solvents, and rinses generated at the sampling sites during equipment decontamination will be collected over 6- or 8-ml plastic sheeting and allowed to evaporate.

4.1.4.1 General Decontamination Procedures. All non-dedicated sampling equipment (bailers, Kemmerer-type samplers, glass bowls, split spoon, stainless steel scoops, spoons, augers, etc.) will be decontaminated using the following procedure.

1. Rinse equipment thoroughly with potable tap water or deionized/distilled water in the field as soon as possible after use.

2. Wash equipment thoroughly with laboratory detergent and deionized/organic-free water using a brush to remove any particulate matter or surface film;

3. Rinse equipment thoroughly with deionized/organic-free water;

4. Rinse equipment with isopropanol alcohol;

5. Rinse equipment thoroughly with deionized/organic-free water;

6. Allow equipment to air dry; and

7. Wrap equipment completely with aluminum foil to prevent contamination during storage and/or transport to the field.

4.1.4.2 Equipment Storage. All decontaminated field and sampling equipment will be stored in covered containers or wrapped in aluminum foil to minimize contamination. Decontaminated equipment shall be clearly identified by labeling the wrapping material. Field equipment and reusable sample containers needing cleaning or repairs shall not be stored with clean equipment. Field sampling equipment that needs to be repaired shall be clearly identified and the repairs shall be documented.

4.1.4.3 Procedures for Cleaning Equipment. The effectiveness of field cleaning procedures shall be monitored by collection of equipment blanks. Equipment blanks will be prepared according to the procedures specified in Section 8.0 of this QAPP. The equipment blank is collected in the same type of sample bottle as the field samples, preserved in the same manner, and analyzed for all parameters of interest. Equipment blanks will be collected during each day of sampling and analyzed for all parameters at a minimum frequency of one per 20 samples. It should be noted that contamination detected in equipment blanks may be due to factors other than poor decontamination techniques. Other sources of potential contamination include the chemical preservatives and the sample bottles used during the investigations as well as laboratory sample handling procedures. Quality control samples (field blanks) will be collected to help evaluate these sources of potential contamination.

4.2 Sampling Preparation Procedures

Prior to initiating each sampling event, the senior member of the field team will assure that the team members have available the appropriate equipment and documents to complete the task. In addition, the senior member will notify the On-Site IR Manager of the sampling schedule at least five days prior to sampling. Upon arrival at the Site, the field team will check in with the On-Site IR Manager, confirm any access restrictions, and, if necessary, obtain keys for access to the PSC and the monitor wells.

The Contractor QAO will contact the appropriate contract laboratories one to two weeks prior to sample collection to obtain bottles and schedule the analyses. During sampling, the senior member of the sampling team will contact the QAO or the laboratory manager at least every other day to confirm sample collection and shipments. In the event samples are to be shipped on a Friday, the QAO will notify the laboratory that a shipment will be delivered Saturday.

4.2.1 Sampling Procedure Documentation

Prior to departure for the sampling location each member of the field team will have become familiar with, and have access to, the following documents:

1) The Quality Assurance Program Plan (QAPP);

2) The Basic Field Sampling and Analysis Plan (BFSP);

3) The OU-Specific Quality Assurance Project Plan (QAPjP);

7.0 ANALYTICAL PROCEDURES

7.1 Laboratory Analytical Procedures

The analytical procedures used during the implementation of the work plan are listed in Table 1-1. Analysis of samples collected by the Contractor will be performed by selected contracted laboratories in accordance with protocols and QA procedures established by the EPA. QC requirements for Levels D and C are described in Section 8.0.

7.2 Field Analytical Procedures

Conductivity, salinity, pH, dissolved oxygen, and temperature will be measured in the field according to EPA methods referenced in the EPA SOP/QAM in Attachment H of the QAPP and instrument manufacturers instructions.

8.0 INTERNAL QUALITY CONTROL CHECKS

Internal quality control (QC) checks are those procedures used during all phases of the work that are designed to control the individual processes involved in data generating activities. Internal QC checks of sampling procedures and laboratory analyses will be conducted periodically throughout the investigation at pre-determined intervals. The following discussion describes the required QC checks to be performed for both the field and laboratory activities at both DQO levels (Level D and Level C).

