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TECHNOLOGY EVALUATION REPORT NAVY ENVIRONMENTAL LEADERSHIP PROGRAM
TECHNOLOGY DEMONSTRATION FOR THERMAL DESORPTION OF PETROLEUM
IMPACTED SOIL SOLID WASTE MANAGEMENT UNITS 6 AND 7 NS MAYPORT FL
1/1/1997
ABB ENVIRONMENTAL SERVICES

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**TECHNOLOGY EVALUATION REPORT
NAVY ENVIRONMENTAL LEADERSHIP PROGRAM
TECHNOLOGY DEMONSTRATION FOR THERMAL DESORPTION OF
PETROLEUM-IMPACTED SOIL AT
SOLID WASTE MANAGEMENT UNITS 6 AND 7**

**U.S. NAVAL STATION
MAYPORT, FLORIDA**

Unit Identification Code: N60201

Contract No.: N62467-89-D-0317/028

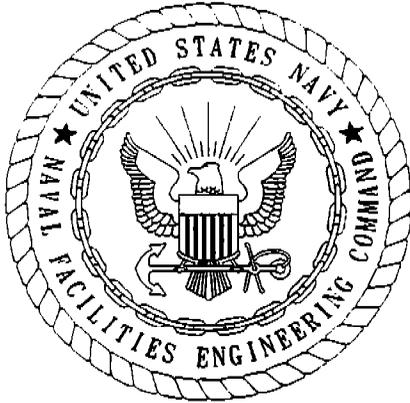
Prepared by:

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

Prepared for:

**Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29419-9010
David Driggers, Code 1852, Engineer-in-Charge**

January 1997



CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

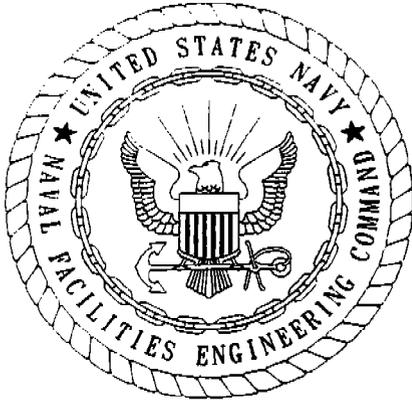
The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/028 are complete and accurate and comply with all requirements of this contract.

DATE: January 15, 1998

NAME AND TITLE OF CERTIFYING OFFICIAL: Terry Hansen, P.G.
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Frank K. Lesesne, P.G.
Project Technical Lead

(DFAR 252.227-7036)

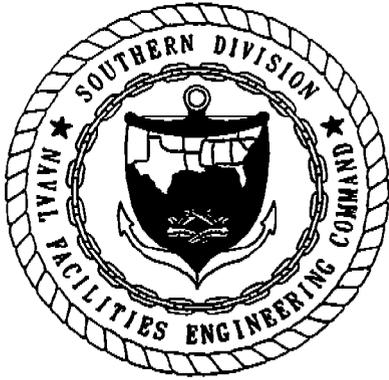


This document, *Implementation Plan Navy Environmental Leadership Program Technology Demonstration for Thermal Desorption of Petroleum-Impacted Soil at Solid Waste Management Units (SWMUs) 6 and 7*, U.S. Naval Station, Mayport, Florida, has been prepared under the direction of a Florida Registered Professional Geologist. The implementation plan rendered in this document was developed in accordance with commonly accepted procedures consistent with applicable standards of practice. The implementation plan is a guide for ABB Environmental Services, Inc., personnel to collect samples and evaluate the demonstration of thermal desorption of petroleum-impacted soil at SWMUs 6 and 7 by Southwest Soil Remediation, Inc.

If site conditions are determined to exist that differ from those described, or the technology demonstration is modified from what is described in the implementation plan, the undersigned geologist should be notified to evaluate the effects of any additional information on the proposed sampling plan presented in this document. This document was prepared for U.S. Naval Station, Mayport, Florida, and should not be construed to apply to any other site.

Frank K. Lesesne
Professional Geologist
State of Florida License No. 1020

Date: _____



FOREWORD

In order to meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Installation Restoration (IR) program. This program complies with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act. The acts, passed by Congress in 1980 and 1986, respectively, established the means to assess and clean up hazardous waste sites for both private-sector and Federal facilities. These acts are the basis for what is commonly known as the Superfund program.

Originally, the Navy's part of this program was called the Navy Assessment and Control of Installation Pollutants (NACIP) program. Early reports reflect the NACIP process and terminology. The Navy eventually adapted the program structure and terminology of the standard IR program.

The IR program is conducted in several stages.

- The preliminary assessment (PA) identifies potential sites through record searches and interviews.
- A site inspection (SI) then confirms which areas contain contamination, constituting actual "sites." (Together, the PA and SI steps were called the initial assessment study under the Navy's old NACIP program.)
- Next, the remedial investigation and the feasibility study (RI/FS) together determine the type and extent of contamination, establish criteria for cleanup, and identify and evaluate any necessary

remedial action alternatives and their costs. As part of the RI/FS, a Risk Assessment identifies potential effects on human health or the environment in order to help evaluate remedial action alternatives.

- The selected alternative is planned and conducted in the remedial design and remedial action stages. Monitoring then ensures the effectiveness of the effort.

A second program to address present hazardous material management is the Resource Conservation and Recovery Act (RCRA) Corrective Action program. This program is designed to identify and clean up releases of hazardous substances at RCRA-permitted facilities. RCRA is the law that ensures that solid and hazardous wastes are managed in an environmentally sound manner. The law applies primarily to facilities that generate or handle hazardous waste.

This program is conducted in three stages.

- The RCRA facility assessment identifies solid waste management units, evaluates the potential for releases of contaminants, and determines the need for future investigations.
- The RCRA facility investigation then determines the nature, extent, and fate of contaminant releases.
- The corrective measures study identifies and recommends measures to correct the release.

The hazardous waste investigations at Naval Station Mayport are presently being conducted under the RCRA Corrective Action program. Earlier preliminary investigations had been conducted at Naval Station Mayport under the Navy's old NACIP program and IR program following Superfund guidelines. In 1988, in coordination with the U.S. Environmental Protection Agency (USEPA) and the Florida Department of Environmental Protection (FDEP), the hazardous waste investigations were formalized under the RCRA program.

Naval Station Mayport is conducting the cleanup at their facility by working through the Southern Division, Naval Facilities Engineering Command. The USEPA and the FDEP oversee the Navy environmental program. All aspects of the program are conducted in compliance with State and Federal regulations, as ensured by the participation of these regulatory agencies.

Questions regarding the RCRA program at Naval Station Mayport should be addressed to Mr. David Driggers, Code 1852, at (803) 743-0501.

EXECUTIVE SUMMARY

As part of the Navy Environmental Leadership program, the Navy contracted Southwest Soil Remediation, Inc. (SSR), of Tucson, Arizona, to conduct a technology demonstration of low temperature thermal desorption (LTTD) of petroleum-contaminated soil at Naval Station Mayport. The demonstration was performed at Solid Waste Management Units (SWMUs) 6 and 7, the Waste Oil Pit, and Sludge Drying Beds. Target treatment levels were set according to Florida Administrative Code (FAC) 62-775, Thermal Treatment Facilities for Petroleum Contaminated Soil. ABB Environmental Services, Inc., collected baseline and performance evaluation soil samples to evaluate the effectiveness of the technology demonstration.

The LTTD technology demonstration appears to have been effective in meeting the requirements of FAC 62-775 for the petroleum-impacted soil at SWMUs 6 and 7. However, there is some uncertainty associated with the lack of documentation (SSR, 1996) concerning whether or not some of the piles were retreated and the results of the retreatment.

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
BTEX	benzene, toluene, ethylbenzene, xylene
CMS	corrective measures study
ESI	expanded site investigation
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
LNAPL	light nonaqueous-phase liquid
LTTD	low temperature thermal desorption
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
NAVSTA	Naval Station
NEESA	Naval Energy and Environment Support Activity
NELP	Navy Environmental Leadership program
NIRP	Navy Installation Restoration program
OWTP	oily waste treatment plant
PAH	polynuclear aromatic hydrocarbon
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
SSR	Southwest Soil Remediation, Inc.
SWMU	solid waste management unit
TRPH	total recoverable petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
VOA	volatile organic aromatic
VOH	volatile organic halocarbon

1.0 INTRODUCTION

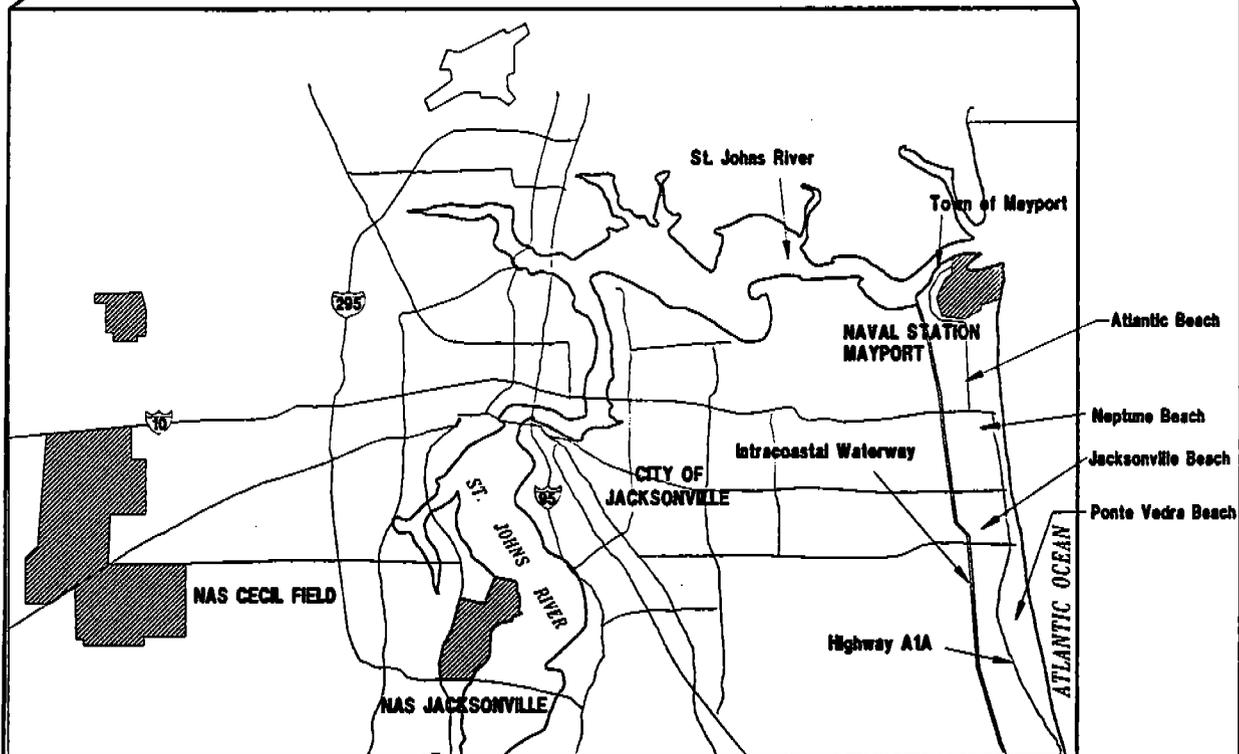
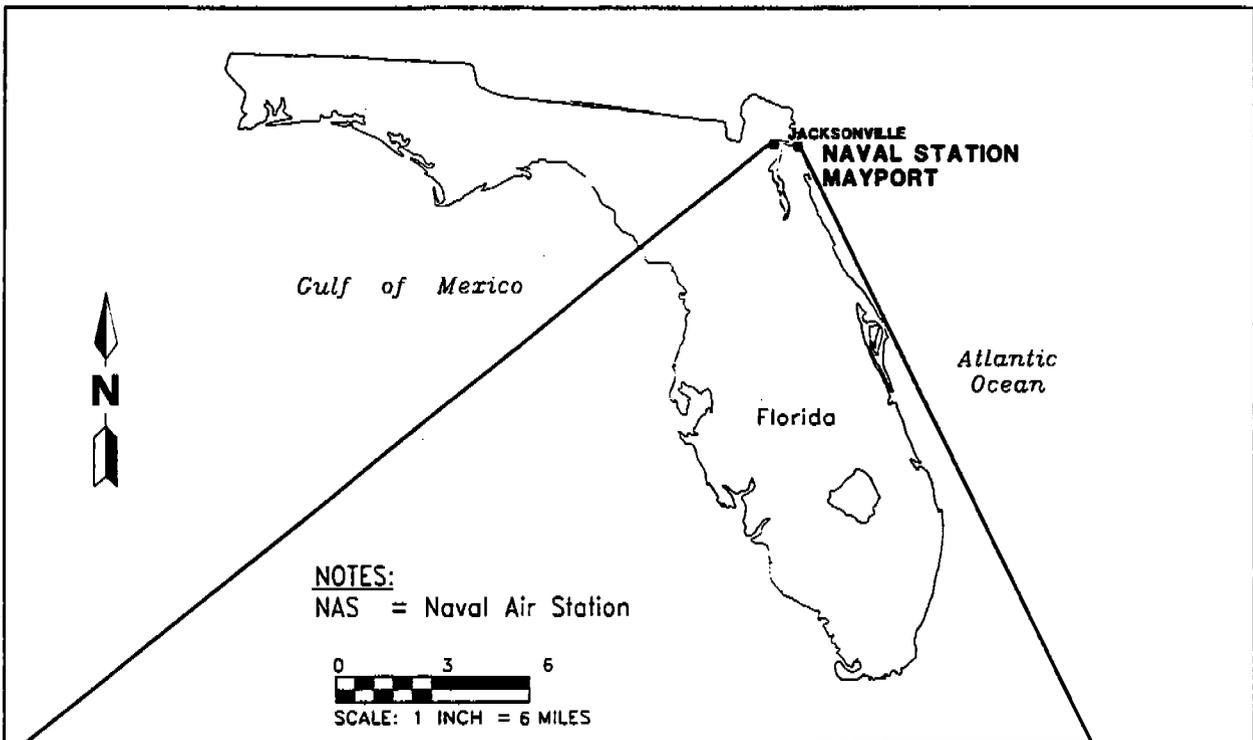
A technology demonstration was conducted under the Navy Environmental Leadership program (NELP) by Southwest Soil Remediation, Inc. (SSR), of Tucson, Arizona, to conduct thermal desorption of petroleum-impacted soil and related organic compounds at Solid Waste Management Units (SWMUs) 6 and 7 at U.S. Naval Station (NAVSTA), Mayport, Florida (Figures 1-1 and 1-2). NELP was created to promote the use of new and innovative technologies in the areas of compliance, conservation, cleanup, and pollution prevention within the Navy. NAVSTA Mayport was selected to participate in NELP because activities at this station are representative of similar activities at other naval stations.

ABB Environmental Services, Inc. (ABB-ES), was contracted by the Department of the Navy, Southern Division, Naval Facilities Engineering Command to provide technical oversight for the technology demonstration at SWMUs 6 and 7.

1.1 SITE DESCRIPTION AND BACKGROUND, SWMUs 6 AND 7. SWMU 6 (Waste Oil Pit) is located beneath the westernmost sludge drying bed (SWMU 7) of the oily waste treatment plant (OWTP) (Figure 1-3). Historical information concerning the operation of SWMUs 6 and 7 was obtained from the Resource Conservation and Recovery Act (RCRA) facility assessment conducted by A.T. Kearney in 1989 on behalf of the U.S. Environmental Protection Agency (USEPA). SWMU 6 was operated in the 1970s as an unlined pit for bilge water that contained oily wastes. The pit was excavated to a depth of approximately 6 feet beneath the land surface. Bilge water was pumped directly from the ships berthed at Mayport Turning Basin into the pit. Waste oil placed in SWMU 6 may have contained other substances such as solvents and transformer oils. Bilge water or oily wastes placed in SWMU 6 seeped into the underlying soils. Estimates indicate that over 250,000 gallons of bilge water and several thousand gallons of waste oil were disposed of in the pit (A.T. Kearney, 1989). In 1979, SWMU 6 was filled and covered; the westernmost sludge drying bed at SWMU 7 was constructed over the central and southern part of SWMU 6 (Figure 1-3) (A.T. Kearney, 1989).

SWMUs 6 was constructed to receive bilge water directly from ships berthed at NAVSTA Mayport. SWMU 7 was constructed to replace SWMU 6 and initially received petroleum hydrocarbons and related chemicals that settled (as sludge) to the bottom of bilge water receiving tanks (the three tanks are part of SWMU 51, Figure 1-2). Each sludge drying bed is about 150 feet in length and 50 feet wide, unlined, and enclosed by an earthen berm. When these holding tanks were at capacity, bilge water overflow was pumped directly into the sludge drying beds. Subsequently, the OWTP was constructed, and SWMU 7 received sludge at the OWTP. Anecdotal information suggests that the drying beds received approximately 3,000 gallons of sludge a week while the OWTP was in operation (A.T. Kearney, 1989). Figures 1-2 and 1-3 show the location and general features of SWMUs 6 and 7.

An initial assessment study, conducted as part of the Navy Installation Restoration program (NIRP), identified SWMU 6 as a NIRP site based on the potential for the bilge water to have been released to the environment and recommended an expanded site investigation (ESI) (Environmental Science and Engineering, Inc., 1986). SWMU 7 was not identified as a NIRP site. An ESI was conducted in 1988 for SWMU 6, which included the collection of soil and ground-



NOTES: SWMU = Solid Waste Management Unit; NELP = Navy Environmental Leadership Program

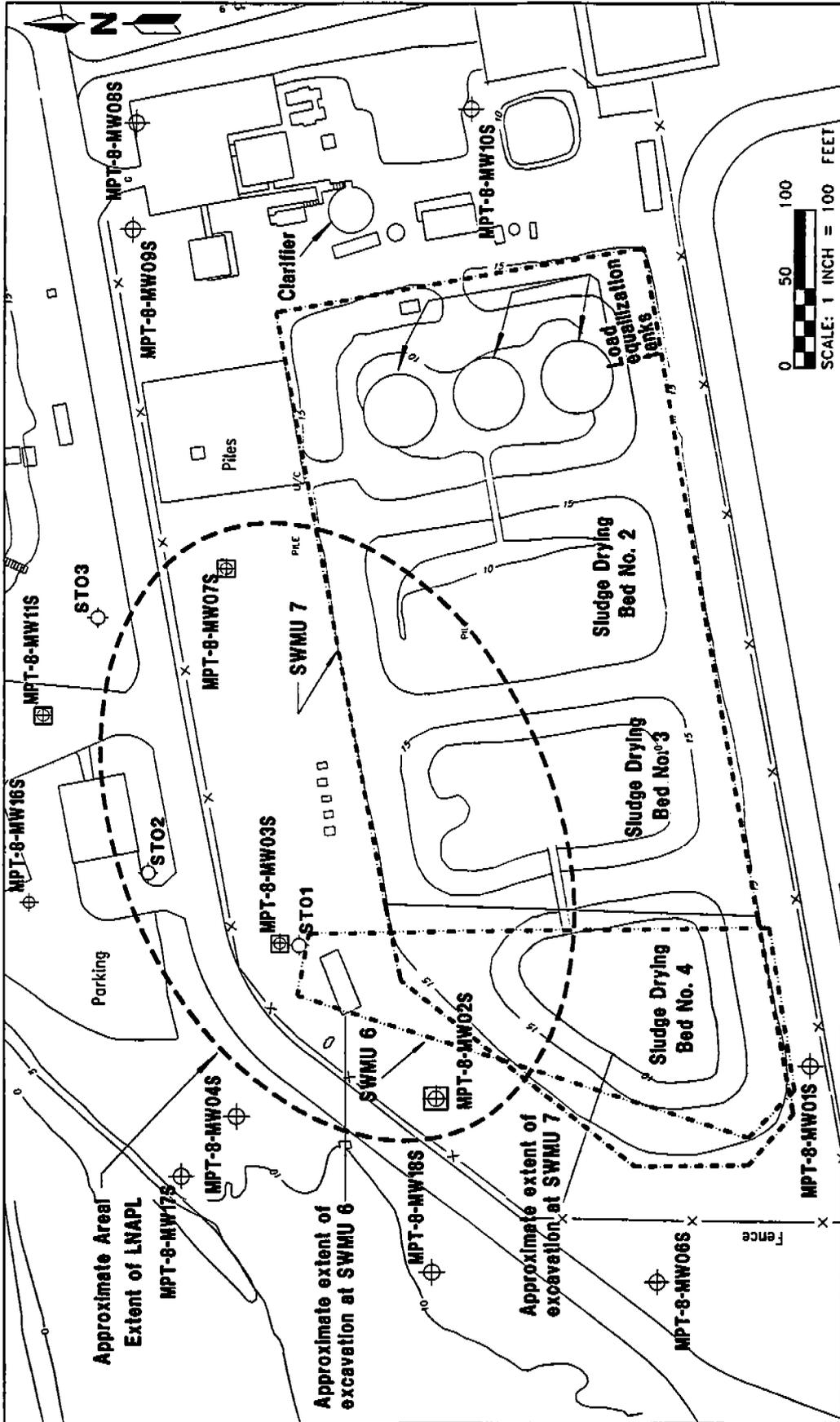
**FIGURE 1-1
FACILITY LOCATION MAP**



**NELP TECHNOLOGY EVALUATION
REPORT, SWMUs 6 AND 7**

**U.S. NAVAL STATION
MAYPORT, FLORIDA**

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**HELP TECHNOLOGY EVALUATION
REPORT, SWMUs 6 AND 7**

**U.S. NAVAL STATION
MAYPORT, FLORIDA**



**FIGURE 1-3
SOLID WASTE MANAGEMENT UNITS
(SWMUs) 6 AND 7
GENERAL SITE FEATURES**

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LEGEND

- Approximate SWMU location
- ⊕ Monitoring well location and designation
- ⊕ Monitoring well and designation containing light nonaqueous-phase liquid (LNAPL)
- ⊕ Recovery sump location and designation
- HELP Navy Environmental Leadership Program

water samples. During the ESI, light nonaqueous-phase liquid (LNAPL), related to petroleum products, was found on the water table hydraulically downgradient of SWMU 6 (E.C. Jordan, 1988). Both SWMUs 6 and 7 were identified in the Hazardous and Solid Waste Amendments permit for NAVSTA Mayport as requiring an RCRA facility investigation (RFI).

An RFI was completed for SWMUs 6 and 7 in 1994 (ABB-ES, 1995a). The results of the RFI for SWMUs 6 and 7 suggest that petroleum-related products have been released at these SWMUs and are contributing to the presence of LNAPL hydraulically downgradient of the SWMUs. SWMU 6 was identified as the primary source of the LNAPL, as petroleum was often released directly to the unlined waste oil pit.

A corrective measures study (CMS) for SWMUs 6 and 7 identified a corrective action objective to eliminate petroleum-impacted soil at SWMUs 6 and 7 that contributes to the presence of LNAPL (ABB-ES, 1995b). During the selection and evaluation of corrective action alternatives for the CMS, the NELP technology demonstration was taken into consideration.

1.2 TREATMENT LEVELS FOR SOIL CONTAINING PETROLEUM-RELATED PRODUCTS AT SWMUs 6 AND 7. Because remedial activities were planned at SWMUs 6 and 7, a human health and ecological risk assessment for exposure to petroleum-impacted soil was not conducted; therefore, no remedial goal options were selected.

Target treatment levels selected in the CMS for petroleum-impacted soil at SWMUs 6 and 7 were based on the Florida Department of Environmental Protection (FDEP) regulation, *Thermal Treatment Facilities for Petroleum Contaminated Soil*, Florida Administrative Code (FAC) 62-775. This regulation provides treatment standards for soil containing petroleum-related products when thermal treatment is used (ABB-ES, 1995b). Table 1-1 shows the treatment levels that thermal treatment must achieve based on FAC 62-775.

1.3 VOLUME OF SOIL CONTAINING PETROLEUM-RELATED PRODUCTS AT SWMUs 6 AND 7. The volume of soil containing petroleum-related products was calculated as part of the CMS. Appendix A provides detailed information on these calculations. In summary, the volume of soil containing petroleum-related products at SWMUs 6 and 7 was calculated using the following assumptions:

- Soil in the vadose zone at the sludge drying beds is contaminated with petroleum hydrocarbons.
- Soil berms surrounding the sludge drying beds are not contaminated.
- SWMU 6 was backfilled with clean soil to a depth of 3 feet and, therefore, is not contaminated (except where SWMU 7 overlaps).
- Petroleum-impacted soil disposed of in the easternmost sludge drying bed was excavated and placed in the adjacent sludge drying bed during construction of the load equalization tanks in 1989. Therefore, the easternmost sludge drying bed is not contaminated.

**Table 1-1
Target Treatment Levels for Soil Based on
Thermal Treatment of Petroleum-Contaminated Soil**

Navy Environmental Leadership Program
Technology Demonstration for Thermal Desorption at SWMUs 6 and 7
U.S. Naval Station
Mayport, Florida

Constituent	Target Treatment Level ¹
Total recoverable petroleum hydrocarbons	² 50
Volatile organic aromatics (BTEX)	³ 100
Volatile organic halocarbons	³ 50
Polynuclear aromatic hydrocarbons	³ 1,000
Arsenic	10
Barium	4,940
Cadmium	37
Chromium	50
Lead	108
Mercury	23
Selenium	389
Silver	353

¹ Target treatment levels are specified in the Florida Administrative Code (FAC) 62-775. The values are in milligrams per kilogram (mg/kg) unless noted otherwise.

² If total recoverable petroleum hydrocarbons are below 10 mg/kg, polynuclear aromatic hydrocarbons and volatile organic halocarbons do not have to meet the target treatment levels listed in this table, as per FAC 62-775.

³ Micrograms per kilogram.

Notes: SWMU = solid waste management unit.
BTEX = benzene, toluene, ethylbenzene, and xylene.

The total volume of soil containing petroleum-related products at SWMUs 6 and 7 was estimated to be 29,800 cubic yards or approximately 35,200 tons (ABB-ES, 1995b).

1.4 TECHNOLOGY EVALUATION REPORT CONTENTS. This Technology Evaluation Report includes the following:

- a description of the technology demonstrated;
- a summary of operations and sampling performed by SSR during the demonstration;
- a description of technical oversight activities performed by ABB-ES, including photographs, observations, and analytical results;
- an evaluation of the technology demonstration by comparison of analytical results to target treatment levels;
- and finally, conclusions based on findings from the technology demonstration.

2.0 SUMMARY OF TECHNOLOGY DEMONSTRATION AT SWMUs 6 AND 7

Through NELP, the Navy proposed to demonstrate low temperature thermal desorption (LTTD) of soil containing petroleum-related products at SWMUs 6 and 7 (SSR, 1995). SSR was contracted by the Navy to perform this demonstration. Photographs of the technology demonstration activities are provided in Appendix B.

This chapter includes an overview of the technology demonstration and description of the sampling activities conducted by both SSR and ABB-ES during the technology demonstration.

2.1 SSR's TECHNOLOGY DEMONSTRATION ACTIVITIES. SSR excavated approximately 2,400 tons of soil containing petroleum-related products from SWMUs 6 and 7. Soil containing petroleum-related products was excavated from two areas. Approximately 1,920 tons were excavated from the SWMU 7 sludge drying bed, and approximately 480 tons were excavated north of SWMU 7 in an area that formerly was within SWMU 6 (Figure 2-1).

Prior to conducting full-scale operations, a small-scale treatability test of the LTTD unit was conducted on April 15 and 16, 1996. Approximately 100 tons of petroleum-impacted soil (five 20-ton stockpiles) was treated during a 12-hour period. The soil was tested in batches of 20 tons to ensure that the unit produced soil meeting the thermal desorption target treatment levels (Table 1-1).

SSR uses the operating parameters determined from the treatability test to determine the most effective settings to operate during full treatment. The LTTD unit went to full-scale (24 hours per day) operation on April 17, 1996. Treatment of the remaining 2,300 tons of petroleum-impacted soil and retreatment of the treatability tested soil occurred during full-scale operation from April 17 through May 4, 1996 (SSR, 1996).

Treated soil was placed in a storage area designed to hold 1,500 tons. The treated soil was stored in individual 100-ton stock piles until treatment was confirmed by chemical analysis. Please refer to SSR's *Summary Report, Naval Station, Mayport, Florida, Oily Waste Treatment Plant, SWMU No. 6 and 7* (1996), for details on the petroleum-impacted soil excavation and operation of the LTTD unit.

SSR collected soil samples, prior to and during the demonstration, to monitor the performance of the LTTD unit and to meet the requirements of FAC 62-775. Please refer to SSR's *Summary Report, Naval Station, Mayport, Florida, Oily Waste Treatment Plant, SWMU No. 6 and 7* (1996), for details on the soil sampling and analysis program conducted by SSR.

2.2 TECHNOLOGY DEMONSTRATION OVERSIGHT. ABB-ES provided technical oversight of the NELP technology demonstration contractor, SSR. ABB-ES was on site during the technology demonstration to observe the contractor's activities, which include the following:

- site preparation,
- construction of the LTTD,
- operation and maintenance activities, and
- soil sampling.

Site Preparation. Site preparation at SWMUs 6 and 7 commenced on April 2, 1996, and included the construction of soil storage cells, soil excavation, and soil stockpiling prior to setup of the LTTD unit. The storage cells were constructed on an asphalt parking lot located south of SWMUs 6 and 7 and less than 50 feet from the LTTD unit (Figure 2-1).

SSR personnel used a trackmounted back-hoe and front-end loader to excavate and transport soil from the SWMU 7 sludge bed to the soil storage cell. Soil from the SWMU 7 sludge bed berm, assumed to be clean, was used to construct the containment berms for the storage cells. Two separate storage cells were constructed and lined with 10-mil plastic, one for petroleum-impacted soil, and one for "clean soil" or treated soil that might require retreatment.

After completion of the soil storage cells, SSR excavated approximately 960 tons of petroleum-impacted soil from the SWMU 7 sludge bed. The excavated materials were transported and stockpiled within the designated storage cell, which was constructed to store approximately 2,000 tons of soil. The excavation depths ranged from 3 to 5 feet beneath the bottom of the sludge drying bed. The materials excavated included sand intermixed with oyster shells.

