

**Post Removal Summary Report
Area A, Sites 1, 2, & 3**

**Naval Air Warfare Center (NAWC)
Warminster, Pennsylvania**

Naval Air Warfare Center
Warminster, Pennsylvania



**Northern Division
Naval Facilities Engineering Command**

Contract No. N62472-90-D-1298

Contract Task Order 0252

May 1999



TETRA TECH NUS, INC.

**POST REMEDIAL SUMMARY REPORT
AREA A SITES
NAVAL AIR WARFARE CENTER
WARMINSTER, PENNSYLVANIA**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION - NAVY (CLEAN) CONTRACT**

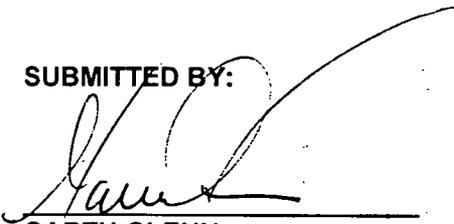
**Submitted to:
Northern Division
Environmental Branch, Code 18
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop No. 82
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**Contract No. N62472-90-D-1298
Contract Task Order 0252**

May 1999

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TETRA TECH NUS

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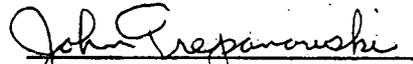

JOHN J. TREPANOWSKI, P.E.
PROGRAM MANAGER
TETRA TECH NUS

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1.0 INTRODUCTION

This report has been prepared by Tetra Tech NUS, Incorporated (TtNUS) for the Northern Division, Naval Environmental Engineering Command, as authorized by Contract Task Order (CTO) 252 under Contract No. N62472-90-D-1298. This work is part of the Installation Restoration Program (IRP), which is designed to identify contamination of Navy and Marine Corps facilities resulting from past operations and to institute corrective measures, as needed. In addition to meeting the objectives of the Navy's IRP, this report meets the requirements of CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act of 1980), as amended by SARA (Superfund Amendments and Reauthorization Act of 1986).

1.1 PURPOSE OF REPORT

The purpose of this post-removal summary report is to present a summary of the actions taken by the Navy in response to soil contamination and the pending transfer of property within Area A at the Naval Air Warfare Center (NAWC) Warminster, Pennsylvania. The need for and the objectives of the removal action are documented in the Navy's June 3, 1998 Removal Action Memorandum. The Navy has completed removal actions of surface and subsurface soils and has completed verification sampling in these areas to confirm that potential threats posed by the contamination have been adequately addressed. The Base Realignment and Closure (BRAC) Cleanup Team (BCT), consisting of representatives of the Navy, Environmental Protection Agency (EPA), and Pennsylvania Department of Environmental Protection (PADEP), were involved throughout the removal process.

Foster Wheeler Environmental Corporation (FWEC) conducted the removal under contract to the Navy. TtNUS coordinated activities with FWEC and conducted the post-removal verification sampling. Post-removal verification sample results are presented in this report. A companion document to this report that details the actual removal actions and volumes of material removed is being prepared by FWEC.

This report presents a brief background review of Area A and the investigations conducted prior to the removal action (Section 2.0), a summary of the evaluation conducted to establish clean-up goals (Section 2.1), a review of the post-removal verification sampling activities and attainment results (Sections 3.0 through 3.3), a summary of supplemental post-removal geophysical surveys conducted in the area (Section 4.0), and a summary and conclusions section (Section 5.0).

2.0 BACKGROUND

The former NAWC Warminster is located in Warminster Township, Bucks County, Pennsylvania. The facility lies in a populated suburban area surrounded by private homes, various commercial/industrial activities, and a golf course. Figure 2-1 shows the general facility location. The facility, approximately 820 acres in size, is being parceled off and transferred to the private sector. Four areas of study (Areas A, B, C, and D) have been identified within the original facility. These areas were identified based on groupings of suspected disposal sites, contamination, geographic boundaries, common sources and receptors, and facility characteristics. Figure 2-2 presents these four major areas of concern. This report summarizes the removal actions taken by the Navy within Area A.

Area A is located in the northwestern corner of NAWC between Jacksonville Road and the off-base railroad tracks west of the base. This area contains Sites 1, 2, and 3. Figure 2-3 depicts the approximate locations of these sites.

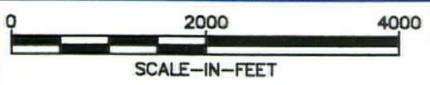
Site 1 is located near the northwestern border of NAWC. This site was reportedly operated as a burn pit from 1948 to 1950. Various waste materials such as paints, oils, asphalt, roofing material, solvents, scrap metal, and unspecified chemicals were reportedly burned within this pit. Historical aerial photographs indicate that this area may also have been used for the placement of fill material.

Site 2 is located southeast of and adjacent to Site 1. This site reportedly received sludge material from the wastewater treatment facility from 1965 to 1970. It is reported that the sludge material, generated from the industrial wastewater treatment plant, was buried within this area.

Site 3 is located immediately northwest of Jacksonville Road. This site was reportedly used as a burn pit from 1955 to 1965. It has been reported that the pit was used to burn solvents, paints, roofing material, and other unspecified chemicals. Historical information suggests that the pit was backfilled and regraded with soils from the base upon closure. The area now consists of a gravel and asphalt parking lot.

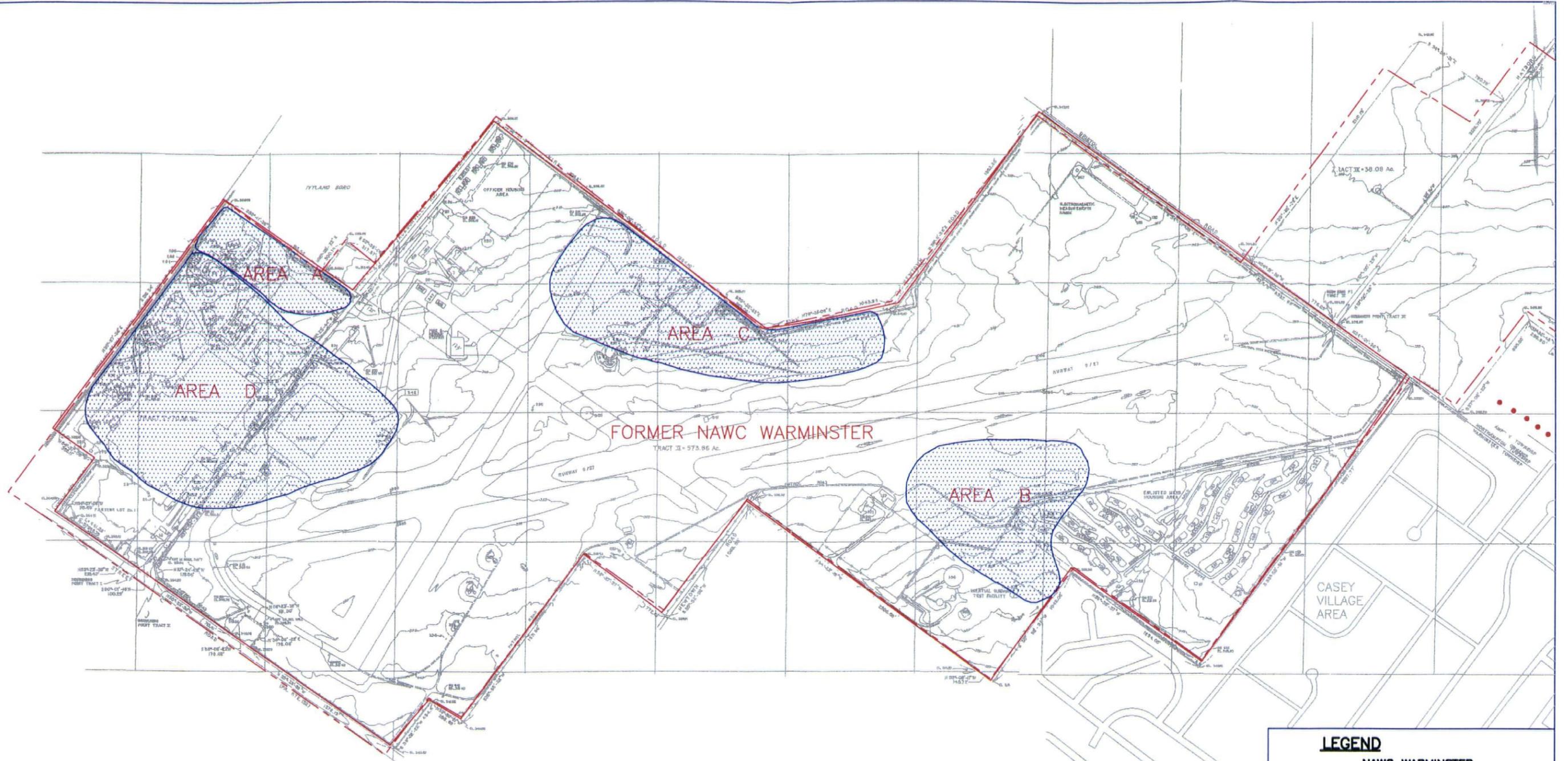
Area A soils have been sampled as part of several remedial investigations (RIs) and numerous supplemental investigations. The most comprehensive sampling investigations conducted in the area were performed under the Phase III RI [Draft Phase III RI, Media Other Than Groundwater, Brown & Root Environmental (B&RE), 1996]. Supplemental sampling investigations completed after the Phase III RI

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LEGEND	
	NAVY PROPERTY LINE

DRAWN BY ASM/LDL	DATE 4/8/99	Tetra Tech NUS Inc.	CONTRACT NO. N62472-90-D-1298	OWNER NO. CTO 0159
CHECKED BY CM	DATE 4/12		APPROVED BY 	DATE 5/27/99
COST/SCHED-AREA		SITE LOCATION MAP FORMER NAWC WARMINSTER WARMINSTER, PENNSYLVANIA	APPROVED BY DATE	DRAWING NO. FIGURE 2-1
SCALE 1"=2000'		REV. 0 - 11/18/98 ASM	REV. 1	



LEGEND

- NAWC WARMINSTER PROPERTY LINE
- APPROXIMATE FORMER WASTE DISPOSAL AREA

CONTRACT NO. N62472-90-D-1298 OWNER NO. CTO 0252

APPROVED BY *[Signature]* DATE 5/27/99

APPROVED BY _____ DATE _____

DRAWING NO. **FIGURE 2-2** REV. 0

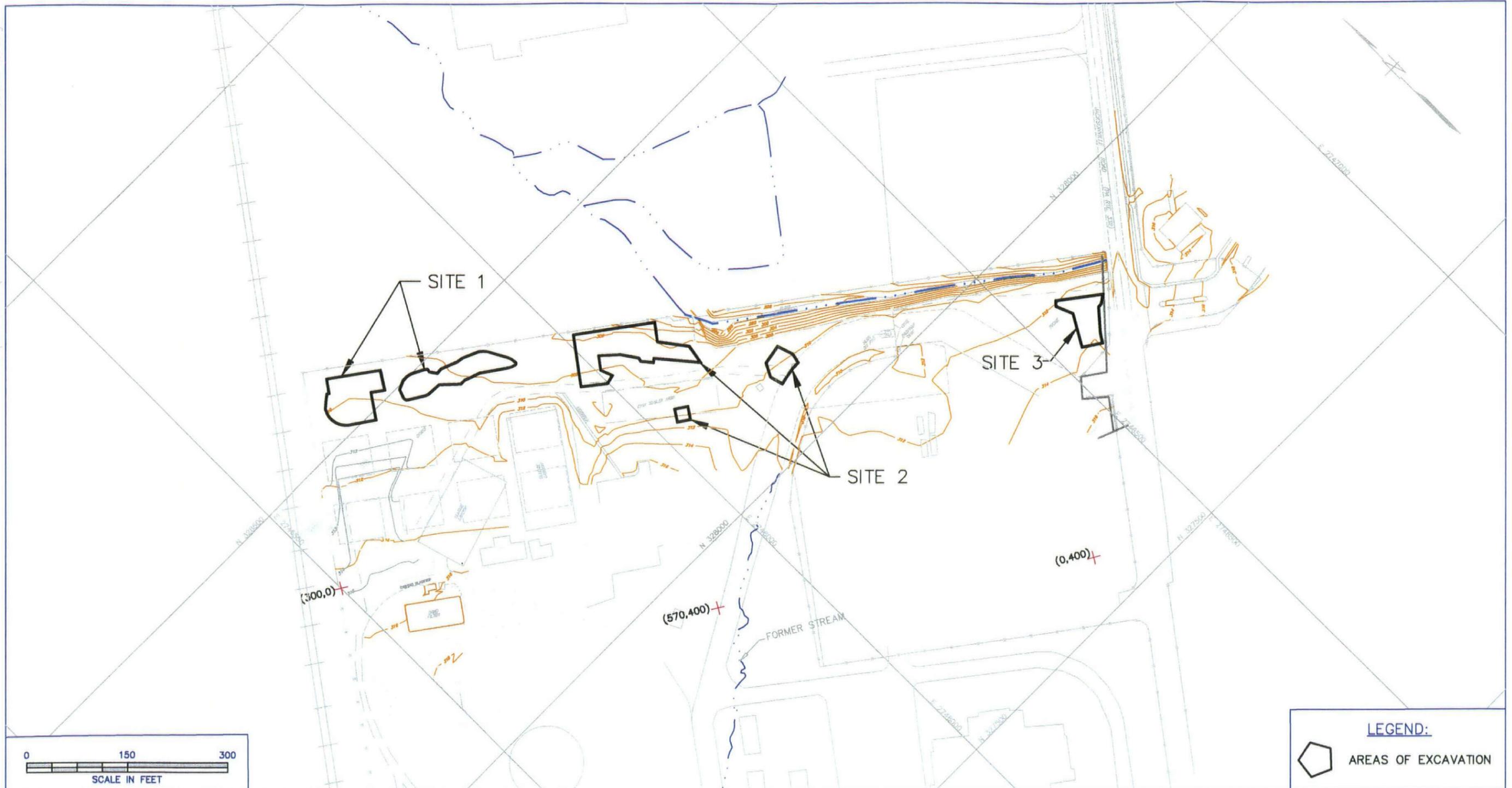
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 CHECKED BY: CM DATE: 4/12
 COST/SCHED-AREA: _____
 SCALE: 1 in. = 800 ft.

Tetra Tech NUS, Inc.

**APPROXIMATE LOCATION OF AREAS OF CONCERN
 FORMER NAWC, WARMINSTER
 WARMINSTER, PENNSYLVANIA**

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

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NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY
LDL
DATE
4/9/99

CHECKED BY
cm
DATE
4/12

COST/SCHED-AREA

SCALE
1" = 150'

Tetra Tech NUS, Inc.

AREA A
REMOVAL ACTIONS LAYOUT
NAWC, WARMINSTER, PA

CONTRACT NO.
6883

OWNER NO.
8341

APPROVED BY
[Signature]
DATE
5/26/99

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FIGURE 2-3

REV.

have been summarized and reported in a series of letter reports (Results from Additional Site 1 Soil Investigation, July 10, 1998, B&RE; Results from Additional Site 2 Soil Investigations, July 21, 1998, TtNUS; Supplemental Subsurface Soils at Site 3, July 23, 1998, B&RE; Results from Additional Site 2 Subsurface Soil Investigation, July 28, 1998, B&RE; Preliminary Results from Verification and Supplemental Sampling Area A Site 2, October 29, 1998, TtNUS; and Characterization Sampling Results Area A Site 1B, November 12, 1998, TtNUS) issued by the Navy and reviewed by the BRAC Closure Team (BCT).

The results of the RIs and supplemental investigations were evaluated by the Navy and became the basis for the removal actions. Removal action alternatives were evaluated and presented in a Removal Evaluation Report (Draft Removal Site Evaluation for Area A Soils, April 1998, B&RE) and further refined in a subsequent evaluation and revised excavation letter report issued in September 1998 (Alternatives 4 and 5 Draft Removal Evaluation Report – Area A Soils, August 4, 1998, TtNUS; and Area A Removal Action – Addendum to Excavation Approach, September 10, 1998, TtNUS).

2.1 REMOVAL CLEAN-UP GOALS

Removal clean-up goals were developed based on the potential risks to human health and the environment presented by the contamination identified in the RIs and supplemental investigations. The Phase III RI presents a baseline risk assessment, which was further refined and revised based on the results of the supplemental sampling. The revised risk assessments are contained in the Removal Site Evaluation Report and in a letter report issued by the Navy (Evaluation of Site 2 Soil Data Area A, November 12, 1998, TtNUS). The Navy, EPA, and the BCT reviewed these risk assessments, along with the data from the supplemental sampling events, and established final clean-up goals for each site. Table 2-1 presents these clean-up goals. In general clean-up goals were established at concentrations that were protective of human health, under non-residential exposure scenarios, groundwater, and potential environmental exposures (ecological stream sediment exposures).

**TABLE 2-1
AREA A SOILS
REMOVAL ACTION CLEAN-UP GOALS
POST-REMOVAL SUMMARY REPORT
NAWC WARMINSTER, PENNSYLVANIA**

SITE	PARAMETER	CLEAN-UP GOAL
Site 1A	Trichloroethylene (TCE)	60 ug/kg
	Antimony	113 mg/kg
	Cadmium	76 mg/kg
	Chromium	16,161 mg/kg
Site 1B	TCE	60 ug/kg
	Antimony	113 mg/kg
	Cadmium	76 mg/kg
	Chromium	16,161 mg/kg
	Thallium ⁽¹⁾	14 mg/kg
Site 2A	Antimony Surface Soils	50 mg/kg
	Lead Surface Soils	1,000 mg/kg
	Antimony Subsurface Soils	113 mg/kg
	Lead Subsurface Soils	1,750 mg/kg
Site 2B	Benz(a)anthracene	2,300 ug/kg
	Indeno(1,2,3-cd)pyrene	1,100 ug/kg
Site 2C	Benzo(a)pyrene	78,000 ug/kg
Site 3	Anthracene	540 ug/kg
	Benz(a)anthracene	2,300 ug/kg
	Benzo(a)pyrene	2,500 ug/kg
	Fluoranthene	5,000 ug/kg

⁽¹⁾ Thallium was added as a clean-up goal for the eastern end of IB after evaluation of characterization samples from drum excavation.

3.0 REMOVAL AND VERIFICATION SAMPLING

Removal action coordination, monitoring, and sampling activities were conducted in accordance with the March 31, 1998 Work Plan (Work Plan for Removal Activities Area A Soils, March 1998, B&RE). Site-specific sampling strategies, analytical parameters, and requirements for the evaluation of analytical results to determine attainment of clean-up goals were established in Verification Sampling and Analysis Plans (VSAP) and site-specific addenda issued for each site (Verification Sampling and Analysis Plan for Removal Activities at Area A Site 1, August 20, 1998, TtNUS; Verification Sampling and Analysis Plan for Removal Activities at Area A Sites 2 and 3, August 20, 1998, TtNUS; Area A Removal Action - Addendum to Excavation Approach, September 10, 1998, TtNUS; and Evaluation of Site 2 Soil Data, Area A November 12, 1998, TtNUS).

The following sections present a summary of the removal and sampling activities and the final verification sample analytical results collected at each site. Sampling-event-specific letter reports are presented in Appendix A. Appendix B presents the analytical results and data validation reports for the final verification sampling effort.

3.1 SITE 1 REMOVAL ACTIVITIES

Removal activities at Site 1 consisted of two discrete excavations, 1A and 1B. Surface soils in this area were not identified as presenting a significant risk. The surface soils were removed and stockpiled for use as fill. The removal activities targeted subsurface soils. Subsurface soils were initially excavated to bedrock in 1A and to approximately 10 feet in 1B. Initial sample results from the floor of 1B indicated the presence of contaminants (cadmium and antimony) above the clean-up goals. In response to this finding, the excavation was extended to bedrock throughout the site. Figure 3-1 shows these two excavation areas. Excavation 1A covers an area approximately 80 feet by 70 feet. This area was excavated to bedrock and extended laterally to remove all evidence of contamination. Three sampling events were conducted in 1A to direct the excavation. Appendix A1 contains the sampling event letter reports for excavation 1A.

Excavation 1B covers an area approximately 140 feet by 60 feet immediately east of 1A. During the excavation of 1B, several deteriorated drums or drum remnants were unearthed, along with what appeared to be a "sludge-like" material. FWEC, under the direction of the Navy, sampled the drum content and extended the excavation to ensure that these materials had been removed. In addition, under direction from the Navy, TtNUS obtained characterization samples of the soils underlying these

**TABLE 3-2
FINAL VERIFICATION SAMPLE RESULTS
EXCAVATION 1B, AREA A
NAWC, WARMINSTER**

Sample ID	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S	VS-1B-18S	VS-1B-19S	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	CLEAN-UP GOALS
Field Sample ID	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S	VS-1B-18S	VS-1B-19S	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	
Sample Date	11/19/98	11/19/98	11/19/98	11/19/98	11/19/98	11/19/98	11/19/98	09/02/98	09/02/98	09/02/98	09/02/98	09/03/98	
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg							
Antimony	0.76 B	0.62 B	0.86 B	0.87 B	0.54 B	0.65 B	0.75 B	8.8 L	0.7 B	0.76 B	15.2 L	16 L	113
Cadmium	0.05	0.12	0.16	0.11	0.72	0.08	0.12	46.8	0.24 U	0.23 U	60.5	17.8	76
Chromium	24.6	31.4	26.2	24	49.7	54.5	23.8	186	25.9	26.3	46	352	16,161
Lead	9.4	14.6	13	16.9	11.4	9.5	16.3	NA	NA	NA	NA	NA	see note
Thallium	0.88	0.85 U	0.54	0.92	0.4 U	0.4	0.37 U	NA	NA	NA	NA	NA	14
VOLATILES								ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Trichloroethene	NA	8.2 UJ	5 U	5.4 U	6.6 U	9 U	60						

Data Qualifiers:

- B - Positive result is considered to be an artifact of blank contamination, and should not be considered present.
- L - Positive result is considered biased low due to exceedance of technical quality control criteria
- U - Value is a non-detected result as reported by the laboratory
- UJ - Non-detected result is considered estimated due to exceedance of technical quality control criteria
- NA - No result is available/applicable for this parameter in this sample

Database source file S\GLENNGU252_RES DBF data retrieved on 05/24/99

NOTE: Results are shown for only the final verification samples.

If Clean-up Goal was attained in initial post-removal sampling, that analytical parameter was not repeated for subsequent sampling and is shown as NA. See text and Appendix A for full explanation.

Special Note Regarding Lead: No clean-up goal was officially established. Final samples were analyzed for lead due to presence in one previous sample. Results were compared to a default standard of 1,000 mg/kg (industrial re-use).

excavation was extended to bedrock. Sample locations were selected according to the work plan and VSAP. EPA or the EPA field representative concurred on final sample locations before sample collection. Table 3-2 presents the sample numbers, analytical results, and the clean-up goals for each compound. Sample results were compared to clean-up goals after each sampling event. If any single compound was identified in a sample in excess of the clean-up goal, the area represented by this sample result was further excavated until follow-up sampling confirmed that the specific clean-up goal was not exceeded. This follow-up sampling was conducted to analyze for only that compound that exceeded a specific clean-up goal. The letter reports contained in Appendix A1 present the results from each sampling event.

The results from the initial sampling performed during the excavation were evaluated using the planned statistical approach, along with the results for excavation 1A. However, based on the results of the statistical analysis conducted for excavation 1A and the low level of contamination identified, the BCT determined that further statistical analysis was not warranted. The BCT also concluded, based on the results of the initial verification sampling and the subsequent characterization sampling conducted within 1B, that the parameters for the final sampling event could be reduced to only those parameters that had previously exceeded clean-up goals. Similarly, thallium was added to the list of parameters for analysis following the review of the drum excavation sampling results. Thallium was analyzed for only during the final round of sampling conducted in the eastern end of the removal area.

As can be seen in Table 3-2, all final verification sample results contained target compounds at concentrations below the established clean-up goals. The BCT reviewed the final results and determined that the clean-up goals had been attained. Excavation 1B was backfilled by FWEC.

3.2 SITE 2 REMOVAL ACTIVITIES

Removal activities at Site 2 consisted of three distinct excavations, 2A, 2B, and 2C. Figures 3-2 and 3-3 show these three areas. Surface soils were the primary concern at all three areas. Excavation 2A also contained a subsurface component. The investigation data and findings associated with 2A indicated the presence of waste materials and a discrete zone of contamination that presented a potential human health risk. This area was defined during the initial RI and in subsequent sampling events. The excavation at 2A consisted of the removal of about the top 2 to 3 feet of soil over the entire area and deeper excavations extending from 4 to 7 feet deep, depending on the depth of waste material encountered, in a smaller area contained within the footprint of 2A. Both floor samples and sidewall samples were collected from this excavation. Excavation 2A covers an area approximately 170 feet by 60 feet. Three sampling events were conducted during and after the excavation to direct the removal actions. Appendix A2 contains the sampling event letter reports for this effort.

**TABLE 3-1
FINAL VERIFICATION SAMPLE RESULTS
EXCAVATION 1A, AREA A
NAWC, WARMINSTER**

Sample ID:	VS-A-1A-01	VS-A-1A-04	VS-A-1A-05	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	CLEAN-UP GOALS
Field Sample ID:	VS-A-1A-01	VS-A-1A-04	VS-A-1A-05	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	
Sample Date:	09/02/98	09/03/98	09/03/98	09/03/98	10/01/98	10/01/98	10/01/98	10/01/98	10/01/98	10/01/98	10/01/98	10/20/98	
INORGANICS	mg/kg												
Antimony	0.23 B	1.4 L	0.17 UL	0.17 B	NA	113							
Cadmium	0.05 U	11.2	0.17	0.39	0.05 U	0.08	0.05 U	0.05 U	0.05 U	0.09	4.9	43.8	76
Chromium	13.9	266	2	46.1	24	21.5	7	7.2	13.4	48.3	842	NA	16,161
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg									ug/kg
Trichloroethene	5.4 U	7 U	6 U	6.2 U	NA	60							

Data Qualifiers:

- B -- Positive result is considered to be an artifact of blank contamination, and should not be considered present.
- L -- Positive result is considered biased low due to exceedance of technical quality control criteria.
- U -- Value is a non-detected result as reported by the laboratory.
- UL -- Non-detected result is considered biased low due to exceedance of technical quality control criteria.
- NA -- No result is available/applicable for this parameter in this sample.

Database source file: S:\GLENNG\252_RES.DBF data retrieved on: 05/24/99

NOTE: Results are shown for only the final verification samples.

If Clean-up Goal was attained in initial post-removal sampling, that analytical parameter was not repeated for subsequent sampling and is shown as NA.
See text and Appendix A for full explanation.

drums. Three sampling events, including the characterization sampling of materials later removed by FWEC, were conducted in 1B. Appendix A1 contains the sampling event letter reports.