8.1 Internal Field Sampling Quality Control Checks

Internal QC checks for general field sampling (field QC samples) will consist of the preparation and submittal of equipment blanks, field blanks, trip (travel) blanks, and field replicates (field duplicates), and field splits (referee duplicates) for analysis of selected parameters of concern at frequencies described in Table 8-1. The blanks, duplicates, and referee samples are defined and explained in Section 8.1.1 through 8.1.5.

Although the number of QC samples changes, the types of field QC samples remain the same regardless of the level of QC implemented. Table 8-1 lists the percentage of field QC samples per level per sample matrix. A sampling event is considered to be from the time the sampling personnel arrive at the site until these personnel leave for more than a day. An example of two events would be if sampling personnel went to a PSC for three weeks, drilled borings, and installed ground-water wells. During this visit, soil and water samples were collected. The sampling crew

Table 8-1. Field QC Samples per Sampling Event

Type of Sample	Level C		Level D	
	Metal	Organic	Metal	Organic
Trip Blank (for VOAs only)	NA[1/]	1/cooler	NA[1/]	1/cooler
Equipment Rinsate[2/]	1/day	1/day	1/day	1/day
Field Blank	1/source/event		1/20	1/20
Field Replicates[3/]	10%	10%	10%	10%
Referee Duplicate[3/]	To be determined[4/]			

1/ NA = Not applicable

2/ Samples are collected daily; however, only samples from every other day are analyzed. Other samples are held and analyzed only if evidence of contamination exists.

3/ The duplicates must be taken from the same sample which will become the laboratory matrix/matrix spike duplicate for organics or for the sample used as a laboratory duplicate in inorganic analysis.

4/ The requirement for split samples has not been defined. If referee duplicates are required for any PSC or site they will be described in the site specific QAPjP and SSFSP.

5/ At a minimum, one sample for each water source for a given sampling event shall be collected for analyses.

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left the PSC for two months, thus concluding the first sampling event. The crew later returned to collect another set of groundwater samples over a three-day period. The second visit would constitute the second sampling event.

8.1.1 Equipment Blank

Equipment blanks (rinsates) are the final analyte-free water rinse from equipment cleaning, collected daily during a sampling event. An equipment blank is made by pouring organic-free/deionized water into or over the field sampling apparatus (bailer, pump tubing, etc.) that conceivably could be a source of contamination. The water is then sealed in the same type of sample bottle as the other samples, preserved in the same manner (using the exact preservative source), transported to the laboratory with the samples, and analyzed for the same parameters of interest. Equipment rinsates should be prepared and submitted at a frequency of one per day for all levels of QC. Initially, rinsate samples from every other day should be analyzed. If analytes pertinent to the project are found in the rinsate, the remaining rinsate samples must be analyzed. The results from the blanks will be used to flag or assess the levels of analytes in the samples. This comparison is made during data validation. The rinsates are analyzed for the same parameters as the related samples.

8.1.2 Field Blanks

Field blanks consist of the source water used in decontamination and source water used in steam cleaning. A field blank consists of sample containers filled in the field with organic-free/deionized water prepared and preserved in the same manner as

the samples. The field blanks are analyzed along with the field samples for the constituents of interest to check for contamination imparted to the samples by the sample container or other exogenous sources. At a minimum, one field blank from each event and each source of water must be collected and analyzed for the same parameters as the related samples. For this project, a field blank will be collected at each PSC for all parameters analyzed at a frequency of 1 per water source per 20 samples for Level D and 1 per water source per sampling event for Level C.

8.1.3 Trip Blank

Trip blanks are defined as samples which originate from organic free (analyte free), deionized water taken from the laboratory that travels unopened with the sample bottles to the sampling site and returned to the laboratory with the volatile organic (VOC) samples. One trip blank should accompany each cooler containing VOCs, should be stored at the laboratory with the samples, and analyzed by the laboratory. Trip blanks are only analyzed for VOCs.

8.1.4 Field Replicates (Duplicates)

A field replicate is a duplicate sample prepared at the sampling location from equal portions of all sample aliquots combined to make the sample. Both the field replicate and the sample are collected at the same time, in the same container type, preserved in the same way, and analyzed by the same laboratory as a measure of sampling and analytical precision.