Five 20-ton stockpiles were created for a treatability test trial burn. The remainder of the excavated material was placed in an 860-ton stockpile. Please refer to SSR's *Summary Report, Naval Station, Mayport, Florida, Oily Waste Treatment Plant, SWMU No. 6 and 7 (1996)*, for details on the excavation of petroleum-impacted soil.

Construction of the LTTD. Construction commenced on April 4, 1996, and included the assembly of the LTTD unit. The LTTD unit consisted of two main operating units: the primary treatment unit that included the feeder bin, rotary dryer, and baghouse and the secondary treatment unit that included the thermal oxidizer and air stack assembly.

The treatment unit of the thermal desorber is a rotary dryer that is 4 feet in diameter and 20 feet long. Typically, soil is treated at 600 to 700 degrees Fahrenheit and is cooled to 300 to 450 degrees Fahrenheit upon exiting with water. The other unit treats exhaust gases that contain particulates and volatile organic compounds. Exhaust gas was treated by collecting particulate in a pulse jet baghouse, and the gas portion was treated in a thermal oxidizer. The thermal oxidizer operates at 1,300 to 2,000 degrees Fahrenheit with a residence time of one second.

The two units were mobilized separately and then assembled at the site prior to testing and operation. Please refer to SSR's *Summary Report, Naval Station, Mayport, Florida, Oily Waste Treatment Plant, SWMU No. 6 and 7 (1996)*, for details on the LTTD unit set up.

Operation and Maintenance Activities. Operation and Maintenance of the LTTD unit commenced on April 15, 1996, with a treatability test trial burn and continued at full-scale operation until completion of the technology demonstration on May

4, 1996. During the treatability test, the soil was treated at different feed rates and temperatures to determine the optimum feed rate and temperature for full-scale treatment. The treatability test of the five 20-ton stockpiles was conducted over a 12-hour period. The feed rates varied from approximately 6 to 10 tons per hour and achieved soil temperatures of 690 to 725 degrees Fahrenheit (SSR, 1996). Treatability test results indicated that higher temperatures would be required for full scale operation because of the higher than expected moisture content and the amount of oyster shells incorporated into the soil matrix.

Daily operation under full-scale 24-hour-a-day operations began on April 17, 1996. Full-scale operations included continued soil excavation using the excavator/front-end loader, stockpiling soil, and operation of the LTTD unit. Additionally, soil treated during the treatability testing was retreated to ensure complete treatment.

The feed rate for the full-scale operation ranged from 6 to 9 tons per hour during full-scale operation. This feed rate resulted in the creation of three 100-ton stockpiles of treated soil each day. The stockpiles were marked to track analytical results to assess whether or not the treatment criteria were met.

The temperatures achieved during full-scale operation generally ranged from 740 to 1,000 degrees Fahrenheit (SSR, 1996).

SSR also screened out material that had a size greater than a 2-inch-square mesh. The material was placed in a roll-off container that was supplied by the Navy. Approximately 1/3 of a ton of material was screened out. Disposal of this material was the responsibility of the Navy.

Site maintenance included general organization and site cleanup, which included keeping the storage cells in good condition, replacing 10-mil plastic when necessary, and keeping the work area near the LTTD feeder bin free of objects and debris that might interfere with loader operations. Maintenance of the LTTD unit included general daily maintenance and system checks to ensure the unit and other necessary equipment were in proper working order. Please refer to SSR's *Summary Report, Naval Station, Mayport, Florida, Oily Waste Treatment Plant, SWMU No. 6 and 7* (1996), for details on the operation and maintenance of the LTTD unit.

Soil Sampling. SSR collected soil samples to monitor and assess the performance of the LTTD unit. SSR collected soil samples before and during the NELP technology demonstration as required under FAC 62-775. SSR collected pretreatment soil samples to evaluate concentrations of organics, inorganics, and total recoverable petroleum hydrocarbons (TRPH) in the petroleum-impacted soil.

SSR collected one grab sample every hour and composited these grabs every 8 hours (SSR, 1996).

SSR also collected samples during the technology demonstration to evaluate the operation of the LTTD and to ensure that the treated soil met the requirements of FAC 62-775. Treated soil was stockpiled on site (approximately 70- to 80-ton stockpiles) until SSR verified through sample analysis that the treated soil met the thermal desorption target treatment levels.

The ABB-ES soil sampling and analysis program consisted of two parts: the collection of baseline (pretreatment) soil samples, and the collection of

performance evaluation (posttreatment) samples that were then compared to the treatment criteria specified under FAC 62-775.

2.2.1 Baseline Soil Sampling. Baseline soil samples were collected prior to SSR conducting the treatability test portion of the technology demonstration. Five composite samples were collected for the first 1,400 tons of petroleum-impacted soil to be treated, and an additional composite sample was collected for each 700 tons thereafter (SSR treated approximately 2,400 tons of soil), as required by FAC 62-775. Based on these criteria, seven composite soil samples were collected (MPT-7-SS01 through MPT-7-SS07) prior to the treatability test. The calculation for determining the number of soil samples is provided in Appendix C.

Each composite soil sample consisted of four discreet grab samples taken from locations randomly distributed throughout the five 100-ton stockpiles and the 860-ton stockpile. The grab samples were collected at a minimum depth of 6 inches below the surface of the petroleum-impacted soil stockpiles.

2.2.2 Performance Evaluation Sampling of Treated Soil. Performance evaluation soil samples were collected to assess whether or not thermal desorption had achieved target treatment levels specified in FAC 62-775.

ABB-ES collected soil samples from the treated soil stockpiles to assess whether or not the thermal desorption target treatment levels had been achieved. The following information and parameters were used to determine the number of samples.

- The LTTD unit, when at full scale, operated for 24 hours per day at an average throughput rate of 7 to 9 tons per hour (approximately 200 tons per day).
- Approximately 2,400 tons of soil were treated in 17 days during this demonstration.

The *Guidelines for Assessment and Remediation of Petroleum Contaminated Soil* (FDEP, 1994) stipulates that a grab sample should be collected every 50 tons of treated soil and composited every 400 tons. ABB-ES collected one composite sample for every 400 tons of treated soil designated as achieving target treatment levels by SSR. Each composite consisted of eight grab samples: one to two grab samples collected from each 56- to 72-ton stockpile. Based on the above criteria, eight performance evaluation (posttreatment) samples (MPT-7-SS8 through MPT-7-SS15) and one duplicate were collected by ABB-ES.

2.2.3 Sampling Procedures. The methodology for soil sample collection was consistent with standard operating procedures described in the NAVSTA Mayport RFI workplan (ABB-ES, 1991), the NAVSTA Mayport General Information Report (ABB-ES, 1995c), and USEPA Region IV standard operating procedures (USEPA, 1991).

The grab samples were collected using a decontaminated stainless-steel hand auger. Soil from the stainless-steel hand auger was transferred to a glass (Pyrex™) bowl using a stainless-steel spoon. Once all necessary grab samples had been collected for a corresponding composite sample, grab samples were homogenized and transferred to an appropriate sample container. The soil samples were placed in a cooler with ice and shipped by express-overnight delivery to a

Naval Energy and Environment Support Activity (NEESA)-approved laboratory under chain-of-custody protocol.

2.2.4 Analytical Program. The baseline samples were analyzed for volatile organic aromatics (VOAs, which include benzene, toluene, ethylbenzene, and xylenes [BTEX]), volatile organic halocarbons (VOHs), polynuclear aromatic hydrocarbons (PAHs), total organic halides, metals (total), and TRPH using appropriate test methods.

The performance evaluation soil samples were analyzed for VOAs, PAHs, total organic halides, metals (total), and TRPH as stated in FAC 62-775.

The soil samples were analyzed using SW-846 methods for organics, inorganics, and TRPH contained in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, USEPA SW846 (USEPA, 1986). The analytical data package produced by the laboratory was NEESA Level C.

NEESA Level C was used to provide analytical data that could be validated substituting the SW-846 method criteria for USEPA's Contract Laboratory Program method criteria using National Functional Guidelines for Organic Data Review (USEPA, 1990). The data have been validated so that appropriate decisions were made as to whether or not soil at the site should be further evaluated by the CMS under NAVSTA Mayport's RCRA Corrective Action program. Summaries of the analytical data are provided in Appendix D, and data validation reports are provided in Appendix E. A copy of the ABB-ES site logbook containing all oversight activities is provided in Appendix F.

3.0 RESULTS AND EVALUATION OF TECHNOLOGY DEMONSTRATION SAMPLING

This chapter presents analytical results from baseline and performance sampling events and an evaluation of the results relative to the thermal desorption target treatment goals.

3.1 ANALYTICAL RESULTS. Below is a general overview of analytical results for soil samples collected during the baseline and performance evaluation sampling events.

Baseline Composite Soil Sampling. VOHs, PAHs, and total organic halides (halogenated organic chemicals such as solvents), if present, were not detected at concentrations exceeding the detection limit. Two VOAs, ethylbenzene, and xylenes were detected in the baseline soil samples (Table 3-1). Ethylbenzene was detected at concentrations ranging from 9.3 to 100 micrograms per kilogram ($\mu\text{g}/\text{kg}$), and xylenes (total) were detected at concentrations ranging from 26 to 62 $\mu\text{g}/\text{kg}$. Seven inorganic analytes (arsenic, barium, cadmium, chromium, lead, mercury, and selenium) were detected in the baseline composite soil samples. TRPH was detected at concentrations ranging from 3,540 to 10,900 milligrams per kilogram (mg/kg) in the baseline composite soil samples.

The analytical results for total organic halides suggest that hazardous substances that are not allowed to be treated by thermal desorption, if present, are not at concentrations that would preclude the use of thermal desorption to remediate the soil.

Prior to treatment, two of the baseline soil samples (MPT-7-SS02, and MPT-7-SS06) contained VOAs (ethylbenzene and xylenes) (Table 3-1) at concentrations that exceeded the thermal desorption treatment criteria (Table 1-1). Each of the soil samples contained TRPH at concentrations that exceeded the thermal desorption treatment criteria. The baseline analytical results were compared to the treatment levels to identify which petroleum-related constituents exceeded the treatment criteria and should also be evaluated in the performance samples.

Performance Composite Soil Sampling. VOAs (BTEX), if present, were not detected at concentrations that exceeded the detection limit. A PAH, naphthalene, was detected in a performance evaluation soil sample (MPT-7-SS10) (Table 3-2). Six inorganic analytes (arsenic, barium, chromium, lead, mercury, and silver) were detected in the performance evaluation soil samples. TRPH was detected at concentrations ranging from 16.9 to 46.1 mg/kg in five of the performance evaluation soil samples.

None of the target analytes were detected at concentrations that exceeded the thermal desorption treatment criteria (Table 1-1).

Table 3-1
Summary of Analytes Detected in Pretreatment Soil Samples at SWMUs 6 and 7

Navy Environmental Leadership Program
Technology Demonstration for Thermal Desorption at SWMUs 6 and 7
U.S. Naval Station
Mayport, Florida

Analytical Batch Number:	MA660	MA660	MA660	MA719	MA719	MA719	MA830	MA830	MA830	MA865
Sample Location:	MPT-7-SS01	MPT-7-SS01	MPT-7-SS02	MPT-7-SS02	MPT-7-SS03	MPT-7-SS04	MPT-7-SS05	MPT-7-SS06	MPT-7-SS07	
Sample Number:	07S00101	07S00101D	07S00201	07S00301	07S00301	07S00401	07S00501	07S00601	07S00701	
Date Sampled:	04-APR-96	04-APR-96	05-APR-96	12-APR-96	12-APR-96	12-APR-96	17-APR-96	25-APR-96	01-MAY-96	
Volatile Organic Compounds (µg/kg)										
Ethylbenzene	13	12	100	9.3	--	--	--	78	--	--
Xylenes	64	59	57	48	--	--	--	26	--	--
VOAs	77	71	157	57.3	--	--	--	104	--	--
Inorganic Analytes (mg/kg)										
Arsenic	0.33 J	--	1 J	1.2 J	2.3	0.61 J	0.45 J	0.45 J	--	--
Barium	7.4 J	8.3 J	8.8 J	7 J	6.8 J	9.5 J	3.7 J	3.7 J	6.3 J	6.3 J
Cadmium	--	--	--	0.44 J	--	--	--	--	--	--
Chromium	--	4.1	4.6	4.1	3.1	4.7	--	--	2.9	2.9
Lead	4.7 J	4.5 J	5.5 J	5.8 J	5.4 J	4.6 J	0.99 J	0.99 J	2.4 J	2.4 J
Mercury	0.09 J	0.75	--	--	--	0.08 J	--	--	--	--
Selenium	--	0.29 J	--	--	--	--	--	--	--	--
Total Recoverable Petroleum Hydrocarbons (TRPH) (mg/kg)										
TRPH	11,500	10,300	10,200	6,410	10,300	8,020	10,200	3,540		

Notes: SWMU = solid waste management unit.

D = duplicate.

µg/kg = micrograms per kilogram.

-- = analyte not detected

VOAs = the total concentrations for benzene, toluene, ethylbenzene, and xylenes.

mg/kg = milligrams per kilogram.

J = estimated value.

**Table 3-2
Summary of Analytes Detected in Posttreatment Soil Samples at SWMUs 6 and 7**

Navy Environmental Leadership Program
Technology Demonstration for Thermal Desorption at SWMUs 6 and 7
U.S. Naval Station
Mayport, Florida

Analytical Batch Number:	MA752	MA781	MA781	MA802	MA802	MA802	MA831	MA866	MA866	MA866
Sample Location:	MPT-7-SS08	MPT-7-SS09	MPT-7-SS09	MPT-7-SS10	MPT-7-SS10	MPT-7-SS11	MPT-7-SS12	MPT-7-SS13	MPT-7-SS14	MPT-7-SS15
Sample Number:	07S00801	07S00901	07S00901D	07S01001	07S01001	07S01101	07S01201	07S01301	07S01401	07S01501
Date Sampled:	16-APR-96	19-APR-96	19-APR-96	23-APR-96	23-APR-96	23-APR-96	26-APR-96	01-MAY-96	02-MAY-96	06-MAY-96
Polynuclear Aromatic Hydrocarbons (µg/kg)										
Naphthalene	--	--	--	--	54	54	--	--	--	--
PAHs (Total)	--	--	--	--	54	54	--	--	--	--
Inorganic Analytes (mg/kg)										
Arsenic	0.72 J	0.63 J	0.75 J	0.54 J	0.43 J	0.68 J	--	--	--	--
Barium	10.1 J	9.7 J	9.5 J	8.2 J	8 J	7.3 J	6.6 J	6.4 J	7.4 J	3.1
Chromium	4.1	5.1	4	3.4	3.1	3.2	2.6	2.9 J	2.7	4.1 J
Lead	6.7	4.6	5	2.6	4	5.7 J	2.9 J	0.05 J	0.05 J	--
Mercury	--	--	--	0.04 J	0.06 J	0.05 J	--	--	--	--
Silver	--	--	0.74 J	--	--	--	--	--	--	--
Total Recoverable Petroleum Hydrocarbons (TRPH) (mg/kg)	53.2	39	41.3	42.7	19.7	16.9 J	--	--	--	--
TRPH										

Notes: SWMU = solid waste management unit.

D = duplicate.

µg/kg = micrograms per kilogram.

-- = analyte not detected.

PAH = polynuclear aromatic hydrocarbons.

mg/kg = milligrams per kilogram.

J = estimated value.

4.0 EVALUATION OF TECHNOLOGY DEMONSTRATION

SSR collected soil samples to conduct a pretreatment analysis and to assess the treatability test and posttreatment of the petroleum-impacted soil during the full-scale demonstration. Below is a discussion of the three sampling events conducted by SSR.

Pretreatment Analysis. SSR stated in their report that total organic halides were not detected in their pretreatment soil samples (SSR, 1996). This is consistent with the analytical results of pretreatment samples collected by ABB-ES. The two analyses support the assumption that hazardous substances that are not allowed to be treated by thermal desorption, if present, are not at concentrations that would preclude the use of thermal desorption to remediate the soil.

Xylenes, TRPH, and arsenic, barium, cadmium, chromium, lead, mercury and selenium were detected in SSR's pretreatment soil samples (Table 4-1). The pretreatment analytical results were compared to the treatment levels to identify which petroleum-related constituents exceeded the treatment criteria and should also be evaluated in the posttreatment samples. Xylenes were detected in four of the pretreatment soil samples at concentrations that were not in compliance with the thermal desorption cleanup level for total volatile organics (Tables 1-1 and 4-1). The thermal desorption criteria for TRPH were also not met for each of the soil samples. The analytical results for the inorganic analytes suggest that they are in conformance with the thermal desorption criteria.

Treatability Testing. The treatability test results suggest that the thermal desorption unit is capable of treating the petroleum-impacted soil to levels that are in conformance with the thermal desorption criteria (Table 4-2). One soil pile, C-5, had to be retreated because the criteria for TRPH were not met. After retreatment, the TRPH results were in conformance with the thermal desorption criteria (SSR, 1996).

Full-Scale Treatment. Posttreatment analytical results suggest that 10 of 54 treated piles did not meet the thermal desorption treatment criteria for total volatile organics, and 7 of 54 piles did not meet the criteria for TRPH (Table 4-3). Entries in the operator's log indicate that six of the soil piles were retreated. The soil piles were indicated to have been moved back to and remixed with the pretreatment material.

With the exception of soil pile C-7, there is no record that specifically indicates when a pile was retreated and what the new number is for such a pile. Analytical results for pile C-7 suggest that the thermal desorption criteria for total volatile organics and TRPH were not met. However, the sample was reanalyzed for halogenated organics, which were not detected in the previous sample, rather than volatile aromatics BTEX and TRPH.

**Table 4-1
Pretreatment Analytical Results¹**

Navy Environmental Leadership Program
Technology Demonstration for Thermal Desorption at SWMUs 6 and 7
U.S. Naval Station
Mayport, Florida

Sample Number	Analytical Results												
	Benzene	Toluene	Ethylbenzene	Xylenes (µg/kg)	TRPH (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)
1	--	--	--	130	6,288	--	--	--	1.9	1.2	0.11	--	--
2	--	--	--	115	2,463	--	--	--	1.4	1.1	0.12	--	--
3	--	--	--	70	3,350	--	--	--	1.6	--	0.04	--	--
4	--	--	--	--	3,038	--	--	--	1.6	1.4	0.07	--	--
5	--	--	--	80	10,475	2.3	57.3	3.1	38.3	55.8	5.6	--	--
6	--	--	--	--	9,988	--	--	--	2.5	1.5	0.04	--	--
7	--	--	--	--	9,450	2	--	--	1.9	1.2	0.02	--	--
8	--	--	--	--	4,588	--	--	--	8.74	14.4	0.122	--	--
9	--	--	--	160	10,563	--	--	--	3.98	4.41	0.062	--	--
10	--	--	--	130	7,788	--	--	--	2.6	--	0.02	--	--
11	--	--	--	90	838	--	4.4	--	1.8	--	0.027	1.3	--
13 ²	--	--	--	--	13,550	--	--	--	--	--	--	--	--
Cleanup Level ³	³ 100	³ 100	³ 100	⁴ 100	10	10	490	37	50	108	23	389	353

¹ Analytical results are from Southwest Soil Remediation, Inc. (SSR), report *Summary Report Mayport Naval Station, City Waste Treatment Plant SWMUs 6 and 7 (1996)*.

² Sample number 12 was not analyzed (SSR, 1996).

³ Thermal desorption cleanup levels for soil under Florida Administrative Code 62-775.400.

⁴ The cleanup level is for the total concentrations of benzene, toluene, ethylbenzene, and xylenes.

Notes: SWMU = solid waste management unit.

µg/kg = micrograms per kilogram.

mg/kg = milligrams per kilogram.

-- = concentration of analyte, if present, was less than the detection limit.

Table 4-2
Treatability Test Analytical Results¹
Navy Environmental Leadership Program
Technology Demonstration for Thermal Desorption at SWMUs 6 and 7
U.S. Naval Station
Mayport, Florida

Sample Number	Analytical Results													
	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Xylenes (µg/kg)	Total BTEX (µg/kg)	TRPH (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)
C-1	15	20	--	--	35	--	--	--	--	2.2	1.8	--	--	--
C-2	20	25	5	5	55	--	--	--	--	1.5	--	--	--	--
C-3	15	30	5	5	55	--	--	--	--	2.1	2	--	--	--
C-4	15	20	--	--	35	--	--	--	--	2.5	2.9	--	--	--
² C-5	20	35	5	5	65	³ 13	--	--	--	3.3	3.5	--	--	--
Cleanup Level ³	⁴ 100	⁴ 100	⁴ 100	⁴ 100	⁴ 100	10	10	490	37	50	108	23	389	353

¹ Analytical results are from Southwest Soil Remediation, Inc., report *Summary Report Mayport Naval Station, Oil Waste Treatment Plant SWMUs 6 and 7 (1996)*.

² Stockpile C-5 was returned and resampled. After treatment, the concentration of TRPH was less than 5 mg/kg.

³ Thermal desorption cleanup levels for soil under Florida Administrative Code 62-775.400.

⁴ The cleanup level is for the total concentrations of BTEX.

Notes: SWMU = solid waste management unit.
BTEX = benzene, toluene, ethylbenzene, and xylenes.
TRPH = total recoverable petroleum hydrocarbons.
µg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
-- = concentration of analyte, if present, was less than the detection limit.

**Table 4-3
Posttreatment Analytical Results'**

Navy Environmental Leadership Program
Technology Demonstration for Thermal Desorption at SWMUs 6 and 7
U.S. Naval Station
Mayport, Florida

Sample Number	Analytical Results													
	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Xylenes (µg/kg)	Total BTEX (µg/kg)	TRPH (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)
C-6	30	50	--	--	80	--	--	--	--	2.6	3.4	--	--	--
¹ C-7	20	40	20	30	110	16	--	--	--	3	3.3	--	--	--
C-7 Retest	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
C-8	15	30	15	45	105	22	--	--	--	2.1	2.1	--	--	--
C-9	20	35	10	15	80	18	--	--	--	2.4	1.2	--	2.8	--
C-10	10	30	10	10	70	34	--	--	--	1.8	16	--	--	--
C-11	5	25	5	10	45	--	--	5.2	--	2.3	1.7	--	--	--
C-12	20	35	10	15	80	--	--	3.3	--	1.5	--	--	--	--
¹ C-13	25	45	20	50	140	13	--	4.4	--	1.7	1	--	--	--
C-14	15	20	25	15	75	10	--	5	--	2.2	1.2	--	--	--
C-15	20	35	10	15	80	--	--	4.7	--	2.4	1.2	--	--	--
C-16	15	30	10	15	70	5	--	8.4	--	2.8	1.8	--	--	--
C-17	15	30	20	50	115	18	--	5.4	--	2.1	1.5	--	--	--
C-18	22	41	15	25	103	--	--	7	0.28	3.4	3	--	--	--
¹ C-19	NP	NP	NP	NP	NP	--	--	--	--	1.7	1.3	--	--	--
¹ C-20	NP	NP	NP	NP	NP	--	--	--	--	2.1	1.6	--	--	--
C-21	NP	NP	NP	NP	NP	--	--	--	--	2.5	2.3	--	--	--
C-22	30	37	20	39	126	--	--	--	--	2.6	2.8	--	--	--
¹ C-23	37	36	18	33	124	--	--	--	--	2.2	2.6	--	--	--
¹ C-24	52	52	23	45	172	--	--	--	--	2.5	4.7	--	--	--
C-25	23	29	7	28	87	--	--	--	--	3.9	3.7	--	--	--
C-26	26	37	19	36	118	--	--	--	--	2.9	2.7	--	--	--
C-27	67	73	25	64	229	--	--	--	--	3.9	4.8	--	--	--

See notes at end of table.

**Table 4-3 (Continued)
Posttreatment Analytical Results¹**

Navy Environmental Leadership Program
Technology Demonstration for Thermal Desorption at SWMUs 6 and 7
U.S. Naval Station
Mayport, Florida

Sample Number	Analytical Results													
	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Xylenes (µg/kg)	Total BTEX (µg/kg)	TRPH (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)
C-28	29	29	7	8	73	--	--	--	--	2.2	2.1	--	--	--
C-29	15	25	8	7	55	--	--	--	1.2	--	--	--	--	--
C-30	26	30	7	7	70	--	--	--	1.6	1.8	--	--	--	--
C-31	29	23	6	6	64	--	--	--	1.5	1.8	--	--	--	--
C-32	31	35	8	8	82	--	--	--	1.9	1.9	--	--	--	--
C-33	32	35	9	9	85	--	--	--	1.8	2.3	--	--	--	--
C-34	19	19	--	--	38	--	--	--	1.6	1.8	--	--	--	--
C-35	12	16	--	--	28	--	--	--	1.7	1.5	--	--	--	--
C-36	22	25	6	5	58	--	--	--	1.5	1.3	--	--	--	--
C-37	21	25	6	5	57	--	--	--	1.4	1.7	--	--	2.05	--
C-38	21	20	5	5	51	--	--	--	1.9	1.9	--	--	--	--
C-39	28	26	5	7	66	--	--	--	1.6	2.2	--	--	--	--
C-40	17	18	5	6	46	--	--	--	1.9	1.3	--	--	2.4	--
C-41	19	17	5	5	46	--	--	--	2.2	1.3	--	--	2.7	--
C-42	18	17	5	6	46	--	--	--	2	1.2	--	--	2.5	--
C-43	16	12	--	--	28	--	--	--	2.4	5.4	--	--	2.7	--
C-44	29	33	11	11	84	--	--	--	2.5	5.1	--	--	2.4	--
C-45	24	33	8	11	76	--	--	--	2.3	4.8	--	--	2.2	--
C-46	13	21	7	10	51	--	--	--	2.9	13.8	--	--	2.8	--
C-47	8	13	--	6	27	--	--	--	2.3	4.6	--	--	2.8	--
C-48	--	--	--	--	--	--	--	--	2.6	5	--	--	2.7	--
C-49	6	--	--	--	6	--	--	--	3.7	5.3	--	--	3.5	--
C-50	15	22	--	6	43	--	--	--	2	5.5	--	--	3.2	--

See notes at end of table.

**Table 4-3 (Continued)
Posttreatment Analytical Results¹**

Navy Environmental Leadership Program
Technology Demonstration for Thermal Desorption at SWMUs 6 and 7
U.S. Naval Station
Mayport, Florida

Sample Number	Analytical Results													
	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Xylenes (µg/kg)	Total BTEX (µg/kg)	TRPH (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)
C-51	26	25	6	6	63	--	--	--	--	2.8	5.1	--	--	--
C-52	19	16	--	--	35	--	--	--	--	3.3	8.4	--	2.6	--
C-53	24	26	--	5	55	--	--	--	--	2.7	7.1	--	3.3	--
C-54	33	28	--	--	61	--	--	--	--	3.9	7.3	--	3.8	--
Cleanup Level ²	4,100	4,100	4,100	4,100	4,100	10	10	490	37	50	108	23	369	--

¹ Analytical results are from Southwest Soil Remediation, Inc., report *Summary Report Mayport Naval Station, oily Waste Treatment Plant SWMUs 6 and 7 (1996)*.

² Soil pile was indicated in SSR's report to have been moved and mixed with the preburn pile, then retreated.

³ Thermal desorption cleanup levels for soil under Florida Administrative Code 62-775.400.

⁴ The cleanup level is for the total concentrations of BTEX.

Notes: SWMU = solid waste management unit.

µg/kg = micrograms per kilogram.

BTEX = benzene, toluene, ethylbenzene, and xylenes.

TRPH = total recoverable petroleum hydrocarbons.

mg/kg = milligrams per kilogram.

-- = concentration of analyte, if present, was less than the detection limit.

NR = analysis not requested by SSR (SSR, 1996).

NP = Analytical results were not provided in SSR's report (SSR, 1996); however, the chain-of-custody documents that the analysis was requested.

5.0 CONCLUSIONS

The LTTD technology demonstration appears to have been effective in meeting the requirements of FAC 62-775 for the petroleum-impacted soil at SWMUs 6 and 7. However, there is some uncertainty associated with the lack of documentation (SSR, 1996) concerning whether or not some of the piles were retreated and the results of the retreatment (Table 4-3). SSR indicated that the moisture content of the soil was higher than expected, which resulted in their operating the thermal desorption unit at lower feed rates and higher temperatures than were used during the treatability test. The oyster shells that were in the soil matrix may also have hindered the treatment of the soil.

Based on the results of the technology demonstration, thermal desorption appears to be an appropriate technology to remediate the petroleum-impacted soil at SWMUs 6 and 7. However, should this technology be used to treat the remainder of the petroleum-impacted soil at SWMUs 6 and 7, a larger rotary dryer unit that would allow for more residence time would be appropriate.