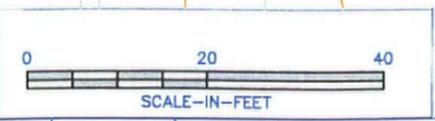
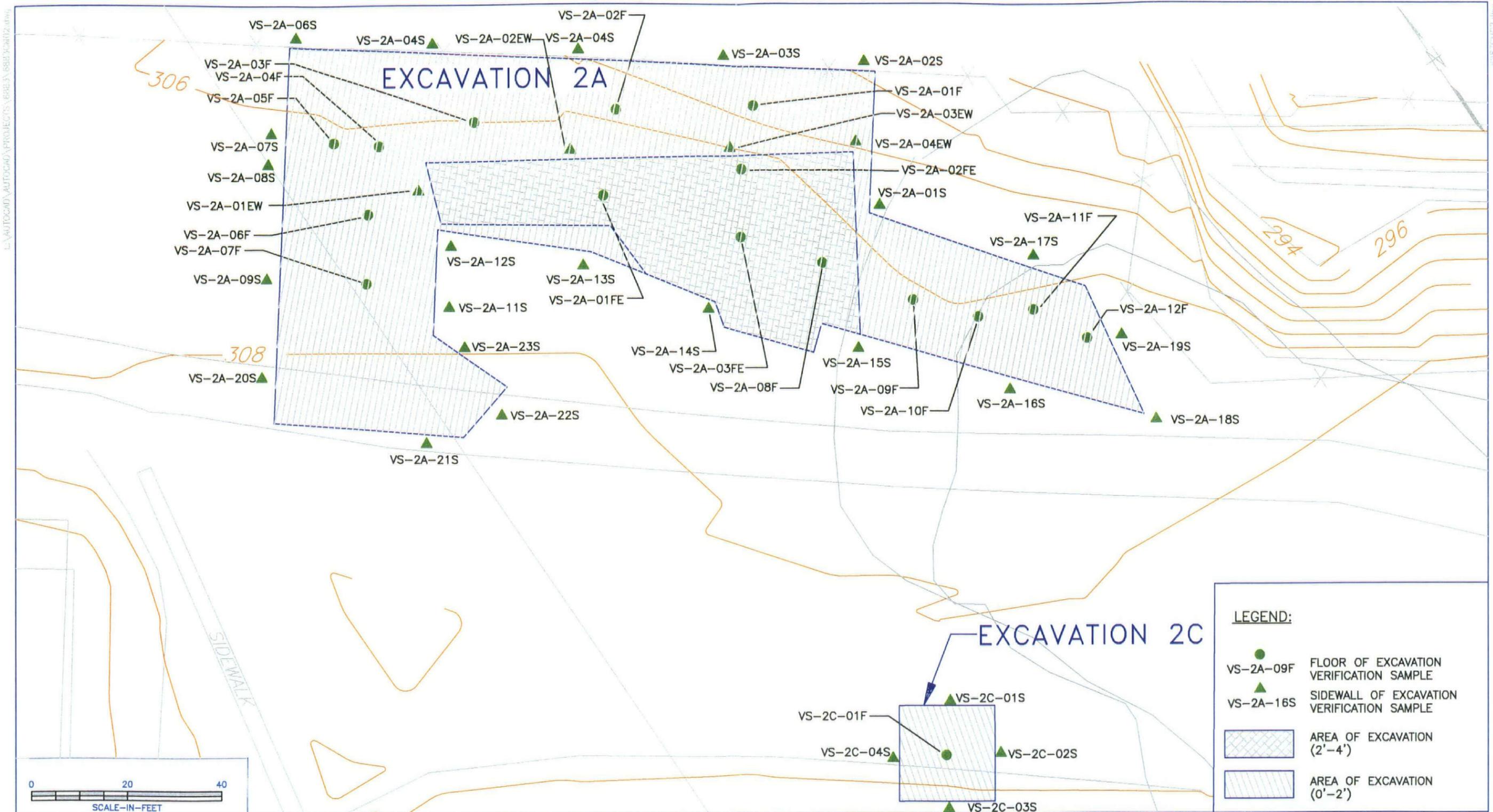
3.1.1 Attainment of Clean-Up Goals

Twelve final verification or attainment samples were collected and evaluated for excavation 1A. All of these samples were collected from the excavation sidewalls. No floor samples were collected because the excavation was extended to bedrock. Sample locations were selected according to the work plan and VSAP. EPA or the EPA field representative concurred on final sample locations before sample collection. Table 3-1 presents the sample numbers, analytical results, and the clean-up goals for each compound.

Sample results were compared to individual compound-specific clean-up goals and evaluated using the approved statistical evaluation approach. As can be seen in Table 3-1, all final verification sample results contained target compounds at concentrations below the established clean-up goals. Sample results were compared to clean-up goals after each sampling event. If any single compound was identified in a sample in excess of the clean-up goal, the area represented by this sample result was further excavated until follow-up sampling confirmed that the specific clean-up goal was not exceeded. This follow-up sampling was conducted to analyze for only that compound that exceeded a specific clean-up goal.

A statistical evaluation of the data was conducted to compare the Upper 95% Confidence Level (UCL) concentration for the data set to the clean-up goals for each compound. The results of this comparison are presented in the letter reports contained in Appendix A1. The UCL for all compounds, with the exception of cadmium, was calculated to be below the clean-up goals. A review of the statistical approach and results indicated that the low number of samples relative to the small range of cadmium concentrations present caused the UCL to be calculated at an inflated and probably unrealistic value. Cadmium concentrations ranged from non-detected to 1 mg/kg for nine samples. The remaining three samples had concentrations of 4.9 mg/kg, 11.2 mg/kg, and 43.8 mg/kg. The clean-up goal for cadmium was 76 mg/kg. The BCT, after reviewing the data and discussing the statistical evaluation, determined that a direct comparison of analytical results to the clean-up goals was an appropriate and acceptable means of determining attainment of the clean-up objectives. The BCT determined that the goals had been attained, and the excavation was backfilled by FWEC.

Twelve verification or attainment samples were collected and evaluated for excavation 1B. All of these samples were collected from the excavation sidewalls. No floor samples were collected because the

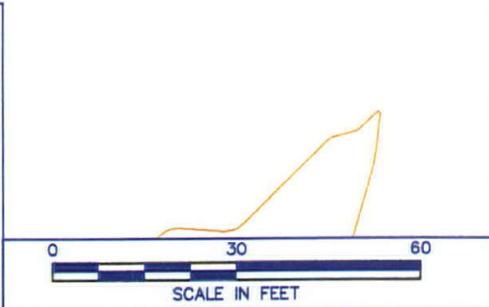
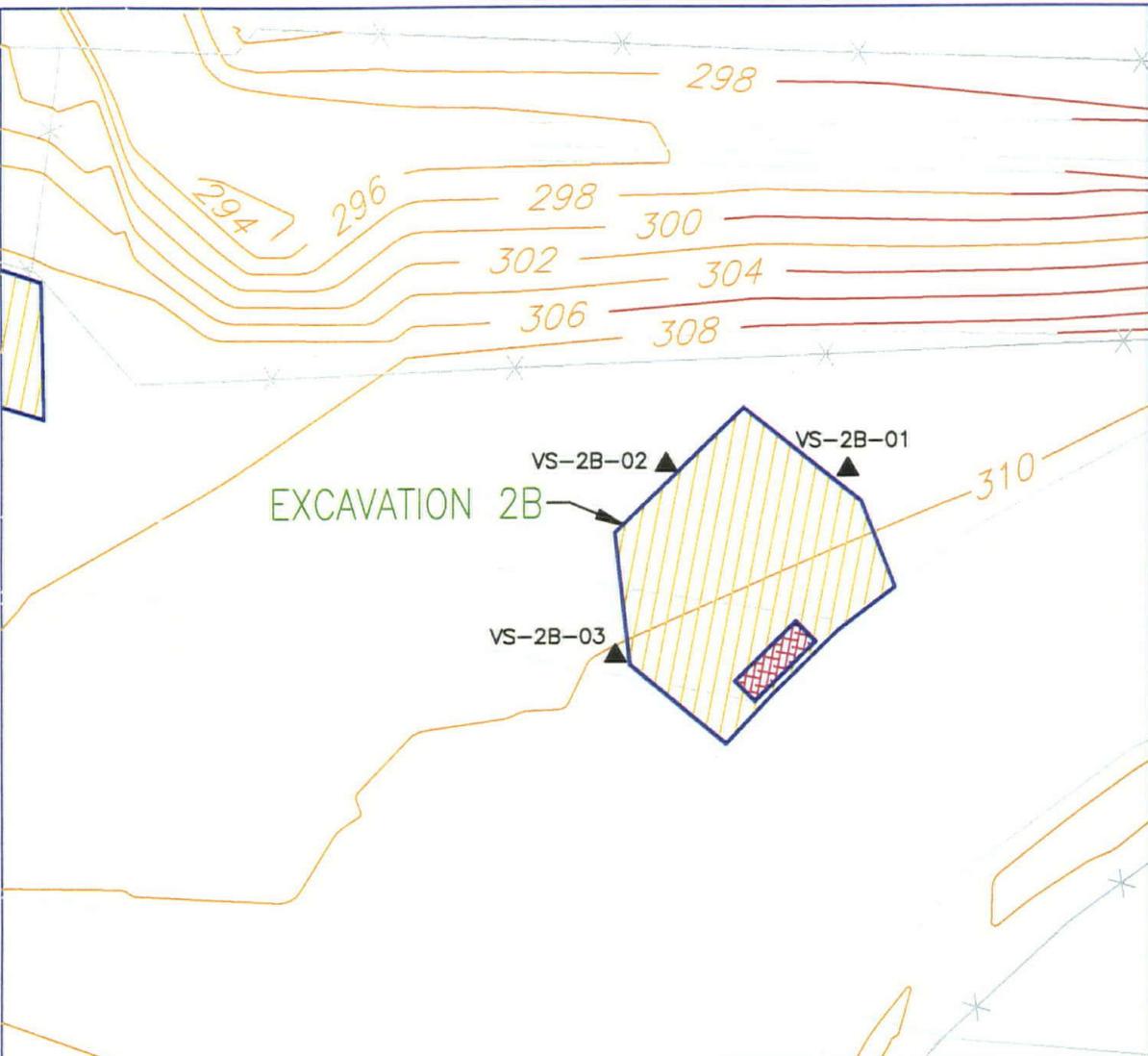


LEGEND:

- VS-2A-09F FLOOR OF EXCAVATION VERIFICATION SAMPLE
- VS-2A-16S SIDEWALL OF EXCAVATION VERIFICATION SAMPLE
- AREA OF EXCAVATION (2'-4')
- AREA OF EXCAVATION (0'-2')

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE	CONTRACT NO.	OWNER NO.	
							LDL	3/18/99	6883		
							C.M.	4/1/2	APPROVED BY: <i>[Signature]</i> DATE: 4/2/99 APPROVED BY: _____ DATE: _____ DRAWING NO. FIGURE 3-2 REV. _____		
							Tetra Tech NUS, Inc. REMOVAL ACTION AND VERIFICATION SAMPLES AREA A - SITES 2A & 2C NAWC, WARMINSTER, PA				
							SCALE AS SHOWN				

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LEGEND	
	VERIFICATION SAMPLE LOCATION
	AREA OF EXCAVATION (0'-2')
	AREA OF EXCAVATION (2'-4')

DRAWN BY LDL	DATE 4/9/99
CHECKED BY CM	DATE 4/12
COST/SCHED-AREA	
SCALE AS NOTED	

Tetra Tech NUS, Inc.

REMOVAL ACTION AND VERIFICATION SAMPLES

AREA 2B

NAWC WARMINSTER, PA

CONTRACT NO. 6883	OWNER NO. 8341
APPROVED BY <i>[Signature]</i>	DATE 5/20/99
APPROVED BY	DATE
DRAWING NO. FIGURE 3-3	REV.

Excavation 2B is located south of 2A and covers an area approximately 45 feet by 30 feet. This excavation consisted of the removal of surface soils and a portion of the facility access road. During the excavation, FWEC encountered what appeared to be residual petroleum contamination. TtNUS and FWEC sampled the soils and the discolored sidewalls of the excavation to determine the nature of the waste. The results of the sampling were forwarded to the BCT and PADEP to determine the need for additional actions. The BCT and EPA concluded that the data indicated the presence of residual petroleum contamination and that the final decision regarding the area should be deferred to PADEP. Upon review of the data, PADEP determined that no further removal for petroleum contamination was warranted. One additional sampling event was conducted in excavation 2B. The letter report of findings is presented in Appendix A2.

Excavation 2C consisted of the removal of surface soils southeast of 2A. This excavation covers an area of about 20 feet square. One sampling event was conducted in this excavation. Both sidewall and floor samples were collected. Appendix A2 presents the letter report for this sampling.

3.2.1 Attainment of Clean-up Goals

Thirty-nine final verification or attainment samples were collected and evaluated from excavation 2A. Samples were collected from the excavation sidewalls and floor as well as from the sidewalls of the deeper portion of the excavation. Sample locations were selected based on the VSAP and were field verified by EPA or the EPA field representative before actual sample collection. Table 3-3 presents the sample numbers, analytical results, and clean-up goals for each compound.

Sample results were compared to individual compound-specific clean-up goals and evaluated according to the approved statistical evaluation approach. In addition to this analysis, a risk evaluation was conducted using all available data from the excavation and the surrounding area to determine the need for additional removal actions. The risk evaluation, presented in Appendix A2, concluded that no further removal was warranted or necessary. Initial statistical analysis also indicated that all removal actions had reached attainment, with the exception of one small area containing surface soil lead concentrations greater than the clean-up goal. In response to this, the Navy conducted additional removal actions in this area to remove the lead-contaminated materials. In addition, the Navy directed FWEC to remove additional subsurface soils in one area that contained concentrations slightly greater than the clean-up goal, even though the statistical analysis (based on the UCL) indicated that attainment had been reached. Final verification samples were collected in the expanded removal area and analyzed for lead to verify the completeness of the removal. Appendix A2 presents the letter reports for this sampling and evaluation.

**TABLE 3-3
FINAL VERIFICATION SAMPLE RESULTS
EXCAVATION 2A, AREA A
NAWC, WARMINSTER**

Sample ID	VS-2A-01F	VS-2A-01S	VS-2A-01WE	VS-2A-02F	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Field Sample ID	VS-2A-01F	VS-2A-01S	VS-2A-01WE	VS-2A-02F	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Sample Date	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg									
INORGANICS														
Antimony	0.88 B	4.9 L	1 B	1.2 B	1.3 B	28.9 L	5.5 L	4.9 L	1.2 B	0.81 B	0.89 B	7.3 L	0.91 B	8.5 L
Cadmium	1.7 K	20.3 K	0.62 K	2.8 K	0.61 K	28.6 K	12.1 K	6.7 K	1.2 K	0.48 K	0.94 K	11.1 K	0.56 K	15 K
Chromium	NA	NA	NA	NA	NA									
Copper	NA	388	12.3	NA	9.7	666	798	121	18.9	NA	8.2	487	NA	315
Lead	21.1 K	42 K	11.4 K	83.9 K	19.5 K	624 K	245 K	261 K	54.4 K	11.2 K	12.8 K	268 K	14.6 K	449 K
Silver	NA	13.7 L	0.05 UL	NA	0.05 UL	50.6 L	14.3 L	5.2 L	0.12 L	NA	0.05 UL	21.4 L	NA	16.4 L
Thallium	NA	NA	NA	NA	NA									
Zinc	NA	688	43.8	NA	41.1	156	446	377	596	NA	30.2	117	NA	113
SEMIVOLATILES		ug/kg			ug/kg			ug/kg			ug/kg			ug/kg
Benzo(g,h,i)perylene	NA	31	NA	NA	4 U	NA	NA	97	NA	NA	39 U	NA	NA	4
Indeno(1,2,3-cd)pyrene	NA	43	NA	NA	49 J	NA	NA	13	NA	NA	39 U	NA	NA	54

Data Qualifiers:

- B - Positive result is considered to be an artifact of blank contamination, and should not be considered present.
- J - Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CROL).
- K - Positive result is considered biased high due to exceedance of technical quality control criteria.
- L - Positive result is considered biased low due to exceedance of technical quality control criteria.
- U - Value is a non-detected result as reported by the laboratory.
- UL - Non-detected result is considered estimated due to exceedance of technical quality control criteria.
- UJ - Non-detected result is considered biased low due to exceedance of technical quality control criteria.
- UL - Non-detected result is considered biased low due to exceedance of technical quality control criteria.
- UR - Non-detected result is considered unusable due to exceedance of technical quality control criteria.
- NA - No result is available/applicable for this parameter in this sample.

Database source file: S:\GLENNG\252_RES.DBF data retrieved on 05/24/99

NOTE: Verification samples were analyzed for additional parameters to support a preliminary risk assessment and to verify nature of contamination. See text and Appendix A2 for a full explanation.

**TABLE 3-3
FINAL VERIFICATION SAMPLE RESULTS
EXCAVATION 2A, AREA A
NAWC, WARMINSTER**

Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-11F	VS-2A-11S	VS-2A-12F	VS-2A-12S	VS-2A-13S
Field Sample ID	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-11F	VS-2A-11S	VS-2A-12F	VS-2A-12S	VS-2A-13S
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98	10/14/98	10/14/98	10/15/98	10/20/98	10/14/98	10/20/98	10/14/98	10/14/98
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Antimony	0.58 B	0.92 B	0.47 B	0.63 B	0.99 B	1.1 L	0.77 B	0.8 B	30.2 L	2.6 L	1.3 B	0.86 L	0.39 B	0.96 B
Cadmium	0.14 K	1.9 K	0.26 K	0.4 K	0.51 K	1.9	0.78 K	0.21 K	14.8	3.5	1.1 K	0.52	0.08 K	1.2 K
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	9.3	NA	5.7	NA	23.4	NA	12.9	10.2	NA	NA	2	NA	10.6	16.1
Lead	16.2 K	62 K	13.7 K	21.8 K	17.2 K	57.4 J	25.7 K	11.8 K	811 J	107 J	28 K	32.8 J	4.4 K	59.9 K
Silver	0.05 UL	NA	0.05 UL	NA	0.05 UL	NA	NA	NA	0.04 UL	NA	NA	0.33 L	NA	0.05 UL
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	33.7	NA	32.2	NA	37.2	NA	83.1	23	NA	NA	337	NA	16.2	59.8
SEMIVOLATILES			ug/kg		ug/kg		ug/kg	ug/kg			ug/kg		ug/kg	ug/kg
Benzo(g,h,i)perylene	NA	NA	41 U	NA	55 J	NA	2	5	NA	NA	28 J	NA	31 J	36 UJ
Indeno(1,2,3-cd)pyrene	NA	NA	41 U	NA	72 J	NA	25	44	NA	NA	32 J	NA	31 J	36 UJ

**TABLE 3-3
FINAL VERIFICATION SAMPLE RESULTS
EXCAVATION 2A, AREA A
NAWC, WARMINSTER**

Sample ID:	VS-2A-14S	VS-2A-15S	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-19S	VS-2A-20S	VS-2A-21S	VS-2A-22S	VS-2A-23S	CLEAN-UP GOALS
Field Sample ID:	VS-2A-14S	VS-2A-15S	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-19S	VS-2A-20S	VS-2A-21S	VS-2A-22S	VS-2A-23S	
Sample Date:	10/14/98	10/15/98	10/15/98	10/15/98	10/20/98	10/20/98	11/19/98	11/19/98	11/19/98	11/19/98	
INORGANICS	mg/kg										
Antimony	4.7 L	0.3 B	0.87 L	10.8 L	0.8 L	0.63 L	0.56 B	0.69 B	0.82 B	0.47 B	SS-50/SubS-113
Cadmium	6.9 K	0.03 U	0.3	11.1	0.43	0.79	0.12	0.09	0.1	0.1	see note
Chromium	NA	NA	NA	NA	NA	NA	16.8	20.8	23.1	20.2	see note
Copper	155	17.2 L	38.8 L	281 L	35.5 J	25.9 J	NA	NA	NA	NA	see note
Lead	295 K	8 J	22.6 J	34 J	35.2 J	38.2 J	18.7	10.1	16.4	25.3	SS-1,000/SubS-1,750
Silver	7.3 L	0.08 UR	0.97 L	9.5 L	0.31	0.57	NA	NA	NA	NA	see note
Thallium	NA	NA	NA	NA	NA	NA	0.41 U	0.42 U	0.4 U	0.39 U	see note
Zinc	434	28.5 L	80.1 L	626 L	87.4	83.5	NA	NA	NA	NA	see note
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Benzo(g,h,i)perylene	44 J	19	38 U	25 J	53 J	44	NA	NA	NA	NA	see note
Indeno(1,2,3-cd)pyrene	5 J	22	38 U	33 J	69 J	48	NA	NA	NA	NA	see note

As can be seen in Table 3-3, all final verification sample results contained target compound concentrations below the established clean-up goals. The BCT reviewed the final results and concluded that clean-up goals had been attained. Excavation 2A was backfilled by FWEC.

Three final verification samples, in addition to the petroleum characterization samples, were collected from excavation 2B. All three of these were collected from the sidewalls of the excavation and analyzed for the established target compounds. Final sample locations were selected based on the VSAP and EPA concurrence. Table 3-4 shows these samples, analytical results, and the established clean-up goals for each compound. As can be seen in Table 3-4, all compounds were identified at concentrations well below the clean-up goals. The BCT reviewed the final results and determined that attainment had been achieved. FWEC backfilled the excavation with clean fill material.

A total of five verification samples, one from each sidewall and one from the floor, were collected from excavation 2C. Table 3-5 presents the sample numbers, analytical results, and clean-up goals for each target compound. As can be seen from the data presented in this table, all compounds were present at concentrations well below the clean-up goals. These data were presented to the BCT (see letter report contained in Appendix A2), and it was determined that attainment had been achieved. Excavation 2C was backfilled by FWEC.

3.3 SITE 3 REMOVAL ACTIVITIES

Removal activities at Site 3 consisted of one excavation. This excavation consisted of an area about 65 feet by 30 feet in size located adjacent to Jacksonville Road. Figure 3-4 shows Site 3 and the removal area. Surface soils were of concern in this area. Surface soils, gravel, and deteriorated asphalt paving were removed from the area to a depth of about 2 to 3 feet. Two separate sampling events were conducted during the excavation to assist in directing the removal. The results of the first sampling effort were reviewed by the BCT, and the excavation was extended to the north and east to remove soils that contained contamination at concentrations in excess of the clean-up goals. Letter reports for each sampling event are presented in Appendix A3.

3.3.1 Attainment of Clean-up Goals

Nine final verification or attainment samples were collected and evaluated for excavation 3. Table 3-6 presents the sample numbers, analytical results, and clean-up goals for each compound. Sidewall samples only were collected from this excavation. Sample locations were selected in accordance with the VSAP for the site. Two separate sampling events were conducted during the excavation to direct removal activities (see Appendix A3).

**TABLE 3-4
FINAL VERIFICATION SAMPLE RESULTS
EXCAVATION 2B, AREA A
NAWC, WARMINSTER**

Sample ID:	VS-2B-01		VS-2B-02		VS-2B-03		CLEAN-UP GOALS
Field Sample ID:	VS-2B-01		VS-2B-02		VS-2B-03		
Sample Date:	12/17/98		12/17/98		12/17/98		
SEMIVOLATILES	ug/kg		ug/kg		ug/kg		ug/kg
Benz(a)anthracene	34 J		38		39 U		2,300
Indeno(1,2,3-cd)pyrene	22 J		28 J		37 J		1,100

Data Qualifiers:

J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
U -- Value is a non-detected result as reported by the laboratory.

Database source file: S:\GLENNG\252_RES.DBF data retrieved on: 05/24/99

**TABLE 3-5
FINAL VERIFICATION SAMPLE RESULTS
EXCAVATION 2C, AREA A
NAWC, WARMINSTER**

Sample ID:	VS-2C-01F		VS-2C-01S		VS-2C-02S		VS-2C-03S		VS-2C-04S		CLEAN-UP GOALS	
Field Sample ID:	VS-2C-01F		VS-2C-01S		VS-2C-02S		VS-2C-03S		VS-2C-04S			
Sample Date:	10/20/98		10/20/98		10/20/98		10/20/98		10/20/98			
SEMIVOLATILES		ug/kg		ug/kg								
Benzo(a)pyrene		25 J		79		36 U		47 J		13		78,000

Data Qualifiers:

J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).

U -- Value is a non-detected result as reported by the laboratory.

Database source file: S:\GLENNG\252_RES.DBF data retrieved on: 05/24/99

**TABLE 3-6
FINAL VERIFICATION SAMPLE RESULTS
EXCAVATION 3, AREA A
NAWC, WARMINSTER**

Sample ID:	VS-3A-01S	VS-3A-02S	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S-D	VS-3A-12S	CLEAN-UP GOALS
Field Sample ID:	VS-3A-01S	VS-3A-02S	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-10S	VS-3A-12S	
Sample Date:	10/23/98	10/23/98	10/23/98	10/23/98	11/06/98	11/06/98	11/06/98	11/06/98	11/06/98	
SEMIVOLATILES	ug/kg	ug/kg	ug/kg							
Acenaphthene	38 U	76 U	76 U	38 U	NA	NA	NA	NA	NA	see note
Acenaphthylene	12 J	89 J	66 J	33 J	NA	NA	NA	NA	NA	see note
Anthracene	14 J	22 J	65 J	1 J	17 J	79 J	21 J	67 J	13 J	540
Benz(a)anthracene	61	12	34 J	48	9	46	11	39	65	2,300
Benzo(a)pyrene	65	12	4 J	49	13	63	14	5	79	2,500
Benzo(b)fluoranthene	8	13	47 J	58	NA	NA	NA	NA	NA	see note
Benzo(g,h,i)perylene	15 J	32 J	11 J	11 J	NA	NA	NA	NA	NA	see note
Benzo(k)fluoranthene	59	1	41 J	59	NA	NA	NA	NA	NA	see note
Chrysene	73	11	43 J	51	NA	NA	NA	NA	NA	see note
Dibenz(a,h)anthracene	63 J	99 J	76 U	35 J	NA	NA	NA	NA	NA	see note
Fluoranthene	15	26	79	12	21	13	33	1	2	5,000
Fluorene	41 J	76 U	76 U	28 J	NA	NA	NA	NA	NA	see note
Indeno(1,2,3-cd)pyrene	2 J	38 J	13 J	14 J	NA	NA	NA	NA	NA	see note
Naphthalene	38 U	76 U	76 U	38 U	NA	NA	NA	NA	NA	see note
Phenanthrene	7	52 J	33 J	46	NA	NA	NA	NA	NA	see note
Pyrene	94	17	59 J	92	NA	NA	NA	NA	NA	see note

Data Qualifiers:

- J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
- U -- Value is a non-detected result as reported by the laboratory
- NA -- No result is available/applicable for this parameter in this sample

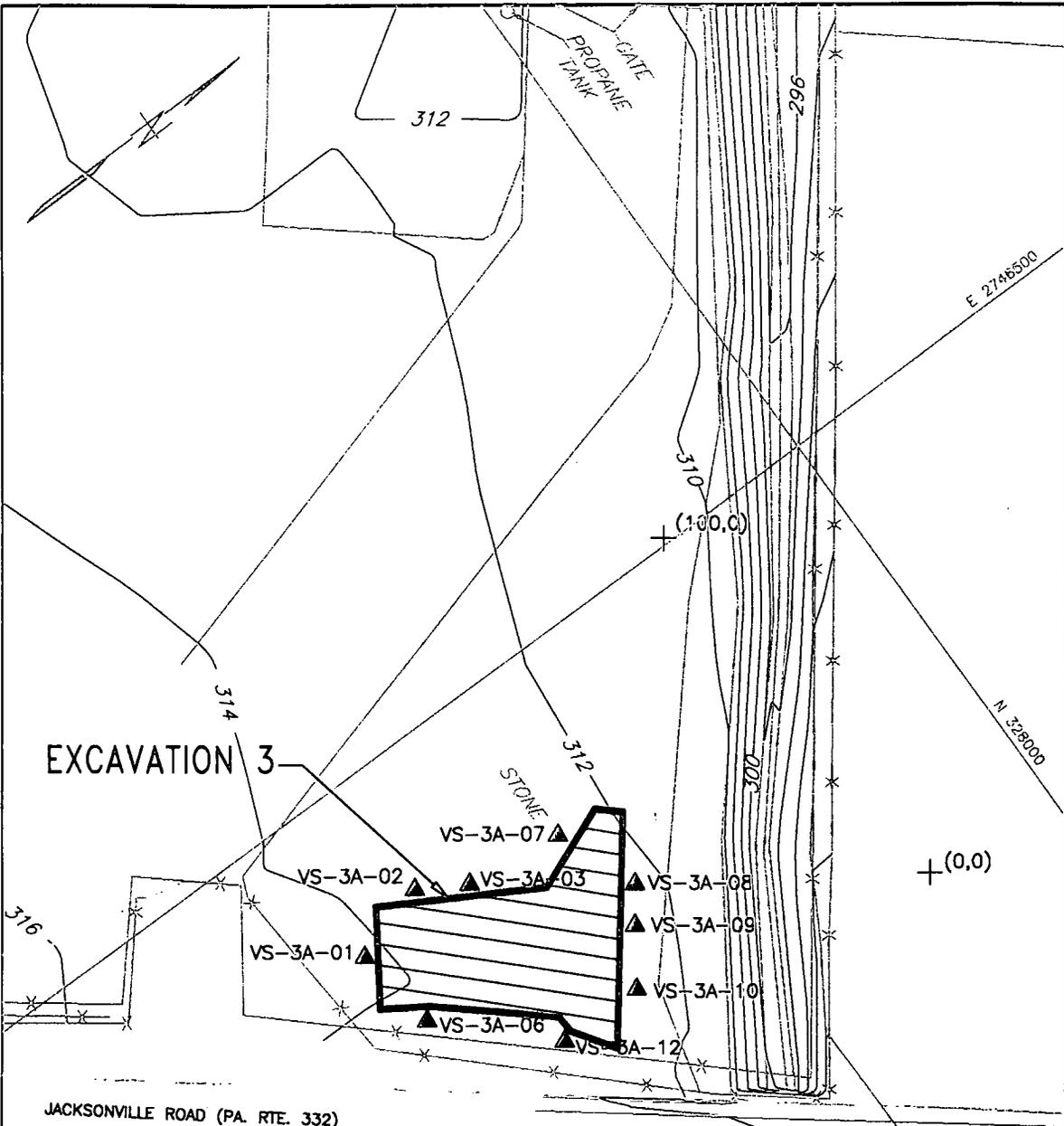
Database source file: S:\GLENNG\252_RES.DBF data retrieved on 05/24/99

NOTE Results are shown for only the final verification samples

If Clean up Goal was attained in initial post removal sampling, that analytical parameter was not repeated for subsequent sampling and is shown as NA.
See text and Appendix A for full explanation

SPECIAL NOTE REGARDING CLEAN-UP GOALS Although no specific clean-up goals were established for all PAH compounds, analysis was performed on initial samples to confirm nature of contamination.