Field replicates for soil samples are collected, homogenized, and split. All samples except VOCs are homogenized and split. Samples collected for VOC analyses will be immediately placed in the appropriate containers.

The field replicates for water samples are collected simultaneously as described above. Field replicates should be collected at a frequency of 10 percent per sample matrix for Levels D and C. All the field replicates should be sent to the same laboratory responsible for analysis. The identification of field replicates should be disguised so the laboratory will not know a test of precision is being conducted. A record of the disguised replicate identification should be maintained on the sample log and in the field log book. The same samples used for field replicates may be split by the laboratory and be used as the laboratory replicate or matrix spike. This means that for the field replicate sample, there will be analyses of the normal sample, the field replicate, and the laboratory matrix spike/matrix spike duplicate or laboratory duplicate.

8.1.5 Field Split (Referee Duplicates)

A field split or referee duplicate is a duplicate sample prepared at the sampling location from equal portions of all sample aliquots combined to make the sample. Both the field split and the sample are collected at the same time, in the same container type, and preserved in the same fashion. The split sample and split of all the equipment blanks and field blanks are submitted to a referee laboratory for analysis to assist in evaluating interlaboratory precision and validating the data.

It is suggested that the surrogates used for volatiles and semi-volatiles analyses be used as control analytes for the GC/MS methods. At least two pesticides should be used when pesticide methods are performed and one polychlorinated biphenyl (PCB) when PCBs are analyzed. For wet chemical methods, a single spike of an appropriate control for each method may be used. As an example for cyanide, a control of sodium cyanide from a source other than that used for calibration may be spiked into water and analyzed alongside the water samples. For the metals, it is suggested that at least three of the metals typically analyzed by ICP be monitored and that each element analyzed by furnace or flame atomic absorption be monitored.

9.0 DATA REDUCTION, VALIDATION, AND REPORTING

The use of laboratories will be accomplished by a laboratory services agreement (contract) between Contractor and the laboratory. The contract will specify the scope of services to be performed by the laboratory, the specific analytical quality assurance requirements to be met, and the information to be developed and reported. The Analytical Result Reportables and Data Validation in conjunction with the levels of quality assurance (Level D and Level C) adopted by the Navy and described in the NEESA 20.2-047B document, are referenced in Section 3.0 of this QAPP.

9.1 Data Reduction

As analyses are completed, the digital electronic, or physical data will be reduced and converted into readily usable form in measurement units appropriate for the analysis. All measurements will be reported in appropriate significant figures. Table 9-1 presents the significant figures to be used in reporting analytical data. In this table the Xs signify numbers that are significant and the Os signify numbers that are not significant. The last significant figure reported for any laboratory value is the least accurate and users must be aware of that when using the information supplied.

Table 9-2. (continued)

	Method Requirements	Deliverables
Metals (cont)	- Postdigest spike for GFAA	Recovery will be noted on raw data
	- Duplicates (1 per 20 samples will be split and digested as separate)	Form 6 samples
	- Method blank spike information will be plotted on control chart, one per batch of samples processed.	Control chart
	- Standard addition. The decision process outlined in CLO page E-3 will be used to determine when standard additions are required.	Form 8
	Holding times.	Form 10
Wet Chemistry	Level C	
	- Blank spike 1/batch	Control chart
	- Method blank 1/batch	Report result No format
	- Sample results	Report result No format
	- Matrix spike/spike duplicate or calibration information	Report result if applicable
	- Calibration check report percent RSD or percent difference from initial calibration	Report percent or percent difference No format