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APPENDIX A

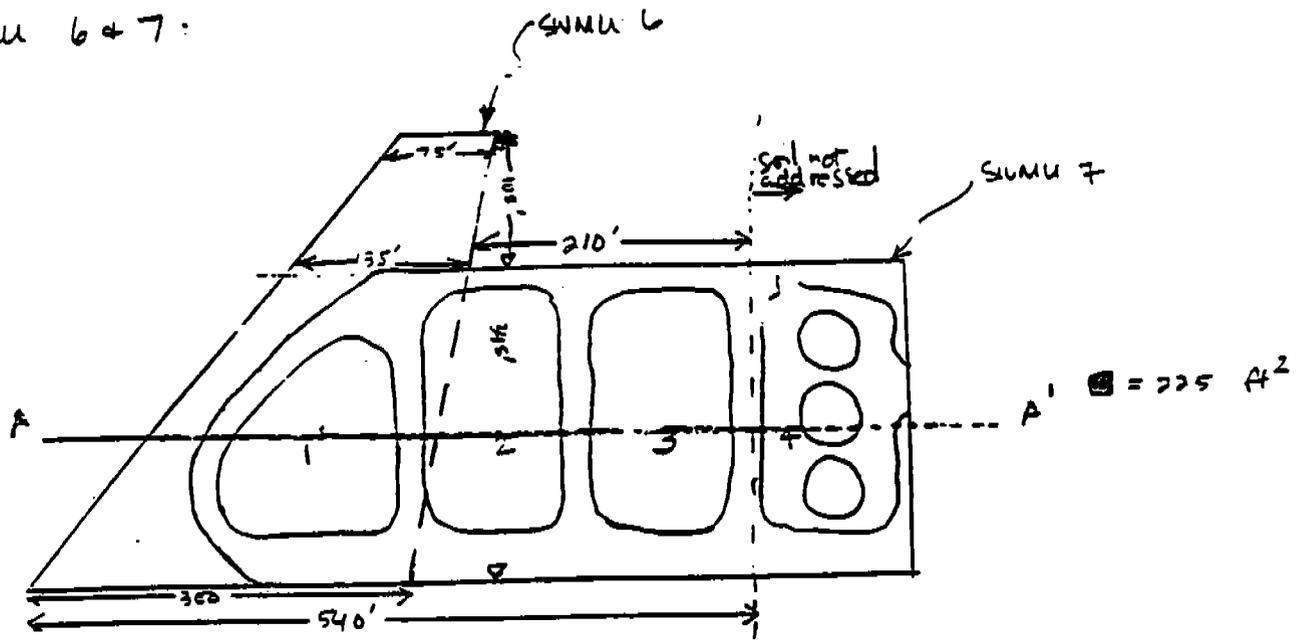
**VOLUME ESTIMATES OF SOIL CONTAINING
PETROLEUM-RELATED PRODUCTS**

PROJECT
 NSM Uppost
 Volume 6 & 7 - Contain Sludge/soil
 SUMU 6 & 7

COMP. BY
 GAB
 CHK. BY
 FJH

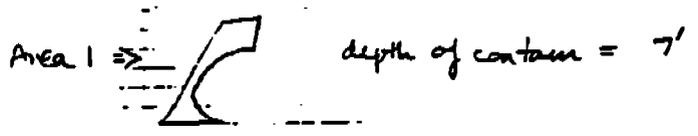
JOB NO.
 8533-29
 DATE
 6/5/95

SUMU 6 & 7:



Assumptions:

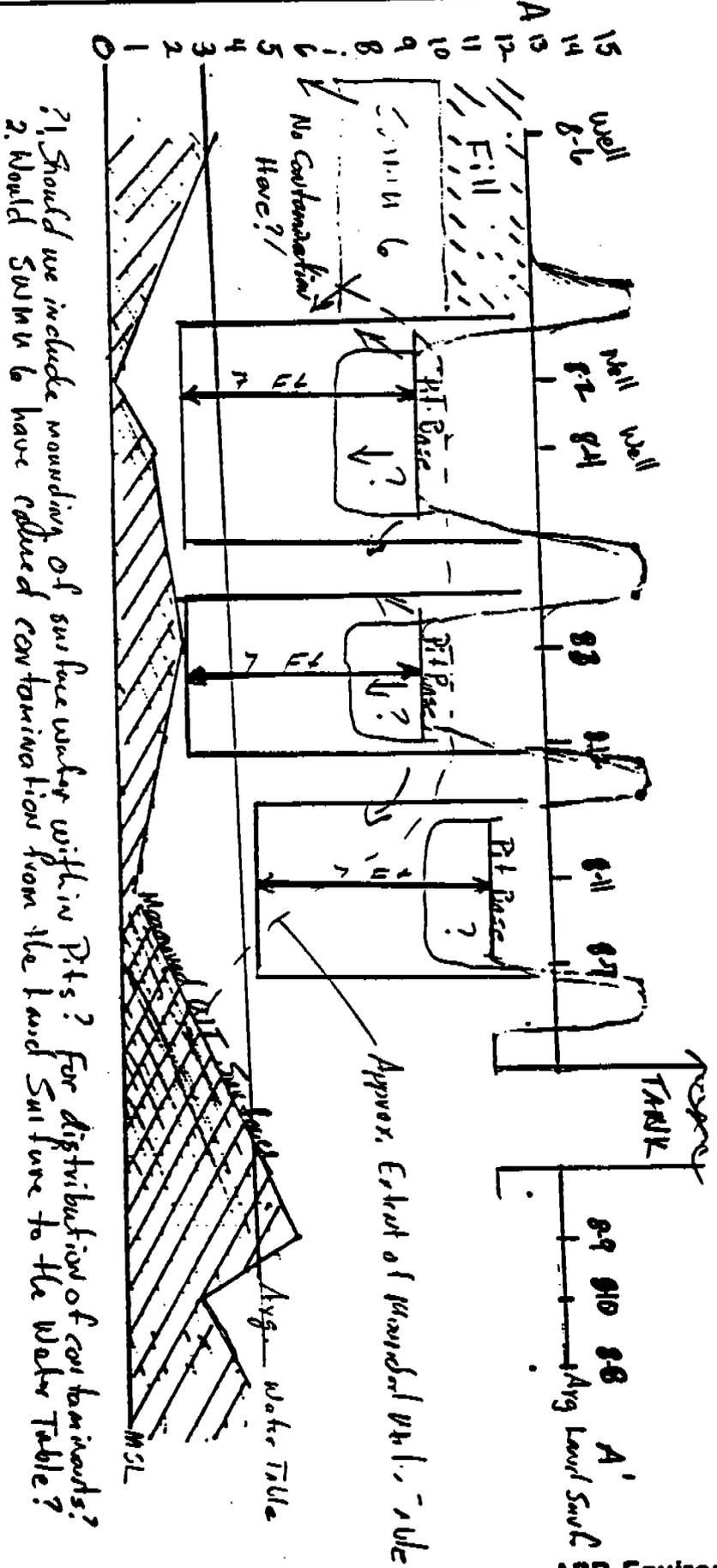
- 1) Sludge/soil in beds 1, 2, and 3 are source of LNAPL (RFI, ABBES, 1995)
- 2) Sludge/soil in bed 4 is NOT source of LNAPL, and will NOT be addressed
- 3) Sludge/soil in SUMU 6 (that lies beneath SUMU 7) is a source of LNAPL and will be addressed.
- 4) Sludge/soil in vadose zone will be addressed - avg depth to water table over SUMU 6 & 7 is ~ 7 feet (taken from bottom of Sludge beds)
- 5) see attached cross section for depths of contamination:



PROJECT SWMU 6-7 Sludge Soil Contamination Extent	COMP. BY LWS	JOB NO. 8533-08
	CHK. BY AH	DATE 6/6/95

Vent Excavation Approx x 3

- Cross Section Elevations from
- A. Avg Level Surface TOC of Flue mount Wells
 - B. Pit Base Elevations of Sludge Sampler
 - C. Avg Water Table Potentiometric Surface of Avg. 30, 94
 - D. Hatched Zone Actual WT Readings Avg. 30, 94



?1. Should we include mounding of surface water within Pits? For distribution of contaminants?
 ?2. Would SWMU 6 have reduced contamination from the land surface to the water table?

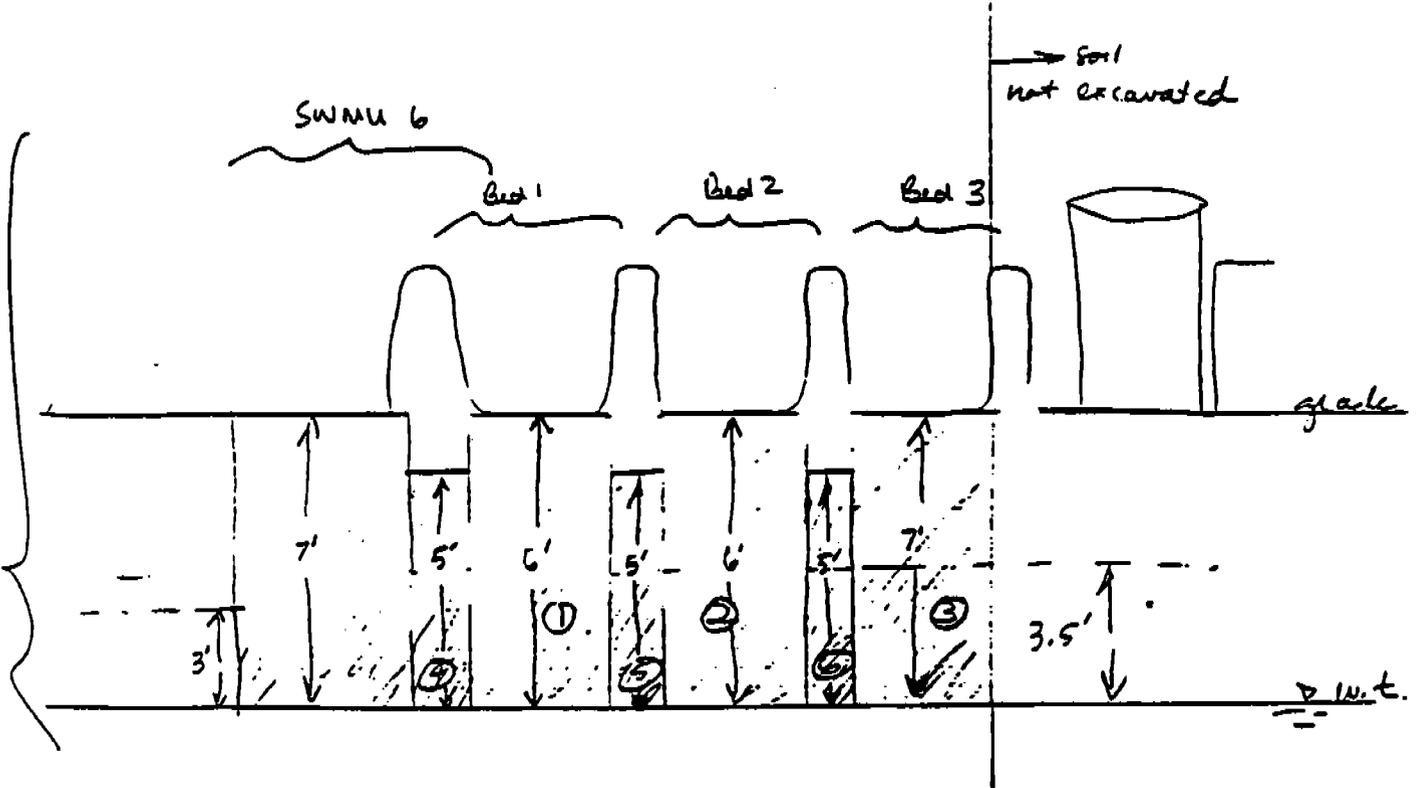
PROJECT
 NS Mayport
 Volume Est - Carbon Sludge/soil
 SWMU 6

COMP. BY
 SCB
 CHK BY
 JAH

JOB NO.
 8533.20
 DATE
 6/5/95

CROSS SECTION A-A'

NOTE:
 All previous figures in scale



- ① From RFI (ABB ES, 1995), depth to water table below beds is approximately 6 to 7'.
- ② From RFI, vadose soil beneath beds 1, 2 and 3 is source of LNAPL (see shaded areas beneath beds 1, 2 and 3)
- ③ Bed materials are considered 'clean' because beds were constructed from excavation of "clean" fuel. However, there would be some smearing between beds in vadose zone. See additional shading between beds 1, 2 and 3
- ④ RFI indicates that SWMU 6 was originally excavated 6' below grade, and then filled to surface grade. It is estimated that top of bed would lie ~ 3' below grade.

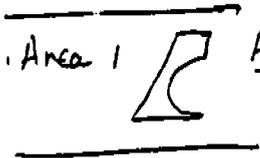
PROJECT
 NS Mayport
 Carbon Sludge Soil

COMP. BY
 SJB
 CHK. BY
 JH

JOB NO.
 E-33 29
 DATE
 6/5/95

Volumes:

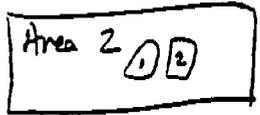
Note: surface areas determined by box method.



Area = Area of trapezoid - area in cutout
 $= \frac{1}{2}(b+t)h$
 (area of trapezoid) = 74,875
 $= \frac{1}{2}(300 + 75) 345$ = 34,875
 = 64,688 = 34,875
 = 29,813 feet²

determined by box method from figure on page 1

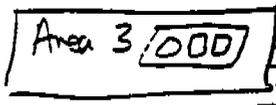
Volume = 29,813 x 7'
 = 208,700 feet³



Area = Bed 1 + Bed 2
 = 17,100 + 18,225
 = 35,325 ft²

All areas & volumes determined by box method

Volume = 35,325 x 6'
 = 212,000 ft³



Area = Area of whole - Area of inside
 = 92,925 - Area 2
 = 92,925 - 53,500
 = 39,425 ft²

Volume = 39,425 x 5'
 = 197,000 ft³

PROJECT
 N3 Mayport
 Current Soil/Sludge SWMU 6+7

COMP. BY
 SGB
 CHK. BY
 JH

JOB NO.
 8533.29
 DATE
 6/7/95

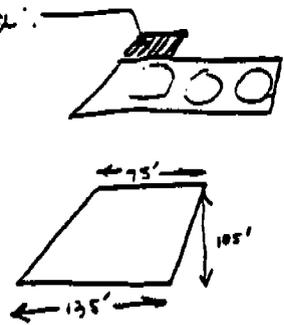
Area 4 ①

$$\begin{aligned} \text{Area} &= \text{Bed 3} \\ &= 18,225 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Volume} &= 18,225 \times 7' \\ &= 127,600 \text{ ft}^3 \end{aligned}$$

6/12/95-

The IM being completed for SWMU 6+7 includes installation of swamps for free product recovery. One swamp will be located within the northern-most portion of SWMU 6. Therefore, the volume of soil to be removed must be decreased by an area:



$$\begin{aligned} \text{Area} &= \frac{1}{2} (b+t) h \\ &= \frac{1}{2} (135 + 75) (105) \\ &= 11,025 \text{ sq ft} \end{aligned}$$

$$\begin{aligned} \text{Volume} &= (11,025) (7') \\ &= 77,175 \text{ cu ft.} \\ &\approx 77,000 \text{ feet}^3 \end{aligned}$$

PROJECT
 NS Wayport
 Volume of Soil Sludges 200006+7

COMP. BY
 SSB
 CHK. BY
 JHA

JOB NO.
 85-3 29
 DATE
 6/5/95

$$\begin{aligned}
 \text{Total Volume} &= \text{Area 1} + \text{Area 2} + \text{Area 3} + \text{Area 4} \\
 &= 208,700 + 20,000 + 197,000 + 127,600 \\
 &= 745,300 \text{ ft}^3 - \text{Area in } \triangle \text{ for sump} \\
 &= 745,300 - 77,000 \\
 &= 668,300 \text{ ft}^3 \\
 &\approx 24,800 \text{ cy}
 \end{aligned}$$

$$\begin{aligned}
 \text{Density} &= \frac{1.4 \text{ gram}}{\text{cm}^3} \cdot \frac{2.205 \times 10^{-3} \text{ lbs}}{\text{gram}} \cdot \frac{1 \text{ ton}}{2000 \text{ lb}} \cdot \frac{\text{cm}^3}{1.308 \times 10^{-6} \text{ cy}} \\
 &= 1.18 \text{ ton/cy}
 \end{aligned}$$

Bulking factor (say 20% expansion upon excavation)

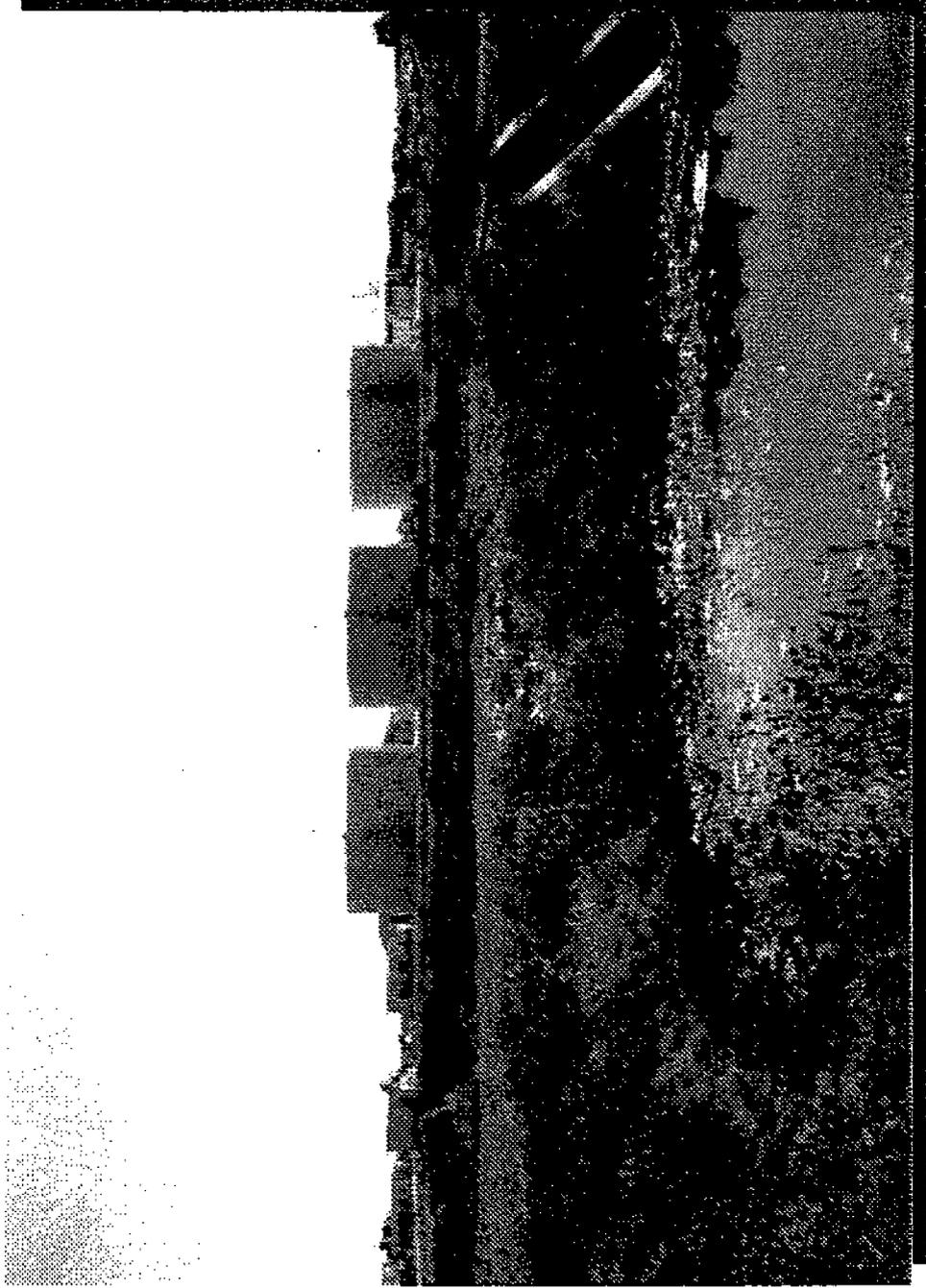
$$24,800 \text{ cy} \times 1.2 \approx 29,800 \text{ cy}$$

weight of soil

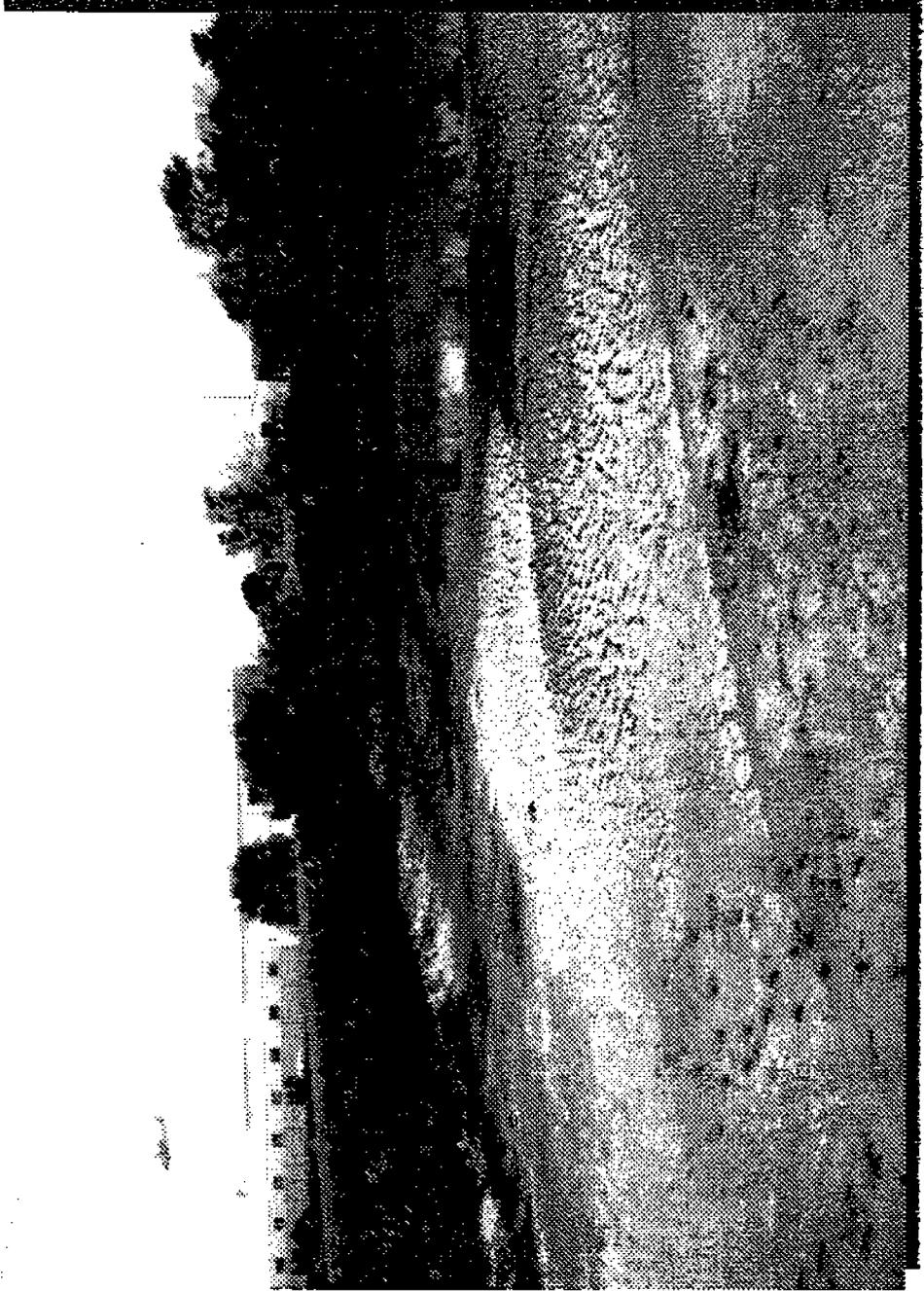
$$(29,800 \text{ cy}) \left(1.18 \frac{\text{ton}}{\text{cy}} \right) \approx 35,200 \text{ tons}$$

APPENDIX B

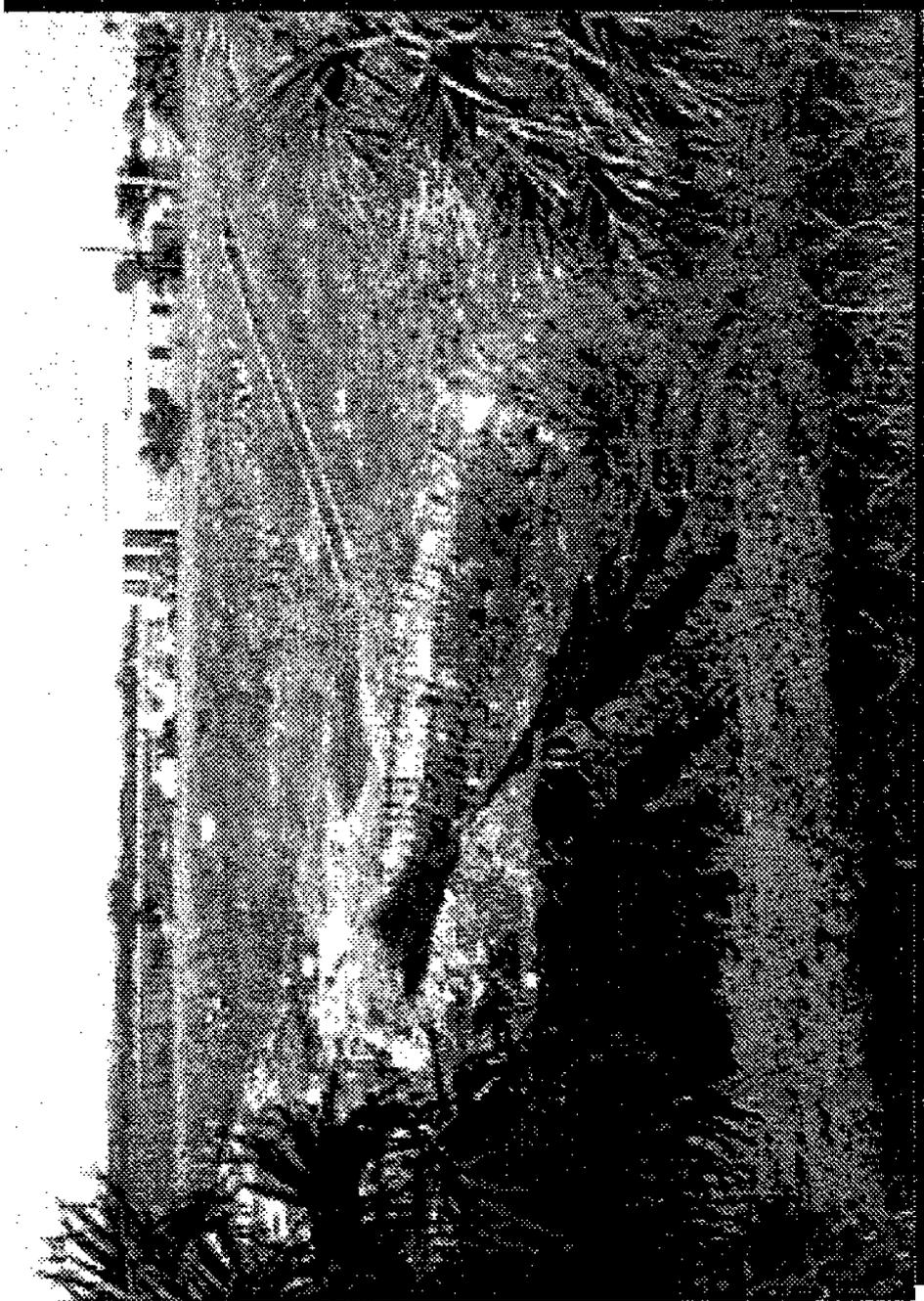
TECHNOLOGY DEMONSTRATION PHOTOGRAPHS



View looking east from the western edge of the westernmost sludge drying bed (Figure 1-3, Sludge Drying Bed No. 4). The three tanks in the background are the load equalization tanks for the Oily Wastewater Treatment Plant.



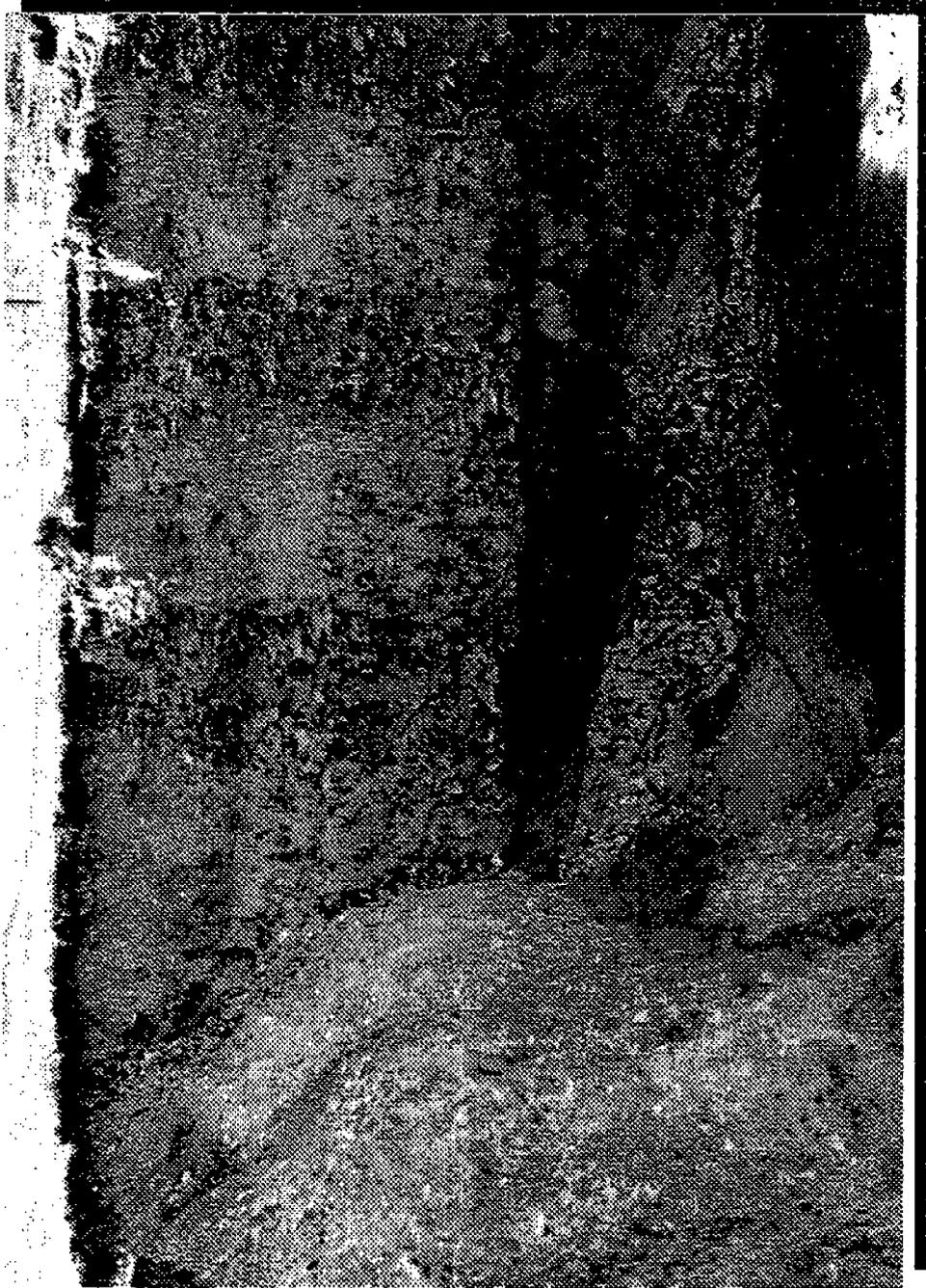
View looking south from the north end of Sludge Drying Bed No. 3.