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<p>0 50 100</p> <p>SCALE IN FEET</p>		<p>LEGEND:</p> <p>▲ VERIFICATION SAMPLE LOCATION</p> <p>VS 3A-10</p> <p>▨ AREA OF EXCAVATION 0 - 2 FEET</p>	
<p>DRAWN BY DATE</p> <p>LDL 3/24/99</p>	<p>TT Tetra Tech NUS, Inc.</p>	<p>CONTRACT NO.</p> <p>6883</p>	<p>OWNER NO.</p> <p>8341</p>
<p>CHECKED BY DATE</p> <p>CM 4/12</p>	<p>REMOVAL ACTION AND VERIFICATION SAMPLES</p> <p>AREA A - SITE 3</p> <p>NAWC WARMINSTER, PA</p>	<p>APPROVED BY</p> <p><i>[Signature]</i> DATE 5/2/99</p>	<p>APPROVED BY</p> <p><i>[Signature]</i> DATE</p>
<p>COST/SCHED-AREA</p>		<p>DRAWING NO. FIGURE 3-4</p>	<p>REV.</p>
<p>SCALE AS NOTED</p>			

The results of the first sampling were evaluated and used to direct the further and final removal actions for Site 3. The sample results from the initial sampling were compared to the clean-up goals on a compound-by-compound basis for each sample. In addition, a statistical evaluation of the UCL was performed to determine if the sample set indicated attainment. The results of this analysis indicated that attainment had not been achieved and that portions of the northern and eastern walls of the excavation still contained an unacceptable level of contamination. The BCT also concluded that further statistical evaluation was not necessary if final verification samples indicated contaminant concentrations below the clean-up goals. The Navy directed further removal actions in this area, after which a final set of samples were collected.

Table 3-6 presents the results of the final sample analysis. As can be seen from this table, all final verification samples contained concentrations of target compounds below the clean-up goals. The BCT reviewed the available data and determined that attainment had been achieved. Site 3 was backfilled and regraded by FWEC.

4.0 Geophysical Surveys

In response to the finding of buried drum remnants in excavation 1B and to investigate the possible presence of other buried drums, the Navy directed TtNUS to conduct a geophysical survey throughout Area A. The survey was conducted after completion of the removal actions but before the complete placement of backfill material. The scope of the geophysical effort and the methods employed were documented in a letter work plan that was reviewed and approved by the BCT and EPA (see Appendix C).

The geophysical survey was conducted using magnetometers (Geometrics G858 Cesium Vapor) and an electromagnetic metal detector (Geonics EM-61). Grid lines were placed throughout the study area at 10-foot intervals. Data were initially reviewed in the field and the grid area expanded to further investigate or refine areas of suspected findings. All data were downloaded and recorded electronically for interpretation. The interpretation and findings of the survey were reported in a letter report issued on December 31, 1998 (see Appendix C).

In general, the geophysical survey identified four areas of significance that warranted further investigation. The results and the interpretation were reviewed by the BCT, and the Navy determined that exploratory test pits were needed in these areas to fully investigate the source of the anomalous readings.

4.1 GEOPHYSICAL TEST PIT FINDINGS

Four test pits were excavated in the potentially significant areas or zones identified in the geophysical survey. The test pits were excavated by FWEC under the direction of the Navy. EPA, the EPA contractor, and TtNUS personnel were present as observers during the excavations. Appendix C presents a summary of the field notes and findings observed during these excavations.

In general, a variety of metal objects and debris were observed during the test pit operation; however, no evidence of buried drums or other containers was encountered. Metal debris consisted of wire, sheet metal, pipe and pipefittings, cables, straps, and other similar miscellaneous items. No significant waste materials were observed during the excavations. The materials encountered and observed were consistent with the anomalous readings identified during the geophysical survey.

As a result of these findings, no further investigation or excavation was performed. After reviewing the data with the BCT, the Navy directed FWEC to backfill the test pits and to proceed with the complete backfilling and regrading of the removal areas.

5.0 SUMMARY AND CONCLUSIONS

The Navy conducted soil removal actions at Sites 1, 2, and 3, located within Area A of NAWC Warminster. Samples were collected and analyzed during the removal action to direct the extent of the removal. Analytical results were compared to clean-up goals established and agreed to by the BCT. Final attainment samples were collected and the analytical results were compared to these clean-up goals and reviewed by the BCT. The analytical results for all samples collected within the removal areas indicate that no single sample contained concentrations of any compound at a concentration greater than the clean-up goals. The BCT reviewed these results and concurred at the time of the removal that attainment had been achieved.

In addition to completing the removal actions at these sites, the Navy also conducted an interim human health risk assessment to determine the need for further removal action at Site 2. The risk assessment indicated, assuming industrial reuse of the area, that no further removal action was warranted in and around Site 2. The Navy also conducted a subsurface investigation to determine the presence of buried drums or waste containers within the study area. No buried waste containers or drums were found. The results of this investigation indicate little to no likelihood of the presence of buried drums within this area.

In summary, removal activities have been completed and all clean-up goals and objectives were attained.

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- 2) Brown & Root Environmental (BR&E). July 10, 1998. Results from Additional Site 1 Soil Investigation.
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- 6) Tetra Tech NUS (TtNUS). October 29, 1998. Results Form Verification and Supplemental Sampling Area A Site 2.
- 7) Tetra Tech NUS (TtNUS). November 12, 1998. Characterization Sampling Results Area A Site 1B.
- 8) Brown & Root Environmental (BR&E). April 1998. Draft Removal Site Evaluation for Area A soils.
- 9) Tetra Tech NUS (TtNUS). August 4, 1998. Alternatives 4 and 5 Draft Removal Evaluation - Area A Soils.
- 10) Tetra Tech NUS (TtNUS). September 10, 1998. Area A Removal Action - Addendum to Excavation Approach.
- 11) Tetra Tech NUS (TtNUS). November 12, 1998. Evaluation of Site 2 Soil Data Area A.
- 12) Tetra Tech NUS (TtNUS). August 20, 1998. Verification Sampling and Analysis Plan for Removal Activities at Area A Site 1.
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- 14) Tetra Tech NUS (TtNUS). September 10, 1998. Area A Removal Action - Addendum to Excavation Approach

- 15) Tetra Tech NUS (TtNUS). November 12, 1998. Evaluation of Site 2 Soil Data, Area A.
- 16) Foster Wheeler Environmental Corporation (FWEC). October 1998. Drum Handling Plan for Site 1 Naval Air Warfare Center Warminster Pennsylvania.
- 17) Foster Wheeler Environmental Corporative (FWEC), 1997. Work Plan for various Source Removal Sites at Naval Air Warfare Center, Warminster, Pennsylvania. Langhorne, Pennsylvania.

APPENDIX A

APPENDIX A1



TETRA TECH NUS, INC.

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C-51-10-8-69

October 27, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

Subject: Verification Sampling Results
Area A Site 1A
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter presents the results of the most recent verification sampling performed in Area A excavation 1A. Tetra Tech NUS (TtNUS) collected a verification sample from the southwest wall of the re-excavated area of the subject excavation on October 20, 1998. The sample was analyzed for Cadmium only. The sample contained 43.8 mg/kg of Cadmium, see attached laboratory analysis report. This concentration is below the clean-up goal of 76 mg/kg.

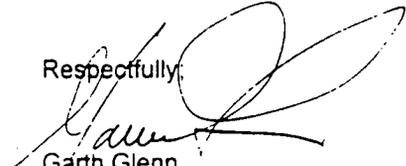
The result was added to the database containing the other results for excavation 1A and the Upper 95% Confidence Level (UCL) for Cadmium was statistically calculated to compare the UCL to the clean-up goal. The results of this evaluation indicate that the UCL for Cadmium is 100 mg/kg (see attached spreadsheet). This concentration is greater the clean-up goal. The relatively low number of samples contained within the database combined with the distribution of the data inflates the value of the UCL calculated for the excavation, perhaps unrealistically. A total of twelve sidewall samples are available from the excavation and the data is distributed such that almost all of the data falls in the range of Non-Detected to 1 mg/kg (9 of the samples). The remaining 3 samples contain Cadmium at 4.9 mg/kg, 11.2 mg/kg, and 43.8 mg/kg. This distribution within this relatively small database results in a calculated UCL greater than the maximum detection. EPA risk assessment guidelines suggest that the maximum contaminant detection concentration, rather than the calculated UCL, be used to determine the representative concentration (Reasonable Maximum Exposure Concentration) in these situations.

Because no single sample exceeds the clean-up goal and the data indicates that no remaining material should present an unacceptable risk, it is recommended that the actual sample results rather than the calculated UCL be used to determine attainment for this excavation. It is further

C-51-10-8-69
Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
October 27, 1998 – Page 2

recommended that the Navy present these findings to the BCT for resolution before the excavation is backfilled.

Respectfully,



Garth Glenn
Project Manager

GG/ejc

- c Tom Ames (NAVFACENGCOM)
- Tim McAntee (NAVFACENGCOM)
- Steve Lehman (NAVFACENGCOM)
- Darius Ostrauskas (EPA Region III)
- April Flipse (PADEP)
- Neil Teamerson (B&R Environmental)
- Jeff Orient (B&R Environmental)

TABLE

RME EXPOSURE POINT CONCENTRATION AND STATISTICAL DISTRIBUTION OF COPCS IN SOIL
 AREA A, SITE 1A, ALL DATA
 NAWC WARMINSTER, PENNSYLVANIA

Substance	Number of Sample Results	Degrees of Freedom	Statistical Distribution of Site Data	Results of Shapiro-Wilk or Shapiro-Francia Distribution Tests			Table Value for $T_{0.05}$ (Normal)	Standard Deviation or Log Standard Deviation	Arithmetic Mean of All Site Results	Upper 95 % Confidence Limit (UCL) of Mean	Maximum Positive Site Concentration	Representative Concentration (Lower of UCL vs Max)
				W-norm	W-lognorm	W-Table						
Cadmium	12	11	nonparametric (assumed lognorm)	0.469	0.8076	0.859	5.0518	2.04	5.16	100	43.8	43.8

Notes

Units are mg/kg

Number of sample results excludes rejected data or blank-qualified data. Duplicates are consolidated into one result. Non-detected results are treated as present at one-half the detection limit in all calculations.

Statistical distribution of data is determined using Shapiro-Wilk test for $n \leq 50$, Shapiro-Francia test for $n > 50$. Statistical significance level is 0.05.

For $N > 10$, a normal distribution is assumed if the test statistic W-norm is \geq than the reference value (W-table), and $W\text{-norm} > W\text{-lognorm}$.

For $N \geq 10$, a lognormal distribution is assumed if the test statistic W-lognorm is \geq the reference value (W-table), and $W\text{-lognorm} \geq W\text{-norm}$. A lognormal distribution is assumed if neither distribution is \geq the reference value.

*For $N < 10$, the maximum concentration is selected as the representative concentration, although the fitted distribution type is shown for information only.

H-values and standard deviations of log-transformed data are used to calculate the UCL if data are assumed to be lognormally distributed. Student's T-values and standard deviations are used for normally distributed data.

Arithmetic mean includes positive detections and non-detected results (detection limits are divided by two).

The representative concentration is selected as the lower of the 95 % UCL on the mean and the maximum positive site concentration.

Duplicate



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C-51-10-8-10

October 7, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

Subject: Verification Sample Analysis Results for Removal Activities at Area A Site 1A
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter summarizes the results of the Tetra Tech NUS (TtNUS) post-excavation sampling and analysis performed at the subject site. Eight samples (plus duplicates and Quality Assurance samples) were collected from excavation 1A on October 1, 1998 after the completion of the extended excavation performed by the Navy RAC (Foster Wheeler). The extended excavation was performed in accordance with the recommendations presented in the TtNUS letter dated September 10, 1998 (C-51-9-8-18). All samples were collected from excavation sidewalls at points selected by and under the oversight of the EPA. Sample locations and descriptions are presented in Attachment 1.

All samples were analyzed for Cadmium and Chromium under 48-hour quick turnaround analysis. The data has not undergone a full validation review. The laboratory analytical results are presented in Attachment 2. The new analytical results were grouped with the data from the original verification sampling (after removing the sample results from the soils/material that had been further excavated) to allow for a complete statistical evaluation of the site. The analytical data set was statistically evaluated according to the methods outlined in the referenced September 10, 1998 correspondence and as described in the August 20, 1998 Verification Sampling and Analysis Plan to determine if clean-up goals had been attained. The results of the statistical evaluation are presented in Attachment 3. In addition individual sample results were compared to the Preliminary Remediation Goals (PRGs) established for the site.

A review of the data indicates:

- No Chromium results (UCL or maximum detected concentration) exceeded the PRGs. Attainment goals have been met for this compound.

- The UCL for Cadmium (1,250 mg/kg) exceeds the PRG (76 mg/kg). Sample VS-A-1A-12 contained Cadmium at 335 mg/kg. This is the only sample that contains Cadmium at a concentration greater than the PRG. An evaluation of the statistics indicates that this single sample result is the reason the UCL exceeds the PRG for the site. Sample VS-A-1A-12 was collected from the southwest side of the excavation, toward the parking area adjacent to the groundwater treatment plant. The sample was collected 2 to 4 feet below ground surface at the edge of the newly excavated portion of the site. The material sampled was a dark red/brown damp clay-like material present only in a small portion of the excavation. The material did not appear to be extensive and appeared to be residual material present in about 10 feet of the excavation wall.

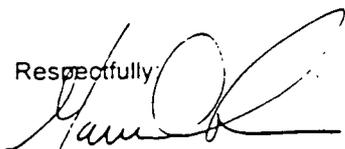
Recommendations

Based on the findings of the verification sampling and the above evaluation, it is recommended that the Navy further excavate the southwest point of the excavation in the area of sample number VS-A-1A-12. It is further recommended that this excavation be limited to 2 feet below the depth of the material sampled and that the excavation continue laterally until the material is completely excavated. The excavation wall should be resampled after completion of the excavation and the samples should be analyzed for Cadmium only. As indicated above and in the referenced September 10, 1998 correspondence, all other clean-up goals have been attained for this site.

In order to enhance the Navy RAC's ability to adequately perform the necessary excavation, the Navy may want to consider a partial backfilling of the remainder of the excavation before the additional work is performed. Backfilling other portions of the excavation, not immediately adjacent to the targeted area, will provide better operating conditions for the excavating equipment and will enhance the ability to completely remove the material in question.

If you have any questions or wish to discuss these data or findings, please contact me.

Respectfully,

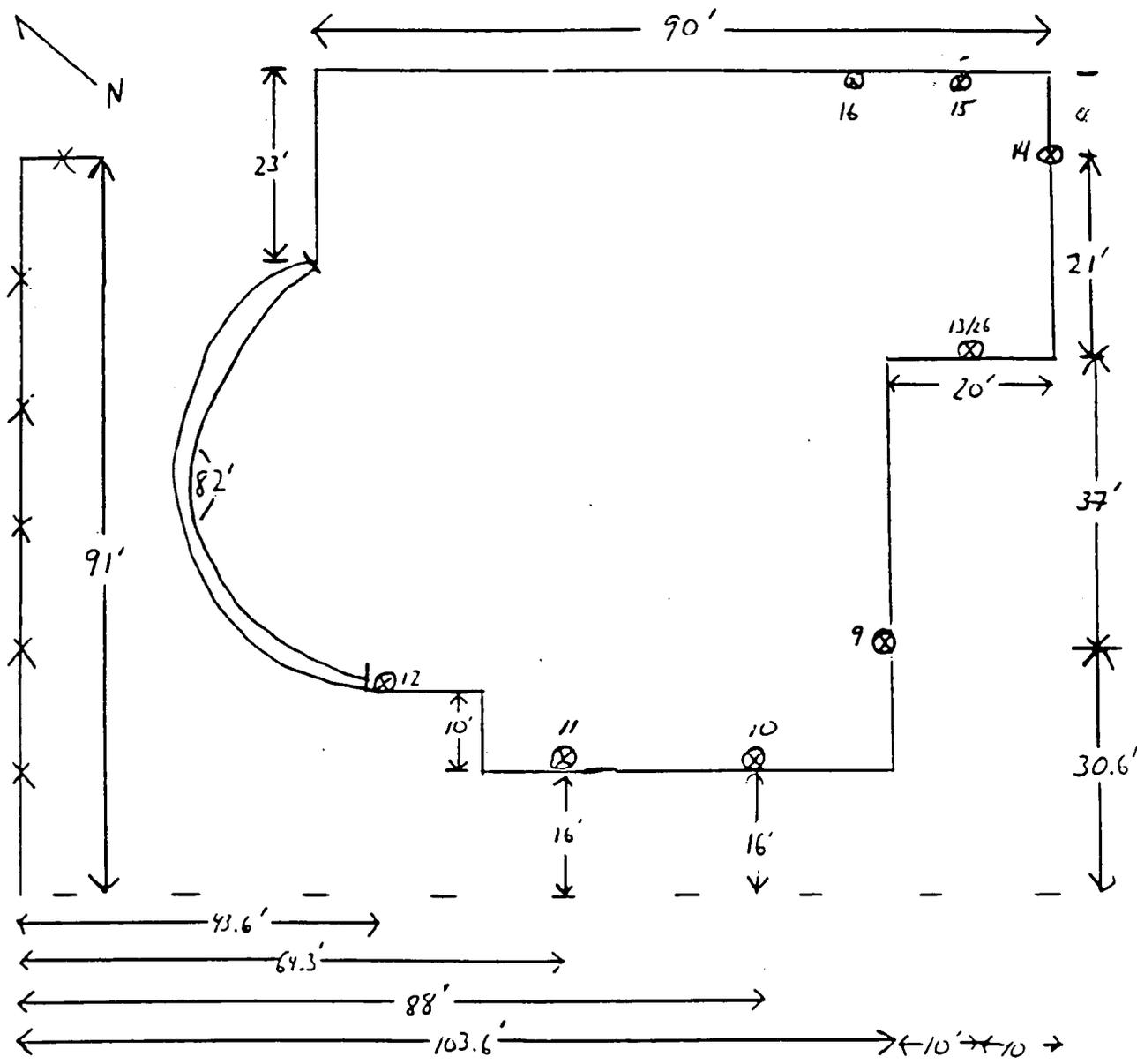


Garth Glenn
Project Manager

- c Tom Ames (NAVFACENGCOM)
Tim McAntee (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
Neil Teamerson (B&R Environmental)
Jeff Orient (B&R Environmental)

Attachment 1

CLIENT		JOB NUMBER	
SUBJECT			
BASED ON		DRAWING NUMBER	
BY	CHECKED BY	APPROVED BY	DATE



--- Edge of parking area
 ** Fence line
 — Excavation line

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former MAWC Warehouse

Project Site Number 6883

Source Number V5-A-1A-09

Source Location Area A Excavation

Sample Method: <u>Stainless Steel Trowel</u>	Composite Sample Data			
Depth Sampled: <u>1-5'</u>	Sample	Time	Color and Description	
Sample Date & Time: <u>10/1/98 0740</u>	<div style="font-size: 2em; transform: rotate(-45deg); opacity: 0.5;">N/A</div>			
Sampled by: <u>Matt Woolford</u>				
Signature(s): <u>Matt Woolford</u>				
Sample Type				
<input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite				
		Sample Data		
		Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
		<u>red</u>	<u>Clay</u>	

Analysis	Preservative:
<input type="checkbox"/> TCL VOAs	<u>dark, 4°C</u>
<input type="checkbox"/> TCL SVOAs	<u>dark, 4°C</u>
<input type="checkbox"/> TCL Pest/PCBs	<u>dark, 4°C</u>
<input type="checkbox"/> TAL Metals	<u>4°C</u>
<input type="checkbox"/> Cyanide	<u>4°C</u>
<input checked="" type="checkbox"/> Cadmium	<u>4°C</u>
<input checked="" type="checkbox"/> Chromium	<u>4°C</u>

Observations and Notes

Duplicate sample taken

Sample Location Map

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former RWMC Warrister

Project Site Number 6883

Source Number VS-A-1A-14

Source Location Area A Excavation 1A

Sample Method: <u>Stainless Steel Trowel</u>	Composite Sample Data		
Depth Sampled: <u>6'</u>	Sample	Time	Color and Description
Sample Date & Time: <u>10/1/98 1200</u>			
Sampled by: <u>Matt Woolford</u>			
Signature(s): <u>Matt Woolford</u>			
Sample Type <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
	Sample Data		
	Color	Description: (Sand, Clay, Grv. Moist. Wet. etc.)	
		<u>reddish brown sandy clay</u>	

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	<u>dark, 4°C</u>
<input type="checkbox"/> TCL SVOA's	<u>dark, 4°C</u>
<input type="checkbox"/> TCL Pest/PCBs	<u>dark, 4°C</u>
<input type="checkbox"/> TAL Metals	<u>4°C</u>
<input type="checkbox"/> Cyanide	<u>4°C</u>
<input checked="" type="checkbox"/> Chromium	<u>4°C</u>
<input checked="" type="checkbox"/> Cadmium	<u>4°C</u>

Sample Location Map

Observations and Notes

Duplicate sample taken:

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former MAWC Wastewater

Project Site Number 6883

Source Number V5-A-1A-16

Source Location Area A Excavation 1A

<p>Sample Method: <u>Stainless Steel Trowel</u></p>	Composite Sample Data		
Depth Sampled: <u>0-8'</u>	Sample	Time	Color and Description
Sample Date & Time: <u>10/1/98 1315</u>			
Sampled by: <u>Matt Woolford</u>			
Signature(s): <u>Matt Woolford</u>			NA
Sample Type			
<input checked="" type="checkbox"/> Low Concentration			
<input type="checkbox"/> High Concentration			
<input checked="" type="checkbox"/> Grab			
<input type="checkbox"/> Composite			
<input type="checkbox"/> Grab - Composite			
Analysis	Sample Data		
<input type="checkbox"/> TCL VOAs	Color	Description: (Sand, Clay, Grv, Moist, Wet, etc.)	
<input type="checkbox"/> TCL SVOAs	<u>Green</u>	<u>1-2 inches below surface</u>	
<input type="checkbox"/> TCL PesuPCBs	Sample Location Map		
<input type="checkbox"/> TAL Metals			
<input type="checkbox"/> Cyanide			
<input checked="" type="checkbox"/> Chromium			
<input checked="" type="checkbox"/> Chromium			
Observations and Notes			
<input type="checkbox"/> Duplicate sample taken			

Attachment 2

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J020122 **Tetra Tech EOS, Inc** PAGE 3
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/05/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: VS-A-1A-26					
Sample #: 006	Date Sampled: 10/01/98 12:07	Date Received: 10/02/98	Matrix: SOLID		
Trace Inductively Coupled Plasma (ICP) Metals Reviewed					
Cadmium	ND	0.57	mg/kg	SW846 6010B	
Chromium	11.4	1.1	mg/kg	SW846 6010B	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis Reviewed
 Total Residue as 87.6 † MCAWW 160.3 MOD
 Percent Solids

Client Sample ID: VS-A-1A-13
 Sample #: 007 Date Sampled: 10/01/98 12:15 Date Received: 10/02/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed					
Cadmium	ND	0.57	mg/kg	SW846 6010B	
Chromium	7.2	1.1	mg/kg	SW846 6010B	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis Reviewed
 Total Residue as 88.0 † MCAWW 160.3 MOD
 Percent Solids

Client Sample ID: VS-A-1A-15
 Sample #: 008 Date Sampled: 10/01/98 13:00 Date Received: 10/02/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed					
Cadmium	0.09 B	0.55	mg/kg	SW846 6010B	
Chromium	48.3	1.1	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: CSJ020122 Tetra Tech EUS, Inc PAGE 4
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/05/98
Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
------------------	---------------	------------------------	--------------	--------------------------

Client Sample ID: VS-A-1A-15
Sample #: 008 Date Sampled: 10/01/98 13:00 Date Received: 10/02/98 Matrix: SOLID

Inorganic Analysis
Total Residue as 90.1 † R viewed
Percent Solids MCAWW 160.3 MOD

Client Sample ID: VS-A-1A-16
Sample #: 009 Date Sampled: 10/01/98 13:15 Date Received: 10/02/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed
Cadmium 4.9 0.56 mg/kg SW846 6010B
Chromium 842 1.1 mg/kg SW846 6010B

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis
Total Residue as 90.0 † Reviewed
Percent Solids MCAWW 160.3 MOD

Client Sample ID: FB-100198
Sample #: 010 Date Sampled: 10/01/98 13:45 Date Received: 10/02/98 Matrix: WATER

Trace Inductively Coupled Plasma (ICP) Metals Reviewed
Cadmium ND 2 ug/L SW846 6010B
Chromium 1.4 B 10 ug/L SW846 6010B

B Estimated result. Result is less than RL.