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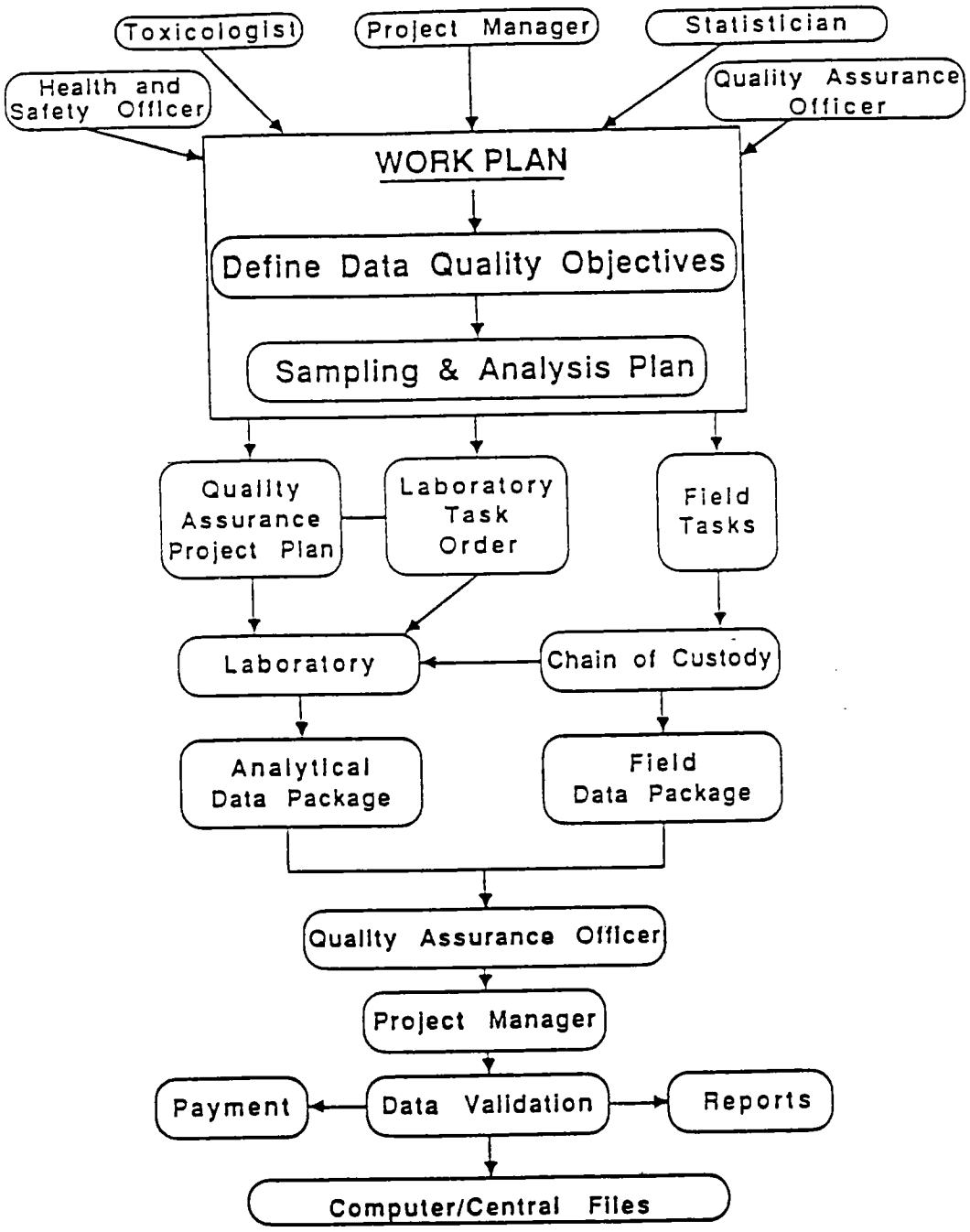
shall be reported. These deliverables and their required format are summarized and explained in more detail in Table 9-2.

9.3 Data Validation

The contract laboratories will utilize precision and accuracy criteria presented in their respective generic QAPs as guidance for internal laboratory data validation prior to submittal of data packages. The data validation procedures employed by ABB-ES will include an evaluation of the field data package and an evaluation of the laboratory analytical data package. The data validation procedures that will be used to evaluate data for this project are presented in detail in the Data Analysis Plan (Appendix 4.2 of Volume 4.0, the Basic Site Work Plan).

9.4 Data Management

All data will be managed as described in the Data Management Plan (Section 2.0 of Volume 1, Organization and Planning). A data management flow chart is presented in Figure 9-1 to illustrate the flow of data through the project management system.



DATA MANAGEMENT FLOW CHART

FIGURE 9-1

REMEDIAL INVESTIGATION/ FEASIBILITY STUDY QUALITY ASSURANCE PROGRAM PLAN

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10.0 PERFORMANCE AND SYSTEM AUDITS

Performance and system audits for sampling and analysis operations consist of on-site review of field and laboratory quality assurance systems and on-site review of equipment for sampling, calibration, and measurement.