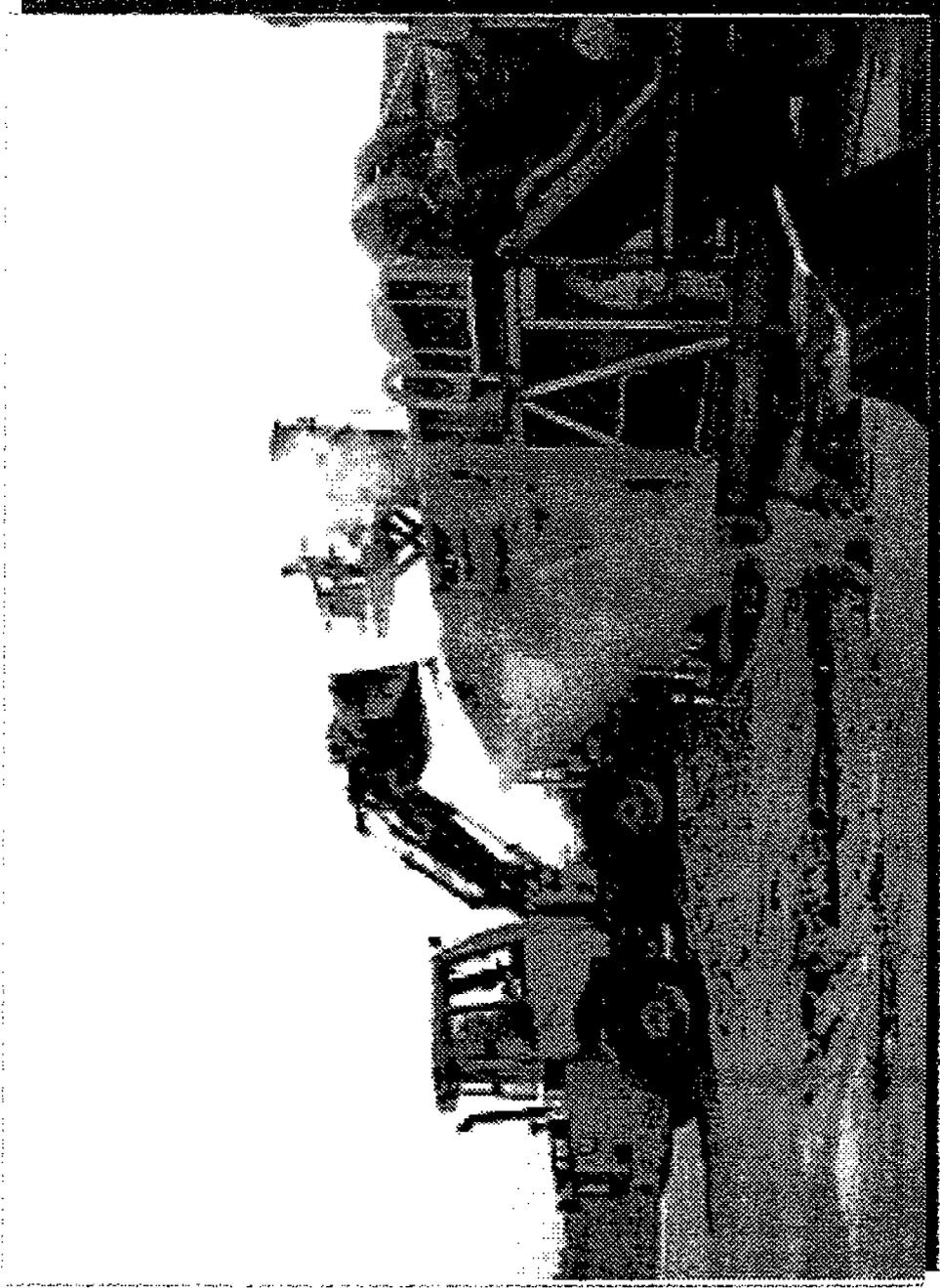
View looking north from the southern side of Sludge Drying Bed No. 4 (Figure 1-3).
Excavation of soil for the low temperature thermal desorption technology demonstration.



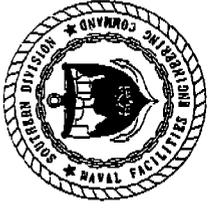
View of test excavation. Note the dark oil-stained soil and groundwater in the pit. The water level in Sludge Drying Bed No. 4 was 3 to 5 feet beneath the bottom of the bed.



View of soil being excavated from the north end of SWMU 6 (Figure 2-1). Note the numerous oyster shells in the soil matrix and the brown oil-stained soil.



View of front end loader placing soil to be treated into the thermal desorber. The steam is from water used to cool and hydrate the treated soil. Soil is typically treated at temperatures of 700 to 900 degrees Fahrenheit.



View of treated soil pile. Note the numerous oyster shells. The treated stockpiles are numbered (pink card) to identify the pile for analytical testing, which is used to confirm whether or not the treatment levels were met.

APPENDIX C
SAMPLING CALCULATIONS

PROJECT IMPLEMENTATION PLAN
THERMAL DESORPTION OF SLUDGE &
SOIL AT SWMS 6 and 7

COMP. BY

F. [unclear]

CHK. BY

JOB NO.

08534.33

DATE

2-14-96

SAMPLING REQUIREMENTS

BASELINE SAMPLING

ACCORDING TO FAC 62-775 if you have a quantity of
Soil over 1,400 tons you would need:

5 composite samples for the first 1,400 tons

1 composite sample for each additional 700 tons

SSR proposes to TREAT 2,700 tons of Sludge and Soil

$$\begin{array}{r} 2,700 \text{ tons} \\ - 1,400 \text{ tons} - 5 \text{ composite samples} \\ \hline 1,300 \text{ TONS} \end{array} \quad \begin{array}{l} 700 \sqrt{1,300 \text{ tons}} = 1.8 \approx 2 \text{ composite samples} \end{array}$$

$$\therefore 5 + 2 = 7 \text{ Composite Samples}$$

ACCORDING TO FAC 62-775 4 GRAB SAMPLES MUST
BE COLLECTED PER COMPOSITE SAMPLE

$$7 \text{ composite samples} \times 4 \frac{\text{grab samples}}{\text{composite samples}} = 28 \text{ grab samples}$$

SUMMARY

7 composite samples ARE REQUIRED for treating 2,700 tons of Soil
5 composites for the first 1,400 tons and 2 composites
for the remaining 1,300 tons.

4 grab samples will be collected per composite sample \therefore
28 grab samples will be collected during the treatment of
2,700 tons of soil.

1 = Sampling AND Analysis PRIOR TO TREATING the Soil

PROJECT
 IMPLEMENTATION PLAN
 THERMAL DESORPTION OF SLUDGE AND
 SOIL AT SWMUS 6 AND 7

COMP. BY
F. Jean
 CHK. BY

JOB NO.
 08534.33
 DATE
 2-14-96

SAMPLING REQUIREMENTS

PERFORMANCE EVALUATION SAMPLING

BASIS: Guidelines for Assessment and Remediation for
 Petroleum Contaminated Soil (FDEP, 1994)

1 composite sample should be collected for
 every 400 tons

1 grab sample should be collected for every 50 tons
 to make the 400 ton composite sample.

∴ Assuming 2,700 tons of soil and a 100 ton
 treatability test.

2,700 tons - total throughput
 100 tons - treatability test

 2,600 tons

100 tons = 1 composite sample and 4 grab samples
 at 20 tons per batch.

2,600 tons / 400 tons = 6.5 ≈ 7 composite samples

2,600 tons / 50 tons = 52 ^{grab} composite samples

1 + 7 = 8 composite samples

4 + 52 = 56 grab samples

APPENDIX D
ANALYTICAL DATA

US Naval Station, Mayport
 NHELP - SMU 7 Preburn Surface Soil Data

Lab Sample Number:
 Site Locator
 Collect Date:

MA660004
 NHELP
 07S00101
 04-APR-96

MA660005
 NHELP
 07S00101D
 04-APR-96

MA660006
 NHELP
 07S00201
 05-APR-96

MA719002
 NHELP
 07S00301
 12-APR-96

Chemical Name	MA660004 VALUE	MA660004 QUAL	MA660004 DL	MA660005 VALUE	MA660005 QUAL	MA660005 DL	MA660006 VALUE	MA660006 QUAL	MA660006 DL	MA719002 VALUE	MA719002 QUAL	MA719002 DL
Halogenated Volatiles												
1,1-Trichloroethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
1,1,2-Trichloroethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
1,1,2-Trichloroethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
1,1-Dichloroethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
1,1-Dichloroethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
1,2-Dichloroethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
1,2-Dichloroethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
1,2-Dichloropropane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
1,3-Dichlorobenzene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
1,4-Dichlorobenzene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
2-Chloroethylvinyl ether	29 U	ug/kg	29	31 U	ug/kg	31	28 U	ug/kg	28	27 U	ug/kg	27
Bromodichloromethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Bromoform	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Bromomethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Carbon tetrachloride	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Chlorobenzene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Chloroethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Chloroform	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Chloromethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Dibromochloromethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Dichlorodifluoromethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Methylene Chloride	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Tetrachloroethene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Trichloroethane	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Vinyl chloride	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
cis-1,2-Dichloroethene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
cis-1,3-Dichloropropene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
trans-1,2-Dichloroethene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
trans-1,3-Dichloropropene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Aromatics												
Benzene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	6.2 U	ug/kg	5.6	5.5 U	ug/kg	5.5
Ethylbenzene	13	ug/kg	5.9	12	ug/kg	6.2	100	ug/kg	5.6	9.3	ug/kg	5.5
Toluene	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	5.6	ug/kg	5.6	5.5 U	ug/kg	5.5
Xylenes (total)	64	ug/kg	5.9	59	ug/kg	6.2	57	ug/kg	5.6	48	ug/kg	5.5
Methyl tert-butyl ether	5.9 U	ug/kg	5.9	6.2 U	ug/kg	6.2	5.6 U	ug/kg	5.6	5.5 U	ug/kg	5.5

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2; 1,3; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
HELP - SIMU 7 Preburn Surface Soil Data

Lab Sample Number:
Site
Locator
Collect Date:

MA660004
HELP
07S00101
04-APR-96

MA660005
HELP
07S00101D
04-APR-96

MA660006
HELP
07S00201
05-APR-96

MA719002
HELP
07S00301
12-APR-96

	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Polynuclear Aromatics (PAH)												
Naphthalene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
2-Methylnaphthalene	28000 UJ	UJ	ug/kg	28000	28000 UJ	UJ	ug/kg	28000	22000 U	U	ug/kg	22000
1-Methylnaphthalene	28000 UJ	UJ	ug/kg	28000	28000 UJ	UJ	ug/kg	28000	22000 U	U	ug/kg	22000
Acenaphthylene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Acenaphthene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Fluorene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Phenanthrene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Anthracene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Fluoranthene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Pyrene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Benzo (a) anthracene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Chrysenes	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Benzo (b) fluoranthene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Benzo (a) pyrene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Indeno (1,2,3-cd) pyrene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Dibenzo (a,h) anthracene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000
Benzo (g,h,i) perylene	14000 U	U	ug/kg	14000	14000 U	U	ug/kg	14000	22000 U	U	ug/kg	22000

U = NOT DETECTED R = RESULT IS REJECTED
J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 HELP - SHMU 7 Preburn Surface Soil Data

Lab Sample Number: MA719003
 Site: HELP
 Locator: 07S00401
 Collect Date: 12-APR-96

MA719003
 HELP
 07S00401
 12-APR-96

MA803002
 HELP
 07S00501
 17-APR-96

MA830002
 HELP
 07S00601
 25-APR-96

MA865002
 HELP
 07S00701
 01-MAY-96

	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
Polyyclic Aromatics (PAH)												
Naphthalene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
2-Methylnaphthalene	22000 U	ug/kg	22000	22000 UJ	ug/kg	22000	44000 UJ	ug/kg	44000	5300 U	ug/kg	5300
1-Methylnaphthalene	22000 U	ug/kg	22000	22000 UJ	ug/kg	22000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Acenaphthylene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Acenaphthene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Fluorene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Phenanthrene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Anthracene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Fluoranthene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Pyrene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Benzo (a) anthracene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Chrysene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Benzo (b) fluoranthene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Benzo (a) pyrene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Indeno (1,2,3-cd) pyrene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Dibenzo (a,h) anthracene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300
Benzo (g,h,i) perylene	22000 U	ug/kg	22000	11000 U	ug/kg	11000	22000 U	ug/kg	22000	5300 U	ug/kg	5300

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
HELP - SHMU 7 Preburn Surface Soil Data

Lab Sample Number:
Site
Locator
Collect Date:

MA660004
HELP
07S00101
04-APR-96

MA660005
HELP
07S00101D
04-APR-96

MA660006
HELP
07S00201
05-APR-96

MA719002
HELP
07S00301
12-APR-96

	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
INORGANICS (SOIL)																
Antimony	.33	J	mg/kg		.29	U	mg/kg		.29	U	mg/kg		.29	U	mg/kg	
Arsenic	7.4	J	mg/kg		8.3	J	mg/kg		8.3	J	mg/kg		8.3	J	mg/kg	
Barium	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	
Beryllium	.4	U	mg/kg		.4	U	mg/kg		.4	U	mg/kg		.4	U	mg/kg	
Cadmium	2.7	UJ	mg/kg	2.7	4.1	-	mg/kg		4.6	-	mg/kg		4.1	-	mg/kg	
Chromium	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	
Cobalt	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	
Copper	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	
Cyanide	4.7	J	mg/kg		4.5	J	mg/kg		5.5	J	mg/kg		5.8	J	mg/kg	
Lead	.09	J	mg/kg		.75	-	mg/kg		.07	UJ	mg/kg		.06	UJ	mg/kg	
Mercury	.29	U	mg/kg		.29	J	mg/kg		.29	J	mg/kg		.28	U	mg/kg	
Nickel	.49	UJ	mg/kg		.48	UJ	mg/kg		.49	UJ	mg/kg		.48	UJ	mg/kg	
Selenium	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	
Silver	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	
Thallium	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	
Tin	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	
Vanadium	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	
Zinc	-	-	mg/kg		-	-	mg/kg		-	-	mg/kg		-	-	mg/kg	

U = NOT DETECTED R = RESULT IS REJECTED
J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 HELP - SWMU 7 Preburn Surface Soil Data

Lab Sample Number:
 Site
 Locator
 Collect Date:

MA719003
 WHELP
 07S00401
 12-APR-96

MA803002
 WHELP
 07S00501
 17-APR-96

MA830002
 WHELP
 07S00601
 25-APR-96

MA865002
 WHELP
 07S00701
 01-MAY-96

	VALUE	QUAL	UNITS	DL												
INORGANICS (SOIL)																
Antimony	2.3	J	mg/kg	.2	.61	J	mg/kg	.2	.45	J	mg/kg	.2	.72	UJ	mg/kg	.72
Arsenic	6.8	J	mg/kg	.1	9.5	J	mg/kg	.1	3.7	J	mg/kg	.1	6.3	J	mg/kg	.1
Beryllium			mg/kg													
Cadmium	.39	U	mg/kg	.39	.4	U	mg/kg	.4	.39	U	mg/kg	.39	.62	UJ	mg/kg	.62
Chromium	3.1		mg/kg	.4	4.7		mg/kg	.4	1.5	UJ	mg/kg	1.5	2.9		mg/kg	.4
Cobalt			mg/kg													
Copper			mg/kg													
Cyanide			mg/kg													
Lead	5.4	J	mg/kg	.2	4.6	J	mg/kg	.2	.99	J	mg/kg	.2	2.4	J	mg/kg	.2
Mercury	.06	UJ	mg/kg	.06	.08	J	mg/kg	.06	.05	UJ	mg/kg	.05	.07	UJ	mg/kg	.07
Nickel			mg/kg													
Selenium	.29	U	mg/kg	.29	.29	U	mg/kg	.29	.28	U	mg/kg	.28	.28	U	mg/kg	.28
Silver	.48	UJ	mg/kg	.48	.48	UJ	mg/kg	.48	.47	UJ	mg/kg	.47	.47	UJ	mg/kg	.47
Thallium			mg/kg													
Tin			mg/kg													
Vanadium			mg/kg													
Zinc			mg/kg													

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 HELP - SMMU 7 Preburn Surface Soil Data

Lab Sample Number:
 Site
 Locator
 Collect Date:

MA660004
 HELP
 07S00101
 04-APR-96
 QVAL UNITS

MA660005
 HELP
 07S00101D
 04-APR-96
 QVAL UNITS

MA660006
 HELP
 07S00201
 05-APR-96
 QVAL UNITS

MA719002
 HELP
 07S00301
 12-APR-96
 QVAL UNITS

VALUE DL VALUE DL VALUE DL VALUE DL VALUE DL

Total petroleum hydrocarbons
 Total organic halides

11500 11 U mg/kg 182 11 mg/kg 10300 11 U mg/kg 181 11 mg/kg 10200 11 U mg/kg 6410 11 U mg/kg 178 11 mg/kg

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTIFICATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 HELP - SMIU 7 Preburn Surface Soil Data

Lab Sample Number: MA719003
 Site Locator: 07S00401
 Collect Date: 12-APR-96

MA719003
 HELP
 07S00401
 12-APR-96
 QUAL UNITS DL
 VALUE

MA803002
 HELP
 07S00501
 17-APR-96
 QUAL UNITS DL
 VALUE

MA830002
 HELP
 07S00601
 25-APR-96
 QUAL UNITS DL
 VALUE

MA865002
 HELP
 07S00701
 01-MAY-96
 QUAL UNITS DL
 VALUE

Total petroleum hydrocarbons
 Total organic halides

10300	179	180	10200	3540	43
11 U	11	11	11 U	10 U	10
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 HELP - SMMU 7 Postburn Surface Soil Data

Lab Sample Number:
 Site
 Locator
 Collect Date:

MA752003
 HELP
 07S00801
 16-APR-96

MA781002
 HELP
 07S00901
 19-APR-96

MA781003
 HELP
 07S00901D
 19-APR-96

MA802002
 HELP
 07S01001
 23-APR-96

Chemical	VALUE	QUAL	UNITS	DL												
Halogenated Volatiles																
1,1,1-Trichloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
1,1,2,2-Tetrachloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
1,1,2-Trichloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
1,1-Dichloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
1,1-Dichlorobenzene	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
1,2-Dichloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
1,2-Dichloropropane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
1,3-Dichlorobenzene	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
1,4-Dichlorobenzene	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
2-Chloroethyl vinyl ether	27 U	U	ug/kg	27	27 U	U	ug/kg	27	27 U	U	ug/kg	27	27 U	U	ug/kg	26
Bromodichloromethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Bromoform	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Carbon tetrachloride	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Chlorobenzene	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Chloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Chloroform	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Chloromethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Dibromochloromethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Dichlorodifluoromethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Methylene Chloride	27 U	U	ug/kg	27	27 U	U	ug/kg	27	27 U	U	ug/kg	27	27 U	U	ug/kg	26
Tetrachloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Trichloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Trichlorofluoromethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Vinyl chloride	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
cis-1,2-Dichloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
cis-1,3-Dichloropropene	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
trans-1,2-Dichloroethane	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
trans-1,3-Dichloropropene	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Aromatic																
Benzene	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Ethylbenzene	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Toluene	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Xylenes (total)	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3
Methyl tert-butyl ether	5.5 U	U	ug/kg	5.5	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3	5.3 U	U	ug/kg	5.3

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTIFICATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 MELP - SMU 7 Postburn Surface Soil Data

Lab Sample Number: Site Locator Collect Date:	MA802003 MELP 07SD1101 23-APR-96	MA831002 MELP 07SD1201 26-APR-96	MA866002 MELP 07SD1301 01-MAY-96	MA866003 MELP 07SD1401 02-MAY-96				
VALUE	QUAL UNITS	DL	VALUE	DL	VALUE	DL	VALUE	DL
ug/kg								
Halogenated Volatiles								
1,1,1-Trichloroethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
1,1,2,2-Tetrachloroethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
1,1,2-Trichloroethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
1,1-Dichloroethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
1,1-Dichloroethene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
1,2-Dichlorobenzene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
1,2-Dichloroethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
1,2-Dichloropropane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
1,3-Dichlorobenzene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
1,4-Dichlorobenzene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
2-Chloroethyl vinyl ether	27 U	27	27 U	27	27 U	27	30 U	ug/kg
Bromodichloromethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Bromoform	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Bromomethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Carbon tetrachloride	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Chlorobenzene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Chloroethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Chloroform	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Chloromethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Dibromochloromethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Dichlorodifluoromethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Methylene Chloride	27 U	27	27 U	27	27 U	27	30 U	ug/kg
Tetrachloroethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Trichloroethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Trichlorofluoromethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Vinyl chloride	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
cis-1,2-Dichloroethane	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
cis-1,3-Dichloropropene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
trans-1,2-Dichloroethene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
trans-1,3-Dichloropropene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Aromatics								
Benzene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Ethylbenzene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Toluene	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Xylenes (total)	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg
Methyl tert-butyl ether	5.4 U	5.4	5.3 U	5.3	5.3 U	5.3	6 U	ug/kg

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTIFICATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 HELP - SMU 7 Postburn Surface Soil Data

Lab Sample Number: MA888002
 Site: HELP
 Locator: 07S01501
 Collect Date: 06-MAY-96

VALUE QUAL UNITS DL

Compound Name	Value	Qual	Units	DL
Halogenated Volatiles				
1,1,1-Trichloroethane	5.2	U	ug/kg	5.2
1,1,2-Trichloroethane	5.2	U	ug/kg	5.2
1,1,2,2-Tetrachloroethane	5.2	U	ug/kg	5.2
1,1,2-Trichloroethane	5.2	U	ug/kg	5.2
1,1-Dichloroethane	5.2	U	ug/kg	5.2
1,1-Dichloroethane	5.2	U	ug/kg	5.2
1,2-Dichlorobenzene	5.2	U	ug/kg	5.2
1,2-Dichloroethane	5.2	U	ug/kg	5.2
1,2-Dichloropropane	5.2	U	ug/kg	5.2
1,3-Dichlorobenzene	5.2	U	ug/kg	5.2
1,4-Dichlorobenzene	5.2	U	ug/kg	5.2
2-Chloroethyl vinyl ether	26	U	ug/kg	26
Bromodichloromethane	5.2	U	ug/kg	5.2
Bromoform	5.2	U	ug/kg	5.2
Bromomethane	5.2	U	ug/kg	5.2
Carbon tetrachloride	5.2	U	ug/kg	5.2
Chlorobenzene	5.2	U	ug/kg	5.2
Chloroethane	5.2	U	ug/kg	5.2
Chloroform	5.2	U	ug/kg	5.2
Chloromethane	5.2	U	ug/kg	5.2
Dibromochloromethane	5.2	U	ug/kg	5.2
Dichlorodifluoromethane	5.2	U	ug/kg	5.2
Methylene Chloride	26	U	ug/kg	26
Tetrachloroethene	5.2	U	ug/kg	5.2
Trichloroethene	5.2	U	ug/kg	5.2
Trichlorofluoromethane	5.2	U	ug/kg	5.2
Vinyl chloride	5.2	U	ug/kg	5.2
cis-1,2-Dichloroethene	5.2	U	ug/kg	5.2
cis-1,3-Dichloropropene	5.2	U	ug/kg	5.2
trans-1,2-Dichloroethene	5.2	U	ug/kg	5.2
trans-1,3-Dichloropropene	5.2	U	ug/kg	5.2
Aromatics				
Benzene	5.2	U	ug/kg	5.2
Ethylbenzene	5.2	U	ug/kg	5.2
Toluene	5.2	U	ug/kg	5.2
Xylenes (total)	5.2	U	ug/kg	5.2
Methyl tert-butyl ether	5.2	U	ug/kg	5.2

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTIFICATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Sta. -1, Mayport
 HELP - SIMU 7 Postburn Surface Soil Data

Lab Sample Number:
 Site
 Locator
 Collect Date:

MA752003
 HELP
 07S00801
 16-APR-96

MA781002
 HELP
 07S00901
 19-APR-96

MA781003
 HELP
 07S00901D
 19-APR-96

MA802002
 HELP
 07S01001
 23-APR-96

	VALUE	QUAL	UNITS	DL												
Polynuclear Aromatics (PAH)																
Naphthalene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
2-Methylnaphthalene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
1-Methylnaphthalene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Acenaphthylene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Acenaphthene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Fluorene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Phenanthrene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Anthracene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Fluoranthene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Pyrene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Benzo (a) anthracene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Chrysenes	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Benzo (b) fluoranthene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Benzo (a) pyrene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Indeno (1,2,3-cd) pyrene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Dibenzo (a,h) anthracene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	
Benzo (g,h,i) perylene	55	U	ug/kg		53	U	ug/kg		53	U	ug/kg		53	U	ug/kg	

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
HELP - SHMU 7 Postburn Surface Soil Data

Lab Sample Number:
Site
Locator
Collect Date:

MAB02003
HELP
07S01101
23-APR-96

MAB31002
HELP
07S01201
26-APR-96

MAB66002
HELP
07S01301
01-MAY-96

MAB66003
HELP
07S01401
02-MAY-96

	VALUE	QUAL	UNITS	DL												
Polynuclear Aromatics (PAH)																
Naphthalene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
2-Methylnaphthalene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
1-Methylnaphthalene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Acenaphthylene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Acenaphthene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Fluorene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Phenanthrene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Anthracene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Fluoranthene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Pyrene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Benzo (a) anthracene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Chrysene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Benzo (b) fluoranthene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Benzo (a) pyrene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Indeno (1,2,3-cd) pyrene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Dibenzo (a,h) anthracene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54
Benzo (g,h,i) perylene	54	U	ug/kg	54	53	U	ug/kg	53	53	U	ug/kg	53	54	U	ug/kg	54

U = NOT DETECTED R = RESULT IS REJECTED
J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 NEMP - SMU 7 Postburn Surface Soil Data

Lab Sample Number: MA888002
 Site: NEMP
 Locator: 07S01501
 Collect Date: 06-MAY-96

VALUE QUAL UNITS DL

Compound	Value	Qual	Units	DL
Polynuclear Aromatics (PAH)				
Naphthalene	52 U		ug/kg	52
2-Methylnaphthalene	52 U		ug/kg	52
1-Methylnaphthalene	52 U		ug/kg	52
Acenaphthylene	52 U		ug/kg	52
Acenaphthene	52 U		ug/kg	52
Fluorene	52 U		ug/kg	52
Phenanthrene	52 U		ug/kg	52
Anthracene	52 U		ug/kg	52
Fluoranthene	52 U		ug/kg	52
Pyrene	52 U		ug/kg	52
Benzo (a) anthracene	52 U		ug/kg	52
Chrysene	52 U		ug/kg	52
Benzo (b) fluoranthene	52 U		ug/kg	52
Benzo (a) pyrene	52 U		ug/kg	52
Indeno (1,2,3-cd) pyrene	52 U		ug/kg	52
Dibenzo (a,h) anthracene	52 U		ug/kg	52
Benzo (g,h,i) perylene	52 U		ug/kg	52

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 NEMP - SWMU 7 Postburn Surface Soil Data

Lab Sample Number:
 Site Locator
 Collect Date:

MA752003
 NEMP
 07S00801
 16-APR-96

MA781002
 NEMP
 07S00901
 19-APR-96

MA781003
 NEMP
 07S00901D
 19-APR-96

MA802002
 NEMP
 07S01001
 23-APR-96

INORGANICS (SOIL)

mg/kg	MA752003	MA781002	MA781003	MA802002
	VALUE	VALUE	VALUE	VALUE
	QUAL	QUAL	QUAL	QUAL
	UNITS	UNITS	UNITS	UNITS
	DL	DL	DL	DL
Antimony	.72 J	.63 J	.75 J	.54 J
Arsenic	10.1 J	9.7 J	9.5 J	8.2 J
Barium				
Beryllium	.39 U	.38 U	.38 U	.38 U
Cadmium	4.1	5.1	4	3.4
Chromium				
Cobalt				
Copper				
Cyanide				
Lead	6.7	4.6	5	2.6
Mercury	.04 U	.03 U	.04 U	.04 J
Nickel				
Selenium	.29 UJ	.28 UJ	.28 UJ	.27 UJ
Silver	.48 U	.47 U	.74 J	.46 U
Thallium				
Tin				
Vanadium				
Zinc				

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 MELP - SWMU 7 Postburn Surface Soil Data

Lab Sample Number: MA888002
 Site: MELP
 Locator: 07S01501
 Collect Date: 06-MAY-96
 VALUE QUAL UNITS DL

INORGANICS (SOIL)	VALUE	QUAL	UNITS	DL
Antimony	.87	UJ	ng/kg	.87
Arsenic	7.4	J	ng/kg	.1
Beryllium	.37	U	ng/kg	.37
Cadmium	3.1	-	ng/kg	.4
Chromium	-	-	ng/kg	-
Cobalt	-	-	ng/kg	-
Copper	-	-	ng/kg	-
Cyanide	4.1	-	ng/kg	.2
Lead	.03	U	ng/kg	.03
Mercury	.27	UJ	ng/kg	.27
Nickel	.45	U	ng/kg	.45
Selenium	-	-	ng/kg	-
Silver	-	-	ng/kg	-
Thallium	-	-	ng/kg	-
Tin	-	-	ng/kg	-
Vanadium	-	-	ng/kg	-
Zinc	-	-	ng/kg	-

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 NERP - SMMU 7 Postburn Surface Soil Data

Lab Sample Number:
 Site
 Locator
 Collect Date:

MA752003
 NERP
 07S00801
 16-APR-96
 QUAL UNITS
 VALUE

MA781002
 NERP
 07S00901
 19-APR-96
 QUAL UNITS
 VALUE

MA781003
 NERP
 07S00901D
 19-APR-96
 QUAL UNITS
 VALUE

MA802002
 NERP
 07S01001
 23-APR-96
 QUAL UNITS
 VALUE

	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
Total petroleum hydrocarbons	1.8	53.2	mg/kg	1.7	41.3	mg/kg	1.8	42.7	mg/kg	1.7
Total organic halide	11	11	mg/kg	11	11	mg/kg	11	11	mg/kg	11

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 NEMP - SIMU 7 Postburn Surface Soil Data

Lab Sample Number:
 Site
 Locator
 Collect Date:

MA802003
 NEMP
 07S01101
 23-APR-96

MA831002
 NEMP
 07S01201
 26-APR-96

MA866002
 NEMP
 07S01301
 01-MAY-96

MA866003
 NEMP
 07S01401
 02-MAY-96

	VALUE	QUAL	UNITS	DL												
Total petroleum hydrocarbons	19.7	U	mg/kg	11	1.8	U	mg/kg	11	1.7	U	mg/kg	11	1.8	U	mg/kg	11
Total organic halide	11	U	mg/kg	11	1.8	U	mg/kg	11	1.7	U	mg/kg	11	1.8	U	mg/kg	11

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTIFICATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

US Naval Station, Mayport
 NPLP - SMMU 7 Postburn Surface Soil Data

Lab Sample Number: MA888002
 Site: NPLP
 Locator: 07S01501
 Collect Date: 06-MAY-96

VALUE QUAL UNITS DL

Total petroleum hydrocarbons	1.7 U	mg/kg	1.7
Total organic halide	10 U	mg/kg	10

U = NOT DETECTED R = RESULT IS REJECTED
 J = ESTIMATED VALUE UJ = REPORTED QUANTITATION LIMIT IS ESTIMATED
 THE ADDITIONAL LISTINGS OF RESULTS FOR 1,2-; 1,3-; AND 1,4-DICHLOROBENZENE WERE GENERATED FROM THE SVOC (8270) ANALYTICAL RUN.