Attachment 3

TABLE

RME EXPOSURE POINT CONCENTRATION AND STATISTICAL DISTRIBUTION OF COPCS IN SOIL
 AREA A, SITE 1A, ALL DATA
 NAWC WARMINSTER, PENNSYLVANIA

Substance	Number of Sample Results	Degrees of Freedom	Statistical Distribution of Site Data	Results of Shapiro-Wilk or Shapiro-Francia Distribution Tests			Table Value for $H_{0.95}$ (Lognorm.) or $T_{0.95}$ (Normal)	Standard Deviation or Log Standard Deviation	Arithmetic Mean of All Site Results	Upper 95 % Confidence Limit (UCL) on Mean	Maximum Positive Site Concentration	RME Exposure Point Concentration
				W-norm.	W-lognorm	W-Table						
Cadmium	12	11	nonparametric (assumed lognorm.)	0.3419	0.7666	0.859	6.0123	2.48	29.4	1250	335	335
Chromium	12	11	nonparametric (assumed lognorm.)	0.4005	0.8317	0.859	5.0517	2.04	614	9360	6050	6050

Units are mg/kg for inorganics

Number of sample results excludes rejected data or blank-qualified data. Duplicates are consolidated into one result. Non-detected results are treated as present at one-half the detection limit in all calculations. Statistical distribution of data is determined using Shapiro-Wilk test for $n \leq 50$, Shapiro-Francia test for $n > 50$. Statistical significance level is 0.05.

For $N \geq 10$, a normal distribution is assumed if the test statistic W-norm is \geq than the reference value (W-table), and W-norm. $>$ W-lognorm.

For $N \geq 10$, a lognormal distribution is assumed if the test statistic W-lognorm is \geq the reference value (W-table), and W-lognorm. \geq W-norm. A lognormal distribution is assumed if neither distribution is \geq the reference value.

*For $N < 10$, the maximum concentration is selected as the representative concentration, although the fitted distribution type is shown for information only.

H-values and standard deviations of log-transformed data are used to calculate the UCL if data are assumed to be lognormally distributed. Student's T-values and standard deviations are used for normally distributed data.

Arithmetic mean includes positive detections and non-detected results (detection limits are divided by two).

The representative concentration is selected as the lower of the 95 % UCL on the mean and the maximum positive site concentration.

Duplicate



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C-51-9-8-18

September 10, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern Division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N62472-90-D-1298
Contract Task Order (CTO) No. 252

Subject: Verification Sample Analysis Results for Removal Activities at Area A Site 1
Former Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter summarizes the results of the Tetra Tech NUS post-excavation sampling and analysis performed at the subject site. Twenty (plus quality control/quality assurance) verification samples were collected from the Area A Site 1 excavations on September 2 and 3, 1998. Samples were collected under the oversight of EPA personnel from both excavations 1a and 1b. Samples were collected from the excavation walls at 1a and from the floor and the walls at 1b. The sample locations and descriptions are summarized in Table 1 and described in the sample log sheets (Attachment 1).

TABLE 1
VERIFICATION SAMPLES FOR AREA A SITE 1
FORMER NAVAL AIR WARFARE CENTER WARMINSTER, PENNSYLVANIA

SAMPLE NO.	LOCATION	DEPTH (ft)	COMMENTS
VS-A-1A-01	SE wall, Excav. 1a	4-6	Light brown silty sand
VS-A-1A-02	SE wall, Excav. 1a	6-8	Dark red clay sludge
VS-A-1A-03	NE wall, Excav. 1a	5-6	Dark red clay sludge
VS-A-1A-04	NE wall, Excav. 1a	2-3	Beige silt
VS-A-1A-05/25	NW wall, Excav. 1a	8-9	Orange-brown silty sand
VS-A-1A-06	NW wall, Excav. 1a	5	Dark brown sandy silt
VS-A-1A-07	SW wall, Excav. 1a	5-6	Dark red clay sludge
VS-A-1A-08	SW wall, Excav. 1a	6-7	Dark red clay sludge
VS-A-1B-01	Floor, Excav. 1b	10	Red brown tan silty clay
VS-A-1B-02	Floor, Excav. 1b	10	Red brown tan silty clay
VS-A-1B-03	Floor, Excav. 1b	10	Red brown tan silty clay
VS-A-1B-04/24	Floor, Excav. 1b	10	Red brown tan silty clay
VS-A-1B-05	SW wall, Excav. 1b	7	Reddish brown silty clay, possibly sludge

SAMPLE NO.	LOCATION	DEPTH (ft)	COMMENTS
VS-A-1B-06	SW wall, Excav. 1b	6-8	Reddish brown clayey silty clay sludge
VS-A-1B-07	SW wall, Excav. 1b	6-8	Grayish red clayey silt
VS-A-1B-08	NW wall, Excav. 1b	3	Tan silt
VS-A-1B-09	NE wall, Excav. 1b	5	Reddish brown silty clay
VS-A-1B-10	NE wall, shelf area, Excav. 1b	5	Dark red clay sludge
VS-A-1B-11	E wall, Excav. 1b	6-7	Reddish brown silty clay, possibly sludge
VS-A-1B-12	NE wall, shelf area, Excav. 1b	5	Black grit

Sample locations were selected based on evidence of waste material and to ensure adequate characterization of a given area. All samples were analyzed for Antimony, Cadmium, Chromium and Trichloroethene (TCE) under 48-hour quick turn around analysis. The data has not undergone a full validation review. One sample from 1b (VS-A-1B-12) was analyzed under 7-day turn around for the full scan of Target Compound List (TCL) organics and Target Analyte List (TAL) metals. The full-scan results for the one sample from 1b are not yet completed for Pesticide/PCB. The raw analytical data for all samples are included with this letter as Attachment 2.

The August 20, 1998 Verification Sampling and Analysis Plan proposed evaluating the data for attainment of clean-up goals by comparing the calculated upper 95% confidence limit (UCL) concentration for each compound to the PRGs. It further proposed that if the UCL exceeded a PRG that the sample populations would be further evaluated by area to define the areas requiring further excavation.

The analytical results were statistically evaluated according to EPA Regional and Headquarters guidance and policies to determine the arithmetic mean, upper 95% confidence limit (UCL), and representative concentration (Reasonable Maximum Exposure Point Concentration). The statistical data are included with this letter as Attachment 3. The representative concentration is the lower of 95% UCL and the site maximum concentration. This concentration is the site concentration used to evaluate and calculate site risks. The sample results were also compared to the compound specific Preliminary Remediation Goals (PRGs) developed for the site. The PRGs were developed to provide a compound specific clean-up goal that would result in eliminating unacceptable risks to human health and the environment.

A review of the data indicates:

- No TCE results (UCL or maximum detected concentration) exceeded the PRGs.
- The UCL for the combined data set for 1a and 1b exceeds the PRGs for Antimony, Cadmium, and Chromium. However, the maximum concentrations for Antimony and Chromium are less than the PRGs for these compounds. The highest concentration of Antimony found was 68.5 mg/kg. The PRG for Antimony is 113 mg/kg. The highest Chromium result found was 11,300 mg/kg. The PRG for Chromium is 16,161 mg/kg.

- The UCL and maximum detected concentration for Antimony in 1a is less than the PRG.
- The UCL for Chromium for 1a exceeds the PRG but the maximum detected concentration (11,300 mg/kg) is below the PRG of 16,161 mg/kg.
- The UCL and the site maximum concentration for Cadmium exceed the PRG at 1a. Samples VS-A-1A-02, -03, -07, and -08 contained Cadmium concentrations greater than the PRG. Sample logs indicate that the material sampled in all four locations was a "dark red clay sludge". This same material is evident in the excavation wall at a depth below sample VS-A-1A-04. This sample was collected from soils at 2 to 3 feet below the surface and the "dark red clay sludge" material was evident at about 6 feet below the surface. These samples also contained the highest concentrations of Chromium identified.
- The UCL for Antimony for 1b exceeds the PRG but the maximum detected concentration (68.5 mg/kg) is below the PRG of 113 mg/kg.
- The UCL and the maximum concentration detected for Chromium in 1b are below the PRG.
- The UCL and maximum detected concentration for Cadmium in 1b exceed the PRG. Samples from the floor and walls of the excavation exceed the PRG.
- All four floor samples contained Cadmium concentrations in excess of the PRG. The highest Antimony concentrations were also identified in these samples.
- The UCL and maximum detected concentration for Antimony in wall samples from 1b are below the PRG.
- The UCL and maximum detected concentration for Cadmium in wall samples for 1b exceed the PRG. Samples VS-A-1B-05 and -11 contained Cadmium concentrations in excess of the PRG.
- * The analytical results for VOCs, SVOCs, and metals of the "black grit" material encountered in 1b (sample VS-A-1b-12) indicated no concentrations above the corresponding Federal industrial Risk Based Concentrations (RBCs). The results for Pesticides/PCBs have not yet been received. Lead was detected at 1460 mg/kg. This concentration exceeds the Pennsylvania Department of Environmental Protection (PADEP) non-residential Medium Specific Concentration (MSC) for surface soil (1000 mg/kg), but not that for subsurface soil (190,000 mg/kg). The sample was collected at a depth of approximately 5 feet. PADEP defines "surface soil" as the top 2 feet of soil. The extent and depth of this material has not been determined.

Recommendations

Due to the number of samples collected and the fact that biased sampling was performed it may not be appropriate to rely on the UCL to determine attainment. It is recommended that individual sample results be compared to PRGs and that additional excavation be performed in all areas where data indicates that PRGs are exceeded. This approach will ensure that the calculated risk for remaining soils after the completed excavation will not present an unacceptable risk.

Based on this evaluation and the above recommendation, it is further recommended that the Navy expand the excavation for both 1a and 1b. Each area is presented in more detail below.

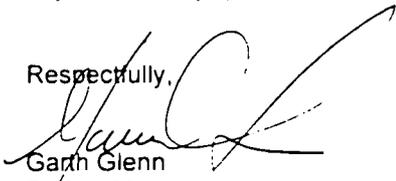
- **Excavation 1a** – It is recommended that the excavation be expanded to remove the dark red clay sludge material present at sample locations VS-A-1A-02, -03, -07, and -08 and below sample location VS-A-1A-04. Figure 1 (Attachment 4) shows the location of these sample points. It is recommended that the area be resampled after completion of the excavation and that the samples be analyzed for Cadmium and Chromium.
- **Excavation 1b** – It is recommended that the floor of the excavation be further excavated to bedrock or groundwater which ever is encountered first. It is further recommended that the excavation walls in the area around and between sample locations VS-A-1B-05 and -11 be further excavated. This area should be reviewed for the visual evidence of the presence of waste and the excavation continued until the evident material has been removed. It is also recommended that the excavation be extended in the area of sample location VS-A-1B-12 in order to remove the "black grit" material. This course of action is deemed prudent based on the material's high lead content and relatively shallow occurrence, even though no cleanup criterion was exceeded. Figure 2 (Attachment 5) shows the areas recommended for further excavation

If the floor is excavated to bedrock or groundwater no sampling should be required. If this is not achieved, sampling should be performed and samples should be analyzed for Cadmium and Antimony. Excavation walls in the area of samples VS-A-1B-05 and -11 should be resampled after excavation and analyzed for Cadmium only. The excavation wall in the vicinity of sample VS-A-1B-12 should be resampled after excavation and analyzed for Lead.

Results from the Pesticide/PCB analysis of the "black grit" material encountered in 1b (sample VS-A-1B-12) will be forwarded with recommendations as soon as they are received.

If you have any questions or wish to discuss these data or the findings, please contact me.

Respectfully,



Garth Glenn
Project Manager

GG/ejc

C: Tom Ames (NAVFACENGCOM)
Tim McAntee (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
Steve Lehman (NAVFACENGCOM)
John Magee (Foster Wheeler)
Neil Teamerson (TtNUS)
Jeff Orient (TtNUS)

ATTACHMENT NO. 1

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former NAWIC Westminster

Project Site Number 6773

Source Number US-A-1A-03

Source Location Area A, Excavation 1A

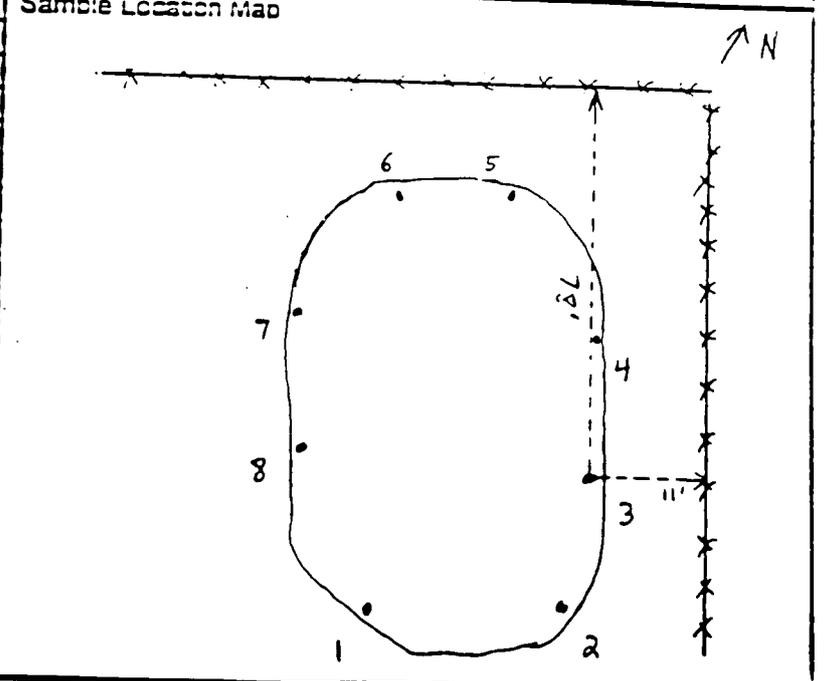
Sample Method: <i>Two hole bucket / S.S. + soil</i>	Composite Sample Data				
Depth Sampled: <i>5-6'</i>	Sample	Time	Color and Description		
Sample Date & Time: <i>1/2/98 1410</i>	<div style="font-size: 2em; opacity: 0.5;">N/A</div>				
Sampled by: <i>D. Whalen</i>					
Signature(s): <i>Douglas Whalen</i>					
Sample Data					
Color				Description: (Sand, Clay, Dry, Moist, Wet, etc.)	

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	<i>dark, 4°C</i>
<input type="checkbox"/> TCL SVOA's	<i>dark, 4°C</i>
<input type="checkbox"/> TCL Pest/PCBs	<i>dark, 4°C</i>
<input type="checkbox"/> TAL Metals	<i>4°C</i>
<input type="checkbox"/> Cyanide	<i>4°C</i>
<input checked="" type="checkbox"/> Antimony, Cadmium, Chromium	<i>4°C</i>
<input checked="" type="checkbox"/> TCE	<i>4°C</i>

Sample Location Map

dark red/brown | silty clay sludge material | damp



Observations and Notes

Duplicate sample taken:

Side wall sample taken from ~6' wide section of wall where sludge layer is not as distinct.

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former NAWC Westminster

Project Site Number 6883

Source Number VS-A-1A-05

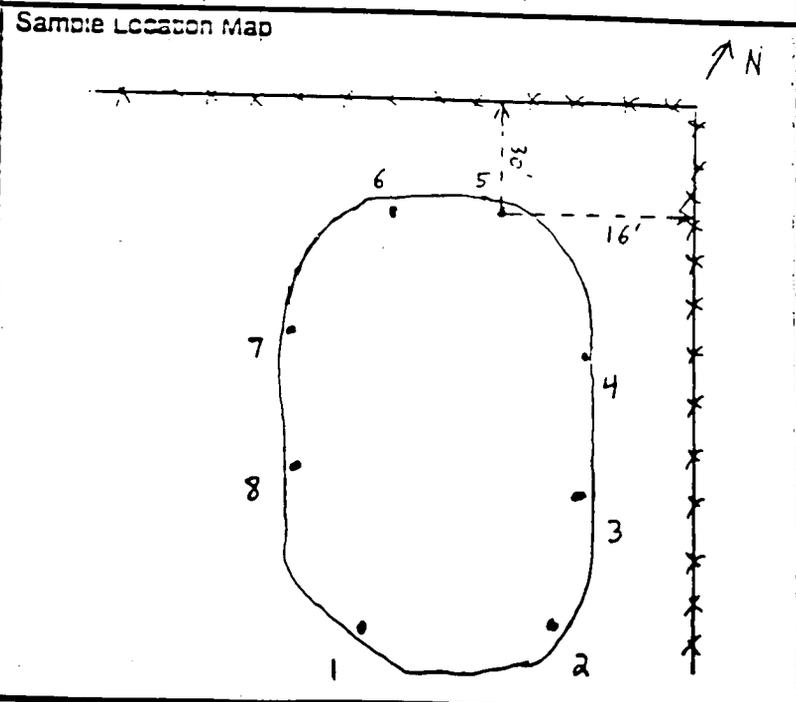
Source Location Area A Excavation 1A

Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
16 00 Top of Excavation 1A, 15.5 Top			
2-01			
Sample Date & Time:			
9/3/93			
Sampled by:			
D. Whalen			
Signature(s):			
<i>Donald Whalen</i>			

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Sample Data	
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
orange-brn	silty sand damp

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	dark, 4°C
<input type="checkbox"/> TCL SVOA's	dark, 4°C
<input type="checkbox"/> TCL PsevPCBs	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> Antimony, Cadmium, Chromium	4°C
<input checked="" type="checkbox"/> TCE	4°C



Observations and Notes

Duplicate sample taken: VS-A-1A-25

side wall sample from area of orange-ish soil near bottom of excavation. This area was largely composed of weathered rock.

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

-
-
-
-
-

Surface Soil
Subsurface Soil
Sediment
Lagoon/Pond
Other _____

Project Site Name Exxon NAHC Warrminster

Project Site Number 4277

Source Number VS-3-1A-06

Source Location Area A Excavation 1A

Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
5'			
Sample Date & Time: 3/21/98			
Sampled by: D. Whalen			
Signature(s): <i>Donald Whalen</i>			
Sample Type <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
	Sample Data		
Analysis <input type="checkbox"/> TCL VOA's <input type="checkbox"/> TCL SVOA's <input type="checkbox"/> TCL PesuPCBs <input type="checkbox"/> TAL Metals <input type="checkbox"/> Cyanide <input checked="" type="checkbox"/> Antimony, Cadmium, Chromium <input checked="" type="checkbox"/> TCE	Preservative: <input type="checkbox"/> dark, 4°C <input type="checkbox"/> dark, 4°C <input type="checkbox"/> dark, 4°C <input type="checkbox"/> 4°C <input type="checkbox"/> 4°C <input type="checkbox"/> 4°C	Color: <u>dark brown</u> Description: <u>sandy silt damp</u>	
Sample Location Map			
Observations and Notes <input type="checkbox"/> Duplicate sample taken: <p>Side wall sample taken from dark brown ^{soil} layer about halfway down the wall. The soil appeared to be natural.</p>			

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former NAWC Warminster

Project Site Number 2883

Source Number MS-A-1A-02

Source Location Area A Excavation 1A

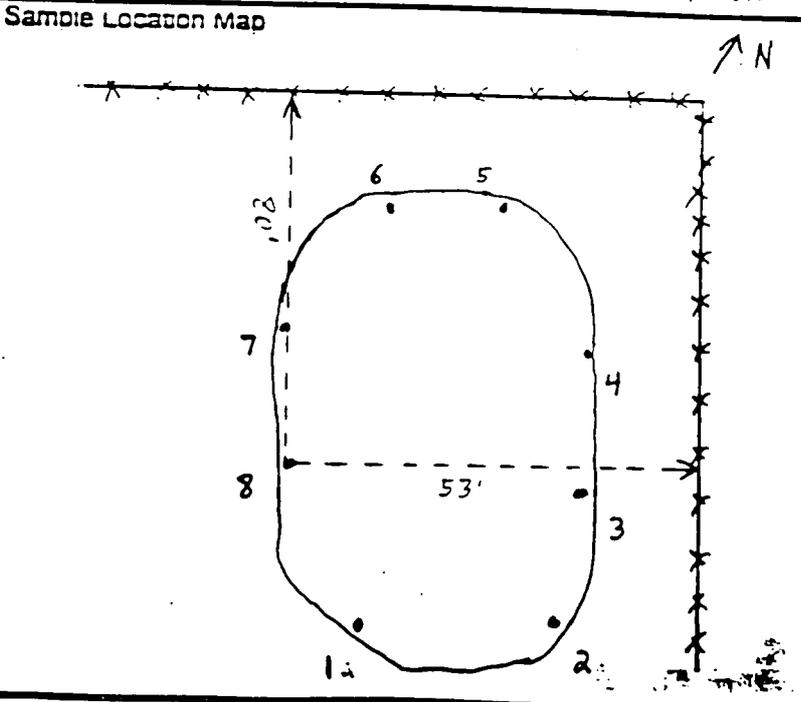
Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
12 to 17 ft (12 to 17 ft)			
Sample Date & Time:			
7/13/18			
Sampled by:			
P. Whalen			
Signature(s):			
<i>[Signature]</i>			

Sample Type

- Low Concentration
- High Concentration
- Grab
- Composite
- Grab - Composite

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	dark, 4°C
<input type="checkbox"/> TCL SVOA's	dark, 4°C
<input type="checkbox"/> TCL Res/PCBs	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> Antimony, Cadmium, Chromium	4°C
<input checked="" type="checkbox"/> TCE	4°C

Sample Data	
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
dark red	clay sludge material damp/moist



Observations and Notes

Duplicate sample taken:

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former NAWC Warmwater

Project Site Number 1773

Source Number VS-A-1B-01

Source Location Area A, Excavation 1B

Sample Method:	Composite Sample Data		
<u>bucket in bucket</u>	Sample	Time	Color and Description
Depth Sampled: <u>15'</u>			
Sample Date & Time: <u>9/2/98 1133</u>			
Sampled by: <u>D. Whaltn</u>			
Signature(s): <u>Donald Whaltn</u>			

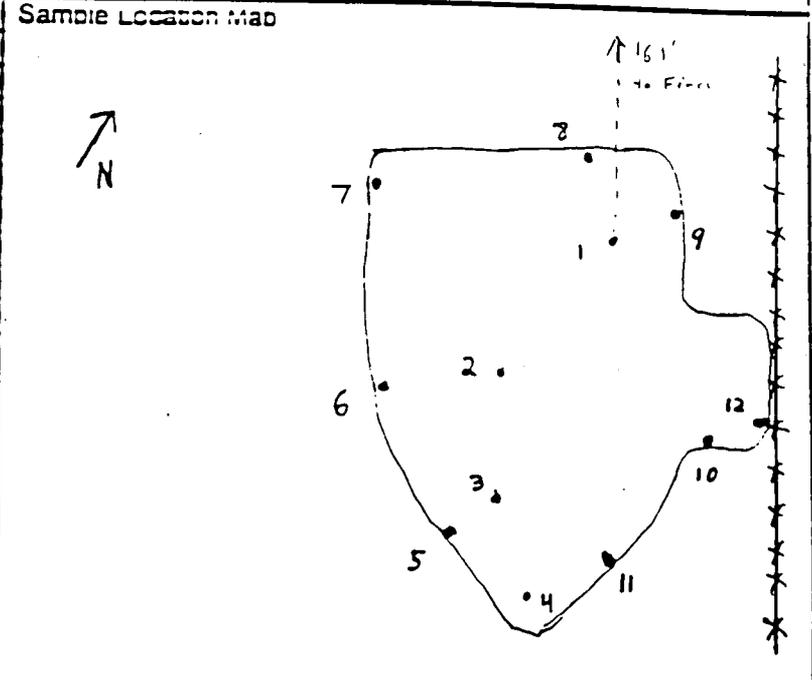
Sample Type

- Low Concentration
- High Concentration
- Grab
- Composite
- Grab - Composite

Sample Data

Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
<u>yellow tan</u>	<u>silty clay</u> <u>dark</u>

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	<u>dark, 4°C</u>
<input type="checkbox"/> TCL SVOA's	<u>dark, 4°C</u>
<input type="checkbox"/> TCL Res/PCBs	<u>dark, 4°C</u>
<input type="checkbox"/> TAL Metals	<u>4°C</u>
<input type="checkbox"/> Cyanide	<u>4°C</u>
<input checked="" type="checkbox"/> Antimony Cadmium	<u>4°C</u>
<u>Chromium</u>	
<input checked="" type="checkbox"/> TCE	<u>4°C</u>



Observations and Notes

Duplicate sample taken

Floor sample

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former NAWC Warehouse

Project Site Number 6783

Source Number VS-4-1B-02

Source Location Area A, Excavation 1B

Sample Method: Truck hop bucket 2.5' depth	Composite Sample Data		
Depth Sampled: 2.5'	Sample	Time	Color and Description
Sample Date & Time: 9/2/97 1140			
Sampled by: D. Whalen			
Signature(s): <i>Donald Whalen</i>			
Sample Type			
<input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
Analysis		Preservative:	
<input type="checkbox"/> TCL VOAs		dark, 4°C	
<input type="checkbox"/> TCL SVOAs		dark, 4°C	
<input type="checkbox"/> TCL Pests/PCBs		dark, 4°C	
<input type="checkbox"/> TAL Metals		4°C	
<input type="checkbox"/> Cyanide		4°C	
<input checked="" type="checkbox"/> Antimony Cadmium		4°C	
<input checked="" type="checkbox"/> Chromium		4°C	
<input checked="" type="checkbox"/> TCE		4°C	
Sample Data			
Color		Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
red/brown		dry clay damp	

Sample Location Map	
↑ N	↑ 173' 100' Edge

Observations and Notes

Duplicate sample taken:

Floor sample

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

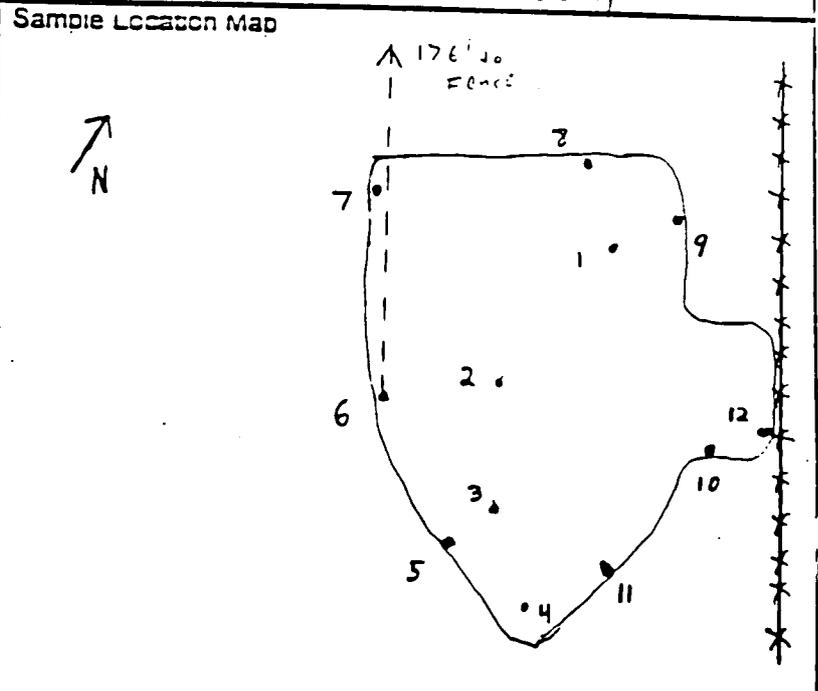
Project Site Name Former NAWC Warminster

Project Site Number 6783

Source Number VS-A-1B-C6

Source Location Area A, Excavation 1B

Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
<u>+ bucket bucket SS + soil</u>			
<u>6'-3"</u>			
Sample Date & Time:			
<u>9/2/00 1235</u>			
Sampled by:			
<u>D. Whalen</u>			
Signature(s):			
<u>David Whalen</u>			
Sample Type			
<input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
Analysis		Preservative:	
<input type="checkbox"/> TCL VOAs		<u>dark 4°C</u>	
<input type="checkbox"/> TCL SVOAs		<u>dark 4°C</u>	
<input type="checkbox"/> TCL PestPCBs		<u>dark 4°C</u>	
<input type="checkbox"/> TAL Metals		<u>4°C</u>	
<input type="checkbox"/> Cyanide		<u>4°C</u>	
<input checked="" type="checkbox"/> Arsenic Cadmium		<u>4°C</u>	
<u>Chromium</u>			
<input checked="" type="checkbox"/> TCE		<u>4°C</u>	
		<u>dark red-brown clayey silt damp</u>	
Sample Data			
Color		Description: (Sand, Clay, Dry, Moist, Wet, etc.)	