10.1 Field System Audit

The Field Coordinator, the Project Manager, and/or the QA Officer will make a non-scheduled visit to the sampling location to evaluate the performance of field personnel and general field operations in progress. The auditor will observe the performance of the field operations team during each kind of activity, such as water-level readings and sampling rounds. A systems audit of field operations personnel by the project QA officer will be performed on a bi-annual basis and a field audit report of the sampling team will be maintained on file by the Contractor.

10.2 Laboratory System Audit

A laboratory systems audit is routinely conducted, at least biannually, of all laboratories subcontracted by ABB Environmental Services, Inc. These audits assure that systems and operational capability is maintained and test methodology and quality control measures for the project are being followed as specified in the laboratory written standard operating procedures and generic Quality Assurance Plans. The Systems Audit Checklist used by the EPA Contract Laboratory Program (CLP) forms the procedural basis for conducting these audits.

The contracted laboratories for this investigation participate in the EPA Contract Laboratory Program or other federal and state agency programs that require recurring on-site audits. In addition, laboratory initiated audits may also be conducted by each laboratory's QA Officer on a routine basis.

10.3 Performance Evaluation Audits

A performance evaluation (PE) audit evaluates a laboratory's ability to obtain an accurate and precise answer in the analysis of a known check sample by a specific analytical method. Following the analytical data validation described in Section 9.0, a performance evaluation audit of the laboratory may be conducted by ABB-ES. This audit may be conducted if it is determined that the quality assurance data provided in the analytical data package or other parameters as described in Sections 8.0 and 9.0 are outside acceptance criteria control limits. These PE audits may include a review of all raw data developed by the laboratory and not reported (laboratory non-reportables) and the submission of blind spiked check samples for the analysis of the parameters in question. These check samples may be submitted disguised as field samples, in which case, the laboratory will not know the purpose of the samples or the samples may be obvious (known) check samples (EPA or NIST traceable).

PE Audits also may be conducted by reviewing the laboratory's results from "round-robin" certification testing and/or EPA CLP evaluation samples. An additional component of PE Audits includes the review and evaluation of raw data generated from the analysis of PE samples and actual field samples that may be in question.

Results of PE Audit and progress reports concerning laboratory performance will be available for Navy review.

10.4 Regulatory Audits

It is understood that field personnel and subcontractor laboratories also are subject to quality assurance audits by the Navy, FDER, and EPA.

11.0 PREVENTATIVE MAINTENANCE

11.1 Field Equipment

A listing of the field testing equipment that may require preventive maintenance and routine service are presented in Table 11-1, Preventive Maintenance Procedures are described in Attachment J. Analytical field laboratory equipment must be routinely serviced after each field program, and checked for proper operation prior to analyzing air samples at the PSC. Records of calibration and maintenance activities for each piece of equipment are maintained in log books assigned to that instrument.

11.2 Laboratory Equipment

To obtain good analytical data, all instruments must be operating properly at all times. To ensure that instruments are operating properly, rigorous maintenance and trouble-shooting procedures must be followed.

All laboratory instruments, including the inductively coupled plasma spectrometers, graphite furnace atomic absorption spectrophotometers, gas chromatographs, and mass spectrometers, undergo regular maintenance as prescribed in the manufacturer's operation manual for each of the instruments. Trouble shooting procedures also are carried out for each instrument according to instructions in the operation manual.

All instruments will be calibrated each day that analyses are conducted. A record is maintained of all instrument calibrations.

Table 11-1
LIST OF FIELD TESTING EQUIPMENT

Field Instrumentation

pH meters (LaMotte Chemical Products Model HA-pH meter and Myron L. Company Model EP II/pH)
Conductivity meters (PI DspH-1 pH conductivity meter and Trimar Industries Model 333 Tripar Meter)
S-C-T Meter (YSI Model No. 33)
OVA (Century Model OVA 128)
Data logger (ORS Interface Probe and ORS Model EL-200 Groundwater Monitoring System)
Photoionization Analyzer (Photovac TIP and HNU Model 101)
Portable Gas Chromatographs (HNU Model 311 and Photovac 10S50)
Dräeger Mult-Gas Detector
Hydrogen Sulfide Meter (Industrial Scientific MX 241)
Oxygen Indicator (MSA Model E)
Methane Meter (MSA Model 60 Gascope)
Explosimeter (Industrial Scientific MX 241)
Field grade thermometers
Water level indicators
Velocity meter (Surface water)
Water level recorder (Stevens)