APPENDIX E
DATA VALIDATION REPORTS

Environmental Data Services, Inc.

Specializing in Laboratory Data Validation

Summary of Organic Data Validation Volatile Organic Compounds EPA Method 8010/8020

Client: ABB Environmental Services, Inc.
Project Name: U.S. Naval Station Mayport, Mayport, Florida
Project Number: CTO 028
Contract Laboratory: Quality Analytical Laboratory
SDG Number: MS001
Purchase Order Number: SE4-21-017
NEESA Level: C
Data Reviewer: Nancy Weaver
Secondary Reviewer: Linda Harding
Date Review Completed: June 10, 1996

Client Sample Number	Laboratory Sample Number	Sample Matrix
07T001	MA660001	Water
07Y001	MA660002	Water
07R001	MA660003	Water
07S00101	MA660004	Soil
07S00101MS	MA660004MS	Soil
07S00101MSD	MA660004MSD	Soil
07S00101D	MA660005	Soil
07S00201	MA660006	Soil
07T002	MA719001	Water
07S00301	MA719002	Soil
07S00401	MA719003	Soil
07T004	MA803001	Water
07S00501	MA803002	Soil
07T007	MA830001	Water
07S00601	MA830002	Soil
07T009	MA865001	Water
07S00701	MA865002	Soil

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I. Validation Procedure Summary

Data review and validation were performed in accordance with Naval Energy and Environmental Support Activity (NEESA) 20.2-047B (June 1988) using the USEPA National Functional Guidelines for Organic Data Review, (12/90, Revised 6/91) and criteria specified in the USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (1986).

II. Data Deliverables

- 1. All required deliverables including QA/QC summary forms and all necessary raw data were present in legible form in the data package.

Yes: X No:

III. Technical Holding Times

Technical holding times for all samples were verified from raw data and chain of custody forms.

- 1. Technical holding times were within the allowable limits shown below:

- a. Preserved water samples analyzed ≤ 14 days from date of sample collection.

Yes: X No: N/A:

- b. Unpreserved water samples, aromatic VOCs analyzed ≤ 7 days from date of sample collection; non-aromatic VOCs analyzed ≤ 14 days from date of sample collection.

Yes: No: N/A: X

- c. Soil samples analyzed ≤ 14 days from date of sample collection.

Yes: X No: N/A:

Comment: Holding time criteria have been met and no action has been taken.

IV. Initial Calibration (ICAL)

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. An initial 5-point calibration was run for each compound.

Yes: X No:

2. The %RSD results from the initial calibration met QC acceptance criteria and no action has been taken.

V. Continuing Calibration

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. A continuing calibration standard containing all target compounds was analyzed.

Yes: X No:

2. The calibration concentration for each compound was within QC acceptance range.

Yes: X No:

3. The retention times (RT) for each compound was within the specified RT window.

Yes: X No:

4. Comments: The following calibration calculations were verified during the validation process.

MS001 DB624-VAR3600 3/22/96 Vinyl Chloride Avg. RF = $1.5785 + 1.4294 + 1.2452 + 1.2353 + 1.2228 / 5 = 1.3422$	MS001 DB624-VAR3600 3/30/96 2-Chloroethylvinylether at 20 ppb = $(7279/323922) = 0.022$
--	--

VI. Blanks

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

A. Laboratory Blanks

1. Laboratory method blanks were analyzed for each matrix type, concentration level, and for each 12 hour time period on each GC system used to analyze samples.

Yes: X No:

2. All laboratory blanks were found to be free of contaminant target compounds at detectable concentrations.

Yes: X No:

Comment: The following table summarizes laboratory blank results:

Volatile Laboratory Blank Summary Table SDG No. MS001								
Blank ID/Date Analyzed	Affected Analyte	Conc. ug/l	Action Level ** ug/l	Affected Sample	Lab Conc ug/l	Lab Qual	EDS Conc ug/l	EDS Qual
VWB10417 4/17/96	None Found	--	--	--	--	--	--	--
VWB10501 5/1/96	None Found	--	--	--	--	--	--	--
VWB10502 5/2/96	None Found	--	--	--	--	--	--	--
VWB10513 5/13/96	None Found	--	--	--	--	--	--	--

Volatile Laboratory Blank Summary Table SDG No. MS001								
Blank ID/Date Analyzed	Affected Analyte	Conc. ug/kg	Action Level ** ug/kg	Affected Sample	Lab Conc ug/kg	Lab Qual	EDS Conc ug/kg	EDS Qual
VSB10416 4/16/96	None Found	--	--	--	--	--	--	--
VSB10426 4/26/96	None Found	--	--	--	--	--	--	--

VSB10501 5/1/96	None Found	--	--	--	--	--	--	--
VSB10508 5/8/96	None Found	--	--	--	--	--	--	--
VSB10513 5/13/96	None Found	--	--	--	--	--	--	--

Comment: All confirmation blanks, BSB10417C, BSB10426C, BSB10509C, and BSB10514C were free of contamination.

B. Field Blanks

1. The field blanks associated with samples in the SDG met the following conditions:

a. All field blanks were found to be free of target analytes at detectable concentrations.

Yes: X No: N/A:

Comment: The following table summarizes field blank results:

Volatile Field Blank Summary Table SDG No. MS001								
Blank ID/Date Analyzed	Affected Analyte	Conc. ug/l	Action Level ** ug/l	Affected Sample	Lab Conc ug/l	Lab Qual	EDS Conc ug/l	EDS Qual
07T001 4/17/96	None Found	--	--	--	--	--	--	--
07Y001 4/17/96	None Found	--	--	--	--	--	--	--
07R001 4/17/96	None Found	--	--	--	--	--	--	--
07T002 4/17/96	None Found	--	--	--	--	--	--	--
07T004 5/1/96	None Found	--	--	--	--	--	--	--
07T007 5/2/96	None Found	--	--	--	--	--	--	--
07T009 5/13/96	None Found	--	--	--	--	--	--	--

VII. System Monitoring Compounds (Surrogates)

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. System monitoring compound recovery results met the QC acceptance criteria for fluorobenzene.

Yes: X No:

2. Sample reanalysis was performed if system monitoring results were outside of criteria.

Yes: No: N/A: X

Comment: Surrogate criteria have been met and no action has been taken.

VIII. Matrix Spikes/Matrix Spike Duplicates

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. For every 20 samples in an SDG, one field sample of each type was spiked for MS/MSD analysis.

Yes: X No:

2. MS/MSD sample I.D.: 07S00101

3. MS/MSD sample results met QC acceptance criteria.

Yes: No: X NA:

4. Comment: The %R for 2-chloroethylvinylether exceeded QC advisory limits for both the MS and MSD. 2-CEVE was not detected in any of the samples, therefore, no action was taken.

IX. Laboratory Control Samples (LCS)

Laboratory control charts were included in the data packages.

1. Laboratory control charts were provided for each surrogate recovery.

Yes: X No: N/A:

2. The percent recoveries were within acceptable QC limits.

Yes: X No: N/A:

Comment: LCS criteria have been met and no action has been taken.

X. Field Duplicates

1. The following duplicate set(s) was analyzed with this SDG:

a. 07S00101 and 07S00101D

2. Comment: The following table summarizes the field duplicate results.

Compound	07S00101 ug/kg	07S00101D ug/kg	RPD
Ethylbenzene	13	12	8
Xylenes (total)	64	59	8

XI. Compound Quantitation and Reported CRQLS

Compound quantitation and reported CRQLs are not verified for Level C data validation.

1. All Form I sample results which were verified were correctly calculated and reported.

Yes: No: N/A: X

2. All sample compounds had on-column concentrations within the upper calibration range of the method.

Yes: X No: N/A:

3. All samples were analyzed only once (i.e., no samples required re-analysis or dilution).

Yes: X No: N/A:

XII. System Performance

1. The instrumental and analytical systems used in the analysis of these samples maintained an acceptable level of performance.

Yes: X No:

XIII. Overall Assessment of Data

The final validated results represent the compilation of all quality control qualification. The analyses of environmental samples and quality control samples are valid.

Organic Data Qualifiers

- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
- NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**Summary of Organic Data Validation
Polynuclear Aromatic Hydrocarbons**

Client: ABB Environmental Services, Inc.
Project Name: U.S. Naval Station Mayport, Mayport, Florida
Project Number: CTO 028
Contract Laboratory: Quality Analytical Laboratory
SDG Number: MS001
Purchase Order Number: SE4-21-017
NEESA Level: C
Data Reviewer: Nancy Weaver
Secondary Reviewer: Linda Harding
Date Review Completed: June 10, 1996

Client Sample Number	Laboratory Sample Number	Sample Matrix
07Y001	MA660002	Water
07R001	MA660003	Water
07S00101	MA660004	Soil
07S00101MS	MA660004MS	Soil
07S00101MSD	MA660004MSD	Soil
07S00101D	MA660005	Soil
07S00201	MA660006	Soil
07S00301	MA719002	Soil
07S00401	MA719003	Soil
07S00501	MA803002	Soil
07S00601	MA830002	Soil
07S00701	MA865002	Soil

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I. Validation Procedure Summary

Data review and validation were performed in accordance with Naval Energy and Environmental Support Activity (NEESA) 20.2-047B (June 1988) using the USEPA National Functional Guidelines for Organic Data Review, (12/90, Revised 6/91) and criteria specified in the USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (1986).

II. Data Deliverables

1. All required deliverables including QA/QC summary forms and all necessary raw data were present in legible form in the data package.

Yes: X No:

III. Technical Holding Times

Technical holding times for all samples were verified from raw data and chain of custody forms.

1. Technical holding times were within the allowable limits shown below:

- a. Water samples extracted <7 days from date of sample collection; analyzed <40 days from date of extraction.

Yes: X No: N/A:

- b. Soil samples extracted <14 days from date of sample collection; analyzed <40 days from date of extraction.

Yes: X No: N/A:

Comment: Holding time criteria have been met and no action has been taken.

IV. Calibration

One hundred percent of the results on summary forms were checked to ensure that reported results met required quality control criteria.

1. Were initial calibration data reviewed and found to meet all method requirements?

Yes: X No:

Comment: Initial calibration criteria have been met and no action has been taken.

2. Were continuing calibration data reviewed and found to meet all method requirements?

Yes: X No:

Comment: Calibration criteria have been met and no action has been taken. All %D values were less than 15.0%.

3. Did the laboratory meet the linearity check criteria?

Yes: X No:

Comment: Linearity check criteria have been met and no action has been taken. The coefficient of determination for each calibration curve was greater than 0.995.

4. Were the retention times within specified limits?

Yes: X No:

Comment: Retention time criteria have been met and no action has been taken.

The following calculations were verified for this data package:

PNAs MS001 RTX-5 HP8904A 4/1/96 Fluorene mean RT= $18.02+18.01+18.01+18.01+18.01/5 = 18.01$	PNAs MS001 RTX-5 HP8904A 4/17/96 Naphthalene $0.5 \text{ Std} = \text{area ratio} = 204640/995417 = 0.20558$	PNAs MS001 HP8904A 4/16/96 Anthracene $\%D = (20.38-18.34)/20.38 \times 100 = 10.0\%$
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V. Blanks

A. Laboratory Blanks

One hundred percent of the results on summary forms were checked to ensure that reported results met required quality control criteria.

1. A method blank analysis was performed for every 20 samples of a similar matrix type in each SDG.

Yes: X No:

2. Laboratory method blanks were found to be clean of target compound contamination at detectable concentrations.

Yes: X No:

3. If analytes were detected in the blanks, the associated samples were found to be free of those analytes at detectable concentrations.

Yes: No: NA: X

Comment: Blank criteria have been met and no action has been taken. Laboratory blanks NBLK06, NBLK09, NBLK10, NBLK17, and NBLK29 were free of contamination.

B. Field Blanks

1. Field blanks were found to be clean of target compound contamination at detectable concentrations.

Yes: X No: N/A:

2. If analytes were detected in the blanks, the associated samples were found to be free of those analytes at detectable concentrations.

Yes: No: N/A: X

Comment: Field blank 07Y001 and rinsate blank 07R001 were free of contamination.

VI. Surrogate Spike Compounds

One hundred percent of the results on summary forms were checked to ensure that reported results met required quality control criteria.

1. The surrogate spike %R values were within the QC advisory limits for terphenyl-d14.

Yes: X No:

Comment: Surrogate criteria have been met and no action has been taken. Several samples were analyzed at a dilution, therefore, the surrogates were not recovered and reported as 0%. No action was taken on this basis.

VII. Matrix Spikes/Matrix Spike Duplicates (MS/MSD)

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. For every 20 samples in an SDG, one field sample of each type was spiked for MS/MSD analysis.

Yes: X No:

2. MS/MSD sample I.D.: 07S00101

3. MS/MSD sample results were acceptable.

Yes: X No:

Comment: MS/MSD criteria have been met and no action has been taken. The MS/MSD sample 07S00101 was analyzed at a dilution, therefore, the spike recoveries could not be determined and were reported as 0%. No action was taken by the reviewer.

VIII. Blank Spikes

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. For every 20 samples in an SDG, one blank sample of each type was spiked for BS analysis.

Yes: X No:

2. Blank Spike sample I.D.: BS041061

3. Blank spike sample results were within acceptable QC limits.

Yes: X No: N/A:

Comment: BS criteria have been met and no action has been taken.

IX. Laboratory Control Samples (LCS)

Laboratory control charts were provided for each analysis.

1. For every batch, one LCS of each type was analyzed.

Yes: X No: N/A:

2. LCS sample I.D.: S04106B1, S04176B1, S04296B1, S05066B1

3. The percent recoveries for the LCS compound were within acceptable limits.

Yes: X No: N/A:

Comment: The LCS' performed on 4/16/96, 4/18/96, 5/2/96, and 5/8/96 were acceptable.

X. Field Duplicates

1. The following duplicate set was analyzed with this SDG:

a. 07S00101 and 07S00101D

2. Comment: There were no positive results reported for either duplicate sample.

XI. Target Compound Identification

Target compound identification is not reviewed for Level C validation.

XII. Compound Quantitation and Reported CRQLS

Compound quantitation and reported CRQLS are not reviewed for Level C validation.

1. CRQL values were adjusted to reflect all sample volumes, sample dilutions, concentrations, cleanup activities, and dry weight factors not accounted for by the method.

Yes: X No: N/A:

2. Comment: The laboratory raised the reporting limits for 1-methylnaphthalene and 2-methylnaphthalene in samples 07S00101, 07S00101D, 07S00201, and 07S00501 due to chemical interferences during analysis. The reporting limits were also raised for anthracene in sample 07S00501 and 2-methylnaphthalene in sample 07S00601. The laboratory qualified these compounds as "UI" and the reviewer further qualified these results as estimated "UJ."

3. Comment: Samples 07S00101, 07S00101D, 07S00201, 07S00301, 07S00401, 07S00501, 07S00601, and 07S00701 were analyzed at a dilution due to interferences. No action was taken on this basis.

XIII. Overall Assessment of Data

The final validated results represent the compilation of all quality control qualification. With the exception of the quality control anomalies presented in Section XII (Compound Quantitation) of this report and the resulting qualifiers, the analyses of environmental samples and quality control samples are valid within the constraints identified with the data quality flags.

Organic Data Qualifiers

- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
- NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Summary of Inorganic Data Validation Metals

Client: ABB Environmental Services, Inc.
 Project Name: U.S. Naval Station Mayport, Mayport, Florida
 Project Number: CTO 028
 Contract Laboratory: Quality Analytical Laboratory
 SDG Number: MS001
 Purchase Order Number: SE4-21-017
 NEESA Level: C
 Data Reviewer: Susan Dalla
 Secondary Reviewer: Nancy Weaver
 Date Review Completed: June 10, 1996

Contractor Sample Number	Laboratory Sample Number	Sample Matrix
07Y001	MA660002	Water
07R001	MA660003	Water
07S00101	MA660004	Soil
07S00101MS	MA660004MS	Soil
07S00101MSD	MA660004MSD	Soil
07S00101D	MA660005	Soil
07S00201	MA660006	Soil
07S00301	MA719002	Soil
07S00401	MA719003	Soil
07S00501	MA803002	Soil
07S00601	MA830002	Soil
07S00701	MA865002	Soil

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I. Validation Procedure Summary

Data review and validation were performed in accordance with Naval Energy and Environmental Support Activity (NEESA) 20.2-047B (June 1988) using the USEPA Functional Guidelines for Inorganic Analyses (7/88) and criteria specified in the USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (1986).

II. Data Deliverables

1. All required deliverables including QA/QC summary forms are present and in legible form in the data package.

Yes: X No:

2. Lab control charts were received and data points were within the control limit windows.

Yes: X No: N/A:

Note: If data points are outside of control limit windows, refer to the Laboratory Control Sample section VIII for any effect on data quality.

III. Technical Holding Times

Chain of custody records and sample preparation logs (Form 13) were checked for all samples to verify that technical holding time, and preservation criteria were met.

1. Technical holding times were within the allowable limits shown below:
 - a. Analysis for all metals was completed within 180 days of sample collection; mercury was completed within 28 days.

Yes: X No:

Comment: Holding time criteria have been met and no action has been taken.

IV. Instrument Calibration and Calibration Verification

One hundred percent of the calibration results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

1. Instrument calibration for metals determined by inductively coupled plasma spectroscopy (ICP) was performed using a blank and one standard for each analyte.

Yes: X No:

2. Instrument calibration for metals determined by graphite furnace atomic absorption spectroscopy (GFAA) was performed using a blank and three standards (one of which was at the CRDL).

Yes: X No:

3. Instrument calibration for mercury was performed using a blank and four standards.

Yes: X No: N/A:

4. Instrument calibration for cyanide was performed using a blank and three standards (one of which was at the CRDL).

Yes: No: N/A: X

5. Calibration verification was performed for each analyte at a frequency of 10%.

Yes: X No:

6. A continuing calibration verification (CCV) was performed after the last analytical sample in each run.

Yes: X No:

7. Initial calibration verification (ICV) and CCV percent recovery (%R) values met the criteria specified below:

a. For all metals except mercury, %R results were between 90% and 110%.

Note: Due to possible rounding errors, allow results to fall within 1% of the contract windows (e.g. 89-111%).

Yes: X No:

8. Correlation coefficients for GFAA analytes, mercury, and cyanide calibration curves were greater than or equal to 0.995.

Yes: No: N/A: X

Comment: Raw data was not provided for this Level C SDG; therefore, calibration curves were not available.

9. Comments: The following calibration calculations were verified during the validation process.

ICV or CCV	Analyte	Calculation $\% R = (\text{Found}/\text{True}) * 100$	% R
ICV	Barium	$2462/2500 \times 100$	98.5
CCV	Barium	$2449/2500 \times 100$	98.0
ICV	Arsenic	$25.12/25.0 \times 100$	100.5
CCV	Arsenic	$24.50/25.0 \times 100$	98.0
ICV	Mercury	$5.19/5.0 \times 100$	103.8
CCV	Mercury	$5.09/5.0 \times 100$	101.8

V. Blanks

A. Laboratory Blanks

One hundred percent of the laboratory blank results on the summary forms were checked to ensure that reported results were within required quality control limits.

1. Preparation blank analyses results have been reported for each matrix type for every extraction batch.

Yes: X No:

2. Calibration blanks were run at a frequency of 10%.

Yes: X No:

3. A calibration blank was analyzed immediately after every ICV and CCV, and after the last sample.

Yes: X No:

4. All reported blank analyte results had absolute values less than the corresponding IDL values.

Yes: No: X

The following sample results were qualified due to laboratory blanks that had target analytes where the absolute value of the reported results was greater than or equal to the corresponding IDL value; sample results were less than 5X the absolute value of the blank result.

Inorganic Laboratory Blank Summary Table SDG No. MS001								
Blank ID/ Date	Affected Analyte	Absolute Conc. ug/l or mg/kg	Action Level ug/l or mg/kg	Affected Sample	Lab Conc ug/l or mg/kg	Lab Qual	EDS Conc ug/l or mg/kg	EDS Qual
PBW 4/16/96	Barium	6.79	34.0	07Y001	10.7	B	10.7	UJ
				07R001	7.2	B	7.2	UJ
PBS 5/6/96	Cadmium	0.624	3.12	07S00701	0.49	B	0.62	UJ
PBS 5/6/96	Arsenic	0.27	1.35	07S00701	0.72	B	0.72	UJ

5. All reported blank analyte results had absolute values less than or equal to the corresponding CRDL values.

Yes: X No:

B. Field Blanks

1. If analytes were detected in the blanks, the associated samples were found to be free of those analytes at detectable concentrations.

Yes: _____ No: X N/A: _____

2. Analytes were detected, but associated sample aliquot concentrations were greater than 5X the blank concentration.

Yes: _____ No: X N/A: _____

The following sample results were qualified due to field blanks that had target analytes where the absolute value of the reported results was greater than or equal to the corresponding IDL value; sample results were less than 5X the absolute value of the blank result.

Inorganic Field Blank Summary Table SDG No. MS001								
Blank ID	Affected Analyte	Absolute Conc. ug/L or mg/kg	Action Level ug/L or mg/kg	Affected Sample	Lab Conc ug/L or mg/kg	Lab Qual	EDS Conc ug/L or mg/kg	EDS Qual
07R001	Chromium	0.56	2.8	07S00101	2.7	-	2.7	UJ
07R001	Mercury	0.014	0.07	07S00201	0.07	B	0.07	UJ
07R001	Chromium	0.56	2.8	07S00601	1.5	B	1.5	UJ
07R001	Mercury	0.014	0.07	07S00301	0.06	B	0.06	UJ
				07S00401	0.06	B	0.06	UJ
				07S00601	0.05	B	0.05	UJ
				07S00701	0.07	B	0.07	UJ

VI. Matrix Spike Sample Recovery

One hundred percent of the matrix spike (MS) sample results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

- For SDG MS001, one field sample from each group of samples of a similar matrix and concentration level was spiked with each target analyte (except: Ca, Mg, K, Na on water samples and Al, Ca, Mg, K, and Na on soil/sediment samples) by the laboratory.

Yes: X No:

- MS sample ID: 07S00101, 07Y001

- For all target analytes, percent recovery (%R) results were within the limits of 75% - 125% (Note: MS %R limits do not apply when the sample concentration exceeded the spike concentration by a factor of 4 or more).

Yes: No: X

Sample	Analyte	% Recovery	Qualifier
07S00101	Lead	162	J
07S00101D	Lead	162	J
07S00201	Lead	162	J
07S00301	Lead	162	J
07S00401	Lead	162	J
07S00501	Lead	162	J
07S00601	Lead	162	J
07S00701	Lead	162	J
07S00101	Silver	29.1	UJ
07S00101D	Silver	29.1	UJ
07S00201	Silver	29.1	UJ
07S00301	Silver	29.1	UJ
07S00401	Silver	29.1	UJ
07S00601	Silver	29.1	UJ
07S00501	Silver	29.1	UJ
07S00701	Silver	29.1	UJ
07Y001	Silver	29.0	UJ
07R001	Silver	29.0	UJ

07Y001	Arsenic	45.5	UJ
07R001	Arsenic	45.5	UJ

4. The following spike calculations were verified during the validation process.

Instrument or Method	Analyte	Calculation $\%R = (SSR - SR / SA) * 100$	$\%R$
ICP	Barium	$(391.1 - 7.44) / 442.5 \times 100$	86.7
GFAA	Lead	$(11.8 - 4.67) / 4.42 \times 100$	161.3
CV	Mercury	$(1.16 - 0.09) / 1.05 \times 100$	101.9

VII. Interference Check Samples

One hundred percent of the ICS results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

1. ICP ICSs (solutions A and AB) were analyzed at the beginning and end of each sample analysis run (or a minimum of twice per 8-hour shift, whichever was more frequent).

Yes: X No:

2. Solution AB analyte recovery results were within the control limits of 80%-120%.

Yes: X No:

3. Concentrations of Ca, Fe, and Mg in the samples are less than or equal to their respective concentration in ICS solution A or AB.

Yes: No: N/A: X

Comment: Ca, Fe and Mg were not requested analytes.

4. Cr is present in a sample(s) at concentrations less than 10,000 ug/L.

Yes: X No: N/A:

5. Comments: ICP ICSs criteria have been met and no action has been taken. The following ICS calculations were verified during the validation process.

Analyte	Calculation %R=(Found Soln AB/True Soln AB)*100	%R
Barium	453.8/500 x 100	90.8

VIII. Laboratory Control Sample (LCS)

One hundred percent of the LCS results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

1. A laboratory control sample was analyzed for each SDG for each matrix type.

Yes: No:

2. Aqueous LCS recovery results were within the control limits of 80% to 120% (except for Sb and Ag which have no required limits).

Yes: No: N/A:

3. Soil LCS recovery results were within the required control limits specified on the laboratory Form VII-IN and control charts.

Yes: No: N/A:

Comment: LCS criteria have been met and no action has been taken.

4. The following LCS calculations were verified during the validation process.

Instrument or Method	Analyte	Calculation %R=(Found/True)*100	%R
ICP	Silver	358.1/500.0 x 100	71.6
GFAA	Arsenic	90.33/100.0 x 100	90.3
CV	Mercury	50.48/50.0 x 100	101.0

IX. Duplicate Sample Analysis

One hundred percent of the duplicate results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

A. Laboratory Duplicates

1. For each SDG, one duplicate sample was analyzed from each group of samples of a similar matrix type and concentration level.

Yes: X No:

MD ID: 07S00101, 07Y001

2. For duplicate analyte concentrations greater than 5X the CRDL, the relative percent difference (RPD) between the two reported results was less than 20% for aqueous samples (35% for soil samples).

Yes: X No:

3. For duplicate analyte concentrations less than 5X the CRDL, the difference between the two reported results was less than the CRDL value for aqueous samples, or less than 2X the CRDL value for soil samples. RPDs for samples with values less than the CRDL are not calculated.

Yes: X No:

4. Comment: Laboratory duplicate criteria have been met and no action has been taken. Matrix duplicate 07S00101 for lead did not meet acceptance criteria. The affected sample results have been qualified for matrix spike problems, and no further action has been taken by the reviewer.

5. The following duplicate calculations were verified during the validation process.

Instrument or Method	Analyte	Calculation $RPD = [S-D/(S+D/2)] * 100$ $D = S - Dup$	RPD or Difference
ICP	Chromium	2.74-3.45	0.71 (± 4.4)
GFAA	Lead	4.67-11.5	6.83 (± 4.0)
CV	Mercury	0.0-0.0	NC

B. Field Duplicates

1. The following duplicate sets were analyzed with this SDG:
 - a. 07S00101 and 07S00101D
2. Comment: Field duplicate criteria have been met and no action has been taken.

X. Furnace Atomic Absorption QC

One hundred percent of the AA summary data was checked to ensure that reported results were within required quality control limits.

1. Duplicate injections for AA analytes with concentrations greater than the CRDL had RSD results < 20%.

Yes: _____ No: _____ N/A: X

Comment: RSD results are contained in the raw data which is not provided for Level C review.

2. For each sample, all AA analytical spike recovery results were between 85% and 115%.

Yes: _____ No: X

Comment: Analytical spike recovery of lead for sample 07S00601 was 118%. The lead result for the above sample has been qualified for MS problems and no further action has been taken.

3. For each sample, all AA results were within the appropriate calibration range, or were diluted to meet this criteria.

Yes: X No: _____ N/A: _____

4. Sample analyte results where the analytical spike recovery was < 40% were diluted once and reanalyzed.

Yes: _____ No: _____ N/A: X

5. Samples having analyte concentrations greater than or equal to 50% of the spike concentrations, and spike %R results <85% or >115% were quantitated by MSA.