Observations and Notes

Duplicate sample taken:

Sidewall sample

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former NAWC Warehouse

Project Site Number 1-773

Source Number VS-A-1B-09

Source Location Area A, Excavation 1B

Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
<u>Truckbed bucket side wall</u>			
<u>~ 5'</u>			
Sample Date & Time:			
<u>9/21/00 1320</u>			
Sampled by:			
<u>D. Whalen</u>			
Signature(s):			
<u>Donald Whalen</u>			

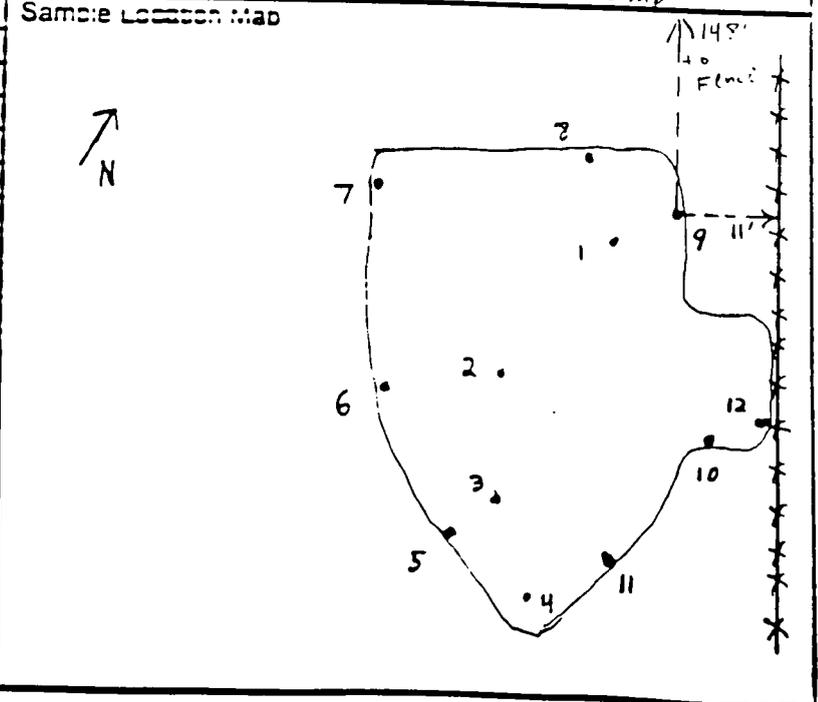
Sample Type

- Low Concentration
- High Concentration
- Grab
- Composite
- Grab - Composite

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	dark, 4°C
<input type="checkbox"/> TCL SVOA's	dark, 4°C
<input type="checkbox"/> TCL Pest/PCBs	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> Antimony Cadmium	4°C
<u>Chromium</u>	
<input checked="" type="checkbox"/> TCE	4°C

Sample Data

Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
<u>3.0 to 4.0</u>	<u>Silty clay damp</u>



Observations and Notes

Duplicate sample taken:

sidewall sample

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former NAWC Warminster

Project Site Number 1-973

Source Number VS-A-13-10

Source Location Area A, Excavation 1B

Sample Method:	Composite Sample Data		
16 oz jar on cooler on S.S. (hand)	Sample	Time	Color and Description
Depth Sampled: <u>~5'</u>			
Sample Date & Time: <u>9/3/97</u>			
Sampled by: <u>D. Whalen</u>			
Signature(s): <u>Donald Whalen</u>			
Sample Type <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
	Sample Data		
	Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
Analysis Preservative: <input type="checkbox"/> TCL VOAs dark 4°C <input type="checkbox"/> TCL SVOAs dark 4°C <input type="checkbox"/> TCL Pest/PCBs dark 4°C <input type="checkbox"/> TAL Metals 4°C <input type="checkbox"/> Cyanide 4°C <input checked="" type="checkbox"/> Antimony 4°C <input type="checkbox"/> Chromium <input checked="" type="checkbox"/> TCE 4°C	dark red	in side material damp	
Observations and Notes	Sample Location Map 		
<input type="checkbox"/> Duplicate sample taken: <u>side wall sample at base of shelved area on NE side of excavation</u>			

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former NAWC Warminster

Project Site Number 2773

Source Number NS-A-1B-11

Source Location Area A, Excavation 1B

Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
1602 ...			
6-7'			
Sample Date & Time: 9/2/98 0955			
Sampled by: D. Whalen			
Signature(s): <i>Donald Whalen</i>			

Sample Type

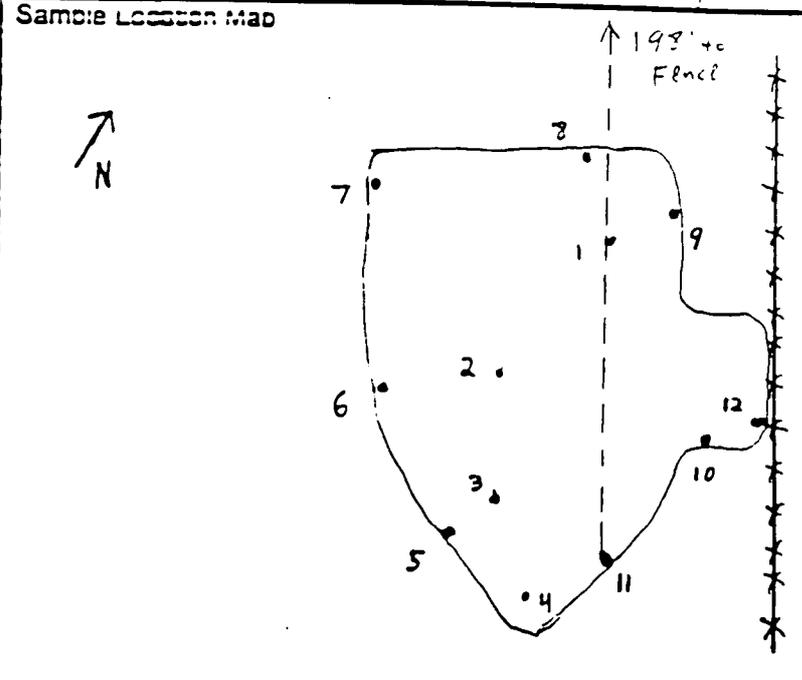
- Low Concentration
- High Concentration
- Grab
- Composite
- Grab - Composite

Analysis	Preservative:
<input type="checkbox"/> TCL VOAs	dark, 4°C
<input type="checkbox"/> TCL SVOAs	dark, 4°C
<input type="checkbox"/> TCL Psev/PCBs	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> Antimony Cadmium	4°C
Chromium	
<input checked="" type="checkbox"/> TCE	4°C

Sample Data

Color _____ Description: (Sand, Clay, Dry, Moist, Wet, etc.)

red brown ... clay damp



Observations and Notes

Duplicate sample taken:

*side wall sample
underneath exposed electrical
conduit near light post*

ATTACHMENT NO. 2



FAX

Date: 9/4/98

Number of pages including cover sheet: 9

Did You Know:

In 1997

ANALYTICAL STANDARDS, INC.

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Phone: (412) 820-8380

Fax: (412) 820-2080

Remarks

Urgent

For your review

Reply ASAP

Please comment

John R. Sh. Warmack Analytical Results
C8F03012B

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS, Inc PAGE 1
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/04/98
 Lot #: C8I030123 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
------------------	---------------	------------------------	--------------	--------------------------

Client Sample ID: VS-A-1B-01

Sample #: 001 Date Sampled: 09/02/98 11:33 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	226	1.7	mg/kg	SW846 6010B
Chromium	8070	8.5	mg/kg	SW846 6010B
Antimony	28.5	8.5	mg/kg	SW846 6010B

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS				Reviewed
Trichloroethene	2.6 J	8.2	ug/kg	SW846 8260B

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	59.1		%	MCANW 160.3 MOD

Client Sample ID: VS-A-1B-02

Sample #: 002 Date Sampled: 09/02/98 11:40 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	739	4.4	mg/kg	SW846 6010B
Chromium	2000	22.2	mg/kg	SW846 6010B
Antimony	68.5	22.2	mg/kg	SW846 6010B

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS				Reviewed
Trichloroethene	4.1 J	11	ug/kg	SW846 8260B

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I030123 Tetra Tech NUS, Inc PAGE 2
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/04/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	-----------------	-------	-------------------

Client Sample ID: VS-A-1B-02

Sample #: 002 Date Sampled: 09/02/98 11:40 Date Received: 09/03/98 Matrix: SOLID

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	45.0		†	MCAFW 160.3 MOD

Client Sample ID: VS-A-1B-03

Sample #: 003 Date Sampled: 09/02/98 11:50 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Review d
Cadmium	782	3.3	mg/kg	SW846 6010B
Chromium	1480	16.4	mg/kg	SW846 6010B
Antimony	49.6	16.4	mg/kg	SW846 6010B

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS				Reviewed
Trichloroethene	2.5 J	7.1	ug/kg	SW846 8260B

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	61.0		†	MCAFW 160.3 MOD

Client Sample ID: VS-A-1B-04

Sampl #: 004 Date Sampled: 09/02/98 12:00 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	91.3	0.25	mg/kg	SW846 6010B
Chromium	1690	1.2	mg/kg	SW846 6010B
Antimony	7.1	1.2	mg/kg	SW846 6010B

Results and reporting limits have been adjusted for dry weight.

(Continued on next page)

**QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY**

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I030123 **Tetra Tech NUS, Inc** **PAGE 3**
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252 **Date Reported: 9/04/98**

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
------------------	---------------	------------------------	--------------	--------------------------

Client Sample ID: VS-A-1B-04

Sample #: 004 Date Sampled: 09/02/98 12:00 Date Received: 09/03/98 Matrix: SOLID

Volatile Organics by GC/MS					
Trichloroethene	ND	5.3	ug/kg	SW846 8260B	Reviewed

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS					
Trichloroethene	ND	5.5	ug/kg	SW846 8260B	Reviewed

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					
Total Residue as Percent Solids	80.7		%	MCAW 160.3 MOD	Reviewed

Client Sample ID: VS-A-1B-24

Sample #: 005 Date Sampled: 09/02/98 12:20 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					
Cadmium	372	0.62	ug/kg	SW846 6010B	Reviewed
Chromium	6120	3.1	ug/kg	SW846 6010B	
Antimony	19.3	3.1	ug/kg	SW846 6010B	

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS					
Trichloroethene	4.0 J	7.5	ug/kg	SW846 8260B	Reviewed

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					
Total Residue as Percent Solids	64.5		%	MCAW 160.3 MOD	Reviewed

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I030123 **Tetra Tech NUS, Inc** PAGE 4
 NAWC WARMINSTER, PENNSYLVANIA **Date Reported: 9/04/98**
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: VS-A-1B-05					
Sample #: 006 Date Sampled: 09/02/98 12:25 Date Received: 09/03/98 Matrix: SOLID					
Trace Inductively Coupled Plasma (ICP) Metals Reviewed					
Cadmium	222	0.56	mg/kg	SW846 6010B	
Chromium	3490	2.8	mg/kg	SW846 6010B	
Antimony	11.6	2.8	mg/kg	SW846 6010B	

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS Reviewed					
Trichloroethene	ND	7.3	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis Reviewed					
Total Residue as Percent Solids	71.4		%	MCAFW 160.3 MOD	

Client Sample ID: VS-A-1B-06
 Sample #: 007 Date Sampled: 09/02/98 12:35 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed					
Cadmium	46.8	1.7	mg/kg	SW846 6010B	
Chromium	1860	1.7	mg/kg	SW846 6010B	
Antimony	8.8	8.3	mg/kg	SW846 6010B	

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS Reviewed					
Trichloroethene	ND	8.0	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS Reviewed					
Trichloroethene	ND	8.2	ug/kg	SW846 8260B	

(Continued on next page)

**QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY**

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech EUS, Inc PAGE 5
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/04/98
 Lot #: C8I030123 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: VS-A-1B-06

Sample #: 007 Date Sampled: 09/02/98 12:35 Date Received: 09/03/98 Matrix: SOLID

Volatile Organics by GC/MS Reviewed

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	60.1		%	MCANW 160.3 MOD

Client Sample ID: VS-A-1B-07

Sample #: 008 Date Sampled: 09/02/98 12:45 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	ND	1.2	mg/kg	SW846 6010B
Chromium	25.9	1.2	mg/kg	SW846 6010B
Antimony	0.70 B	1.2	mg/kg	SW846 6010B

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	84.5		%	MCANW 160.3 MOD

Client Sample ID: VS-A-1B-08

Sample #: 009 Date Sampled: 09/02/98 13:00 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	ND	1.1	mg/kg	SW846 6010B
Chromium	26.3	1.1	mg/kg	SW846 6010B
Antimony	0.76 B	1.1	mg/kg	SW846 6010B

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech MUS, Inc PAGE 7

Lot #: C8I030123 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/04/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-A-1A-02

Sample #: 012 Date Sampled: 09/02/98 14:00 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	131	1.8	mg/kg	SW846 6010B
Chromium	4980	9.2	mg/kg	SW846 6010B
Antimony	18.9	9.2	mg/kg	SW846 6010B

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	54.3		‡	MCAWW 160.3 MOD

Client Sample ID: VS-A-1A-03

Sample #: 013 Date Sampled: 09/02/98 14:10 Date Received: 09/03/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	857	1.4	mg/kg	SW846 6010B
Chromium	11300	7.1	mg/kg	SW846 6010B
Antimony	35.8	7.1	mg/kg	SW846 6010B

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	70.1		‡	MCAWW 160.3 MOD

Client Sample ID: EB-090298

Sample #: 014 Date Sampled: 09/02/98 15:10 Date Received: 09/03/98 Matrix: WATER

Trace Inductively Coupled Plasma (ICP) Metals				In Review
Cadmium	ND	2.0	ug/L	SW846 6010B
Chromium	ND	10.0	ug/L	SW846 6010B
Antimony	2.4 B	10.0	ug/L	SW846 6010B

B Estimated result. Result is less than RL.

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I030123 **Tetra Tech NUS, Inc** **DATE REPORTED:** 9/04/98 **PAGE** 8
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>	
Client Sample ID: RB-090298					
Sample #: 014 Date Sampled: 09/02/98 15:10 Date Received: 09/03/98 Matrix: WATER					

Volatile Organics by GC/MS					Reviewed
Trichloroethene	ND	5.0	ug/L	SW846 8260B	

Client Sample ID: 1TB-090298
 Sample #: 015 Date Sampled: 09/02/98 09:00 Date Received: 09/03/98 Matrix: WATER

Volatile Organics by GC/MS					Reviewed
Trichloroethene	ND	5.0	ug/L	SW846 8260B	

September 10, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern Division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N62472-d-1298
Contract Task Order (CTO) No. 252

Subject: Verification Sample Analysis Results for Removal Activities at Area A Site 1
Former Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter summarizes the results of the Tetra Tech NUS post-excavation sampling and analysis performed at the subject site. Twenty (plus quality control/quality assurance) verification samples were collected from the Area A Site 1 excavations on September 2 and 3, 1998. Samples were collected under the oversight of EPA personnel from both excavations 1a and 1b. Samples were collected from the excavation walls at 1a and from the floor and the walls at 1b. The sample locations and descriptions are summarized in Table 1 and described in the sample log sheets (Attachment 1). Sample locations were selected based on evidence of waste material and to ensure adequate characterization of a given area. All samples were analyzed for Antimony, Cadmium, Chromium and Trichloroethene (TCE) under 48-hour quick turn around analysis. The data has not undergone a full validation review. One sample from 1b (VS-A-1B-12) was analyzed under 7-day turn around for the full scan of Target Compound List (TCL) organics and Target Analyte List (TAL) metals. The full-scan results for the one sample from 1b are not yet completed for Pesticide/PCB. The raw analytical data are included with this letter as Attachment 2.

TABLE 1

VERIFICATION SAMPLES FOR AREA A SITE 1
FORMER NAVAL AIR WARFARE CENTER WARMINSTER, PENNSYLVANIA

SAMPLE NO.	LOCATION	DEPTH (ft)	COMMENTS
VS-A-1A-01	SE wall, Excav. 1a	4-6	Light brown silty sand
VS-A-1A-02	SE wall, Excav. 1a	6-8	Dark red clay sludge
VS-A-1A-03	NE wall, Excav. 1a	5-6	Dark red clay sludge
VS-A-1A-04	NE wall, Excav. 1a	2-3	Beige silt
VS-A-1A-05/25	NW wall, Excav. 1a	8-9	Orange-brown silty sand
VS-A-1A-06	NW wall, Excav. 1a	5	Dark brown sandy silt
VS-A-1A-07	SW wall, Excav. 1a	5-6	Dark red clay sludge
VS-A-1A-08	SW wall, Excav. 1a	6-7	Dark red clay sludge
VS-A-1B-01	Floor, Excav. 1b	10	Red, brown, tan silty clay
VS-A-1B-02	Floor, Excav. 1b	10	Red, brown, tan silty clay
VS-A-1B-03	Floor, Excav. 1b	10	Red, brown, tan silty clay
VS-A-1B-04/24	Floor, Excav. 1b	10	Red, brown, tan silty clay
VS-A-1B-05	SW wall, Excav. 1b	7	Reddish brown silty clay, possibly

SAMPLE NO.	LOCATION	DEPTH (ft)	COMMENTS
			sludge
VS-A-1B-06	SW wall, Excav. 1b	8-8	Reddish brown clayey silt, possibly sludge
VS-A-1B-07	SW wall, Excav. 1b	6-8	Grayish red clayey silt
VS-A-1B-08	NW wall, Excav. 1b	3	Tan silt
VS-A-1B-09	NE wall, Excav. 1b	5	Reddish brown silty clay
VS-A-1B-10	NE wall, shelf area, Excav. 1b	5	Dark red clay sludge
VS-A-1B-11	E wall, Excav. 1b	6-7	Reddish brown silty clay, possibly sludge
VS-A-1B-12	NE wall, shelf area, Excav. 1b	5	Black grit

The August 20, 1998 Verification Sampling and Analysis Plan proposed evaluating the data for attainment of clean-up goals by comparing the calculated upper 95% confidence limit concentration for each compound to the PRGs. It further proposed that if the UCL exceeded a PRG that the sample populations would be further evaluated by area to define the areas requiring further excavation.

The analytical results were statistically evaluated according to EPA Regional and Headquarters guidance and policies to determine the arithmetic mean, upper 95% confidence limit (UCL), and representative concentration (Reasonable Maximum Exposure Point Concentration). The statistical data are included with this letter as Attachment 3. The representative concentration is the lower of 95% UCL and the site maximum concentration. This concentration is the site concentration used to evaluate and calculate site risks. The sample results were also compared to the compound specific Preliminary Remediation Goals (PRGs) developed for the site. The PRGs were developed to provide a compound specific clean-up goal that would result in eliminating unacceptable risks to human health and the environment.

A review of the data indicates:

- No TCE results (UCL or maximum detected concentration) exceeded the PRGs.
- The UCL for the combined data set for 1a and 1b exceeds the PRGs for Antimony, Cadmium, and Chromium. However, the maximum concentrations for Antimony and Chromium are less than the PRGs for these compounds. The highest concentration of Antimony found was 68.5 mg/kg. The PRG for Antimony is 113 mg/kg. The highest Chromium result found was 11,300 mg/kg. The PRG for Chromium is 16,161 mg/kg.
- The UCL and maximum detected concentration for Antimony in 1a is less than the PRG.
- The UCL for Chromium for 1a exceeds the PRG but the maximum detected concentration (11,300 mg/kg) is below the PRG of 16,161 mg/kg.
- The UCL and the site maximum concentration for Cadmium exceed the PRG at 1a. Samples VS-A-1A-02, -03, -07, and -08 contained Cadmium concentrations greater than the PRG. Sample logs indicate that the material sampled in all four locations was a "dark red clay sludge". This same material is evident in the excavation wall at a depth below sample VS-A-1A-04. This sample was collected from soils at 2 to 3 feet below the

surface and the "dark red clay sludge" material was evident at about 6 feet below the surface. These samples also contained the highest concentrations of Chromium identified.

- The UCL for Antimony for 1b exceeds the PRG but the maximum detected concentration (68.5 mg/kg) is below the PRG of 113 mg/kg.
- The UCL and the maximum concentration detected for Chromium in 1b are below the PRG.
- The UCL and maximum detected concentration for Cadmium in 1b exceed the PRG. Samples from the floor and walls of the excavation exceed the PRG.
- All four floor samples contained Cadmium concentrations in excess of the PRG. The highest Antimony concentrations were also identified in these samples.
- The UCL and maximum detected concentration for Antimony in wall samples from 1b are below the PRG.
- The UCL and maximum detected concentration for Cadmium in wall samples for 1b exceed the PRG. Samples VS-A-1B-05 and -11 contained Cadmium concentrations in excess of the PRG.
- The analytical results for VOCs, SVOCs, and metals of the "black grit" material encountered in 1b (sample VS-A-1b-12) indicated no concentrations above the corresponding Federal recreational Risk Based Concentrations (RBCs). The results for Pesticides/PCBs have not yet been received. Lead was detected at 1460 mg/kg. This concentration exceeds the Pennsylvania Department of Environmental Protection (PADEP) non-residential Medium Specific Concentration (MSC) for surface soil (1000 mg/kg), but not that for subsurface soil (190,000 mg/kg). The sample was collected at a depth of approximately 5 feet. PADEP defines "surface soil" as the top 2 feet of soil.

Recommendations

Due to the number of samples collected and the fact that biased sampling was performed it may not be appropriate to rely on the UCL to determine attainment. It is recommended that individual sample results be compared to PRGs and that additional excavation be performed in all areas where data indicates that PRGs are exceeded. This approach will ensure that the calculated risk for remaining soils after the completed excavation will not present an unacceptable risk.

Based on this evaluation and the above recommendation, it is further recommended that the Navy expand the excavation for both 1a and 1b. Each area is presented in more detail below.

- **Excavation 1a** – It is recommended that the excavation be expanded to remove the dark red clay sludge material present at sample locations VS-A-1A-02, -03, -07, and -08 and below sample location VS-A-1A-04. Figure 1 (Attachment 4) shows the location of these sample points. It is recommended that the area be resampled after completion of the excavation and that the samples be analyzed for Cadmium and Chromium.
- **Excavation 1b** – It is recommended that the floor of the excavation be further excavated to bedrock or groundwater which ever is encountered first. It is further recommended that the excavation walls in the area around and between sample locations VS-A-1B-05 and -11 be further excavated. This area should be reviewed for the visual evidence of the presence of waste and the excavation continued until the evident material has been

removed. It is also recommended that the excavation be extended in the area of sample location VS-A-1b-12 in order to remove the "black grit" material. This course of action is deemed prudent based on the material's high lead content and relatively snailow occurrence, even though no cleanup criterion was exceeded. Figure 2 (Attachment 5) shows the areas recommended for further excavation.

If the floor is excavated to bedrock or groundwater no sampling should be required. If this is not achieved, sampling should be performed and samples should be analyzed for Cadmium and Antimony. Excavation walls in the area of samples VS-A-1B-05 and -11 should be resampled after excavation and analyzed for Cadmium only. The excavation wall in the vicinity of sample VS-A-1B-12 should be resampled after excavation and analyzed for Lead.

Results from the Pesticide/PCB analysis of the "black grit" material encountered in 1b (sample VS-A-1B-12) will be forwarded with recommendations as soon as they are received.

If you have any questions or wish to discuss these data or the findings, please contact me.

Respectfully,

Garth Glenn
Project Manager



FAX

COPY

Date:

9/8/98

Number of pages including cover sheet:

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Remarks Urgent For your review Reply ASAP Please comment

C8I040138

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QUANTERRA INCORPORATED PRELIMINARY DATA SUMMARY

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Lot #: CSI040138

Tetra Tech **EUS, Inc**
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

PAGE 1
 Date Reported: 9/08/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-A-1B-10
 Sample #: 001 Date Sampled: 09/03/98 09:40 Date Received: 09/04/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				
Cadmium	17.8	0.57	mg/kg	SW846 6010B
Chromium	3520	2.9	mg/kg	SW846 6010B
Antimony	16.0	2.9	mg/kg	SW846 6010B

In Review

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS				
Trichloroethene	ND	8.9	ug/kg	SW846 8260B

Reviewed

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				
Total Residue as Percent Solids	69.7		%	MCAW 160.3 MOD

Reviewed

Client Sample ID: VS-A-1B-11
 Sample #: 002 Date Sampled: 09/03/98 09:55 Date Received: 09/04/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				
Cadmium	79.3	1.3	mg/kg	SW846 6010B
Chromium	2030	1.3	mg/kg	SW846 6010B
Antimony	8.6	6.4	mg/kg	SW846 6010B

In Review

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS				
Trichloroethene	ND	6.7	ug/kg	SW846 8260B

Reviewed

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				
Total Residue as Percent Solids	78.0		%	MCAW 160.3 MOD

Reviewed

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I040138 Tetra Tech NUS, Inc PAGE 2
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/08/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: VS-A-1B-12					
Sample #: 003 Date Sampled: 09/03/98 10:15 Date Received: 09/04/98 Matrix: SOLID					
Trace Inductively Coupled Plasma (ICP) Metals					
Silver	3.1	1.0	mg/kg	SW846 6010B	In Review
Arsenic	0.53 B	1.0	mg/kg	SW846 6010B	
Cadmium	ND	25.1	mg/kg	SW846 6010B	
Chromium	89.9	1.0	mg/kg	SW846 6010B	
Lead	1460	1.5	mg/kg	SW846 6010B	
Antimony	4.5 B	5.0	mg/kg	SW846 6010B	
Selenium	7.3	2.5	mg/kg	SW846 6010B	
Thallium	45.8	5.0	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					
Aluminum		20.1	mg/kg	SW846 6010B	In Review
Barium		20.1	mg/kg	SW846 6010B	
Beryllium		0.50	mg/kg	SW846 6010B	
Calcium		501	mg/kg	SW846 6010B	
Cobalt		5.0	mg/kg	SW846 6010B	
Copper		2.5	mg/kg	SW846 6010B	
Iron	217000	50.1	mg/kg	SW846 6010B	
Potassium		501	mg/kg	SW846 6010B	
Magnesium		501	mg/kg	SW846 6010B	
Manganese	4620	7.5	mg/kg	SW846 6010B	
Sodium		501	mg/kg	SW846 6010B	
Nickel		4.0	mg/kg	SW846 6010B	
Vanadium		5.0	mg/kg	SW846 6010B	
Zinc		2.0	mg/kg	SW846 6010B	
Mercury in Solid Waste (Manual Cold-Vapor)					
Mercury		IN PROCESS 0.10	mg/kg	SW846 7471A	In Review

Results and reporting limits have been adjusted for dry weight.
 B Estimation result. Result is less than DL.