12.0 ASSESSMENT OF DATA PRECISION, ACCURACY, AND COMPLETENESS

12.1 Precision

Precision is an estimate of the reproducibility of a method, and it may be estimated by several statistical tests including the coefficient of variation and the relative percent difference between replicate (duplicate) samples. ABB-ES will determine the precision of the analyses conducted during this investigation by reviewing the results of field replicate samples and laboratory duplicate samples (where applicable), then, if sufficient data are obtained, the arithmetic mean and standard deviation of a group of results may be calculated.

Precision can then be assessed by using the coefficient of variation (CV), which expresses the standard deviation as a percentage of the mean. Specific statistical comparison of duplicate samples (field and laboratory), as a measure of precision evaluating both sample collection procedures and laboratory instrument performance, may be accomplished by first comparing the obtained duplicate results with the published EPA criteria for method precision. If EPA criteria is not available, the relative percent difference (RPD) may be calculated and compared to the precision criteria established by the laboratory for the analysis of laboratory duplicates.

12.2 Accuracy

The accuracy of a method is an estimate of the difference between the true value and the determined mean value. Certain QA parameters such as laboratory control samples, reagent water spike

samples, QC check samples, matrix spike samples, and surrogate spike samples all have known concentrations prior to analysis. By comparing the percent recovery of the analysis of these samples to the known true value it is possible to measure the accuracy of the analysis. In routine practice the laboratory collects recovery data for each of these parameters from approximately 30 analytical batches. The percent recovery data are averaged and the standard deviation of the percent recoveries is calculated. Then, based on the desired level of confidence, ranges will be established as practical control limits. To be valid, these control limits must be at least as stringent as the accuracy limits specified by EPA for each analyte measured by the method. If the determined control limits are within the range established for the analyte and method by EPA then the determined range becomes the practical control limits used by the laboratory until another set of data is developed and new control limits are calculated. Specific procedures addressing the development of these control values and preparation of control charts are presented in Section 4.0 of NEESA 20.2-047B referenced in Section 1.0.

Specific statistical comparison of percent recovery values and control limits (DQOs) reported by the laboratory as a measure of method accuracy will be compared with the published EPA criteria for the accuracy of an individual method. Data not meeting the EPA criteria for accuracy may be considered qualitative or unusable.

each data package a discussion of the problems encountered and corrective actions taken. In addition, the laboratories will maintain a file for Contractor review that documents all corrective actions taken regardless of whether the actions performed were pertinent to the analysis of samples from Geraghty & Miller projects.

Reports of corrective actions taken during the implementation of the Basic Site Work Plan will be provided to the U.S. Navy according to the frequency and procedures specified in the Data Analysis Plan (Appendix 4.2 of Volume 4, the Basic Site Work Plan).

14.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

Each day that field activities are conducted on-site, a representative of the Field Team will complete a Quality Control Report (QCR) (Figure 14-1). These reports will be transmitted weekly to the Project QA Officer for review and inclusion into the project file. These DQCRs, along with associated field records and laboratory data, form the basis for preparing a Quality Control Summary Report (QCSR).

A Final QCSR for the RI/FS program will be prepared for each OU following completion of data gathering activities. Each report will address the following:

1) Quality assurance activities and quality of collected data (results of data validation);

2) Equipment calibration and preventive maintenance activities;

3) Laboratory quality control data pertinent to the site;

4) Evaluation of data completeness and usability; and

5) Field and/or laboratory QA problems and implemented corrective actions.

All quality assurance documentation and reports will be available for review by EPA Region IV and the FDER.