Yes: _____ No: _____ N/A: X

6. MSA analyses with correlation coefficients less than 0.995 were rerun once.

Yes: _____ No: _____ N/A: X

7. MSA spike values met the criteria specified below:

- a. Spike 1 was approximately 50% of the sample concentration.
- b. Spike 2 was approximately 100% of the sample concentration.
- c. Spike 3 was approximately 150% of the sample concentration.

Yes: _____ No: _____ N/A: X

XI. ICP Serial Dilution

ICP serial dilution results were provided by the laboratory.

1. ICP serial dilution analysis was performed on one sample from each SDG of a similar matrix type and concentration level.

Yes: _____ No: _____ N/A: X

2. For each analyte in the serial dilution sample which was minimally a factor of 50 above the IDL in the original sample, the serial dilution result agreed within 10% of the original determination after correction for dilution.

Yes: _____ No: _____ N/A: X

XII. Sample Result Verification

Ten percent of all reported sample results were not verified since the raw data is not provided for a Level C data package.

1. All sample results which were verified were correctly calculated and reported.

Yes: No: N/A:

Comment: Calculations and transcriptions can not be verified without the raw data.

2. All sample results fall within the linear range of the ICP (Form XIII) and within the calibrated range of the instrument for AA and cyanide.

Yes: No: N/A:

3. All reported concentrations were above the CRDL.

Yes: No: N/A:

Comment: The "B" qualifier applied by the laboratory for results between the CRDL and the IDL were amended with a "J" qualifier.

4. Sample results on Form 1 were reported down to the IDL not CRDL for all analytes.

Yes: No: N/A:

5. Reported sample results that were analyzed by ICP for As, Pb, Se, and Tl were at least 5X the ICP IDL.

Yes: No: N/A:

6. Sample weights, volumes and dilutions were taken into account when reporting detection limits on Form 1.

Yes: No: N/A:

7. IDLs were present and found to be less than CRDL.

Yes: No: N/A:

8. All CRDLs and IDLs were included on Form X.

Yes: No: N/A:

9. Raw data were free of anomalies (e.g. baseline shifts, negative absorbances/emissions, omissions, etc.). If no, please describe anomalies in the comments section below.

Yes: _____ No: _____ N/A: X

Comment: Raw data is not provided for Level C review.

XIII. Additional Comments/Professional Judgment

The final validated results represent the compilation of all quality control qualification. With the exception of the quality control anomalies presented in Sections V.A.4., V.B.2., VI.3., XII.3 and the resulting qualifiers, the analyses of environmental samples and quality control samples are valid within the constraints identified with the data quality flags. All false positive/negative results are summarized on Table A-1 and matrix interferences on Table A-3.

Inorganic Data Qualifiers

- U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- J - The associated value is an estimated quantity.
- R - The data are unusable. (Note: Analyte may or may not be present.)
- UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

APPENDIX A

Summary Tables and Work Sheets

Table A-1
Review of False Positive/Negative Results

Sample	Parameter	False Positive or Negative	Rationale	Reported		Validated	
				Conc. (ug/l or mg/kg)	Qual	Conc. (ug/l or mg/kg)	Qual
07Y001	Barium	P	2	10.7	B	10.7	UJ
07R001	Barium	P	2	7.2	B	7.2	UJ
07S00701	Cadmium	P	2	0.49	B	0.62	UJ
07S00701	Arsenic	P	2	0.72	B	0.72	UJ
07S00101	Chromium	P	2	2.7	-	2.7	UJ
07S00201	Mercury	P	2	0.07	B	0.07	UJ
07S00601	Chromium	P	2	1.5	B	1.5	UJ
07S00301	Mercury	P	2	0.06	B	0.06	UJ
07S00401	Mercury	P	2	0.06	B	0.06	UJ
07S00601	Mercury	P	2	0.05	B	0.05	UJ
07S00701	Mercury	P	2	0.07	B	0.07	UJ

Rationale

- 1 = Professional judgement
- 2 = Blank contamination (laboratory or field)
- 3 = Prep Blank - negative value > IDL

Table A-3
Matrix Interferences (Inorganics)

Sample	Parameter	Initial	Re-analysis ID	Final	Was the Re-analysis Needed?	Most Appropriate Result	Comment
07S00701	Lead	%R=162	NA	NA	NO	2.4 J	VI.3
07S00101	Lead	%R=162	NA	NA	NO	4.7 J	VI.3
07S00101D	Lead	%R=162	NA	NA	NO	4.5 J	VI.3
07S00201	Lead	%R=162	NA	NA	NO	5.5 J	VI.3
07S00301	Lead	%R=162	NA	NA	NO	5.8 J	VI.3
07S00401	Lead	%R=162	NA	NA	NO	5.4 J	VI.3
07S00601	Lead	%R=162	NA	NA	NO	0.99 J	VI.3
07S00501	Lead	%R=162	NA	NA	NO	4.6 J	VI.3
07S00101	Silver	%R=29.1	NA	NA	NO	0.49 UJ	VI.3
07S00101D	Silver	%R=29.1	NA	NA	NO	0.48 UJ	VI.3
07S00201	Silver	%R=29.1	NA	NA	NO	0.49 UJ	VI.3
07S00301	Silver	%R=29.1	NA	NA	NO	0.48 UJ	VI.3
07S00401	Silver	%R=29.1	NA	NA	NO	0.48 UJ	VI.3
07S00601	Silver	%R=29.1	NA	NA	NO	0.47 UJ	VI.3
07S00501	Silver	%R=29.1	NA	NA	NO	0.48 UJ	VI.3
07S00701	Silver	%R=29.1	NA	NA	NO	0.47 UJ	VI.3
07Y001	Silver	%R=29.0	NA	NA	NO	2.2 UJ	VI.3
07R001	Silver	%R=29.0	NA	NA	NO	2.2 UJ	VI.3
07Y001	Arsenic	%R=45.5	NA	NA	NO	1.3 UJ	VI.3
07R001	Arsenic	%R=45.5	NA	NA	NO	1.3 UJ	VI.3

Environmental Data Services, Inc.

Specializing in Laboratory Data Validation

Summary of Organic Data Validation Volatile Organic Compounds EPA Method 8010/8020

Client: ABB Environmental Services, Inc.
 Project Name: U.S. Naval Station Mayport, Mayport, Florida
 Project Number: CTO 028
 Contract Laboratory: Quality Analytical Laboratory
 SDG Number: MS002
 Purchase Order Number: SE4-21-017
 NEESA Level: C
 Data Reviewer: Nancy Weaver
 Secondary Reviewer: Linda Harding
 Date Review Completed: June 10, 1996

Client Sample Number	Laboratory Sample Number	Sample Matrix
07T003	MA752001	Water
07R002	MA752002	Water
07S00801	MA752003	Soil
07T005	MA781001	Water
07S00901	MA781002	Soil
07S00901MS	MA781002MS	Soil
07S00901MSD	MA781002MSD	Soil
07S00901D	MA781003	Soil
07T006	MA802001	Water
07S01001	MA802002	Soil
07S01101	MA802003	Soil
07T008	MA831001	Water
07S01201	MA831002	Soil
07T010	MA866001	Water
07S01301	MA866002	Soil
07S01401	MA866003	Soil
07T011	MA888001	Water
07S01501	MA888002	Soil

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I. Validation Procedure Summary

Data review and validation were performed in accordance with Naval Energy and Environmental Support Activity (NEESA) 20.2-047B (June 1988) using the USEPA National Functional Guidelines for Organic Data Review, (12/90, Revised 6/91) and criteria specified in the USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (1986).

II. Data Deliverables

1. All required deliverables including QA/QC summary forms and all necessary raw data were present in legible form in the data package.

Yes: X No:

III. Technical Holding Times

Technical holding times for all samples were verified from raw data and chain of custody forms.

1. Technical holding times were within the allowable limits shown below:

a. Preserved water samples analyzed ≤ 14 days from date of sample collection.

Yes: No: X N/A:

b. Unpreserved water samples, aromatic VOCs analyzed ≤ 7 days from date of sample collection; non-aromatic VOCs analyzed ≤ 14 days from date of sample collection.

Yes: No: N/A: X

c. Soil samples analyzed ≤ 14 days from date of sample collection.

Yes: X No: N/A:

Comment: Samples 07T003 and 07R002 were analyzed outside of holding time criteria. All associated results were qualified as estimated "UJ" since they were all non-detects.

IV. Initial Calibration (ICAL)

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. An initial 5-point calibration was run for each compound.

Yes: X No:

2. The %RSD results from the initial calibration met QC acceptance criteria and no action has been taken.

V. Continuing Calibration

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. A continuing calibration standard containing all target compounds was analyzed.

Yes: X No:

2. The calibration concentration for each compound was within QC acceptance range.

Yes: X No:

3. The retention times (RT) for each compound was within the specified RT window.

Yes: X No:

4. Comments: The following calibration calculations were verified during the validation process.

MS002 DB624-VAR3600 4/16/96 1,1-Dichloroethene Avg. RF = 2.5073 + 2.2539 + 2.2104 + 2.1495 + 2.2334/5 = 2.2709	MS002 DB624-VAR3600 3/30/96 2-Chloroethylvinylether at 20 ppb (7279/323922) = 0.02247
--	--

VI. Blanks

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

A. Laboratory Blanks

- Laboratory method blanks were analyzed for each matrix type, concentration level, and for each 12 hour time period on each GC system used to analyze samples.

Yes: X No:

- All laboratory blanks were found to be free of contaminant target compounds at detectable concentrations.

Yes: X No:

Comment: The following table summarizes laboratory blank results:

Volatile Laboratory Blank Summary Table SDG No. MS002								
Blank ID/Date Analyzed	Affected Analyte	Conc. ug/l	Action Level ** ug/l	Affected Sample	Lab Conc ug/l	Lab Qual	EDS Conc ug/l	EDS Qual
VWB10501 5/1/96	None Found	--	--	--	--	--	--	--
VWB10502 5/2/96	None Found	--	--	--	--	--	--	--
VWB10513 5/13/96	None Found	--	--	--	--	--	--	--

Volatile Laboratory Blank Summary Table SDG No. MS002								
Blank ID/Date Analyzed	Affected Analyte	Conc. ug/kg	Action Level ** ug/kg	Affected Sample	Lab Conc ug/kg	Lab Qual	EDS Conc ug/kg	EDS Qual
VSB10426 4/26/96	None Found	--	--	--	--	--	--	--
VSB10502 5/2/96	None Found	--	--	--	--	--	--	--
VSB10508 5/8/96	None Found	--	--	--	--	--	--	--

VSB10513 5/13/96	None Found	--	--	--	--	--	--	--
---------------------	------------	----	----	----	----	----	----	----

Comment: Confirmation blank, BSB10514C was free of contamination.

B. Field Blanks

1. The field blanks associated with samples in the SDG met the following conditions:

a. All field blanks were found to be free of target analytes at detectable concentrations.

Yes: X No: N/A:

Comment: The following table summarizes field blank results:

Volatile Field Blank Summary Table SDG No. MS002								
Blank ID/Date Analyzed	Affected Analyte	Conc. ug/l	Action Level ** ug/l	Affected Sample	Lab Conc ug/l	Lab Qual	EDS Conc ug/l	EDS Qual
07T003 5/1/96	None Found	--	--	--	--	--	--	--
07R002 5/1/96	None Found	--	--	--	--	--	--	--
07T005 5/1/96	None Found	--	--	--	--	--	--	--
07T006 5/2/96	None Found	--	--	--	--	--	--	--
07T008 5/2/96	None Found	--	--	--	--	--	--	--
07T010 5/13/96	None Found	--	--	--	--	--	--	--
07T011 5/13/96	None Found	--	--	--	--	--	--	--

VII. System Monitoring Compounds (Surrogates)

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. System monitoring compound recovery results met the QC acceptance criteria for fluorobenzene.

Yes: X No:

2. Sample reanalysis was performed if system monitoring results were outside of criteria.

Yes: No: N/A: X

Comment: Surrogate criteria have been met and no action has been taken.

VIII. Matrix Spikes/Matrix Spike Duplicates

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. For every 20 samples in an SDG, one field sample of each type was spiked for MS/MSD analysis.

Yes: X No:

2. MS/MSD sample I.D.: 07S00901

3. MS/MSD sample results met QC acceptance criteria.

Yes: X No: NA:

4. Comment: MS/MSD criteria have been met and no action has been taken.

IX. Laboratory Control Samples (LCS)

Laboratory control charts were included in the data packages.

1. Laboratory control charts were provided for each surrogate recovery.

Yes: X No: N/A:

2. The percent recoveries were within acceptable QC limits.

Yes: X No: N/A:

Comment: LCS criteria have been met and no action has been taken.

X. Field Duplicates

1. The following duplicate set(s) was analyzed with this SDG:
 - a. 07S00901 and 07S00901D
2. Comment: There were no positive results reported for either duplicate sample.

XI. Compound Quantitation and Reported CRQLS

Compound quantitation and reported CRQLs are not verified for Level C data validation.

1. All Form I sample results which were verified were correctly calculated and reported.
Yes: _____ No: _____ N/A: X
2. All sample compounds had on-column concentrations within the upper calibration range of the method.
Yes: X No: _____ N/A: _____
3. All samples were analyzed only once (i.e., no samples required re-analysis or dilution).
Yes: X No: _____ N/A: _____

XII. System Performance

1. The instrumental and analytical systems used in the analysis of these samples maintained an acceptable level of performance.
Yes: X No: _____

XIII. Overall Assessment of Data

The final validated results represent the compilation of all quality control qualification. With the exception of the quality control anomalies presented in Section III (Holding Times) and the resulting qualifiers, the analyses of environmental samples and quality control samples are valid within the constraints identified with the data quality flags.

Organic Data Qualifiers

- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
- NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Summary of Organic Data Validation
Polynuclear Aromatic Hydrocarbons

Client: ABB Environmental Services, Inc.
Project Name: U.S. Naval Station Mayport, Mayport, Florida
Project Number: CTO 028
Contract Laboratory: Quality Analytical Laboratory
SDG Number: MS002
Purchase Order Number: SE4-21-017
NEESA Level: C
Data Reviewer: Nancy Weaver
Secondary Reviewer: Linda Harding
Date Review Completed: June 10, 1996

Client Sample Number	Laboratory Sample Number	Sample Matrix
07R002	MA752002	Water
07S00801	MA752003	Soil
07S00901	MA781002	Soil
07S00901MS	MA781002MS	Soil
07S00901MSD	MA781002MSD	Soil
07S00901D	MA781003	Soil
07S01001	MA802002	Soil
07S01101	MA802003	Soil
07S01201	MA831002	Soil
07S01301	MA866002	Soil
07S01401	MA866003	Soil
07S01501	MA888002	Soil

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X.	Field Duplicates	5
XI.	Target Compound Identification	5
XII.	Compound Quantitation and Reported CRQLS	5
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I. Validation Procedure Summary

Data review and validation were performed in accordance with Naval Energy and Environmental Support Activity (NEESA) 20.2-047B (June 1988) using the USEPA National Functional Guidelines for Organic Data Review, (12/90, Revised 6/91) and criteria specified in the USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (1986).

II. Data Deliverables

1. All required deliverables including QA/QC summary forms and all necessary raw data were present in legible form in the data package.

Yes: X No:

III. Technical Holding Times

Technical holding times for all samples were verified from raw data and chain of custody forms.

1. Technical holding times were within the allowable limits shown below:
 - a. Water samples extracted < 7 days from date of sample collection; analyzed < 40 days from date of extraction.

Yes: X No: N/A:

- b. Soil samples extracted < 14 days from date of sample collection; analyzed < 40 days from date of extraction.

Yes: X No: N/A:

Comment: Holding time criteria have been met and no action has been taken.

IV. Calibration

One hundred percent of the results on summary forms were checked to ensure that reported results met required quality control criteria.

1. Were initial calibration data reviewed and found to meet all method requirements?

Yes: X No:

Comment: Initial calibration criteria have been met and no action has been taken.

2. Were continuing calibration data reviewed and found to meet all method requirements?

Yes: X No:

Comment: Calibration criteria have been met and no action has been taken. All %D values were less than 15.0%.

3. Did the laboratory meet the linearity check criteria?

Yes: X No:

Comment: Linearity check criteria have been met and no action has been taken. The coefficient of determination for each calibration curve was greater than 0.995.

4. Were the retention times within specified limits?

Yes: X No:

Comment: Retention time criteria have been met and no action has been taken.

The following calculations were verified for this data package:

PNAs MS002 RTX-5 HP8904A 4/1/96 Fluorene mean RT= $18.02 + 18.01 + 18.01 + 18.01 +$ $18.01 / 5 = 18.01$	PNAs MS002 RTX-5 HP8904A 4/17/96 Acenaphthene 0.5 Std = area ratio = $242330 / 995417 = 0.24345$	PNAs MS002 HP8904A 4/26/96 Anthracene %D = $(20.38 - 19.86) / 20.38 \times$ $100 = 2.5\%$
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V. Blanks

A. Laboratory Blanks

One hundred percent of the results on summary forms were checked to ensure that reported results met required quality control criteria.

1. A method blank analysis was performed for every 20 samples of a similar matrix type in each SDG.

Yes: X No:

2. Laboratory method blanks were found to be clean of target compound contamination at detectable concentrations.

Yes: X No:

3. If analytes were detected in the blanks, the associated samples were found to be free of those analytes at detectable concentrations.

Yes: No: NA: X

Comment: Blank criteria have been met and no action has been taken. Laboratory blanks NBLK02, NBLK09, NBLK18, NBLK19, and NBLK22 were free of contamination.

B. Field Blanks

1. Field blanks were found to be clean of target compound contamination at detectable concentrations.

Yes: X No: N/A:

2. If analytes were detected in the blanks, the associated samples were found to be free of those analytes at detectable concentrations.

Yes: No: N/A: X

Comment: Rinsate blank 07R002 was free of contamination.

VI. Surrogate Spike Compounds

One hundred percent of the results on summary forms were checked to ensure that reported results met required quality control criteria.

1. The surrogate spike %R values were within the QC advisory limits for terphenyl-d14.

Yes: X No:

Comment: Surrogate criteria have been met and no action has been taken.

VII. Matrix Spikes/Matrix Spike Duplicates (MS/MSD)

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. For every 20 samples in an SDG, one field sample of each type was spiked for MS/MSD analysis.

Yes: X No: _____

2. MS/MSD sample I.D.: 07S00901

3. MS/MSD sample results were acceptable.

Yes: X No: _____

Comment: MS/MSD criteria have been met and no action has been taken.

VIII. Blank Spikes

One hundred percent of the results on the summary forms were checked to ensure that reported results met required quality control criteria.

1. For every 20 samples in an SDG, one blank sample of each type was spiked for BS analysis.

Yes: X No: _____

2. Blank Spike sample I.D.: BS042261

3. Blank spike sample results were within acceptable QC limits.

Yes: X No: _____ N/A: _____

Comment: BS criteria have been met and no action has been taken.

IX. Laboratory Control Samples (LCS)

Laboratory control charts were provided for each analysis.

1. For every batch, one LCS of each type was analyzed.

Yes: X No: _____ N/A: _____

2. LCS sample I.D.: S04186B1, S04226B1, S05026B1, S05096B1

3. The percent recoveries for the LCS compound were within acceptable limits.

Yes: X No: _____ N/A: _____

Comment: The LCS' performed on 4/26/96, 5/8/96, and 5/14/96 were acceptable.

X. Field Duplicates

1. The following duplicate set was analyzed with this SDG:
 - a. 07S00901 and 07S00901D
2. Comment: There were no positive results reported for either duplicate sample.

XI. Target Compound Identification

Target compound identification is not reviewed for Level C validation.

XII. Compound Quantitation and Reported CRQLS

Compound quantitation and reported CRQLS are not reviewed for Level C validation.

1. CRQL values were adjusted to reflect all sample volumes, sample dilutions, concentrations, cleanup activities, and dry weight factors not accounted for by the method.

Yes: X No: N/A:

XIII. Overall Assessment of Data

The final validated results represent the compilation of all quality control qualification. The analyses of environmental samples and quality control samples are valid.

Organic Data Qualifiers

- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
- NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Summary of Inorganic Data Validation Metals

Client: ABB Environmental Services, Inc.
Project Name: U.S. Naval Station Mayport, Mayport, Florida
Project Number: CTO 028
Contract Laboratory: Quality Analytical Laboratory
SDG Number: MS002
Purchase Order Number: SE4-21-017
NEESA Level: C
Data Reviewer: Susan Dalla
Secondary Reviewer: Nancy Weaver
Date Review Completed: June 11, 1996

Client Sample Number	Laboratory Sample Number	Sample Matrix
07R002	MA752002	Water
07S00801	MA752003	Soil
07S00901	MA781002	Soil
07S00901D	MA781003	Soil
07S00901MS	MA781002MS	Soil
07S00901MSD	MA781002MSD	Soil
07S01001	MA802002	Soil
07S01101	MA802003	Soil
07S01201	MA831002	Soil
07S01301	MA866002	Soil
07S01401	MA866003	Soil
07S01501	MA888002	Soil

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I. Validation Procedure Summary

Data review and validation were performed in accordance with Naval Energy and Environmental Support Activity (NEESA) 20.2-047B (June 1988) using the USEPA Functional Guidelines for Inorganic Analyses (7/88) and criteria specified in the USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (1986).

II. Data Deliverables

1. All required deliverables including QA/QC summary forms are present and in legible form in the data package.

Yes: X No:

2. Lab control charts were received and data points were within the control limit windows.

Yes: X No: N/A:

Note: If data points are outside of control limit windows, refer to the Laboratory Control Sample section VIII for any effect on data quality.

III. Technical Holding Times

Chain of custody records and sample preparation logs (Form 13) were checked for all samples to verify that technical holding time, and preservation criteria were met.

1. Technical holding times were within the allowable limits shown below:
 - a. Analysis for all metals was completed within 180 days of sample collection; mercury was completed within 28 days.

Yes: X No:

Comment: Holding time criteria have been met and no action has been taken.

IV. Instrument Calibration and Calibration Verification

One hundred percent of the calibration results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

1. Instrument calibration for metals determined by inductively coupled plasma spectroscopy (ICP) was performed using a blank and one standard for each analyte.

Yes: X No:

2. Instrument calibration for metals determined by graphite furnace atomic absorption spectroscopy (GFAA) was performed using a blank and three standards (one of which was at the CRDL).

Yes: X No:

3. Instrument calibration for mercury was performed using a blank and four standards.

Yes: X No: N/A:

4. Instrument calibration for cyanide was performed using a blank and three standards (one of which was at the CRDL).

Yes: No: N/A: X

5. Calibration verification was performed for each analyte at a frequency of 10%.

Yes: X No:

6. A continuing calibration verification (CCV) was performed after the last analytical sample in each run.

Yes: X No:

7. Initial calibration verification (ICV) and CCV percent recovery (%R) values met the criteria specified below:

a. For all metals except mercury, %R results were between 90% and 110%.

Note: Due to possible rounding errors, allow results to fall within 1% of the contract windows (e.g. 89-111%).

Yes: X No:

8. Correlation coefficients for GFAA analytes, mercury, and cyanide calibration curves were greater than or equal to 0.995.

Yes: No: N/A: X

Comment: Raw data was not provided for this Level C SDG; therefore, calibration curves were not available.

9. Comments: The following calibration calculations were verified during the validation process.

ICV or CCV	Analyte	Calculation $\% R = (\text{Found}/\text{True}) * 100$	% R
ICV	Barium	$2516/2500 \times 100$	100.6
CCV	Barium	$2497/2500 \times 100$	99.9
ICV	Arsenic	$26.09/25.0 \times 100$	104.4
CCV	Arsenic	$26.08/25.0 \times 100$	104.3
ICV	Mercury	$4.72/5.0 \times 100$	94.4
CCV	Mercury	$5.16/5.0 \times 100$	103.2

V. Blanks

A. Laboratory Blanks

One hundred percent of the laboratory blank results on the summary forms were checked to ensure that reported results were within required quality control limits.

1. Preparation blank analyses results have been reported for each matrix type for every extraction batch.

Yes: X No:

2. Calibration blanks were run at a frequency of 10%.

Yes: X No:

3. A calibration blank was analyzed immediately after every ICV and CCV, and after the last sample.

Yes: X No:

4. All reported blank analyte results had absolute values less than the corresponding IDL values.

Yes: No: X

The following sample results were qualified due to laboratory blanks that had target analytes where the absolute value of the reported results was greater than or equal to the corresponding IDL value; sample results were less than 5X the absolute value of the blank result.

Inorganic Laboratory Blank Summary Table SDG No. MS002								
Blank ID/ Date	Affected Analyte	Absolute Conc. ug/l or mg/kg	Action Level ug/l or mg/kg	Affected Sample	Lab Conc ug/l or mg/kg	Lab Qual	EDS Conc ug/l or mg/kg	EDS Qual
PBW 4/22/96	Barium	16.3	81.5	07R002	12.1	B	16.3	UJ
PBS 5/6/96	Cadmium	0.624	3.12	07S01301	0.70	B	0.70	UJ
PBS 5/6/96	Arsenic	0.272	1.36	07S01301	0.90	B	0.90	UJ
PBS 5/6/96	Arsenic	0.272	1.36	07S01401	0.83	B	0.83	UJ
PBS 5/14/96	Arsenic	0.39	1.95	07S01501	0.87	B	0.87	UJ

5. All reported blank analyte results had absolute values less than or equal to the corresponding CRDL values.

Yes: X No:

B. Field Blanks

1. If analytes were detected in the blanks, the associated samples were found to be free of those analytes at detectable concentrations.

Yes: _____ No: X N/A: _____

2. Analytes were detected, but associated sample aliquot concentrations were greater than 5X the blank concentration.

Yes: _____ No: X N/A: _____

The following sample results were qualified due to field blanks that had target analytes where the absolute value of the reported results was greater than or equal to the corresponding IDL value; sample results were less than 5X the absolute value of the blank result.

Inorganic Field Blank Summary Table SDG No. MS002								
Blank ID	Affected Analyte	Absolute Conc. ug/L or mg/kg	Action Level ug/L or mg/kg	Affected Sample	Lab Conc ug/L or mg/kg	Lab Qual	EDS Conc ug/L or mg/kg	EDS Qual
07R002	Chromium	0.46	2.3	07S01401	2.2	-	2.2	UJ

VI. Matrix Spike Sample Recovery

One hundred percent of the matrix spike (MS) sample results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

1. For SDG MS002, one field sample from each group of samples of a similar matrix and concentration level was spiked with each target analyte (except: Ca, Mg, K, Na on water samples and Al, Ca, Mg, K, and Na on soil/sediment samples) by the laboratory.

Yes: X No: _____

2. MS sample ID: 07S00901

3. For all target analytes, percent recovery (%R) results were within the limits of 75% - 125% (Note: MS %R limits do not apply when the sample concentration exceeded the spike concentration by a factor of 4 or more).

Yes: _____ No: X

Sample	Analyte	% Recovery	Qualifier
07S00801	Selenium	68.3	UJ
07S00901	Selenium	68.3	UJ
07S00901D	Selenium	68.3	UJ
07S01001	Selenium	68.3	UJ
07S01101	Selenium	68.3	UJ
07S01201	Selenium	68.3	UJ
07S01301	Selenium	68.3	UJ
07S01401	Selenium	68.3	UJ
07S01501	Selenium	68.3	UJ

4. The following spike calculations were verified during the validation process.

Instrument or Method	Analyte	Calculation %R = (SSR-SR/SA)*100	% R
ICP	Barium	$(399-9.70)/425 \times 100$	91.6
GFAA	Arsenic	$(7.85-0.64)/8.49 \times 100$	84.9
CV	Mercury	$(1.04-0.0)/1.06 \times 100$	98.1

VII. Interference Check Samples

One hundred percent of the ICS results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

1. ICP ICSs (solutions A and AB) were analyzed at the beginning and end of each sample analysis run (or a minimum of twice per 8-hour shift, whichever was more frequent).

Yes: X No: _____

2. Solution AB analyte recovery results were within the control limits of 80%-120%.

Yes: X No:

3. Concentrations of Ca, Fe, and Mg in the samples are less than or equal to their respective concentration in ICS solution A or AB.

Yes: No: N/A: X

Comment: Ca, Fe and Mg were not requested analytes.

4. Cr is present in a sample(s) at concentrations less than 10,000 ug/L.

Yes: X No: N/A:

5. Comments: ICP ICSs criteria have been met and no action has been taken. The following ICS calculations were verified during the validation process.

Analyte	Calculation %R=(Found Soln AB/True Soln AB)*100	%R
Barium	475.8/500 x 100	95.2

VIII. Laboratory Control Sample (LCS)

One hundred percent of the LCS results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

1. A laboratory control sample was analyzed for each SDG for each matrix type.

Yes: X No:

2. Aqueous LCS recovery results were within the control limits of 80% to 120% (except for Sb and Ag which have no required limits).

Yes: X No: N/A:

3. Soil LCS recovery results were within the required control limits specified on the laboratory Form VII-IN and control charts.

Yes: X No: N/A:

Comment: LCS criteria have been met and no action has been taken.

4. The following LCS calculations were verified during the validation process.

Instrument or Method	Analyte	Calculation % R = (Found/True)*100	% R
ICP	Barium	2435/2500 x 100	97.4
GFAA	Arsenic	85.2/100.0 x 100	85.2
CV	Mercury	5.33/5.0 x 100	106.6

IX. Duplicate Sample Analysis

One hundred percent of the duplicate results on the quality control summary forms were checked to ensure that reported results were within required quality control limits.

A. Laboratory Duplicates

1. For each SDG, one duplicate sample was analyzed from each group of samples of a similar matrix type and concentration level.

Yes: X No:

MD ID: 07S00901

2. For duplicate analyte concentrations greater than 5X the CRDL, the relative percent difference (RPD) between the two reported results was less than 20% for aqueous samples (35% for soil samples).

Yes: X No:

3. For duplicate analyte concentrations less than 5X the CRDL, the difference between the two reported results was less than the CRDL value for aqueous samples, or less than 2X the CRDL value for soil samples. RPDs for samples with values less than the CRDL are not calculated.