Organochlorine Pesticides In Review
IN PROGRESS

(Continued on next page)

QUANTERRA INCORPORATED PRELIMINARY DATA SUMMARY

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Lot #: C8I040138
 Tetra Tech NUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252
 Date Reported: 9/08/98
 PAGE 3

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-A-1B-12
 Sample #: 003 Date Sampled: 09/03/98 10:15 Date Received: 09/04/98 Matrix: SOLID

PCBs

IN PROGRESS

In Review

Volatile Organics by GC/MS

Acetone	ND	20	ug/kg	SW846 8260B	Reviewed
Benzene	ND	5.0	ug/kg	SW846 8260B	
Bromodichloromethane	ND	5.0	ug/kg	SW846 8260B	
Bromoform	ND	5.0	ug/kg	SW846 8260B	
Bromomethane	ND	9.9	ug/kg	SW846 8260B	
2-Butanone	ND	20	ug/kg	SW846 8260B	
Carbon disulfide	ND	5.0	ug/kg	SW846 8260B	
Carbon tetrachloride	ND	5.0	ug/kg	SW846 8260B	
Chlorobenzene	ND	5.0	ug/kg	SW846 8260B	
Dibromochloromethane	ND	5.0	ug/kg	SW846 8260B	
Chloroethane	ND	9.9	ug/kg	SW846 8260B	
Chloroform	ND	5.0	ug/kg	SW846 8260B	
Chloromethane	ND	9.9	ug/kg	SW846 8260B	
1,1-Dichloroethane	ND	5.0	ug/kg	SW846 8260B	
1,2-Dichloroethane	ND	5.0	ug/kg	SW846 8260B	
1,1-Dichloroethene	ND	5.0	ug/kg	SW846 8260B	
1,2-Dichloroethene	ND	5.0	ug/kg	SW846 8260B	
(total)		5.0	ug/kg	SW846 8260B	
1,2-Dichloropropane	ND	5.0	ug/kg	SW846 8260B	
cis-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B	
trans-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B	
Ethylbenzene	ND	5.0	ug/kg	SW846 8260B	
2-Hexanone	ND	20	ug/kg	SW846 8260B	
Methylene chloride	ND	5.0	ug/kg	SW846 8260B	
4-Methyl-2-pentanone	ND	20	ug/kg	SW846 8260B	
Styrene	ND	5.0	ug/kg	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	SW846 8260B	
Tetrachloroethene	ND	5.0	ug/kg	SW846 8260B	
Toluene	ND	5.0	ug/kg	SW846 8260B	
1,1,1-Trichloroethane	ND	5.0	ug/kg	SW846 8260B	
1,1,2-Trichloroethane	ND	5.0	ug/kg	SW846 8260B	
Trichloroethene	ND	5.0	ug/kg	SW846 8260B	

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I040138 Tetra Tech NUS, Inc PAGE 4
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/08/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-A-1B-12
 Sample #: 003 Date Sampled: 09/03/98 10:15 Date Received: 09/04/98 Matrix: SOLID

Volatile Organics by GC/MS

Vinyl chloride	ND	9.9	ug/kg	SW846 8260B	Reviewed
Xylenes (total)	ND	5.0	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

Semivolatile Organic Compounds by GC/MS

Acenaphthene	ND	330	ug/kg	SW846 8270C	Reviewed
Acenaphthylene	ND	330	ug/kg	SW846 8270C	
Anthracene	ND	330	ug/kg	SW846 8270C	
Benzo(a)anthracene	ND	330	ug/kg	SW846 8270C	
Benzo(b)fluoranthene	ND	330	ug/kg	SW846 8270C	
Benzo(k)fluoranthene	ND	330	ug/kg	SW846 8270C	
Benzo(ghi)perylene	ND	330	ug/kg	SW846 8270C	
Benzo(a)pyrene	ND	330	ug/kg	SW846 8270C	
bis(2-Chloroethoxy) methane	ND	330	ug/kg	SW846 8270C	
bis(2-Chloroethyl) ether	ND	330	ug/kg	SW846 8270C	
2,2'-oxybis(1-Chloropropane)	ND	330	ug/kg	SW846 8270C	
bis(2-Ethylhexyl) phthalate	74 J,B	330	ug/kg	SW846 8270C	
4-Bromophenyl phenyl ether	ND	330	ug/kg	SW846 8270C	
Butyl benzyl phthalate	ND	330	ug/kg	SW846 8270C	
4-Chloroaniline	ND	330	ug/kg	SW846 8270C	
4-Chloro-3-methylphenol	ND	330	ug/kg	SW846 8270C	
2-Chloronaphthalene	ND	330	ug/kg	SW846 8270C	
2-Chlorophenol	ND	330	ug/kg	SW846 8270C	
4-Chlorophenyl phenyl ether	ND	330	ug/kg	SW846 8270C	
Chrysene	ND	330	ug/kg	SW846 8270C	
Dibenzofuran	ND	330	ug/kg	SW846 8270C	
Di-n-butyl phthalate	81 J	330	ug/kg	SW846 8270C	
1,2-Dichlorobenzene	ND	330	ug/kg	SW846 8270C	
1,3-Dichlorobenzene	ND	330	ug/kg	SW846 8270C	
1,4-Dichlorobenzene	ND	330	ug/kg	SW846 8270C	
3,3'-Dichlorobenzidine	ND	1600	ug/kg	SW846 8270C	

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I040138

Tetra Tech NUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

PAGE 5
 Date Reported: 9/08/98

PARAMETER	RESULT	LIMIT	UNITS	REPORTING METHOD	ANALYTICAL METHOD
Client Sample ID: VS-A-1B-12					
Sample #: 003 Date Sampled: 09/03/98 10:15 Date Received: 09/04/98 Matrix: SOLID					
Semivolatile Organic Compounds by GC/MS					
2,4-Dichlorophenol	ND	330	ug/kg	SW846	8270C
Diethyl phthalate	ND	330	ug/kg	SW846	8270C
2,4-Dimethylphenol	ND	330	ug/kg	SW846	8270C
Dimethyl phthalate	ND	330	ug/kg	SW846	8270C
Di-n-octyl phthalate	ND	330	ug/kg	SW846	8270C
2,4-Dinitrophenol	ND	1600	ug/kg	SW846	8270C
2,4-Dinitrotoluene	ND	330	ug/kg	SW846	8270C
2,6-Dinitrotoluene	ND	330	ug/kg	SW846	8270C
Fluoranthene	ND	330	ug/kg	SW846	8270C
Fluorene	ND	330	ug/kg	SW846	8270C
Hexachlorobenzene	ND	330	ug/kg	SW846	8270C
Hexachlorobutadiene	ND	330	ug/kg	SW846	8270C
Hexachlorocyclopentadiene	ND	1600	ug/kg	SW846	8270C
Hexachloroethane	ND	330	ug/kg	SW846	8270C
Indeno(1,2,3-cd)pyrene	ND	330	ug/kg	SW846	8270C
Isophorone	ND	330	ug/kg	SW846	8270C
2-Methylnaphthalene	ND	330	ug/kg	SW846	8270C
2-Methylphenol	ND	330	ug/kg	SW846	8270C
Naphthalene	ND	330	ug/kg	SW846	8270C
2-Nitroaniline	ND	1600	ug/kg	SW846	8270C
3-Nitroaniline	ND	1600	ug/kg	SW846	8270C
4-Nitroaniline	ND	1600	ug/kg	SW846	8270C
Nitrobenzene	ND	330	ug/kg	SW846	8270C
2-Nitrophenol	ND	330	ug/kg	SW846	8270C
4-Nitrophenol	ND	1600	ug/kg	SW846	8270C
N-Nitrosodi-n-propylamine	ND	330	ug/kg	SW846	8270C
N-Nitrosodiphenylamine	ND	330	ug/kg	SW846	8270C
Pentachlorophenol	ND	1600	ug/kg	SW846	8270C
Phenanthrene	ND	330	ug/kg	SW846	8270C
Phenol	ND	330	ug/kg	SW846	8270C
Pyrene	ND	330	ug/kg	SW846	8270C
1,2,4-Trichlorobenzene	ND	330	ug/kg	SW846	8270C
2,4,5-Trichlorophenol	ND	330	ug/kg	SW846	8270C
2,4,6-Trichlorophenol	ND	330	ug/kg	SW846	8270C
3-Methylphenol & 4-Methylphenol	ND	330	ug/kg	SW846	8270C
2-Methyl-4,6-dinitro- phenol	ND	1600	ug/kg	SW846	8270C

Reviewed

(Continued on next page)

QUANTERRA INCORPORATED PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I040138 Tetra Tech NUS, Inc PAGE 6
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/08/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-A-1B-12

Sample #: 003 Date Sampled: 09/03/98 10:15 Date Received: 09/04/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Dibenz (a,h)anthracene	ND	330	ug/kg	SW846 8270C	Reviewed
Carbazole	ND	330	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

1 Estimated result. Result is less than RL.

2 Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Inorganic Analysis

Total Residue as Percent Solids	99.7	%	MCAWW 160.3	Reviewed MOD
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Client Sample ID: VS-A-1A-04

Sample #: 004 Date Sampled: 09/03/98 10:45 Date Received: 09/04/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	11.2	0.21	mg/kg	SW846 6010B	Review
Chromium	266	1.0	mg/kg	SW846 6010B	
Antimony	1.4	1.0	mg/kg	SW846 6010B	

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS

Trichloroethene	ND	6.6	ug/kg	SW846 8260B	Reviewed
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Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis

Total Residue as Percent Solids	96.6	%	MCAWW 160.3	Reviewed MOD
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(Continued on next page)

QUANTERRA INCORPORATED PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I040138

Tetra Tech NUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

PAGE 7
 Date Reported: 9/08/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: VS-A-1A-05
 Sample #: 005 Date Sampled: 09/03/98 11:20 Date Received: 09/04/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	0.17 B	0.25	mg/kg	SW846 6010B	In Review <i>[Signature]</i>
Chromium	20.0	1.2	mg/kg	SW846 6010B	
Antimony	ND	1.2	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.
 Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis

Total Residue as Percent Solids	80.2			MCANW 160.3 MOD	Reviewed
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Client Sample ID: VS-A-1A-25

Sample #: 006 Date Sampled: 09/03/98 11:40 Date Received: 09/04/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	0.13 B	0.25	mg/kg	SW846 6010B	In Review <i>[Signature]</i>
Chromium	22.0	1.3	mg/kg	SW846 6010B	
Antimony	0.18 B	1.3	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.
 Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis

Total Residue as Percent Solids	79.6			MCANW 160.3 MOD	Reviewed
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Client Sample ID: VS-A-1A-06

Sample #: 007 Date Sampled: 09/03/98 12:00 Date Received: 09/04/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	0.39	0.23	mg/kg	SW846 6010B	In Review <i>[Signature]</i>
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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I040138 Tetra Tech MOS, Inc PAGE 9
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/08/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-A-1A-08
Sample #: 009 Date Sampled: 09/03/98 14:15 Date Received: 09/04/98 Matrix: SOLID

Inorganic Analysis				
Total Residue as Percent Solids	66.3		%	Reviewed MCAWW 160.3 MOD

Client Sample ID: 1TB-090398
Sample #: 010 Date Sampled: 09/03/98 09:05 Date Received: 09/04/98 Matrix: WATER

Volatile Organics by GC/MS				Reviewed
Acetone	5.7 J	20	ug/L	SW846 8260B
Benzene	ND	5.0	ug/L	SW846 8260B
Bromodichloromethane	ND	5.0	ug/L	SW846 8260B
Bromoform	ND	5.0	ug/L	SW846 8260B
Bromomethane	ND	10	ug/L	SW846 8260B
2-Butanone	2.6 J	20	ug/L	SW846 8260B
Carbon disulfide	ND	5.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/L	SW846 8260B
Chlorobenzene	ND	5.0	ug/L	SW846 8260B
Dibromochloromethane	ND	5.0	ug/L	SW846 8260B
Chloroethane	ND	10	ug/L	SW846 8260B
Chloroform	ND	5.0	ug/L	SW846 8260B
Chloromethane	ND	10	ug/L	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	5.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	5.0	ug/L	SW846 8260B
1,2-Dichloroethene	ND	5.0	ug/L	SW846 8260B
(total)				
1,2-Dichloropropane	ND	5.0	ug/L	SW846 8260B
cis-1,3-Dichloropropane	ND	5.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B
Ethylbenzene	ND	5.0	ug/L	SW846 8260B
2-Hexanone	ND	20	ug/L	SW846 8260B
Methylene chloride	ND	5.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/L	SW846 8260B
Styrene	ND	5.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L	SW846 8260B
Tetrachloroethane	ND	5.0	ug/L	SW846 8260B

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I040138 Tetra Tech EUS, Inc PAGE 10
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/08/98
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: 1TB-090398

Sample #: 010 Date Sampled: 09/03/98 09:05 Date Received: 09/04/98 Matrix: WATER

Volatile Organics by GC/MS

Reviewed

Toluene	ND	5.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/L	SW846 8260B
Trichloroethene	ND	5.0	ug/L	SW846 8260B
Vinyl chloride	ND	10	ug/L	SW846 8260B
Xylenes (total)	ND	5.0	ug/L	SW846 8260B

J Estimated result. Result is less than RL.

Client Sample ID: FB-090398

Sample #: 011 Date Sampled: 09/03/98 15:30 Date Received: 09/04/98 Matrix: WATER

Trace Inductively Coupled Plasma (ICP) Metals

In Review

Silver	ND	5.0	ug/L	SW846 6010B
Arsenic	ND	10.0	ug/L	SW846 6010B
Cadmium	ND	2.0	ug/L	SW846 6010B
Chromium	1.0 B	10.0	ug/L	SW846 6010B
Lead	1.7 B	3.0	ug/L	SW846 6010B
Antimony	ND	10.0	ug/L	SW846 6010B
Selenium	ND	5.0	ug/L	SW846 6010B
Thallium	4.9 B	10.0	ug/L	SW846 6010B

Inductively Coupled Plasma (ICP) Metals

In Review

Aluminum		200	ug/L	SW846 6010B
Barium		200	ug/L	SW846 6010B
Beryllium		5.0	ug/L	SW846 6010B
Boron		200	ug/L	SW846 6010B
Calcium		5000	ug/L	SW846 6010B
Cobalt		50.0	ug/L	SW846 6010B
Copper		25.0	ug/L	SW846 6010B
Iron	ND	100	ug/L	SW846 6010B
Potassium		5000	ug/L	SW846 6010B
Magnesium		5000	ug/L	SW846 6010B
Manganese	ND	15.0	ug/L	SW846 6010B

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I040138 Tetra Tech NUS, Inc PAGE 12
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/08/98
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: FB-090398

Sample #: 011 Date Sampled: 09/03/98 15:30 Date Received: 09/04/98 Matrix: WATER

Volatile Organics by GC/MS

Reviewed

1,1,2,2-Tetrachloroethane	ND	5.0	ug/L	SW846 8260B
T trachloroethene	ND	5.0	ug/L	SW846 8260B
Toluene	ND	5.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/L	SW846 8260B
Trichloroethene	ND	5.0	ug/L	SW846 8260B
Vinyl chloride	ND	10	ug/L	SW846 8260B
Xylenes (total)	ND	5.0	ug/L	SW846 8260B

† Estimated result. Result is less than RL.

Client Sample ID: FB-090398

Sample #: 012 Date Sampled: 09/03/98 15:15 Date Received: 09/04/98 Matrix: WATER

~~Trace Inductively Coupled Plasma (ICP) Metals~~

~~In Review~~

Silver	ND	5.0	ug/L	SW846 6010B
Arsenic	ND	10.0	ug/L	SW846 6010B
Cadmium	ND	2.0	ug/L	SW846 6010B
Chromium	0.60 B	10.0	ug/L	SW846 6010B
Lead	1.3 B	3.0	ug/L	SW846 6010B
Antimony	ND	10.0	ug/L	SW846 6010B
Selenium	2.3 B	5.0	ug/L	SW846 6010B
Thallium	ND	10.0	ug/L	SW846 6010B

~~Inductively Coupled Plasma (ICP) Metals~~

~~In Review~~

Aluminum	200	ug/L	SW846 6010B
Barium	200	ug/L	SW846 6010B
Beryllium	5.0	ug/L	SW846 6010B
Boron	200	ug/L	SW846 6010B
Calcium	5000	ug/L	SW846 6010B
Cobalt	50.0	ug/L	SW846 6010B
Copper	25.0	ug/L	SW846 6010B
Iron	ND	100	ug/L

(Continued on next page)

QUANTERRA INCORPORATED PRELIMINARY DATA SUMMARY

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Lot #: C8I040138

Tetra Tech NUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

PAGE 13
 Date Reported: 9/08/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Client Sample ID: RB-090398				
Sample #: 012 Date Sampled: 09/03/98 15:15 Date Received: 09/04/98 Matrix: WATER				
Potassium		5000	ug/L	SW846 6010B
Magnesium		5000	ug/L	SW846 6010B
Manganese	ND	15.0	ug/L	SW846 6010B
Sodium		5000	ug/L	SW846 6010B
Nickel		40.0	ug/L	SW846 6010B
Vanadium		50.0	ug/L	SW846 6010B
Zinc		20.0	ug/L	SW846 6010B

Mercury in Liquid Waste (Manual Cold-Vapor)
 Mercury **IN PROCESS** 0.20 ug/L SW846 7470A In Review

B Estimated result. Result is less than RL.

Volatile Organics by GC/MS

Acetone	5.5 J	20	ug/L	SW846 8260B	Reviewed
Benzene	ND	5.0	ug/L	SW846 8260B	
Bromodichloromethane	ND	5.0	ug/L	SW846 8260B	
Bromoform	ND	5.0	ug/L	SW846 8260B	
Bromomethane	ND	10	ug/L	SW846 8260B	
2-Butanone	ND	20	ug/L	SW846 8260B	
Carbon disulfide	ND	5.0	ug/L	SW846 8260B	
Carbon tetrachloride	ND	5.0	ug/L	SW846 8260B	
Chlorobenzene	ND	5.0	ug/L	SW846 8260B	
Dibromochloromethane	ND	5.0	ug/L	SW846 8260B	
Chloroethane	ND	10	ug/L	SW846 8260B	
Chloroform	ND	5.0	ug/L	SW846 8260B	
Chloromethane	ND	10	ug/L	SW846 8260B	
1,1-Dichloroethane	ND	5.0	ug/L	SW846 8260B	
1,2-Dichloroethane	ND	5.0	ug/L	SW846 8260B	
1,1-Dichloroethene	ND	5.0	ug/L	SW846 8260B	
1,2-Dichloroethene	ND	5.0	ug/L	SW846 8260B	
(total)		5.0	ug/L	SW846 8260B	
1,2-Dichloropropane	ND	5.0	ug/L	SW846 8260B	
cis-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B	
trans-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B	
Ethylbenzene	ND	5.0	ug/L	SW846 8260B	
2-Hexanone	ND	20	ug/L	SW846 8260B	

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8I040138 Tetra Tech NUS, Inc PAGE 14
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 9/08/98
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: EB-090398

Sample #: 012 Date Sampled: 09/03/98 15:15 Date Received: 09/04/98 Matrix: WATER

Volatile Organics by GC/MS

Methylene chloride	ND	5.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/L	SW846 8260B
Styrene	ND	5.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L	SW846 8260B
Tetrachloroethene	ND	5.0	ug/L	SW846 8260B
Toluene	ND	5.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/L	SW846 8260B
Trichloroethene	ND	5.0	ug/L	SW846 8260B
Vinyl chloride	ND	10	ug/L	SW846 8260B
Xylenes (total)	ND	5.0	ug/L	SW846 8260B

Reviewed

J Estimated result. Result is less than RL.



FAX

Date: 9/9/97

Number of pages including cover sheet: 3

Did You Know:

In 1997

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ENVIRONMENTAL LABORATORY PROGRAM

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Remarks Urgent For your review Reply ASAP Please comment

C81040:38 - Sample VS-A-1B (TAL Metals)

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TETRA TECH NUS, INC.

Client Sample ID: VS-A-1B-12

TOTAL Metals

Lot-Sample #....: C8I040138-003
 Date Sampled....: 09/03/98
 % Moisture.....: 0.29

Date Received...: 09/04/98

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8251146						
Silver	3.1	1.0	mg/kg	SW846 6010B	09/08/98	CL8GD10C
		Dilution Factor: 1		MS Run #.....: 8251036		
Aluminum	30500	20.1	mg/kg	SW846 6010B	09/08/98	CL8GD10F
		Dilution Factor: 1		MS Run #.....: 8251036		
Arsenic	0.53 B	1.0	mg/kg	SW846 6010B	09/08/98	CL8GD107
		Dilution Factor: 1		MS Run #.....: 8251036		
Barium	945	20.1	mg/kg	SW846 6010B	09/08/98	CL8GD10G
		Dilution Factor: 1		MS Run #.....: 8251036		
Beryllium	194	1.0	mg/kg	SW846 6010B	09/08/98	CL8GD10H
		Dilution Factor: 2		MS Run #.....: 8251036		
Calcium	68400	1000	mg/kg	SW846 6010B	09/08/98	CL8GD10J
		Dilution Factor: 2		MS Run #.....: 8251036		
Cadmium	ND	25.1	mg/kg	SW846 6010B	09/08/98	CL8GD10B
		Dilution Factor: 50		MS Run #.....: 8251036		
Cobalt	161	10.0	mg/kg	SW846 6010B	09/08/98	CL8GD10K
		Dilution Factor: 2		MS Run #.....: 8251036		
Chromium	89.9	1.0	mg/kg	SW846 6010B	09/08/98	CL8GD10E
		Dilution Factor: 1		MS Run #.....: 8251036		
Copper	9220	25.1	mg/kg	SW846 6010B	09/08/98	CL8GD10L
		Dilution Factor: 10		MS Run #.....: 8251036		
Iron	217000	50.1	mg/kg	SW846 6010B	09/08/98	CL8GD10M
		Dilution Factor: 5		MS Run #.....: 8251036		
Potassium	1860	501	mg/kg	SW846 6010B	09/08/98	CL8GD10R
		Dilution Factor: 1		MS Run #.....: 8251036		
Magnesium	7690	501	mg/kg	SW846 6010B	09/08/98	CL8GD10N
		Dilution Factor: 1		MS Run #.....: 8251036		
Manganese	4620	7.5	mg/kg	SW846 6010B	09/08/98	CL8GD10P
		Dilution Factor: 5		MS Run #.....: 8251036		

(Continued on next page)

TETRA TECH NUS, INC.

Client Sample ID: VS-A-1B-12

TOTAL Metals

Lot-Sample #....: C8I040138-003

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION-ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Sodium	7950	501	mg/kg	SW846 6010B	09/08/98	CL8GD10T
		Dilution Factor: 1		MS Run #.....: 8251036		
Nickel	363	4.0	mg/kg	SW846 6010B	09/08/98	CL8GD10Q
		Dilution Factor: 1		MS Run #.....: 8251036		
Lead	1460	1.5	mg/kg	SW846 6010B	09/08/98	CL8GD109
		Dilution Factor: 5		MS Run #.....: 8251036		
Antimony	4.5 B	5.0	mg/kg	SW846 6010B	09/08/98	CL8GD106
		Dilution Factor: 5		MS Run #.....: 8251036		
Selenium	7.3	2.5	mg/kg	SW846 6010B	09/08/98	CL8GD10A
		Dilution Factor: 5		MS Run #.....: 8251036		
Thallium	4.6 B	5.0	mg/kg	SW846 6010B	09/08/98	CL8GD10D
		Dilution Factor: 5		MS Run #.....: 8251036		
Vanadium	30.2	10.0	mg/kg	SW846 6010B	09/08/98	CL8GD10U
		Dilution Factor: 2		MS Run #.....: 8251036		
Zinc	56600	20.1	mg/kg	SW846 6010B	09/08/98	CL8GD10V
		Dilution Factor: 10		MS Run #.....: 8251036		
Prep Batch #....: 8252119						
Mercury	ND	0.10	mg/kg	SW846 7471A	09/09/98	CL8GD10W
		Dilution Factor: 1		MS Run #.....: 8252010		

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

ATTACHMENT NO. 3

TABLE

RME EXPOSURE POINT CONCENTRATION AND STATISTICAL DISTRIBUTION OF COPCS IN SOIL
 AREA A, SITES 1A AND 1B, COMBINED DATA
 NAWC WARMINSTER, PENNSYLVANIA

Substance	Number of Sample Results	Degrees of Freedom	Statistical Distribution of Site Data	Results of Shapiro-Wilk or Shapiro-Francia Distribution Tests			Table Value for $H_{0.95}$ (Lognorm.) or $T_{0.95}$ (Normal)	Standard Deviation or Log Standard Deviation	Arithmetic Mean of All Site Results	Upper 95 % Confidence Limit (UCL) on Mean	Maximum Positive Site Concentration	RME Exposure Point Concentration
				W-norm.	W-lognorm	W-Table						
Antimony	19	18	nonparametric (assumed lognorm.)	0.8292	0.8613	0.901	4.1981	1.97	16.7	284	68.5	68.5
Cadmium	19	18	nonparametric (assumed lognorm.)	0.7446	0.8592	0.901	6.1917	3.06	212	274000	857	857
Chromium	19	18	nonparametric (assumed lognorm.)	0.871	0.8093	0.901	4.8476	2.33	3080	190000	11300	11300
Trichloroethene	20	19	lognormal	0.8728	0.9089	0.905	1.7889	0.223	2.93	3.21	4.1	3.21

Units are mg/kg for inorganics, ug/kg for organics.

Number of sample results excludes rejected data or blank-qualified data. Duplicates are consolidated into one result. Non-detected results are treated as present at one-half the detection limit in all calculations.

Statistical distribution of data is determined using Shapiro-Wilk test for $n \leq 50$, Shapiro-Francia test for $n > 50$. Statistical significance level is 0.05.

For $N \geq 10$, a normal distribution is assumed if the test statistic W-norm. is \geq than the reference value (W-table), and W-norm. $>$ W-lognorm.

For $N \geq 10$, a lognormal distribution is assumed if the test statistic W-lognorm. is \geq the reference value (W-table), and W-lognorm. \geq W-norm. A lognormal distribution is assumed if neither distribution is \geq the reference value.