QUALITY CONTROL REPORT
NAS JACKSONVILLE

Date: _____

A. Weather (temperature, wind speed and direction, precipitation, etc.): _____

B. Work Performed: _____

C. Sampling Performed (location/number, sample type, etc.):

D. Field Analyses Performed (including instrument checks, calibration, etc.): _____

E. Problems Encountered and Corrective Actions Taken (sampling problems, alternate methods/locations, etc.): _____

F. Quality-Control Activities Initiated: _____

Signature of Reporter: _____

g:\user\nasdqcr.w51

A-E DATA QUALITY CONTROL REPORT

FIGURE 14-1

REMEDIAL INVESTIGATION/ FEASIBILITY STUDY QUALITY ASSURANCE PROGRAM PLAN

NAS JACKSONVILLE
SEPTEMBER 1991

An Interim Quality Assurance report as indicated in the Data Analysis Plan will be prepared and submitted to the U.S. Navy. These reports will cover routine quality assurance activities such as:

1) Results of QA audits;
2) Results of PE samples;
3) Revision of laboratory data quality objectives;
4) Summary of data gathering tasks; and
5) Summary of QA problems and corrective actions.

15.0 RESUMES

Resumes of key ABB-ES personnel are included in Attachment K of this QAPP.

BASIC SAMPLING AND ANALYSIS PLAN
BASIC FIELD SAMPLING PLAN
AT THE NAVAL AIR STATION
JACKSONVILLE, FLORIDA

Prepared for:

SOUTHERN DIVISION
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA

February 1992

Revised by:

ABB Environmental Services, Inc.
2590 Executive Center Circle East
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Tallahassee, Florida 32301

- weighted steel measuring tapes, and

- electric water level indicators.

4.13.5.4 Specific Quality Control Procedures. All devices used to measure ground water levels shall be calibrated against the Invar steel surveyor's chain. These devices shall be calibrated to 0.01 foot per 10 feet length. Before each use, these devices shall be prepared according to the manufacturer's instructions (if appropriate) and checked for obvious damage. These devices should be rinsed after use as described in Attachment A, and also before being used in the next well to be measured. All calibration and maintenance data shall be recorded in a log book.

4.14 Soil-Gas Survey

A soil-gas survey will be conducted at the Oil and Solvent Disposal Pits Area and the residential housing area to investigate the potential for contaminant transport and human exposure via soil-gas migration through the vadose zone. Sixty soil-gas probes will be installed during the investigation. Eleven permenant sample probes will be installed along the western and northern periphery of the family housing area. The sample and analysis plan for the soil gas contained in Attachment B describes the details for the probe designs, sample collection, sample analyses, and field quality assurance and quality control.

Table 1. Specific Field Analytical Methods

Analytical Parameter	Method	Equipment
Temperature	Calibrated glass (mercury) dial (mechanical), or electrometric thermometer	Mercury filled glass, mechanical dial-type thermometer, or thermistor with electronic readout.
pH	Electrometrically using a glass electrode in combination with a reference potential or a combination electrode	Portable field pH meter
Specific Conductance	Wheatstone bridge type or equivalent meter corrected to 25°C	Self-contained conductivity meter, Wheatstone bridge type, or equivalent with automatic temperature compensation to 25°C or "dial in" temperature compensation.
Organic Vapor	Organic Vapor Analyzer Flame Ionization Detector (FID)	Foxboro OVA 128
Volatile Organic Compounds	Gas Chromatography - PID	Photovac-PID HNu

5.4.1 Quality Control Procedures

Quality assurance procedures for field analysis, and field analytical and test instrumentation calibration are described in the BSAP-QAPP. All field analytical procedures shall be conducted in duplicate at a minimum of 10 percent of the time. A record of these duplicate analyses shall be kept in field logbooks by field sampling personnel. A significant difference in the replicate analyses (greater than specified in the following sections) shall result in recalibration of the instruments used, re-examination of the analytical methodology being used, or re-examination of the sampling location.

All field analyses must be traceable to the specific individual performing the analyses and to the specific equipment utilized. This information shall be entered into the field logbooks for all field analyses. Time records shall be kept in local time utilizing the military 2400 hour format and shall be recorded to the nearest five minutes.

A specific calibration and/or standardization plan for all field analytical equipment is presented in this subsection. Included in this plan are: calibration and maintenance intervals; listing of required calibration standards; environmental conditions requiring recalibration; and use of a logbook to record calibration and maintenance data for each piece of field analytical equipment.

5.4.1.1 Temperature.

(a) Initial Calibration -- All thermometers shall be initially calibrated against a National Bureau of Standards (NBS) certified thermometer or one traceable to NBS certification.