Yes: X No:

4. Comment: Laboratory duplicate criteria have been met and no action has been taken.

5. The following duplicate calculations were verified during the validation process.

Instrument or Method	Analyte	Calculation $RPD = [S-D/(S+D/2)] * 100$ $D = S - Dup$	RPD or Difference
ICP	Chromium	5.10-4.37	0.73 (± 4.2)
GFAA	Lead	$[(4.62-4.45)/(4.62+4.45)]/2 \times 100$	3.7 (± 35)
CV	Mercury	$[(0.0-0.0)/(0.0+0.0)]/2 \times 100$	NC

B. Field Duplicates

1. The following duplicate sets were analyzed with this SDG:
 - a. 07S00901 and 07S00901D
2. Comment: Field duplicate criteria have been met and no action has been taken.

X. Furnace Atomic Absorption QC

One hundred percent of the AA summary data was checked to ensure that reported results were within required quality control limits.

1. Duplicate injections for AA analytes with concentrations greater than the CRDL had RSD results < 20%.

Yes: No: N/A:

Comment: RSD results are contained in the raw data which is not provided for Level C review.

2. For each sample, all AA analytical spike recovery results were between 85% and 115%.

Yes: No:

Comment: Selenium analytical spike recoveries for samples 07S00901 and 07S01501 exceeded acceptance criteria. Selenium results for the above samples have already been qualified for low matrix spike recovery and no further qualification is required.

3. For each sample, all AA results were within the appropriate calibration range, or were diluted to meet this criteria.

Yes: X No: N/A:

4. Sample analyte results where the analytical spike recovery was <40% were diluted once and reanalyzed.

Yes: No: N/A: X

5. Samples having analyte concentrations greater than or equal to 50% of the spike concentrations, and spike %R results <85% or >115% were quantitated by MSA.

Yes: No: N/A: X

6. MSA analyses with correlation coefficients less than 0.995 were rerun once.

Yes: No: N/A: X

7. MSA spike values met the criteria specified below:

- a. Spike 1 was approximately 50% of the sample concentration.
- b. Spike 2 was approximately 100% of the sample concentration.
- c. Spike 3 was approximately 150% of the sample concentration.

Yes: No: N/A: X

XI. ICP Serial Dilution

ICP serial dilution results were provided by the laboratory.

1. ICP serial dilution analysis was performed on one sample from each SDG of a similar matrix type and concentration level.

Yes: No: N/A: X

2. For each analyte in the serial dilution sample which was minimally a factor of 50 above the IDL in the original sample, the serial dilution result agreed within 10% of the original determination after correction for dilution.

Yes: No: N/A: X

XII. Sample Result Verification

Ten percent of all reported sample results were not verified since the raw data is not provided for a Level C data package.

1. All sample results which were verified were correctly calculated and reported.

Yes: _____ No: _____ N/A: X

Comment: Calculations and transcriptions can not be verified without the raw data.

2. All sample results fall within the linear range of the ICP (Form XIII) and within the calibrated range of the instrument for AA.

Yes: X No: _____ N/A: _____

3. All reported concentrations were above the CRDL.

Yes: _____ No: X N/A: _____

Comment: The "B" qualifier applied by the laboratory for results between the CRDL and the IDL were amended with a "J" qualifier.

4. Sample results on Form 1 were reported down to the IDL not CRDL for all analytes.

Yes: X No: _____ N/A: _____

5. Reported sample results that were analyzed by ICP for As, Pb, Se, and Tl were at least 5X the ICP IDL.

Yes: _____ No: _____ N/A: X

6. Sample weights, volumes and dilutions were taken into account when reporting detection limits on Form 1.

Yes: X No: _____ N/A: _____

7. IDLs were present and found to be less than CRDL.

Yes: X No: _____ N/A: _____

8. All CRDLs and IDLs were included on Form X.

Yes: X No: N/A:

9. Raw data were free of anomalies (e.g. baseline shifts, negative absorbances/emissions, omissions, etc.). If no, please describe anomalies in the comments section below.

Yes: No: N/A: X

Comment: Raw data is not provided for Level C review.

XIII. Additional Comments/Professional Judgment

The final validated results represent the compilation of all quality control qualification. With the exception of the quality control anomalies presented in Sections V.A.4, V.B.2, VI.3, XII.3 and the resulting qualifiers, the analyses of environmental samples and quality control samples are valid within the constraints identified with the data quality flags. All false positive/negative results are summarized on Table A-1 and matrix interferences on Table A-3.

Inorganic Data Qualifiers

- U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- J - The associated value is an estimated quantity.
- R - The data are unusable. (Note: Analyte may or may not be present.)
- UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

APPENDIX A

Summary Tables and Work Sheets

Table A-1
Review of False Positive/Negative Results

Sample	Parameter	False Positive or Negative	Rationale	Reported		Validated	
				Conc. (ug/l or mg/kg)	Qual	Conc. (ug/l or mg/kg)	Qual
07R002	Barium	P	2	12.1	B	16.3	UJ
07S01301	Cadmium	P	2	0.70	B	0.70	UJ
07S01301	Arsenic	P	2	0.90	B	0.90	UJ
07S01401	Arsenic	P	2	0.83	B	0.83	UJ
07S01501	Arsenic	P	2	0.87	B	0.87	UJ
07S01401	Chromium	P	2	2.2	--	2.2	UJ

Rationale

- 1 = Professional judgement
- 2 = Blank contamination (laboratory or field)
- 3 = Prep Blank - negative value > IDL

Table A-3
Matrix Interferences (Inorganics)

Sample	Parameter	Initial	Re-analysis ID	Final	Was the Re-analysis Needed?	Most Appropriate Result	Comment
07S00801	Selenium	% R = 68.3	NA	NA	NO	0.29 UJ	VI.3
07S00901	Selenium	% R = 68.3	NA	NA	NO	0.28 UJ	VI.3
07S00901D	Selenium	% R = 68.3	NA	NA	NO	0.28 UJ	VI.3
07S01001	Selenium	% R = 68.3	NA	NA	NO	0.27 UJ	VI.3
07S01101	Selenium	% R = 68.3	NA	NA	NO	0.28 UJ	VI.3
07S01201	Selenium	% R = 68.3	NA	NA	NO	0.26 UJ	VI.3
07S01301	Selenium	% R = 68.3	NA	NA	NO	0.28 UJ	VI.3
07S01401	Selenium	% R = 68.3	NA	NA	NO	0.28 UJ	VI.3
07S01501	Selenium	% R = 68.3	NA	NA	NO	0.27 UJ	VI.3

APPENDIX F

COPY OF ABB-ES SITE LOGBOOK

NAVSTA MAYPORT

OWTP - SLUDGE BEDS

NEEP - SAMPLS 6+7

L.T.T.D.

DEMONSTRATION

08534-14

TKB

NATIONAL

416

FIELD / TRANSIT BOOK

①

4/1/96

HEALEY CAMP, SHELBY ≈ 70°F
OBJECTIVE: MEET OFF HELD ACTIVITIES
AT OUTP-SLUDGE BEDS (SUMMS
6+7).

PERSONNEL (AT PRE-CON MEETING):

- MIKE JEVES (EGB-ES)
- FRANK LESSENE "
- CAROL MITCHELL (NEWSTE SCE)
- MIKE LINDELL (ISSA)
- HEROLD TIGHE (SOUTHADN)
- MILTON MORRIS (MUSSTE TORC)
- CAUCH BREEDLOVE (NEWSTE FINE)

1300 RAINING AT SCE BLDG. FOR
PRE-CON MEET OFF MEETING OF
SOUTHWEST SOIL REMEDIATION,
INC. (ISSA) LOW-TEMP. THERMAL
DESORPTION (LTTD) SOIL
REMEDIATION DEMONSTRATION
AT THE OUTP-SLUDGE BEDS,
SUMMS 6+7.

1315 LOGISTICS AND SCHEDULE ARE
DISCUSSED AND IT IS DETERMINED
THAT THE NEW TOTAL TONNAGE
OF PETROLEUM CONTAMINATED SOIL
(MCS) TO BE EXCERATED AND
TREATED IS TO BE 2,400 TONS.

②

4/1/96

CLEARING, WINDY ≈ 70°F
1345 VISIT THE SITE TO DETERMINE
BEST AREA FOR EXCAVATION +
TREATMENT. F. LESSENE, C. MITCHELL
AND M. LINDELL DISCUSS AND DECIDE
TO GO WITH A SECTION FROM THE
SOUTHWEST CORNER OF THE WESTERN
HEAT SLUDGE BED (THE ONE ON
TOP OF THE ORIGINAL SUMMS 6 MT).

1405 ALL PARTIES AGREED, MEETING
BREAKS. M. LINDELL SEES THEY
MAY HAVE SOME SOIL THIS
AFTERNOON.

1415 I (M. JEVES) TRAVEL TO EGB
TRUCK TO WILKINS AND RECEIVE
DOTTED ORDER w/ CHEM WILL FOR
PRE-SAMPLES LATER THIS WEEK.

1700 BREAK AT SITE, NO ISSA PERSONNEL
ON-SITE, BUT SOME EXCAVATION HAS
BEGUN.

PHOTO LOG: (CASE #16)

#14 - INITIAL EXCAVATION + LOCATION

#15 - " " "

#16 - EXCAVATION, END OF DAY
AND

#17 - LTTD UNIT + PROCEED STORAGE

CELL SET-UP (SOUTH OF SUMMS 6+7).

Michael O. Jaynes 4/1/96

③

4/2/96

CLEAR COOL, HIGH WINDS ~ 50%
OBSERVE SSA EXCAVATION
+ SET-UP AT SUMM GPT.

PERSONNEL:
MIKE JAMES (COB-ES)
MIKE UNDER (SSA)
LOUAY CARLISE (SSA)
TYLER FOUGHT (SSA)

0800 ARRIVE AT SITE. SSA PERSONNEL
READY ON-SITE AND HAVE MORE
NO WHERE THEY LEFT OFF W/ THE
EXCAVATION YESTERDAY. CONSTRUCTION
OF THE STORAGE CELL BEGINS AS
PROGRESSING WELL.

0815 TALK W/ M. UNDER ABOUT SCHEDULE
HE VERIFIES WHAT WAS DISCUSSED
YESTERDAY THEY WILL BE SETTING
UP THE STORAGE CELLS AND CON-
LETING THE WIREL EXCAVATION
+ STOCKPILING OF PLS THIS WEEK.
THE WIREL OURN + TBT WILL
BE SOMETIME AT THE END OF
NEXT WEEK (MON OR TUE).

0830 RECENT SITE FOR TRAILER.
1000 REMAIN BEAT AT SITE. BEAT
CONSTRUCTION CONTINUES. SET AS
USING SOIL FROM SUMM GPT

④

4/2/96

1000 (CONT) SLUDGE BED BEGINS (ASUMED
TO BE CLEAN SOIL) TO CONSTRUCT
THE CONTAINMENT BEGINS BUT THE
PRE-POST TREATMENT SOIL STORAGE
STEPS.

PHOTO LOG: (BOOK PG.)

#18 - CONSTRUCTION OF STORAGE CELLS
#19 - "
#20 - EXCAVATION OF WASTE AND
SCHEDULE BED (SUMM G).

1115 DEPART SITE TO CHECK ON FEO-
EX SAMPLING.

1120 AT TRUCK, NO BOTTLES. WILL NEED
TO CALL MONTGOMERY (MS).

1130 WORK ON FILE MANAGEMENT AND COC
FOR IMPROVING SAMPLES.

1200 BREAK FOR LUNCH

1330 BREAK AT SITE, STORAGE CELL
CONSTRUCTION IS GOING WELL. SOIL
WAS LAD THE 10-MIL PLASTIC IN THE
POST (CLEAN) SOIL STORAGE CELL. THEY
HAVE RUN OUT OF PLASTIC AND
WILL NEED MORE TO COMPLETE
THE (PARTY) SOIL STORAGE CELL. IN
UNDER MINIMUMS SEE THAT THE

⑤

4/2/96 CLEAR MORNING ≈ 60°F
 1330 (cont.) STORAGE CELL WILL NOT BE
 ROLE TO BE COMPLETED UNTIL
 THE L.T.T.O UNIT THAT IS
 CURRENTLY IN THE BERT IS
 MOVED HE EXPECTS THAT TO
 HAPPEN TOMORROW WHEN THEIR
 OTHER TRUCK ARRIVES.
 1440 SSA OFF-SITE TO GET NOTE
 10-MIN PLASTIC.
PHOTO LOG: (CONT #16)
 #21 - PROGRESS ON STORAGE CELLS
 (POST ON CLEAN-UP TO THE SOUTH,
 PRE ON DIRT SOIL TO THE NORTH)
 #22 - SOIL STORAGE AREA GIVEN FROM
 THE NORTH
 #23 - EXECUTION OF SUMM G ORAM.
 1500 DEPART SITE.
 1515 AT TRAILER, WAITING ON COC +
 LABELS FOR BOTTLE SET THAT
 HAS NOT ARRIVED. (CONTINUE)
 1615 CELL FROM RICHARD RECALLER/VERMILIES
 SHIPMENT + CORES WILL ARRIVE
 TOMORROW.
 1700 DEPART TRAILER, END OF DAY

Richard O. Joyner
 4/2/96

⑥

4/3/96 CLEAR, WIND ≈ 60°F
OBJECTIVE: OBSERVE EXCAVATION, STORAGE
 CELL CONSTRUCTION, PCS STORAGE-
 ING, AND POSSIBLY SAMPLE.
PERSONNEL: MIKE JAYNES (CBOO-ES),
 MIKE UNDER (SSA),
 LARRY CORTSE (SSA),
 TYLER FOULGART (SSA)
 0815 ARRIVE AT SITE, NO SSA PERSONNEL
 PRESENT AS YET
 0830 DEPART FOR TRAILER TO PREP
 LABELS FOR SAMPLING TODAY AND
 TOMORROW.
 0930 BACK AT SITE, SSA PERSONNEL
 HAVE ARRIVED AND ARE PREPARING
 FOR TODAY'S ACTIVITIES.
 1020 AFTER TALKING TO THE SSA ORAM,
 IT TURNIS OUT THEY WANT BE
 ABLE TO DO MUCH AS THE TRUCK
 THAT WILL MOVE THE L.T.T.O UNIT
 WILL NOT ARRIVE UNTIL LATE
 TODAY.
 1030 BACK AT TRAILER BOTTLES HAVE
 ARRIVED. WILL GO TO WORK ON
 SAMPLE BOTTLE + LABEL ORGANIZATION.
 1200 ARRIVE BACK AT SITE WHERE

13

4/5/96

OBJECTIVE:

CLEAR, VIEW AREA = 20%
CONTINUE OBSERVATION OF
SITE EXCAVATION & STOCKPILING
OF TDS AT JUMP 6-7 AND
COLLECT ADDITIONAL COMPOSITE
BASELINE SOC SAMPLES.

PERSONNEL:

MIKE JEVNES (MOB-ES)
LARRY CARLISE (SST)
TYLER FOUGHT (SST)
DREWY AEBLUNEN (SST)

0730 ARRIVE AT SITE, NO SST
PERSONNEL PRESENT, NO EXCAV-
TION TAKING PLACE.

PHOTO LOG: (DIRT #16)

#42 - 5 20-TON STOCKPILES, COVERED
#43 - EXCAVATION IN STAGE 200
#44 - " " "

0750 DEPART SITE FOR TRUCK TO
PIT AND BACK PETERSON'S
SAMPLES.

0830 OFF-BASE FOR ICE + GAS.
1000 C. METERED STOPS BY TRUCK
SITE HAS COME FROM SAMPLE 6-
7 AND SAYS THEY ARE STOCK-
PILING.

1015 MOB TO SITE TO CHECK OUT

4/5/96

14

1015 (CONT.) SST'S PROGRESS.

1030 ARRIVE AT SITE, STOCKPILING
IS IN PROGRESS, THEY ARE AT
BOTTOM. 150 TONS ON THE BIG
PILE (1,100 TONS WILL BE FINAL
PORTAL).

1100 SST INFORMS ME THEY WILL
STOP STOCKPILING BECAUSE 200
TONS ARE NOT CONTINUE
EXCAVATION UNTIL LATE NEXT
WEEK. THAT MEANS ILL BE BACK
TO COLLECT ONE ADDITIONAL
COMPOSITE SAMPLE TODAY. THE SST
WILL HAVE TO WAIT UNTIL NEXT
WEEK.

1130 COLLECT COMPOSITE SAMPLE:
07500201, STAKE ABOUT 100 CM.
TDS TO TRUCK.

1210 OFF-SITE FOR LUNCH
1300 CLEAN UP TRUCK + NETWORK FOR
SHIPMENT OF ALL SAMPLES TODAY.
1500 PACKING COMPLETE + SHIPMENT
READY FOR MOB-EX PICK-UP.

1510 MOB BACK TO SITE TO CHECK ON
SST STAFFS.

13 15

4/5/96

WENT, WIND = 75°F
AT SITE, BT CLEANING UP
SOIL STOCKPILES ARE COVERED.

PHOTO LOG:

- 045. SOIL STOCKPILES + STORAGE AREA
- 046. EXCAVATION PITS IN SQUARE
- 050 w/ WATER
- 047. " "
- 048. LTRD FULLY RESEALING.
- OFF-SITE TO TRUCKER
- AT TRUCKER, FRO-EX HAS NOT
- RETURNED YET.
- FRO-EX RETURNS, SAMPLES
- PACKED-UP. CLEAN-UP, CORROD.
- OFF-SITE, END OF SHIFT.

Michael O. Jayne

4/5/96

14

4/10/96

CLEAR, COOL = 60°F

OBJECTIVE: OBSERVE EXCAVATION, STOCKPILING
AND SET-UP OF 55A'S LTRD
REINFORCEMENT AT PILING 0-7

PERSONNEL: MIKE WAINES (RODSS)

LEAHY GARCIA (SDST)

1015 REMOVE OUSITE, EXCAVATION
AND STOCKPILING OF 6100 TON
PIL 15 IN PROGRESS.

TRAGEDY L. CEMENT AND HE
SAND, TO THE BEST OF HIS
KNOWLEDGE, THE SCHEDULE FOR
THE TEST OVERNIGHT WILL BE
SAME (GENERAL, THE 12th).

HE GUESSED ABOUT 300 TONS
HAS BEEN STOCKPILED (NOT QUITE
EVALUATED THE NEXT SOURCE)

AND HE WOULD BE SOME MICH
MORE TOGETHER. SCHEDULE WILL
BE REVISIT TO AT LEAST TOMORROW.

1100

1200

1515

REMOVE AT SITE. NO ONE ON-SITE
AND 55A'S ARE

REMOVED AT SITE, NO OTHER
WORK.

Michael O. Jayne

4/10/96

(17)

4/11/96

clear, cool = 60°F

OBJECTIVE: OBSERVE EXCAVATION ACTIVITIES

AND PROPERTY SAMPLE AS STOCKPILES AT SUMM. Q. 7%

PERSONNEL: MIKE JONES (GEO-85)

0800 RETIRE AT SITE, NO SST PERSONNEL ON-SITE, SITE SECURED.

0810 DEPART SITE FOR TRUCK.

0930 DECK AT SITE, EXCAVATION AND STACKING OF PES HAS RESUMED. BRADSHAW/TRECH 500 TONS OF PES HAS BEEN STOCKPILED.

1000 DEPART SITE, ROAD TO ORANGE PARK (VIA INSTRUCTIONS FROM SAN MICHIGON) TO ROUND UP BATTERIES FOR CHARGE CENTER.

1300 RETIRE DECK AT SITE, NO SST PERSONNEL PRESENT, ONLY BRADSHAW STOCKPILING HAS TAKEN PLACE.

1310 DEPART SITE TO TRUCKS TO MOBY FOR SAMPLING WHICH WILL TAKE PLACE TOMORROW.

1500 DECK AT SITE, MIKE JONES & LARRY CORLISS HAVE RETURNED AND ARE SECURING THE SITE.

(18)

4/11/96

clear, warmer = 70°F

1510 M. LINDA MICHIGON RE THE TEST BURN (PROPERTY TEST) HAS BEEN FINISHED ACCORD TO COMPANY (THE 1514) ONE TO SCHEDULE CONTRACTS AND THE FEEL THAT THE BUT MAINTAINING GUNS HAVEN'T STARTED UP TO SET-UP YET. HE EXPECTS THEM TO RETURN TOMORROW AND SET-UP AND CALIBRATE THE LOTO UNIT OVER THE WEEKEND.

THEY ARE COVERING THE ONE STOCKPILE WHICH CONSISTS OF APPROX. 500 TONS AT THIS POINT. THEY WILL BE COLLECTING SAMPLES (PES) TOMORROW AFTERNOON SO I WILL DO THE SAME.

PHOTO LOG: (NEW DIST. 500)

- #1 - ADDRESS OF STOCKPILE
 - #2 - " " EXCAVATION IN CEO
 - #3 - " " " "
 - #4 - STOCKPILE (800 TONS) COVERED
 - #5 - ADDRESS OF EXCAVATION
- 1530 OFF-SITE, END OF DAY.

Michael O. Payne

4/11/96

(19)

4/12/96

OBJECTIVE:

CLEAR, NICE = 65°F
OBSERVE SET-UP AT SWIM
6 & 7 AND COLLECT ADDITIONAL
OBSERVE (WATER) SAMPLES OF
MS.

PERSONNEL:

REARME AT SITE, SST INSTRUCTING
SET-UP INSULATION INTO THE
SPEC ASSEMBLY. NO SIGN OF
BIT MONITORING GUYS.
OFF-SITE TO TABLE
TALK w/ FRANK LESSENE (CALL) TO
CONFIRM SAMPLE COLLECTION ~~TIME~~
RETURNED AT WILL ONLY BE JOURNAL
REARME. HE OKS IT.
SET-UP FOR SAMPLING. ALSO EAR.
END NOTES.

BRACK. AT SITE. BIT MONITORING
CREW HAS ARRIVED AND IS SETTING
UP THEIR EQUIPMENT. SST HAS
NOT DONE ANY ADDITIONAL SPEAK-
ING SO AS IT STRONGS I'LL BE
ABLE TO TAKE 2 ADDITIONAL
COMPOSITE SAMPLES.
OFF-SITE FOR LUNCH.
REARME BEEN AT SITE TO COLLECT

(20)

4/12/96

CLEAR, WINDY = 70°F
1800 (CONT.) STORAGE COMPOSITE SAMPLES
0750030 / + 0750040
1930 COLLECT 0750030, CONT. PRESENT.
1945 COLLECT 0750040, STRONG OCEAN.
1955 CLEAN-UP, CORRECT-UP, ROAD TO PARKER
PHOTO LOG:

- #6 - SET-UP TOOL INSTRUCTION
 - #7 - BIT MON. START PROTECT
 - #8 - STORAGE PREPARE, EOS
 - #9 - EXCITATION PREPARE, EOS
- 1430 BEGIN MEETING AND REARRANGE
PHOZZES
- 1600 SAMPLES PREPARED. ABOUT FOR SWIM-
MENT WILL HAVE TO STOP AT 1600
EAT ON THE WAY HOME.
- 1630 OFF-TRIP FOR 1600-ET, EOS.

Michael O. Jayman

4/12/96

21

4/15/96

clear, ~ 70°F

OBJECTIVE:

OBSEIVE TEST RUN (MORT-
FALITY TEST) AND COLLECT
FIRST-RUN CLEAN (COST-) SOIL
SAMPLES AT SUMMERS CRT.

PERSONNEL:

MIKE JAYNES (COST-25)
ARRIVE AT SITE FROM TRUCK,
TEST RUN IS BEGAIN IN
PROGRESS. TALKED WITH
JAYNES ABOUT THE TEST
RESULTS. HE MENTIONS HE
WANT AT 0930 W/ THE
20-TON BATCH. THEY EXPECT TO
RUN FOR 12 HOURS TO APPROX 11

5 20-TON PILES AND COLLECT
SAMPLES FOR ANALYTICAL. MEASURE
REMAINING CRUSH AND BE
PREPARING TESTS FOR
MORTS TO TRUCK TO GETTER
SOMEONE TO BEGIN COLLECTING
GRASS FOR FIRST CLEAN
COMPOSITE SAMPLE.

1030

ARRIVE AT SITE TO COLLECT
GRASS SAMPLE WILL COLLECT
FROM SPECIMPLE AND RETURN
OUTPATY TRUCK.

1130

COLLECT FIRST GRASS OF
"ELSEN"

22

4/15/96

clear, ~ 75°F

1140 (sum)

SOIL FROM STOCKPILE C-1 +
OUTPATY. SOIL TEMP. - 71.5°F
TEMPERATURE - 40.1°F

FIELD LOG:

#10 - "ELSEN" (COST-) SOIL STORAGE CELL
W/ BRUSH SOIL
#11 - "ELSEN" (COST-) SOIL STORAGE CELL
#12 - "ELSEN" (COST-) SOIL STORAGE CELL
#13 - "ELSEN" (COST-) SOIL STORAGE CELL
#14 - "ELSEN" (COST-) SOIL STORAGE CELL
#15 - "ELSEN" (COST-) SOIL STORAGE CELL

1210

MOOS TO TRUCK TO APPROX 12
MILES TO TRUCK TO APPROX 12

1320

TRUCKS TO COLLECT
GRASS.

1330

COLLECT END GRASS FROM
C-2 + OUTPATY. SOIL TEMP. - 62.2°F

1345

TRUCKS TO COLLECT
GRASS FROM STOCKPILE

1430

TRUCKS TO COLLECT
GRASS FROM STOCKPILE

NO CHANGE WILL CONTINUE

(25)

4/16/96
 1030 BECK AT MILLER, COOL ~ 50°F
 MS RANNO COATERS FOR SECOND
 50%).

1130 BACK AT SITE TO COLLECT NEAT
 (4th) GAPS FOR COMPOSITE 07500801.

1145 COLLECT GAPS SAMPLE FROM STOCK-
 PNE C-4 AND OUTPUT.
 SOLR TANK - 680°F
 TP RATE - 9.5-10.5 ROWS/MIN

1200 OFF-SITE FOR LUNCH.

1300 BACK AT SITE, THE UNIT IS
 DOWN AGAIN, THE ELECTRICAL
 PROBLEMS HAVE BEEN BOGEM,
 SSX THROUHOLE SHOOTING

1400 DEPART TO MILLER

1500 BACK AT SITE, SET STAC MOUND
 PROBLEMS w/ THE UNIT.

1530 AT MILLER, PREPARE FOR SUBTURAL
 SAMPLING.

1800 SOING BECK BY SITE NO SOX
 PERSONNEL ON-SITE, BUT SAMPLES
 HAVE BEEN COMPLETED WILL COLLECT
 FINAL GAPS FROM STOCKPNE C-5.
 COMPOSITE AND COLLECT "CLEAN"
 SAMPLE: 07500801 FINALLY

(26)

4/16/96
 1815 (cont.) WILL START TOMORROW WITH
 OFF-BC SAMPLES
 1830 WAYS TO MILLER, THEN SAMPLE,
 OFF-SITE, END OF WPT.

REPORT LOGS
 # 19 - 20-TON "CLEAN" SOLR STOCK-
 PNE BETTER THROUGHPUT
 TEST - 17000

W. D. D. Johnson
 4/16/96

(29)

4/17/96
 1700 (cont.) WILL PROBABLY START FULL
 SCORE TONIGHT. C MITCHELL WILL
 MAKE THE CELL. I WILL CHECK
 BY SITE LATER TONIGHT
 2100
 ARRIVE BY SITE, THEY ARE
 OPERATING UNDER THE LIGHTS
 SO FULL SCORE OPERATION IS
 UNDERWAY. OFF-SITE, END OF DAY

J. J. [Signature]
 4/17/96

(30)

4/18/96
 0815
 PERSONNEL: TAKE METRES (CORROSES)
 ARRIVE AT SITE, FIRST 100-
 TON STACKS OF "BURN" SOIL
 HAS BEEN SPREAD IN LINE AND
 STORAGE AREA FENCED (S-G). 2nd
 PILE IN PROGRESS. TAKED % MOIST
 CONTENT BY TAKING 2X 100-
 TON STACKS FROM S-G. (2000)
 ON THE 24-HOUR SCHEDULE &
 PILE WILL BE GENERATED EVERY
 8 HOURS. RESOURCES OF SIZE AND
 GOOD SAMPLES WILL BE COLLECTED
 EVERY HOUR TWO COMPOSITE FOR
 EACH 8-HOUR STACK. S-G. CELL
 TO APPROX. 5X TONS. EVERYTHING
 SENDS TO BE BURNED IN STACKS.
 I WILL CHECK THE LATER TONIGHT
 TO SEEN OPERATING CORROSES FROM
 STACKS FOR BEST APPROXIMATE
 0900
 0930
 0960
 0990
 1020
 1050
 1080
 1110
 1140
 1170
 1200
 1230
 1260
 1290
 1320
 1350
 1380
 1410
 1440
 1470
 1500
 1530
 1560
 1590
 1620
 1650
 1680
 1710
 1740
 1770
 1800
 1830
 1860
 1890
 1920
 1950
 1980
 2010
 2040
 2070
 2100
 2130
 2160
 2190
 2220
 2250
 2280
 2310
 2340
 2370
 2400

REMOVED TO TRUCK.
 2400
 2430
 2460
 2490
 2520
 2550
 2580
 2610
 2640
 2670
 2700
 2730
 2760
 2790
 2820
 2850
 2880
 2910
 2940
 2970
 3000

(3)

4/19/96

clean up area at 75%
for "clean" soil site.
also began preparations +
equipment for re-sampling
at SURF 14 (CFT-5).

1130 LUNCH

1430 BEGAN AT SITE TO BEGON COLLECTION
OF GROSS SAMPLES FOR FIRST FULL
SCALE SAMPLE (07500901, 0.45, 100).
1445 COLLECT GROSS FROM STOCKPILE
C-6 + C-7 (cont. soil runnel - 265).

PHOTO LOG:

#24 - FIRST 2 8-HOUR STOCKPILES
(C-6 + C-7) FROM FULL SCALE
OPERATION.