*For $N < 10$, the maximum concentration is selected as the representative concentration, although the fitted distribution type is shown for information only.

H-values and standard deviations of log-transformed data are used to calculate the UCL if data are assumed to be lognormally distributed. Student's T-values and standard deviations are used for normally distributed data.

Arithmetic mean includes positive detections and non-detected results (detection limits are divided by two).

The representative concentration is selected as the lower of the 95 % UCL on the mean and the maximum positive site concentration.

SAMPLES:	VS-A-1A-01
	VS-A-1A-02
	VS-A-1A-03
	VS-A-1A-04
	VS-A-1A-05
	VS-A-1A-05-DUP
	VS-A-1A-06
	VS-A-1A-07
	VS-A-1A-08
	VS-A-1B-01
	VS-A-1B-02
	VS-A-1B-03
	VS-A-1B-04
	VS-A-1B-04-DUP
	VS-A-1B-05
	VS-A-1B-06
	VS-A-1B-07
	VS-A-1B-08
	VS-A-1B-09
	VS-A-1B-10
	VS-A-1B-11
	VS-A-1B-12

TABLE

**RME EXPOSURE POINT CONCENTRATION AND STATISTICAL DISTRIBUTION OF COPCS IN SOIL
AREA A, SITE 1A, ALL DATA
NAWC WARMINSTER, PENNSYLVANIA**

Substance	Number of Sample Results	Degrees of Freedom	Statistical Distribution of Site Data	Results of Shapiro-Wilk or Shapiro-Francia Distribution Tests			Table Value for $H_{0.95}$ (Lognorm.) or $T_{0.95}$ (Normal)	Standard Deviation or Log Standard Deviation	Arithmetic Mean of All Site Results	Upper 95 % Confidence Limit (UCL) on Mean	Maximum Positive Site Concentration	RME Exposure Point Concentration
				W-norm.	W-lognorm	W-Table						
Antimony	8	7	normal	0.8456	0.8248	0.818	1.8946	13.8	12	21.3	35.8	35.8
Cadmium	8	7	lognormal	0.7471	0.8621	0.818	11.0809	3.71	203	71370000000	857	857
Chromium	8	7	lognormal	0.8365	0.8594	0.818	8.441	2.8	3440	200000000	11300	11300

Units are mg/kg for inorganics, ug/kg for organics.

Number of sample results excludes rejected data or blank-qualified data. Duplicates are consolidated into one result. Non-detected results are treated as present at one-half the detection limit in all calculations.

Statistical distribution of data is determined using Shapiro-Wilk test for $n \leq 50$, Shapiro-Francia test for $n > 50$. Statistical significance level is 0.05.

For $N \geq 10$, a normal distribution is assumed if the test statistic W-norm is \geq than the reference value (W-table), and W-norm. $>$ W-lognorm.

For $N \geq 10$, a lognormal distribution is assumed if the test statistic W-lognorm is \geq the reference value (W-table), and W-lognorm. \geq W-norm. A lognormal distribution is assumed if neither distribution is \geq the reference value.

*For $N < 10$, the maximum concentration is selected as the representative concentration, although the fitted distribution type is shown for information only.

H-values and standard deviations of log-transformed data are used to calculate the UCL if data are assumed to be lognormally distributed. Student's T-values and standard deviations are used for normally distributed data.

Arithmetic mean includes positive detections and non-detected results (detection limits are divided by two).

The representative concentration is selected as the lower of the 95 % UCL on the mean and the maximum positive site concentration.

SAMPLES:	VS-A-1A-01
	VS-A-1A-02
	VS-A-1A-03
	VS-A-1A-04
	VS-A-1A-05
	VS-A-1A-05-DUP
	VS-A-1A-06
	VS-A-1A-07
	VS-A-1A-08

TABLE

RME EXPOSURE POINT CONCENTRATION AND STATISTICAL DISTRIBUTION OF COPCS IN SOIL
 AREA A, SITE 1B, ALL DATA
 NAWC WARMINSTER, PENNSYLVANIA

Substance	Number of Sample Results	Degrees of Freedom	Statistical Distribution of Site Data	Results of Shapiro-Wilk or Shapiro-Francia Distribution Tests			Table Value for $H_{0.05}$ (Lognorm.) or $T_{0.95}$ (Normal)	Standard Deviation or Log Standard Deviation	Arithmetic Mean of All Site Results	Upper 95 % Confidence Limit (UCL) on Mean	Maximum Positive Site Concentration	RME Exposure Point Concentration
				W-norm.	W-lognorm	W-Table						
Antimony	11	10	lognormal	0.8057	0.8673	0.85	3.967	1.47	20.1	192	68.5	68.5
Cadmium	11	10	lognormal	0.7399	0.8547	0.85	6.3284	2.51	219	185000	782	782
Chromium	11	10	normal	0.9089	0.7104	0.85	1.8125	2290	2820	4070	8070	4070
Trichloroethene	12	11	lognormal	0.908	0.9192	0.859	1.8859	0.253	3.14	3.64	4.1	3.64

Units are mg/kg for inorganics, ug/kg for organics.

Number of sample results excludes rejected data or blank-qualified data. Duplicates are consolidated into one result. Non-detected results are treated as present at one-half the detection limit in all calculations.

Statistical distribution of data is determined using Shapiro-Wilk test for $n \leq 50$, Shapiro-Francia test for $n > 50$. Statistical significance level is 0.05.

For $N \geq 10$, a normal distribution is assumed if the test statistic W-norm. is \geq than the reference value (W-table), and W-norm. $>$ W-lognorm.

For $N \geq 10$, a lognormal distribution is assumed if the test statistic W-lognorm is \geq the reference value (W-table), and W-lognorm. \geq W-norm. A lognormal distribution is assumed if neither distribution is \geq the reference value.

*For $N < 10$, the maximum concentration is selected as the representative concentration, although the fitted distribution type is shown for information only.

H-values and standard deviations of log-transformed data are used to calculate the UCL if data are assumed to be lognormally distributed. Student's T-values and standard deviations are used for normally distributed data.

Arithmetic mean includes positive detections and non-detected results (detection limits are divided by two).

The representative concentration is selected as the lower of the 95 % UCL on the mean and the maximum positive site concentration.

SAMPLES:	VS-A-1B-01
	VS-A-1B-02
	VS-A-1B-03
	VS-A-1B-04
	VS-A-1B-04-DUP
	VS-A-1B-05
	VS-A-1B-06
	VS-A-1B-07
	VS-A-1B-08
	VS-A-1B-09
	VS-A-1B-10
	VS-A-1B-11
	VS-A-1B-12

TABLE

RME EXPOSURE POINT CONCENTRATION AND STATISTICAL DISTRIBUTION OF COPCS IN SOIL
 AREA A, SITE 1B, EXCAVATION WALLS DATA
 NAWC WARMINSTER, PENNSYLVANIA

Substance	Number of Sample Results	Degrees of Freedom	Statistical Distribution of Site Data	Results of Shapiro-Wilk or Shapiro-Francia Distribution Tests			Table Value for $H_{0.95}$ (Lognorm.) or $T_{0.95}$ (Normal)	Standard Deviation or Log Standard Deviation	Arithmetic Mean of All Site Results	Upper 95 % Confidence Limit (UCL) on Mean	Maximum Positive Site Concentration	RME Exposure Point Concentration
				W-norm.	W-lognorm	W-Table						
Antimony	7	6	*normal	0.8857	0.7408	0.803	1.9432	6.2	8.81	13.4	16	16
Cadmium	7	6	*lognormal	0.7923	0.8386	0.803	8.0181	2.4	61.1	744000	222	222
Chromium	7	6	*normal	0.91	0.7079	0.803	1.9432	1770	2220	3520	4600	4600

Units are mg/kg for inorganics, ug/kg for organics.

Number of sample results excludes rejected data or blank-qualified data. Duplicates are consolidated into one result. Non-detected results are treated as present at one-half the detection limit in all calculations.

Statistical distribution of data is determined using Shapiro-Wilk test for $n \leq 50$, Shapiro-Francia test for $n > 50$. Statistical significance level is 0.05.

For $N \geq 10$, a normal distribution is assumed if the test statistic W-norm. is \geq than the reference value (W-table), and W-norm. $>$ W-lognorm.

For $N \geq 10$, a lognormal distribution is assumed if the test statistic W-lognorm is \geq the reference value (W-table), and W-lognorm. \geq W-norm. A lognormal distribution is assumed if neither distribution is \geq the reference value.

*For $N < 10$, the maximum concentration is selected as the representative concentration, although the fitted distribution type is shown for information only.

H-values and standard deviations of log-transformed data are used to calculate the UCL if data are assumed to be lognormally distributed. Student's T-values and standard deviations are used for normally distributed data.

Arithmetic mean includes positive detections and non-detected results (detection limits are divided by two).

The representative concentration is selected as the lower of the 95 % UCL on the mean and the maximum positive site concentration.

SAMPLES:	VS-A-1B-05
	VS-A-1B-06
	VS-A-1B-07
	VS-A-1B-08
	VS-A-1B-09
	VS-A-1B-10
	VS-A-1B-11
	VS-A-1B-12

ATTACHMENT NO. 4

ATTACHMENT NO. 5



TETRA TECH NUS, INC.

600 Clark Avenue, Suite 3 • King of Prussia, PA 19406-1433
(610) 491-9688 • FAX (610) 491-9645 • www.tetrattech.com

C-51-11-8-61

November 25, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

Subject: Verification Sample Results, Site 1B, Area A
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter presents the findings of the most recent verification sampling and analysis conducted at excavation 1B at NAWC Warminster. Seven samples and a duplicate sample were collected from the sidewalls of the subject excavation on November 19, 1998. The samples were collected from the eastern portion of the excavation where it had been extended to remove material that contained high concentrations of Cadmium and in response to the discovery of buried drums (see attachment 1 for sample logs). No floor samples were collected because the excavation extended to the bedrock. The samples were analyzed for Cadmium, Chromium, Lead, Antimony, and Thallium (see Attachment 2 for Laboratory Analytical Reports). The data has not undergone a complete validation review.

The analytical results were compared to the clean-up goals to determine if attainment had been achieved. Although no clean-up goal had been established for lead, the samples were analyzed for this compound in response to the presence of elevated concentrations previously identified in the northern sidewall (see TiNUS September 10, 1998 letter C-51-9-8-18). The highest concentration of Lead identified in the samples was 19.9 mg/kg. This concentration is well below the surface clean-up goal established for other areas of 1,000 mg/kg.

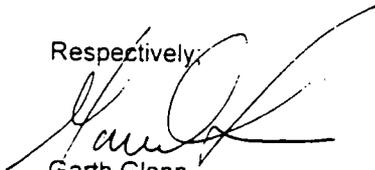
No sample contained concentrations of any of the remaining compounds in excess of the PRGs. Cadmium concentrations ranged from 0.05 mg/kg to 0.72 mg/kg. This is well below the PRG of 76 mg/kg. Chromium concentrations ranged from 23.8 mg/kg to 54.9 mg/kg. This is below the PRG of 16,161 mg/kg. The Antimony concentrations ranged from 0.54 mg/kg to 0.87 mg/kg. This is well below the PRG of 113 mg/kg. Thallium concentrations ranged from 0.4 mg/kg to 0.92 mg/kg. This is also significantly below the PRG established at 14 mg/kg.

During the November 19, 1998 sampling it was confirmed that the floor of the previous excavation area of 1B had been extended to bedrock, therefore no additional sampling or evaluation of this area is required.

C-51-11-8-61
Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
November 25, 1998 - Page 2

It is recommended that no further excavation or sampling be performed at Site 1B. It is further recommended that the area be backfilled.

Respectively,



Garth Glenn
Project Manager

C: Tom Ames (NAVFACENGCOM)
Tim McEntee (NAVFACENGCOM)
Steve Lehman (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
Neil Teamerson (TtNUS)
Jeff Orient (TtNUS)

**ATTACHMENT 1
SAMPLE LOGS**

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name WAWC Warminster

Project Site Number TC 252

Source Number VS-13-13.5

Source Location Site 13

Sample Method: <u>stainless steel trowel</u>	Composite Sample Data		
Depth Sampled: <u>4'</u>	Sample	Time	Color and Description
Sample Date & Time: <u>11/19/98</u> <u>1345</u>			
Sampled by: <u>Dan Whalen</u>			
Signatures:			
Sample Type			
<input checked="" type="checkbox"/> Low Concentration			
<input type="checkbox"/> High Concentration			
<input checked="" type="checkbox"/> Grab			
<input type="checkbox"/> Composite			
<input type="checkbox"/> Grab - Composite			
			Sample Data
Analysis Preservative:		Color Description: (Sand, Clay, Dry, Moist, Wet, etc.):	
<input type="checkbox"/> TCL VOCs dark, 4°C		Lt Brown 214409 silt dump	
<input type="checkbox"/> TCL SVOCs dark, 4°C		Sample Location Map	
<input type="checkbox"/> TCL Pesticides dark, 4°C			
<input type="checkbox"/> TAL Metals 4°C			
<input type="checkbox"/> Cyanide 4°C			
<input checked="" type="checkbox"/> Cd, Cr, Thallium 4°C			
Observations and Notes <input type="checkbox"/> Duplicate sample taken:		Brown Silty clay 0-2' ----- Lt Brown clay silt 2-5' ----- weathered bedrock 5-7'	

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Warminster

Project Site Number 15-113-153

Source Number 15-113-153

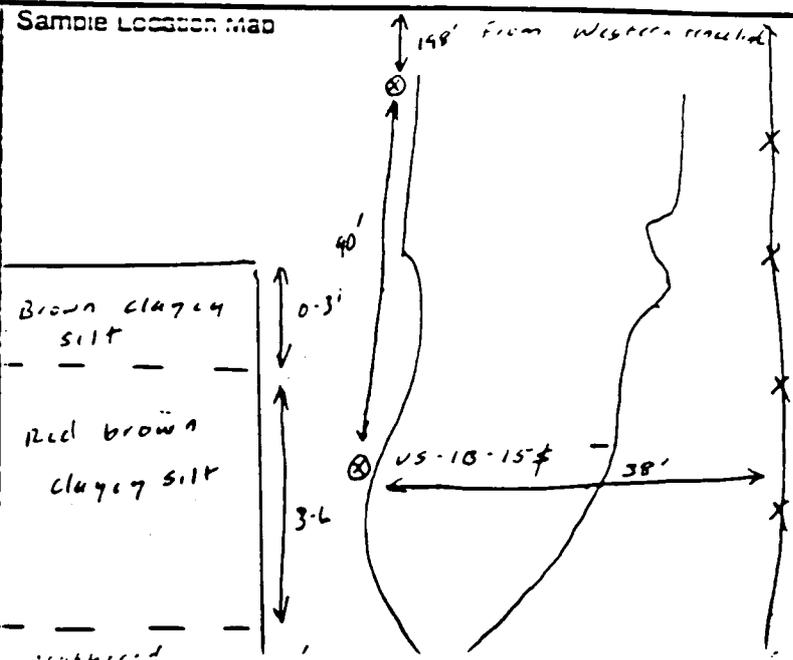
Source Location Site 1B

Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
<u>4" stainless steel Trowel</u>			
<u>4"</u>			
Sample Date & Time:			
<u>11/19/88 1410</u>			
Sampled by:			
<u>Don Whalen</u>			
Signature(s):			

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Sample Data	
Color	Description: (Sand, Clay, Drv, Moist, Wet, etc.)
<u>red brown</u>	<u>clayey silt</u>

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	dark 4°C
<input type="checkbox"/> TCL SVOA's	dark 4°C
<input type="checkbox"/> TCL Pest/PCBs	dark 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> Lead, Cd, Thallium	4°C



Observations and Notes

Duplicate sample taken:

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Westminster

Project Site Number TC 252

Source Number VS-13-163

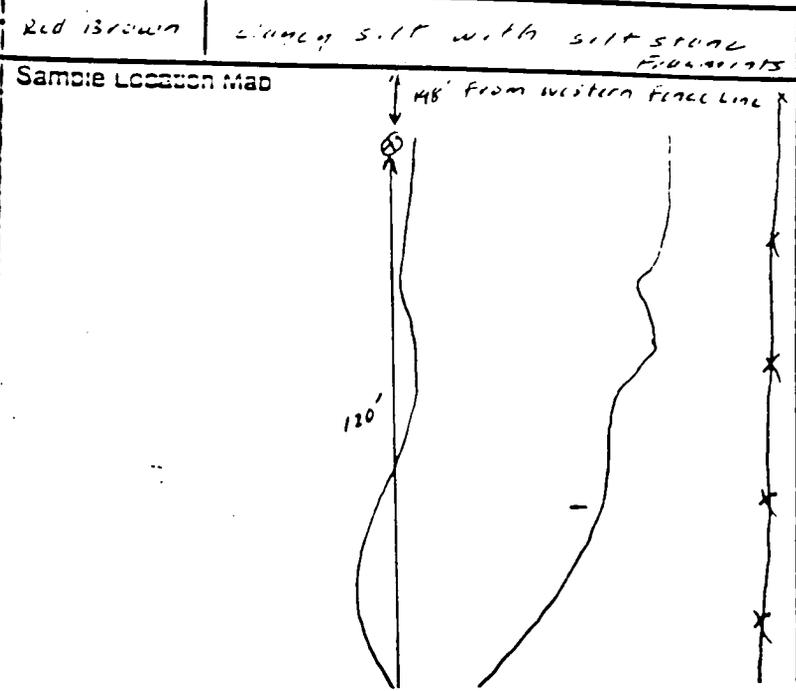
Source Location Site 13

Sample Method:	Composite Sample Data		
	Sample	Time	Color and Description
<u>Standard Steel Tunnel</u>			
Depth Sampled: <u>3'</u>			
Sample Date & Time: <u>11/19/98 1418</u>			
Sampled by: <u>Don Whalen</u>			
Signature(s):			

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Sample Data	
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
<u>Red Brown</u>	<u>Wet silt with silt stone</u>

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	<u>dark, 4°C</u>
<input type="checkbox"/> TCL SVOA's	<u>dark, 4°C</u>
<input type="checkbox"/> TCL Res/PCBs	<u>dark, 4°C</u>
<input type="checkbox"/> TAL Metals	<u>4°C</u>
<input type="checkbox"/> Cyanide	<u>4°C</u>
<input checked="" type="checkbox"/> CD, CL, Thallium	<u>4°C</u>



Observations and Notes

Duplicate sample taken :

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Bank Warminster

Project Site Number TC 252

Source Number VS-18-18.6

Source Location Site 18

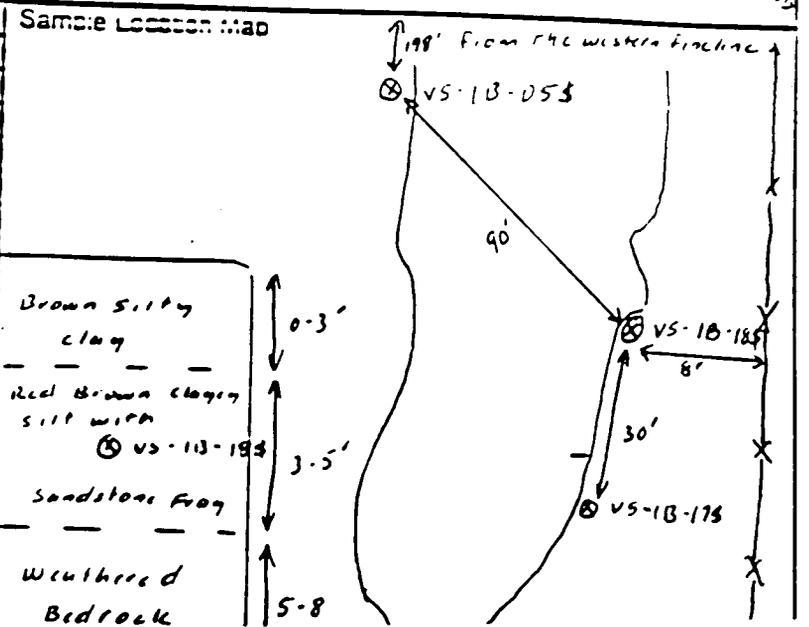
Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
<u>stainless steel Trench</u>			
<u>4'</u>			
Sample Date & Time:			
<u>11/19/95 1450</u>			
Sampled by:			
<u>Don Whalen</u>			
Signature(s):			

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	dark 4°C
<input type="checkbox"/> TCL SVOA's	dark 4°C
<input type="checkbox"/> TCL Res/PCBs	dark 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> CO CR, Thallium	4°C

Sample Data

Color: red brown | Description: clay silt with sandstone fragments



Observations and Notes

Duplicate sample taken:

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET

TETRA TECH NUS, INC.



<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Surface Soil
Subsurface Soil
Sediment
Lagoon/Pond
Other _____

Project Site Name NAWC Warmaster
Source Number VS-113-143

Project Site Number -TC 252
Source Location -TC 1B

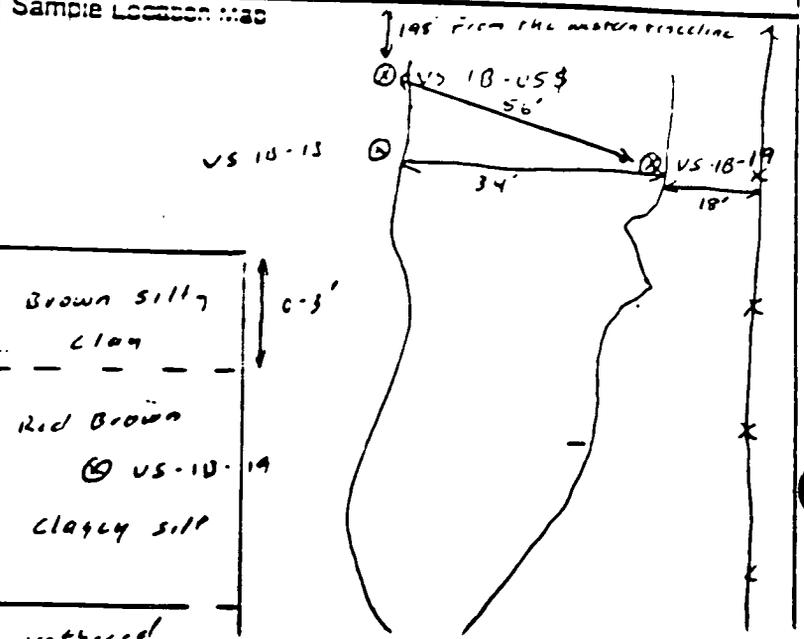
Sample Method: <i>stainless steel Trowl</i>	Composite Sample Data		
	Sample	Time	Color and Description
Depth Sampled: <i>4'</i>			
Sample Date & Time: <i>11/19/95 1450</i>			
Sampled by: <i>Don Whalen</i>			
Signature(s):			

Sample Type

Low Concentration
 High Concentration
 Grab
 Composite
 Grab - Composite

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	dark, 4°C
<input type="checkbox"/> TCL SVOA's	dark, 4°C
<input type="checkbox"/> TCL Pest/PCBs	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> Cd, Cr, Thallium	4°C

Sample Data	
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
<i>red brown</i>	<i>clayey silt</i>



Observations and Notes

Duplicate sample taken

Brown silty clay
Red Brown
VS-10-19
clayey silt
watered

**ATTACHMENT 2
ANALYTICAL RESULT REPORTS**

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C2K200150 Tetra Tech NUS, Inc PAGE 3
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/24/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	-----------------	-------	-------------------

Client Sample ID: VS-1B-13S

Sample #: 005 Date Sampled: 11/19/98 13:48 Date Received: 11/20/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Cadmium	0.05 B	0.24	mg/kg	SW846 6010B	
Chromium	24.6	0.6	mg/kg	SW846 6010B	
Lead	9.4	0.36	mg/kg	SW846 6010B	
Antimony	0.76 BN	1.2	mg/kg	SW846 6010B	
Thallium	0.88 B	1.2	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	83.2	%	MCAWW 160.3	MOD

Client Sample ID: VS-1B-14S

Sample #: 006 Date Sampled: 11/19/98 14:00 Date Received: 11/20/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Cadmium	0.12 B	0.25	mg/kg	SW846 6010B	
Chromium	31.4	0.62	mg/kg	SW846 6010B	
Lead	14.6	0.37	mg/kg	SW846 6010B	
Antimony	0.62 BN	1.2	mg/kg	SW846 6010B	
Thallium	ND	2.5	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	80.1	%	MCAWW 160.3	MOD

Client Sample ID: VS-1B-15S

Sample #: 007 Date Sampled: 11/19/98 14:10 Date Received: 11/20/98 Matrix: SOLID

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8K200150 Tetra Tech NUS, Inc PAGE 4
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/24/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-1B-15S

Sample #: 007 Date Sampled: 11/19/98 14:10 Date Received: 11/20/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	0.16 B	0.21	mg/kg	SW846 6010B
Chromium	26.2	0.6	mg/kg	SW846 6010B
Lead	13.0	0.36	mg/kg	SW846 6010B
Antimony	0.86 BN	1.2	mg/kg	SW846 6010B
Thallium	0.54 B	1.2	mg/kg	SW846 6010B

B Estimated result. Result is less than RL.

Inorganic Analysis		Reviewed
Total Residue as Percent Solids	83.7 %	MCAWW 160.3 MOD

Client Sample ID: VS-1B-16S

Sample #: 008 Date Sampled: 11/19/98 14:18 Date Received: 11/20/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	0.11 B	0.23	mg/kg	SW846 6010B
Chromium	24.0	0.58	mg/kg	SW846 6010B
Lead	16.9	0.35	mg/kg	SW846 6010B
Antimony	0.87 BN	1.2	mg/kg	SW846 6010B
Thallium	0.92 B	1.2	mg/kg	SW846 6010B

B Estimated result. Result is less than RL.

Inorganic Analysis		Reviewed
Total Residue as Percent Solids	86.3 %	MCAWW 160.3 MOD

Client Sample ID: VS-1B-17S

Sample #: 009 Date Sampled: 11/19/98 14:31 Date Received: 11/20/98 Matrix: SOLID

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: CSK200150
 Tetra Tech NUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252
 Date Reported: 11/24/98
 PAGE 5

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-1B-17S

Sample #: 009 Date Sampled: 11/19/98 14:31 Date Received: 11/20/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Cadmium	0.72	0.23	mg/kg	SW846 6010B	
Chromium	49.7	0.58	mg/kg	SW846 6010B	
Lead	11.4	0.35	mg/kg	SW846 6010B	
Antimony	0.54 BN	1.2	mg/kg	SW846 6010B	
Thallium	ND	1.2	mg/kg	SW846 6010B	

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	85.9		%	MCAWW 160.3 MOD	

Client Sample ID: VS-1B-18S

Sample #: 010 Date Sampled: 11/19/98 14:50 Date Received: 11/20/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Cadmium	0.08 B	0.24	mg/kg	SW846 6010B	
Chromium	54.5	0.59	mg/kg	SW846 6010B	
Lead	9.5	0.35	mg/kg	SW846 6010B	
Antimony	0.65 BN	1.2	mg/kg	SW846 6010B	
Thallium	0.40 B	1.2	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	84.7		%	MCAWW 160.3 MOD	

Client Sample ID: VS-1B-19S

Sample #: 011 Date Sampled: 11/19/98 14:58 Date Received: 11/20/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Cadmium	0.12 B	0.22	mg/kg	SW846 6010B	

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8K200150

Tetra Tech NUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

PAGE
 Date Reported: 11/24/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
Client Sample ID: VS-1B-19S				
Sample #: 011 Date Sampled: 11/19/98 14:58 Date Received: 11/20/98 Matrix: SOLID				
Chromium	23.8	0.54	mg/kg	SW846 6010B
Lead	16.3	0.32	mg/kg	SW846 6010B
Antimony	0.75 BN	1.1	mg/kg	SW846 6010B
Thallium	ND	1.1	mg/kg	SW846 6010B

B Estimated result. Result is less than RL.