1510 PREPARE SITE TO TRAVEL TO
CONTINUE w/ SURVEY PREP STAFF.
1600 BEGON FOR TOMORROW'S SURVEY
AT BOTH SITES.

1730 LABELING BOTTLES AND NUMBERING ON
COC'S

2000 SET-UP COCCOS w/ SURVEY BOTTLES
EQUIPMENT, AND APPROPRIATE EQUIP.

2030 FINISH OFF SITE, END OF DAY

Michael D. Joyner

4/19/96

(32)

4/19/96

OBSERVATION:

clean at 65%

OBSERVE FULL SCALE
OPERATION OF LTR WITH
END COLLECT REMOVAL
SERVICES.

PERSONNEL: WHITE SERVICES (GROSS-ES)

0730 RETURN ON-SITE. OUR LABORER
NEXT 2 8-HOUR PILES (C-8 + C-9)
HAVE BEEN ABANDONED (CONT.
SOIL TONNAGE - 413).

0815 COLLECT FULL GROSS SAMPLES +
COMPOSITE "GROSS" (JUST) SOIL
SAMPLE (07500901, 07500902,
07500903, + 07500904).

0835 PREPARE SITE FOR TRAVEL TO
PREP FOR SURVEY AT SURF 14
(CFT-5) - SEE PLAN #
PHOTO LOG.

*25 - CLEAN-UP STOCKPILES, C-6 + C-9
*26 - PROGRESS ON EXCAVATION IN BED
- SURVEY AT SITE TO CHECK ON
PROGRESS. THEY HAVE COMPLETED
EXCAVATION IN AVAILABLE AREA
AND STOCKPILE IS ESTIMATED TO
BE AT 1500 TONS PCS. STILL
WORKING ON LOCATING REMAINING
GROSS.

(33)

4/18/96

WEE, WIND 280°F

1400 (CONT) CHEVY BIRCHALL WILL HAVE TO OAT IT.

1445 DECENT SITE FOR TRUCK.

PHOTO LOG:

#27 - EXCRETION PROBES IN BED

#28 - "ENTRY" (ONE) SOL STOCKPILE AT APPROX. 1500 YDS.

1500 AT TRUCK, SAMPLE RECOVERED + PROBLEMATIC PROCESSED COMPLETES.

1700 STILL RECEIVING AND PROCESSING SAMPLES.

1830 SAMPLES RECOVERED, READY FOR SHIPMENT WILL HAVE DELIVER TO FID-EX. OFF-SITE, END OF DAY.

John O. Johnson

4/19/96

(35)

4/22/96

CLEAR, WIND 280°F

OBJECTIVE: GET UP DATE ON WEATHER PROBES OF FULL SCALE OPERATION OF LTR UNIT BY 5:30 PM SEPARATE 6-7.

PERSONNEL: MIKE NEPES (8000-50)

1400 REARRANGE AT TRUCK, WIND, WIND TO SITE

1415 AT SITE, LOOKS TO BE OVER NORMAL AS SEVERAL NEW "CLUSTERS" OBSERVED HAVE BEEN OBSERVED. TRUCK 1/2 FULLY RE-ENTERED AND OBTAIN THE UPDATE. THEY HAVE PROCESSED APPROX 1800 TONS END END UP TO STOCKPILE C-18. THE REVERSE FOR THE 8-HOUR STOCKPILES IS APPROX 20 TONS AS THEY ARE RUNNING THE UNIT AT 7-8 TONS PER HOUR (APPROXIMATE). A FEW PILES HAVE FENCED BUREAU/CHEMICAL (10-000 TONS) AT SITE ALSO THEY ARE SCANNING DOWN TO END INCREASING SOL

BEHIND TIME. (UP TO 8000°F) THE STOCKPILES THAT FENCED ARE BEING RE-PROCESSED. I WILL CHECK UP ON THE "CLUSTERS" SAMPLE

(35)

4/22/96 clear = 80°F

1445 (cont.) COLLECTION STARTING PROMPTLY
 AT THIS POINT I CAN COLLECT
 2 MORE POST-SAMPLES.
 1500 DEPART SITE TO CHECK SAMPLES
 (FTC) AND PK5. SEE BOOK #
 1600 AT TRAILER, ARRANGE FOR
 TOMORROW'S RETRIEVES.
 1700 OFF-SITE, END OF DAY.

John
4/22/96

(36)

4/23/96

clear = 70°F

OBJECTIVE:
 OBSERVE CONTAMINANTS L.T.P.D
 DEMO AT SINKS G-7 AND
 COLLECT BACKGROUND RETURN
 (POST) SAMPLES FROM THE
 SORE STACKSITES.
PERSONNEL: THREE SERVICES (BOBES)
 0800 ARRIVE ON-SITE, ONE WORKER
 "EVEN" STACKSITE C-21 HAS NOT
 BEEN COMPLETED (0730), CONT.
 DOWNAGE TO THIS POINT - 1,275.
 0845 DEPART SITE FOR TRAILER TO
 PREP FOR COMPOSITE SAMPLE
 COLLECTION.
 1000 TRAP SCENT (077006) COLLECTED,
 LONG UP AND WAS NEAR TO SITE.
 1020 AT SITE, COLLECT GRS SAMPLES
 FROM STACKSITES C-10, C-13, C-14, C-16
 (C-11, C-12, C-15 WERE NOT NEAR IN
 THE STAGOE DEP OVER THE WEEKEND).
 1045 COMPOSITE GRS SAMPLES AND
 COLLECT POST-SAMPLE - 0750/100/
 1050 COLLECT GRS SAMPLES FROM STACK
 PK5 C-17 - C-22.
 1100 COMPOSITE GRS SAMPLES AND COLLECT
 POST-SAMPLE - 0750/10/.

(57)

4/23/96 CLEAT ≈ 75°F
 1130 OFF-SITE FOR LUNCH
 1230 BEGAN PACKING & REPERMANENT
 PROCESS FOR SAMPLE SHIPMENT
 THIS AFTERNOON.
 1430 SAMPLES PREPARED READY FOR
 SHIPMENT VIA FED-EX.
 1500 BREAK AT SITE, OPERATIONS
 UNDER CONTROL. "CLEAN" STOCK-
 PILE C-22 IS NEAR COMPLETION.
 PHOTO LOG:
 #29 - EXCAVATION AREA SHOWING
 "CLEAN" SOIL OBSERVED ON
 TOP OF PLASTIC SHEETING
 #30 - "CLEAN" SOIL AREA
 #31 - "DIRTY" SOIL AREA
 #32 - LTTD UNIT, HATCHER UNIT
 1520 DEPART SITE
 1600 SAMPLES PICKED UP BY FED-EX
 1700 OFF-SITE, END OF DAY.

Richard O. Joyner
 4/23/96

(58)

4/24/96 CLEAT ≈ 70°F

OBJECTIVE: OBSERVE LTTD CEMP AT
 SAMPLE C-7
 PERFORMANCE: NINE HOURS (ARRIVED)
 BEFORE AT SITE, ISD CONTINUING
 OPERATIONS AS NORMAL. STOCKPILE
 C-25 IS IN PROGRESS AND CURRENT
 RANGE IS AT APPROX 1500 TONS
 DEPART SITE FOR TRUCK
 1115 AT SITE, QMS NORMAL. THE UNIT
 IS BEING RUN AT AN AVERAGE OF
 8 TONS/HR.
 1130 DEPART SITE FOR LUNCH.
 1305 CHECK AT SITE, TAKING 1/2 DEPTH
 MEASUREMENT. HE IS TRYING TO FIND
 THE BEST LOCATION FOR REPERMANENT
 EXCAVATION OUTSIDE SOURCE AREA.
 HE HAS TAKEN 1/2 DEPTH MEASUREMENT (SEE
 END SITE IS WORKING ON IT.
 1400 DEPART SITE FOR SAMPLE 14.
 1515 CHECK AT SITE. STOCKPILE C-16 IS
 UNDERWAY. NO NEW EXCAVATION HAS
 BEGUN
 1600 OFF-SITE, END OF DAY.

Richard O. Joyner
 4/24/96

39

4/25/96

WARRER = 75%

OBJECTIVE: OBSERVE L.T.O. BIRD AT SAMPLING
GET TWO POSSIBLY COLLECT BIRD
OR SAMPLES.

PERSONNEL: MIKE HYNES (BIRD-ES)

0800 ARRIVE AT SITE, OPS NORMAL.
"CLEAN" STOCKPILE C-18 IS IN PROGRESS
IT IS A RE-SHOW OF C-13. LOOKS LIKE
I SHOULD BE ABLE TO COLLECT THE
NEXT "CLEAN" SAMPLE SOMETIME
TOMORROW. ^{SSA} THEY HAVE PROCEEDED
NEARLY 1700 TONS OF PCS.
"CLEAN" STOCKPILES ARE BEING PUT
BACK IN THE SURFACE BED (SUMM 7)
AS THEY ARE UNAVAILABLE.

PHOTO LOG:

0930 OFF-SITE TO CHECK ON THINGS
AT SUMM 14.
1130 DEPT AT SITE, THINGS CONTINUING
AS NORMAL.
1145 OFF-SITE FOR LUNCH. WILL CHECK
THIS AFTERNOON FOR NEW EXCAVATION.

40

4/25/96

WARRER = 50%

1430 CHECK ON THINGS AT SITE. SSA
HAS BEGUN NEW AREA OF EXCAVATION
OUTSIDE THE SURFACE BED, NORTH OF
THE BED NEXT TO G. RAILS AND
THE DEBRIS PILE. NOT INSIDE
THE DIRT FENCE (SEE PHOTO).

1500 McLENNAN SAYS THEY'LL PROBABLY
HAVE THE SOIL SOON AND SPACE IT
IN THE LARGE "EMPTY" SOIL STORAGE
I DECIDE TO GET/GRAZE A SAMPLE
OF THIS SOIL BEFORE IT IS COM-
BINED W/ THE "OLD" SURFACE BED
SOILS.

1515 DEPART TO PARK TO OBTAIN MORE
BOTTLES AND SAMPLING EQUIPMENT.

1615 BACK AT SITE, HURRY WITH ENTER
TO COLLECT NEW SAMPLE.

1630 COLLECT ONE SAMPLE 07500001 FROM
"NEW" EXCAVATION AREA (ABOUT 200
TONS PCS).

1645 CHECK TO WHETHER TO PASS FOR
REENTRY. WILL SPOT TANDARON
W/ REENTRY OVER SAMPLES.

PHOTO LOG:

#35 - "NEW" EXCAVATION AREA N. OF BED
#36 - "

(42)

4/25/96 warm = 80°F

1700 AT TRUCK, SECURE SAMPLES AND ALSO FOR TOMERSON'S SAMPLING AND REPAIR WORK.

1730 OFF-SITE, AND ON RT.

Handwritten signature and date: 4/25/96

(43)

4/26/96

clear = 70°

0800 REPORT: CONCRETE EXPANSION TESTS. COLLECT RECONSTRUCTION SAMPLES AT SUMMIT 6-7.

PERSONNEL: MIKE JAMES (C-23)

0800 BEGAN AT SITE TO TAKE SAMPLES. TESTS WERE AS STRENGTH AND COMPRESSIVE STRENGTH. WE HAD TO WAIT FOR THE RESULTS TO BE AVAILABLE. WE HAD TO WAIT FOR THE RESULTS TO BE AVAILABLE. WE HAD TO WAIT FOR THE RESULTS TO BE AVAILABLE.

0830 REPORT: WE TOOK SAMPLES FROM TRUCK. WE TOOK SAMPLES FROM TRUCK. WE TOOK SAMPLES FROM TRUCK.

1000 COLLECT 6000 SAMPLES FROM TRUCK. WE TOOK SAMPLES FROM TRUCK. WE TOOK SAMPLES FROM TRUCK.

1015 REPORT FOR TRUCK TO CONCRETE REPAIR WORK AND PAVING PROCESS. QUICK BREAK, FOR LUNCH AND CHECK OF SUMMIT 4, P.C.

(95)

4/26/96

clear = 75°F

1230 BACK AT TRUCK TO OBTAIN SAMPLE PAPER AND PACK SAMPLES PACKED AND BORN FOR SHIPMENT. FEED-EX WILL NOT UP BY 1600, HAZARDOUS.

1400 BACK AT SITE, OWS NORMAL "CLEAR" STOCKPILE C-31 HURDLES. THEY SHOULD HAVE BEEN TO SEIZE AFTER THE WEEKEND.

1520 PERMIT SITE BACK TO TRUCK

1545 FEED-EX ARRIVES, PICKS UP SAMPLES.

1600 OFF-SITE, END OF SHIFT.

Richard O. Jayne
4/26/96

(96)

4/30/96

clear / AM = 75°F

OBJECTIVE: OCSAVE CONTAINING 1770 TEEN DEMO AND GET UPDATE ON SEQUENCE.

PERSONNEL: MIKE JAYNES (PROBES)

1230 ARRIVE AT TRUCK, CHECK MESSAGES. UNLOAD, MOVE TO SINKING GUT.

1300 AT SITE, UNIT IS BURN RUSTY AND NOISE. HEAVY RAINS HAVE SLOWED OWS SINCE YESTERDAY STOCKPILE C-40 WAS COMPLETED AT APPROX 11:30, TOTAL PACKAGE AT 2,406.

1345 REPORT AND SUMM 14 TO GET UPDATE ON THAT SITE (OCSAVE #)

1530 BACK AT TRUCK GUT. THINGS SEEM TO BE STABILIZING TO OWS NORMAL UNIT WAS RECOVERED FROM HEAVY RAINS.

PHOTO LOG:

#37 - "NEW" (AMBITIOUS) EXCAVATION, MONTH OF SUBJECT OWS AFTER THIS

#38 - 4300 - ESTIMATED TO BE CALLED IN 200.

#39 - 640 - CONDITION OF OCSAVE IN 200.

#40 - 1770 UNIT AFTER HEAVY RAINS

1605 DEPART SITE, WILL CHECK UP ON SINKING IN THE AM.

Richard O. Jayne 4/30/96

48

5/1/96

CLEAR, COOL ~ 60°F
OBSERVING: OBSERVE LTRB DEMO AND
COLLECT NEXT SET OF SOIL
SAMPLES.

PERSONNEL: MIKE JAMES (DOB-ES)
0745 ARRIVE AT TRAILER TO PREP
FOR TODAY'S SAMPLING ACTIVITIES.

WILL BE COLLECTING FINAL PRE-
TREATMENT SOIL SAMPLE ALONG W/
BIORETINAL POST-TREATMENT SAMPLES.
DESCEND TO CHECK ON TRUCKS AT
SUMMS 6.7.

0845 AT SITE
AS THE UNIT HAS RECOVERED FROM
THE MANY RAINS. STOCKPILE C-4S
IS IN PROGRESS. C-42 WAS COMPLET
SO AT 0800 AT 2.5% TOTAL TONS.

0930 BACK TO TRAILER TO COLLECT AND
SAMPLING SUPPLIES AND EQUIPMENT.
1045 DESCEND TO SUMMS 14 FOR AN
ATTEMPTED UPGRADE.

1300 BACK AT SITE TO COLLECT FINAL
PRE-DOWN (ON PRE-TREATMENT) SOIL
SAMPLE.

1330 COLLECT (PRE) SAMPLE 0750100L TMS
COMPLETES PRE-DOWN 500 TMS.

49

5/1/96

CLEAR ~ 75°F

1345 TRUCKS TO SUMMS 14 FOR UPGRADE
WILL RETURN TO COLLECT NEXT
(POST-) SOIL SAMPLE LATER.

1530 RETURN TO SITE, STOCKPILE C-4S
ALMOST COMPLETE. WILL COLLECT
2 MORE SAMPLES.

1600 COLLECT (POST-) SOIL SAMPLE 0750100/
WHICH CONSISTS OF ALL PREVIOUS
(C-3) -> C-37, EXCEPT C-33-C-36).
COLLECT GROSS AND NET SAMPLE,
BUT DECIDE TO INCLUDE NET AND
STOCKPILES, SO WILL FINISH COLLECTION
TOMORROW WITH C-41 - C-45.

1615 TRUCKS TO TRAILER, TO PREP SAMPLES
FOR SHIPMENT IN THE EV.

1645 DEPART SITE, END

Michael O. James
5/1/96

(47)

5/2/96

Clear, Cool ~ 60°F

OBJECTIVE:

OBSERVE LT10 TECH DEMO AND COLLECT BOTTOM SAMPLES.

PERSONNEL:

TRINE JAYNES (CROSS-ES)

1015

ARRIVE AT SITE BEFORE STARTING

MORNING AT SUMM 14, FTL.

REPORTERS TO BE ON HAND.

CHECK WITH STEW ON SCHEDULE

THEY EXPECT TO BE FINISHED W

SOME TIME SOMETIME 5/4. STORAGE

C-45 WAS COMPLETED THIS MORNING

AT APPROX. 0800, TOTAL TONS -

2,684. WILL RETURN AFTER LUNCH

TO COMPLETE COLLECTION OF SAMPLE

IN PROGRESS FROM YESTERDAY.

1130

DEPART SITE FOR QUICK LUNCH

AND ARR BY SUMM 14.

1310

BREK AT SITE TO COLLECT

FINAL GMS SAMPLES FOR NEXT

(CONT.) SAMPLE.

1315

COLLECT SAMPLE 0750/404.

1330

PROG TO TABLET TO BEG

SAMPLE RECEIVING PROCESS AND

PREP WORK.

1450

PROG TO SUMM 14 FOR E

QUICK CHECK.

(48)

5/2/96

Clear ~ 75°F

ARR BY SUMM 617, AND ARRIVE STOCKPILE C-46 W MORNING.

PHOTO LOG:

8/41 - 50K STORAGE CELLS

8/42 - " "

8/43 - PROGRESS OF BREAKING IN BED

1000 OFF-SITE TO TABLET TO AREA

SAMPLES ARE SHOWN.

1700 SAMPLES WERE PICKED UP BY FEED-

EX. OFF-SITE FOR THE DAY.

5/2/96
JAYNES

49

5/3/96

Clear = 60°F

OBJECTIVE: CHECK-IN + OBSERVE LTD TECH DEMO PROGRESS AT SANDS 6+7

PERSONNEL: MIKE REYNES (EAS-ES)

0815 ARRIVE AT SITE, OPS NORMAL STOCKPILE C-48 IN PROGRESS, TOTAL TONNAGE AT APPROX. 2,800 TONS OF PROCESSED SAND.

- FUEL COMPART "CLEAN" SAND SAMPLE WILL BE COLLECTED MONDAY 5/6 FROM REMAINING STOCKPILES. FILL IN AND LIKELY COLLECT THE SAMPLE (07501501) AS I WILL BE IN HIS TRAINING.

0900 OFF-SITE FOR TRAILER

1000 CLEAN-UP + DE-MOB FOR THE SHIFT

1030 DEPART SITE, EOS.

Michael O. Joyce

5/3/96

50

5/6/96

SUNNY = 80°F

*NOTE: FIELD NOTES TRANSCRIBED FROM NOTES TAKEN BY STAN HICKMATHORPE (EAS-ES) SHOWING FOR TIME SPENT AS ON-SITE HERE FOR THE WEEK

OBJECTIVE: OBSERVE SORTS LTD TECH DEMO AT SANDS 6+7.

PERSONNEL: STAN HICKMATHORPE (EAS-ES) DEMO REMAIN ON-SITE TWO SORT PERSONNEL ON-SITE. THEY ARE RUNNING AN EXPERIMENTAL RESULTS FOR STREAMING SANDS THAT TO DETERMINE % SAND AND ASPHALT.

0845 DEPART SITE TO VISIT CHECK WORKER.

1045 BACK ON-SITE. SORT STILL WAITING FOR EXPERIMENTAL RESULTS. E. HICKMATHORPE MENTIONED THAT SAND INCLUDED SANDS' EQUIPMENT AND COLLECTING FIRST 4 SORTS ON THE GRADING FOR ANALYSIS BY THE WEEK. THE USE OF WATER FOR SAND WAS NOT SUGGESTED.

1115 PERSONNEL BEGAN SWEETING THE MICHENERPORT.
PHOTO LOG:
#44 - CLEAN (SWEETING) OF MICHENERPORT
#45 - "
#46 - "

(57)

5/6/96 SUNNY = 80°F

1130 SSA PERSONNEL TAKING A BREAK. GAS BUBBLER BEING USED TO CHECK CO READING. READING WAS APPROXIMATELY 3-6 ppm. BUBBLER IS FROM RAINBOW ALLIANCE NAT. INC., - GAS FILTER CORPORATION CO BUBBLER MODEL 300.

1200 APPROX. 3,152 TONS OF SOIL (UNKNOWN REMAINS) WAS TREATED USING THE L.T.T.O. THIS INCLUDES THE ORIGINAL PRINTED AMOUNT OF APPROX 2,400 TONS OF APPARENTLY CONTAMINATED SOIL.

1215 DEBRIS SITE FOR UNIT 5 (S. NUMBER).
1245 DECK ON-SITE, SSA PERSONNEL ARRIVE ON CLEANING EAST OFF THE NUMBER. TOP EAST DECK COLLECTED, CLEAN ON THE SURFACE, EMPTY ON THE NORTH SIDE.

1345 CLEAN AND TREATED SOIL WILL BE RECED DECK IN THE SURGE DECK. THE UNIT HAS BEEN TRAINED ON TO IMPROVE REMOVAL OF SOIL FROM N-SIDE AND OUTSIDE THE EQUIPMENT + THE L.T.T.O. DEBRIS SITE FOR TRACK.

(58)

5/6/96 SUNNY = 80°F

1430 CECED C. MITCHELL (SEE) SHE SAID THAT SHE WOULD TREAT ME AT THE SITE.

1445 BREAK AT SITE. SSA PERSONNEL SPEAK TO C. MITCHELL THAT SOIL CLEANUP IS COMPLETE AND THEY ARE RETURNING THE FUEL MACHINERY RESULTS BEFORE DISMISSED THE EQUIPMENT. C. MITCHELL ADVISES SSA THAT THEY COULD REMOVE THEIR EQUIPMENT IN THE EARLY MORNING ABOUT THE SURGE DECK. SSA WILL SIGN PERMIT IN THE MORNING. THE DEBRIS SOILS WILL BE DISPOSED ABOVE THE FIVE MOUNTAIN AND EAST SOIL WITH SHIMPO I. THE PRACTICE AND INSURE FROM THE DEBRIS WILL BE HANDLED OF IN A NEARBY QUARTERS.

1530 C. MITCHELL COMMENTS SITE IS NEARLY COMPLETE SITE TO INSURE TO CHECK THAT DEBRIS (EAST) BEING REMOVED. M. JAMES REQUESTS COLLECTION OF FUEL SOIL SAMPLE FROM "CLEAN" STOCK PILES, DECK + ABOVE.

1545 COLLECT FUEL SOIL
1600 EXHAUST DECK AT SITE, SOIL SAMPLE COLLECTED FROM "CLEAN" TREATED

5/7/96 cloudy ~ 75°F

OBJECTIVE: CHECK FINAL SERVICES FROM SUNDAY 6-7 TEST DEBRIS AND ASSURE FINAL STAGES OF JETS WORK.

PERSONNEL: MIKE JEVNESS (001-25) 1200 ARRIVE AT TABLET, GATHER UP BIRD ORIGINALLY STOPPED FOR SERVICE RECORDS OF SAMPLE COLLECTED BY SPAN MUMFORD (0750/1501).

1230 BEGIN SAMPLE PACKING, CHECKING & PREPARATION PROCESS

1430 SERVICES NEEDED READY FOR PICK-UP BY FBO-EX.

1445 LOGS TO SUNDAY 6/7 FOR UPDATE ON JETS PROGRESS.

1500 AT SITE, JETS PERSONNEL IN THE PROCESS OF CHECKING OUT THE BETA ELEMENTS INTO UNIT, AND ARRANGING FINAL SCHEDULE OF EXTENSION. THEY SHOULD BE WORKING UP BY TOMORROW AT THEORETICAL 4:15 NEEDS TO BE SHIPPED TO NEW JER.

PHOTO LOG: (CONT #1)

019 - BACKFILL INDICATES N. BOUNDARY EXPECTATION AT SITE

#50 - "

5/6/96 sunny ~ 80°F

1600 (CONT.) STOCKMILES C-46 THROUGH C-54. BIRK SERVICES WERE COLLECTED USING A WATKINS CONE & STAINLESS STEEL SPAN.

CONE SERVICES WERE COLLECTED ON BOTH ENDS OF THE TUBES FROM ONE FOOT OVER.

PHOTO LOG: (CONT #1)

#47 - STOCKMILES ENDS AT SITE

#48 - " " "

1650 CEMENT SITE.

1715 SERVICES STOPPED IN FRIDGE FOR 12 JETS TO BEAT END JETS TO LAB TOMORROW. CEMENT TO INFROM M. JEVNESS OF STATUS AT SITE.

1730 REPORT TABLET, END OF DAY

Richard O. Jevness
 M. JEVNESS at 5/11/96
 CRP 5/10/96

52

5/7/96 clear = 80°F
1600 DEMANT SITE, WILL CHECK BEEN
TOMORROW FOR PROGRESS ON FUEL
CLEAN-UP + CLOSURE

53

5/8/96 clear = 80°F
OBJECTIVE: OBSERVE FUEL STAGES OF
SITE'S BREAKDOWN, CLEANUP, + CLOSURE
RE - JUNKS CRT TECH DEMO.
PERSONNEL: MIKE JAYNES (CRS-ES)
CRS0 BRYAN AT SITE, KEVIN + KE-
RAB NEARLY COMPLETE. FUEL BEEN
FNL OF FURN 7 SLUDGE BED +
ADDITIONAL BTR WAS COMPLETED
WRT VESTIBUL. ISR PREPARING
LITD UNIT FOR MOBILIZATION OFF-
SITE.

APPRO LOG: CONX #2)

- FUEL CLOSURE PHOTOS:
- #1 - REAR STORAGE AREA w/ REMAINING
LITD. UNIT
 - #2 - FURN 7 SLUDGE BED ENTRANCE
 - #3 - ADDITIONAL EXCAVATION AREA, OUT-
SIDE SLUDGE BED, BTRX PERKILL
 - #4 - " " " "
 - #5 - FURN 7 SLUDGE BED EXCAVATION
AREA, REFR FUEL DECK/FLL
 - #6 - " " " "
 - #7 - SOIL STORAGE AREA BTRX PERK
CLEAN-UP.

CR30 DEMANT SITE, LITD UNIT WILL BE MOVED
OUT TOMORROW. TECH CR30 COMPLETE.
Michael O. Jaynes 5/8/96

54

5/7/96 clear = 80°F
1600 DEMANT SITE, WILL CHECK BEEN
TOMORROW FOR PROGRESS ON FUEL
CLEAN-UP + CLOSURE

Michael O. Jaynes
5/7/96

APPENDIX G
RESPONSE TO REGULATORY COMMENTS

1.0 INTRODUCTION

As part of the Navy Environmental Leadership program (NELP), the Navy contracted Southwest Soil Remediation, Inc. (SSR), of Tucson, Arizona, to conduct a technology demonstration of low temperature thermal desorption of petroleum-contaminated soil at Naval Station Mayport. The demonstration was performed at Solid Waste Management Units (SWMUs) 6 and 7, the Waste Oil Pit and Sludge Drying Beds. Target treatment levels were set according to Florida Administrative Code (FAC) 62-775, Thermal Treatment Facilities for Petroleum Contaminated Soil. ABB Environmental Services, Inc. (ABB-ES), collected baseline and performance evaluation soil samples to evaluate the effectiveness of the technology demonstration.

The purpose of this document is to respond to comments by the Florida Department of Environmental Protection (FDEP) concerning the draft report (June 1997), entitled *Technology Evaluation Report Navy Environmental Leadership Program Technology Demonstration for Thermal Desorption of Petroleum-Impacted Soil at SWMUs 6 & 7, U.S. Naval Station, Mayport, Florida* (ABB-ES, 1997). The U.S. Environmental Protection Agency declined to comment on the report.

The following correspondence was received from FDEP.

- September 30, 1997, Correspondence from James H. Cason, P.G. Remedial Project Manager, FDEP, to Mr. David Driggers, Department of the Navy, Southern Division Naval Facilities Engineering Command, Subject: Draft Technology Evaluation Report: Naval Environmental Leadership Program Technology Demonstration of Petroleum-Impacted Soil at SWMU 14.

The following chapter provides point-by-point responses to FDEP's comments.

2.0 RESPONSE TO FDEP COMMENTS

2.1 Comment 1. Please confirm the operating temperatures (refer to Section 2-2, page 2-5) as noted the entry appears to be in question.

The entry is correct and inadvertently highlighted. The highlight will be removed.

2.2 Comment 2. Because of the uncertainty in retreatment of some soil batches that was noted in the desorber operating records, the Navy should consider conducting limited random sampling to insure that the remediated soil is in conformance with clean soil standards. These data can then be incorporated into the final overall evaluation of SWMUs 6 and 7.

The *Guidelines for Assessment and Remediation of Petroleum Contaminated Soil* (FDEP, 1994) stipulates that a grab sample should be collected every 50 tons of treated soil and composited every 400 tons. ABB-ES collected one composite sample for every 400 tons of treated soil designated as achieving target treatment levels by SSR. Each composite consisted of eight grab samples: one to two grab samples collected from each 56 to 72-ton stockpile.

Evaluation of the analytical results of the performance samples suggest that none of the analytes were detected at concentrations that exceed the thermal desorption criteria. Though there are discrepancies in SSR's records, it would appear that based on the ABB-ES analytical results that the soil was successfully treated.

In addition, Visqueen™ was placed on the excavation subgrade to minimize the potential for the treated soil to become recontaminated by the wicking of petroleum or related constituents into the treated soil.

2.3 Comment 3. I suggest that one of the "lessons learned" in this demonstration is that the project would have been improved if the Navy had direct, full-time, and responsible charge of the actual operation of the desorption unit; this perhaps could have helped assure that all documentation was sufficient.

Comment acknowledged.

REFERENCES

ABB-Environmental Services, Inc (ABB-ES), 1997. *Technology Evaluation Report, Navy Environmental Leadership Program Technology Demonstration for Thermal Desorption of Petroleum-Impacted Soil at Solid Waste Management Units 6 and 7, U.S. Naval Station, Mayport, Florida (Draft)*. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina (July).