Inorganic Analysis
 Total Residue as
 Percent Solids

92.7

%

Reviewed
 MCAWW 160.3 MOD

Client Sample ID: VS-1B-20S Duplicate VS-1B-175

Sample #: 012 Date Sampled: 11/19/98 15:15 Date Received: 11/20/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	0.69	0.23	mg/kg	SW846 6010B	Reviewed
Chromium	54.9	0.59	mg/kg	SW846 6010B	
Lead	10.4	0.35	mg/kg	SW846 6010B	
Antimony	0.75 BN	1.2	mg/kg	SW846 6010B	
Thallium	ND	1.2	mg/kg	SW846 6010B	

Inorganic Analysis
 Total Residue as
 Percent Solids

85.3

%

Reviewed
 MCAWW 160.3 MOD

Duplicate



TETRA TECH NUS, INC.

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C-51-11-8-29

November 12, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

Subject: Characterization Sampling Results
Area A Site 1B
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter presents the results of the recent characterization sampling performed by Tetra Tech NUS (TtNUS) at excavation 1B at the subject facility. The samples were collected to further characterize the materials encountered within the excavation for consideration in determining the need to include additional parameters in the Verification Sampling and Analysis Plan (VSAP) for this area.

Five samples and a duplicate sample were collected from different waste materials/layers encountered during the drum removal performed by the Navy RAC (Foster Wheeler) on October 27, 1998. Sample logs describing the material sampled are enclosed as Attachment 1. As noted, several of these samples were collected from materials that exhibited Photo-Ionization Detector (PID) readings reported from 200 PPM to 2,000 PPM. All samples were analyzed for full-scan Target Compound List (TCL) Organics and Target Analyte List (TAL) Metals. Volatile Organic Compound (VOC) sampling and analysis were performed according to SW-846 (method 5035/8260B) requirements. The data was received on a quick turn around basis, has not undergone a full validation, and includes only target compounds (see Attachment 1). Tentatively Identified Compound (TIC) data will not be available until the data undergoes a complete internal lab review. This data will not be available for another 3 weeks. However, this data should not significantly effect the ability to select additional parameters for verification sampling purposes.

The sample results were compared to previous Site 1 subsurface sample results, the Site 1 risk assessment, and EPA Region III Risk-Based Criteria (RBC). The EPA RBCs were adjusted to reflect industrial screening criteria of 1E-6 for carcinogens and a Hazard Index (HI) of 0.01 for non-carcinogens. Attachment 2 to this letter presents a summary of the analytical results and the comparison and identifies those compounds recommended for addition to the VSAP. It should be noted that in conducting the previous risk assessment, Contaminants of Potential Concern (COPC) were selected by comparing the site data to background data and the adjusted residential RBC. The table in Attachment 2 indicates whether the compound was previously selected as a COPC using this criteria and whether the compound was identified as a contributor to an unacceptable industrial exposure risk calculated for the site.

Findings

A review of the inorganic data indicates that Thallium concentrations exceeded the results of previous samples and the RBC. Only one sample contained Thallium concentrations greater than the industrial RBC (19.7 mg/kg versus 14 mg/kg). Analysis of previous samples from the area did not detect this compound. If a statistical analysis were performed on the data set it would likely indicate a representative concentration below any significant risk level, suggesting no need to analyze for this compound. However, to ensure a conservative approach to the removal action, it is recommended that Thallium be added to the list of parameters for the remaining VSAP sampling to be conducted at excavation 1B. No other inorganic sample result exceeded the previous analytical results and the RBC. Therefore no other inorganic compound is recommended for addition to the VSAP.

Only seven Semi-Volatile Organic Compounds (SVOC) were identified in the new characterization samples. The maximum detected concentrations for each of these compounds were well below the previous analytical findings and/or the RBC. No additional SVOCs are recommended for addition to the VSAP.

Six VOCs were identified in the new characterization samples. Of these, two had been previously identified (Acetone and Tetrachloroethene). All analytical results were orders of magnitude below the industrial RBCs, indicating that no unacceptable risk would be expected from any of these compounds. The results were also compared to groundwater protection criteria. Attachment 3 shows the criteria used for this comparison. Both EPA and PADEP guidance documents were considered in conducting this comparison. No VOC sample result exceeded either standard. Therefore, no VOCs are recommended for addition to the VSAP.

Four pesticides were identified in the new characterization samples. The data for sample number W-1B-WA02 presented in the Attachment 1 is preliminary. A review of the analytical results revealed that the analysis for this sample was outside of the internal laboratory standards and the sample is being reanalyzed. No pesticide result exceeded the industrial RBCs or the EPA groundwater protection standard. The preliminary results for sample W-1B-WA02 exceed the PADEP soil to groundwater standard for 4,4-DDD and 4,4-DDE. Considering the fact that this data is preliminary, that these compounds have not been identified as contaminants of concern in Area A groundwater, and that these compounds were not found at elevated levels in other Area A soils and waste, it is recommended that no pesticides be added to the VSAP.

The Polychlorinated Biphenyls (PCBs) Aroclor 1242 and Aroclor 1260 were identified in samples collected from within excavation 1B. The maximum detected concentrations were well below the industrial RBC for both compounds. One sample contained concentrations of both Aroclors (Aroclor 1242 at 1.4 mg/kg and Aroclor 1260 at 0.6 mg/kg) at levels that slightly exceed the EPA and PADEP soil-screening standard for protection of groundwater (see Attachment 3). Considering the levels identified and the fact that PCBs have not been identified as a contaminant of concern in Area A groundwater, it is recommended that no PCB analysis be added to the VSAP for excavation 1B.

Recommendations

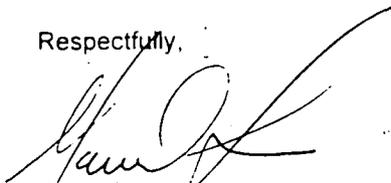
It is recommended that Thallium be added to the list of parameters to be analyzed for under the VSAP for excavation 1B. The proposed Preliminary Remediation Goal (PRG) is 14 mg/kg. This represents an HI of 0.1 (based on the EPA RBC of 140 mg/kg for industrial soils). The PADEP non-residential soil Medium-Specific Concentration (MSC) for Thallium is 220 mg/kg for surface soils and 190,000 mg/kg for subsurface soils.

C-51-11-8-29
Mr. Lonnie Monaco
Naval Facilities Engineering Command
November 12, 1998 – Page 3

Previous verification sampling results from excavation 1B indicated that Cadmium was the only PRG that had been exceeded in wall samples (see TtNUS correspondence C-51-9-8-18 dated September 10, 1998). It was because of this contamination that the excavation was expanded. This was the only compound to be analyzed for in the follow-up verification sampling. The concentrations for the remaining clean-up criteria compounds (Chromium, Antimony, and Trichloroethene) identified in the new characterization samples was compared to the previous verification sample results to determine if waste material exceeding the maximum detected concentrations or PRGs had been identified. Although no PRG was exceeded in any of the waste samples, the maximum Chromium concentration exceeds that previously identified in verification samples and the result, if included in the statistical evaluation of data for the excavation, may cause the Upper 95 % Confidence Level (UCL) to exceed the PRG. Because of this it would be prudent to include Chromium in the VSAP list of parameters.

In summary, it is recommended that the eastern sidewalls of excavation 1B be sampled and analyzed for Cadmium, Chromium and Thallium. The data should then be evaluated and the results compared to the PRGs (Cadmium 76 mg/kg, Chromium 16.161 mg/kg, and Thallium 14 mg/kg) to determine attainment of clean-up goals.

Respectfully,



Garth Glenn
Project Manager

GG/nfs

c: Tom Ames (NAVFACENGCOM)
Tim McEntee (NAVFACENGCOM)
Steve Lehman (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
Neil Teamerson (TtNUS)
Jeff Orient (TtNUS)

ATTACHMENT 1

Sample Logs
And
Analytical Results Reports

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 **Tetra Tech NUS, Inc** **PAGE 1**
 NAWC WARMINSTER, PENNSYLVANIA **Date Reported: 11/09/98**
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING		ANALYTICAL
		LIMIT	UNITS	METHOD

Client Sample ID: W-TB-102798

Sample #: 001 Date Sampled: 10/27/98 07:00 Date Received: 10/28/98 Matrix: WATER

Volatile Organics by GC/MS

Review d

Acetone	4.8 J	20	ug/L	SW846 8260B
Benzene	ND	5.0	ug/L	SW846 8260B
Bromodichloromethane	ND	5.0	ug/L	SW846 8260B
Bromoform	ND	5.0	ug/L	SW846 8260B
Bromomethane	ND	10	ug/L	SW846 8260B
2-Butanone	ND	20	ug/L	SW846 8260B
Carbon disulfide	ND	5.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/L	SW846 8260B
Chlorobenzene	ND	5.0	ug/L	SW846 8260B
Dibromochloromethane	ND	5.0	ug/L	SW846 8260B
Chloroethane	ND	10	ug/L	SW846 8260B
Chloroform	9.3	5.0	ug/L	SW846 8260B
Chloromethane	ND	10	ug/L	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	5.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	5.0	ug/L	SW846 8260B
1,2-Dichloroethene	ND	5.0	ug/L	SW846 8260B
(total)				
1,2-Dichloropropane	ND	5.0	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B
Ethylbenzene	ND	5.0	ug/L	SW846 8260B
2-Hexanone	ND	20	ug/L	SW846 8260B
Methylene chloride	3.3 J	5.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/L	SW846 8260B
Styrene	ND	5.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L	SW846 8260B
Tetrachloroethene	ND	5.0	ug/L	SW846 8260B
Toluene	ND	5.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/L	SW846 8260B
Trichloroethene	ND	5.0	ug/L	SW846 8260B
Vinyl chloride	ND	10	ug/L	SW846 8260B
Xylenes (total)	ND	5.0	ug/L	SW846 8260B

J Estimated result. Result is less than RL.

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 Tetra Tech EUS, Inc PAGE 2
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA01

Sample #: 002 Date Sampled: 10/27/98 08:30 Date Received: 10/28/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed

Silver	0.53 B	2	mg/kg	SW846 6010B
Arsenic	ND	2	mg/kg	SW846 6010B
Cadmium	0.69 B	1	mg/kg	SW846 6010B
Chromium	9.5	2	mg/kg	SW846 6010B
Lead	28.2	0.61	mg/kg	SW846 6010B
Antimony	1.1 <i>BN*</i>	2	mg/kg	SW846 6010B
Selenium	ND	1	mg/kg	SW846 6010B
Thallium	1.4 B	2	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals Reviewed

Aluminum	480	40.4	mg/kg	SW846 6010B
Barium	29.5 B	40.4	mg/kg	SW846 6010B
Beryllium	ND	1	mg/kg	SW846 6010B
Calcium	13400	1010	mg/kg	SW846 6010B
Cobalt	5.5 B	10.1	mg/kg	SW846 6010B
Copper	66.9	5.1	mg/kg	SW846 6010B
Iron	19400	20.2	mg/kg	SW846 6010B
Potassium	ND	1010	mg/kg	SW846 6010B
Magnesium	849 B	1010	mg/kg	SW846 6010B
Manganese	108 <i>N</i>	3	mg/kg	SW846 6010B
Sodium	40.6 B	1010	mg/kg	SW846 6010B
Nickel	20.2	8.1	mg/kg	SW846 6010B
Vanadium	1.2 B	10.1	mg/kg	SW846 6010B
Zinc	1750 <i>N</i>	4	mg/kg	SW846 6010B

Mercury in Solid Waste (Manual Cold-Vapor)

Mercury	0.31	0.2	mg/kg	SW846 7471A
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Reviewed

B Estimated result. Result is less than RL.
 N Spiked analyte recovery is outside stated control limits.

Organochlorine Pesticides

Aldrin	ND	34	ug/kg	SW846 8081A
alpha-BHC	ND	34	ug/kg	SW846 8081A
beta-BHC	ND	34	ug/kg	SW846 8081A
delta-BHC	ND	34	ug/kg	SW846 8081A

In Review

Reviewed
11/9/98

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech HUS, Inc PAGE 3

Lot #: C8J290162 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA01

Sample #: 002 Date Sampled: 10/27/98 08:30 Date Received: 10/28/98 Matrix: SOLID

Organochlorine Pesticides

gamma-BHC (Lindane)	ND	34	ug/kg	SW846 8081A
alpha-Chlordane	ND	34	ug/kg	SW846 8081A
gamma-Chlordane	ND	34	ug/kg	SW846 8081A
4,4'-DDD	ND	34	ug/kg	SW846 8081A
4,4'-DDE	55	34	ug/kg	SW846 8081A
4,4'-DDT	ND	34	ug/kg	SW846 8081A
Dieldrin	ND	34	ug/kg	SW846 8081A
Endosulfan I	ND	34	ug/kg	SW846 8081A
Endosulfan II	ND	34	ug/kg	SW846 8081A
Endrin ketone	ND	34	ug/kg	SW846 8081A
Endosulfan sulfate	ND	34	ug/kg	SW846 8081A
Endrin	ND	34	ug/kg	SW846 8081A
Endrin aldehyde	ND	34	ug/kg	SW846 8081A
Heptachlor	ND	34	ug/kg	SW846 8081A
Heptachlor epoxide	ND	34	ug/kg	SW846 8081A
Toxaphene	ND	1400	ug/kg	SW846 8081A
Methoxychlor	ND	340	ug/kg	SW846 8081A

In Review
Reviewed
11/9/98

Results and reporting limits have been adjusted for dry weight.

PCBs

Aroclor 1016	ND	670	ug/kg	SW846 8082
Aroclor 1221	ND	670	ug/kg	SW846 8082
Aroclor 1232	ND	670	ug/kg	SW846 8082
Aroclor 1242	ND	670	ug/kg	SW846 8082
Aroclor 1248	ND	670	ug/kg	SW846 8082
Aroclor 1254	ND	670	ug/kg	SW846 8082
Aroclor 1260	ND	670	ug/kg	SW846 8082

Reviewed

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS

Acetone	90	66	ug/kg	SW846 8260B
Benzene	ND	16	ug/kg	SW846 8260B
Bromodichloromethane	ND	16	ug/kg	SW846 8260B

Reviewed

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS, Inc PAGE 4

Lot #: C8J290162 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA01

Sample #: 002 Date Sampled: 10/27/98 08:30 Date Received: 10/28/98 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	Reviewed
Volatile Organics by GC/MS					Reviewed
Bromoform	ND	16	ug/kg	SW846 8260B	
Bromomethane	3.7 J	33	ug/kg	SW846 8260B	
2-Butanone	ND	66	ug/kg	SW846 8260B	
Carbon disulfide	26	16	ug/kg	SW846 8260B	
Carbon tetrachloride	ND	16	ug/kg	SW846 8260B	
Chlorobenzene	ND	16	ug/kg	SW846 8260B	
Dibromochloromethane	ND	16	ug/kg	SW846 8260B	
Chloroethane	ND	33	ug/kg	SW846 8260B	
Chloroform	ND	16	ug/kg	SW846 8260B	
Chloromethane	ND	33	ug/kg	SW846 8260B	
1,1-Dichloroethane	ND	16	ug/kg	SW846 8260B	
1,2-Dichloroethane	ND	16	ug/kg	SW846 8260B	
1,1-Dichloroethene	ND	16	ug/kg	SW846 8260B	
1,2-Dichloroethene	3.9 J	16	ug/kg	SW846 8260B	
(total)					
1,2-Dichloropropane	ND	16	ug/kg	SW846 8260B	
1,1-Dichloropropene	ND	16	ug/kg	SW846 8260B	
2,3-Dichloropropene	ND	16	ug/kg	SW846 8260B	
Acetone	ND	16	ug/kg	SW846 8260B	
Hexanone	ND	66	ug/kg	SW846 8260B	
Methylene chloride	ND	16	ug/kg	SW846 8260B	
4-Methyl-2-pentanone	ND	66	ug/kg	SW846 8260B	
Styrene	ND	16	ug/kg	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	16	ug/kg	SW846 8260B	
Tetrachloroethene	14 J,B	16	ug/kg	SW846 8260B	
Toluene	7.5 J	16	ug/kg	SW846 8260B	
1,1,1-Trichloroethane	ND	16	ug/kg	SW846 8260B	
1,1,2-Trichloroethane	ND	16	ug/kg	SW846 8260B	
Trichloroethene	ND	16	ug/kg	SW846 8260B	
Vinyl chloride	ND	33	ug/kg	SW846 8260B	
Xylenes (total)	ND	16	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 Tetra Tech HUS, Inc PAGE 5
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA01

Sample #: 002 Date Sampled: 10/27/98 08:30 Date Received: 10/28/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Compound Name	Result	Reporting Limit	Units	Analytical Method	Reviewed
Acenaphthene	ND	27000	ug/kg	SW846 8270C	
Acenaphthylene	ND	27000	ug/kg	SW846 8270C	
Anthracene	ND	27000	ug/kg	SW846 8270C	
Benzo(a)anthracene	ND	27000	ug/kg	SW846 8270C	
Benzo(b)fluoranthene	ND	27000	ug/kg	SW846 8270C	
Benzo(k)fluoranthene	ND	27000	ug/kg	SW846 8270C	
Benzo(ghi)perylene	ND	27000	ug/kg	SW846 8270C	
Benzo(a)pyrene	ND	27000	ug/kg	SW846 8270C	
bis(2-Chloroethoxy) methane	ND	27000	ug/kg	SW846 8270C	
bis(2-Chloroethyl) ether	ND	27000	ug/kg	SW846 8270C	
2,2'-oxybis(1-Chloropropane)	ND	27000	ug/kg	SW846 8270C	
bis(2-Ethylhexyl) phthalate	27000	27000	ug/kg	SW846 8270C	
4-Bromophenyl phenyl ether	ND	27000	ug/kg	SW846 8270C	
Butyl benzyl phthalate	30000	27000	ug/kg	SW846 8270C	
4-Chloroaniline	ND	27000	ug/kg	SW846 8270C	
4-Chloro-3-methylphenol	ND	27000	ug/kg	SW846 8270C	
2-Chloronaphthalene	ND	27000	ug/kg	SW846 8270C	
2-Chlorophenol	ND	27000	ug/kg	SW846 8270C	
4-Chlorophenyl phenyl ether	ND	27000	ug/kg	SW846 8270C	
Chrysene	ND	27000	ug/kg	SW846 8270C	
Dibenzofuran	ND	27000	ug/kg	SW846 8270C	
Di-n-butyl phthalate	ND	27000	ug/kg	SW846 8270C	
1,2-Dichlorobenzene	ND	27000	ug/kg	SW846 8270C	
1,3-Dichlorobenzene	ND	27000	ug/kg	SW846 8270C	
1,4-Dichlorobenzene	4300 J	27000	ug/kg	SW846 8270C	
3,3'-Dichlorobenzidine	ND	130000	ug/kg	SW846 8270C	
2,4-Dichlorophenol	ND	27000	ug/kg	SW846 8270C	
Diethyl phthalate	ND	27000	ug/kg	SW846 8270C	
2,4-Dimethylphenol	ND	27000	ug/kg	SW846 8270C	
Dimethyl phthalate	ND	27000	ug/kg	SW846 8270C	
Di-n-octyl phthalate	ND	27000	ug/kg	SW846 8270C	
2,4-Dinitrophenol	ND	130000	ug/kg	SW846 8270C	

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 Tetra Tech HUS, Inc PAGE 6
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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W-1B-WA01

Date Sampled: 10/27/98 08:30 Date Received: 10/28/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Review d

2,4-Dinitrotoluene	ND	27000	ug/kg	SW846 8270C
2,6-Dinitrotoluene	ND	27000	ug/kg	SW846 8270C
Fluoranthene	ND	27000	ug/kg	SW846 8270C
Fluorene	ND	27000	ug/kg	SW846 8270C
Hexachlorobenzene	ND	27000	ug/kg	SW846 8270C
Hexachlorocyclopentadiene	ND	27000	ug/kg	SW846 8270C
Hexachloroethane	ND	130000	ug/kg	SW846 8270C
Hexachloroethane	ND	27000	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	ND	27000	ug/kg	SW846 8270C
Isophorone	ND	27000	ug/kg	SW846 8270C
2-Methylnaphthalene	ND	27000	ug/kg	SW846 8270C
2-Methylphenol	ND	27000	ug/kg	SW846 8270C
Naphthalene	ND	27000	ug/kg	SW846 8270C
2-Nitroaniline	ND	130000	ug/kg	SW846 8270C
3-Nitroaniline	ND	130000	ug/kg	SW846 8270C
4-Nitroaniline	ND	130000	ug/kg	SW846 8270C
Nitrobenzene	ND	27000	ug/kg	SW846 8270C
2-Nitrophenol	ND	27000	ug/kg	SW846 8270C
4-Nitrophenol	ND	130000	ug/kg	SW846 8270C
N-Nitrosodimethylpropylamine	ND	27000	ug/kg	SW846 8270C
N-Nitrosodiphenylamine	ND	27000	ug/kg	SW846 8270C
1,2,4-Trichlorophenol	ND	130000	ug/kg	SW846 8270C
Phenanthrene	ND	27000	ug/kg	SW846 8270C
Phenol	ND	27000	ug/kg	SW846 8270C
Pyrene	ND	27000	ug/kg	SW846 8270C
1,2,4-Trichlorobenzene	ND	27000	ug/kg	SW846 8270C
2,4,5-Trichlorophenol	ND	27000	ug/kg	SW846 8270C
2,4,6-Trichlorophenol	ND	27000	ug/kg	SW846 8270C
3-Methylphenol & 4-Methylphenol	ND	27000	ug/kg	SW846 8270C
2-Methyl-4,6-dinitrophenol	ND	130000	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	ND	27000	ug/kg	SW846 8270C
Carbazole	ND	27000	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

J. Exceeded result. Result is less than RL.

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

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 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech BUS, Inc PAGE 7
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

Lot #: C8J290162

PARAMETER	RESULT	LIMIT	UNITS	ANALYTICAL REPORTING METHOD
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Client Sample ID: W-1B-WA01

Sample #: 002 Date Sampled: 10/27/98 08:30 Date Received: 10/28/98 Matrix: SOLID

Inorganic Analysis				Reviewed
Total Residue as	49.5		†	MCAWW 160.3 MOD
Percent Solids				

Client Sample ID: W-1B-WA02

Sample #: 003 Date Sampled: 10/27/98 08:42 Date Received: 10/28/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed

Silver	406	10.4	mg/kg	SW846 6010B
Arsenic	ND	10.4	mg/kg	SW846 6010B
Cadmium	62.2	5.2	mg/kg	SW846 6010B
Chromium	11000	10.4	mg/kg	SW846 6010B
Lead	110	3.1	mg/kg	SW846 6010B
Antimony	7.9 BN*	10.4	mg/kg	SW846 6010B
Selenium	ND	5.2	mg/kg	SW846 6010B
Thallium	19.7	10.4	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals Reviewed

Aluminum	3320	41.7	mg/kg	SW846 6010B
Barium	234	41.7	mg/kg	SW846 6010B
Beryllium	0.22 B	1	mg/kg	SW846 6010B
Calcium	138000	5210	mg/kg	SW846 6010B
Cobalt	53.2	10.4	mg/kg	SW846 6010B
Copper	435	26	mg/kg	SW846 6010B
Iron	210000	104	mg/kg	SW846 6010B
Potassium	98.6 B	1040	mg/kg	SW846 6010B
Magnesium	2920	1040	mg/kg	SW846 6010B
Manganese	810 B	15.6	mg/kg	SW846 6010B
Sodium	159 B	1040	mg/kg	SW846 6010B
Nickel	37.7	8.3	mg/kg	SW846 6010B
Vanadium	22.7	10.4	mg/kg	SW846 6010B
Zinc	337 B	20.8	mg/kg	SW846 6010B

Mercury in Solid Waste (Manual Cold-Vapor) Reviewed

Mercury	1.7	0.21	mg/kg	SW846 7471A
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QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C6J290162 Tetra Tech **NUS, Inc** PAGE 8
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA02

Sample #: 003 Date Sampled: 10/27/98 08:42 Date Received: 10/28/98 Matrix: SOLID

Mercury in Solid Waste (Manual Cold-Vapor)

Reviewed

B Estimated result. Result is less than RL.

N Spiked analyte recovery is outside stated control limits.

Organochlorine Pesticides

In Review

Aldrin	ND	18	ug/kg	SW846 8081A
alpha-BHC	ND	18	ug/kg	SW846 8081A
beta-BHC	ND	18	ug/kg	SW846 8081A
delta-BHC	ND	18	ug/kg	SW846 8081A
gamma-BHC (Lindane)	ND	18	ug/kg	SW846 8081A
alpha-Chlordane	ND	18	ug/kg	SW846 8081A
gamma-Chlordane	ND	18	ug/kg	SW846 8081A
4,4'-DDD	1000	18	ug/kg	SW846 8081A
4,4'-DDE	170	18	ug/kg	SW846 8081A
4,4'-DDT	39	18	ug/kg	SW846 8081A
Dieldrin	ND	18	ug/kg	SW846 8081A
Endosulfan I	ND	18	ug/kg	SW846 8081A
Endosulfan II	ND	18	ug/kg	SW846 8081A
Endrin ketone	ND	18	ug/kg	SW846 8081A
Endosulfan sulfate	ND	18	ug/kg	SW846 8081A
Endrin	ND	18	ug/kg	SW846 8081A
Endrin aldehyde	ND	18	ug/kg	SW846 8081A
Heptachlor	ND	18	ug/kg	SW846 8081A
Heptachlor epoxide	ND	18	ug/kg	SW846 8081A
Toxaphene	ND	700	ug/kg	SW846 8081A
Methoxychlor	ND	180	ug/kg	SW846 8081A

Sample need reanalyzed at a dilution

Results and reporting limits have been adjusted for dry weight.

PCBs

Reviewed

Aroclor 1016	ND	340	ug/kg	SW846 8082
Aroclor 1221	ND	340	ug/kg	SW846 8082
Aroclor 1232	ND	340	ug/kg	SW846 8082
Aroclor 1242	1400	340	ug/kg	SW846 8082
Aroclor 1248	ND	340	ug/kg	SW846 8082

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 Tetra Tech **WUS, Inc** PAGE 9
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: **W-1B-WA02**

Sample #: 003 Date Sampled: 10/27/98 08:42 Date Received: 10/28/98 Matrix: SOLID

PCBs

Aroclor 1254	ND	340	ug/kg	SW846 8082
Aroclor 1260	660	340	ug/kg	SW846 8082

Review d

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS

Acetone	80	47	ug/kg	SW846 8260B
Benzene	ND	12	ug/kg	SW846 8260B
Bromodichloromethane	ND	12	ug/kg	SW846 8260B
Bromoform	ND	12	ug/kg	SW846 8260B
Bromomethane	ND	23	ug/kg	SW846 8260B
2-Butanone	ND	47	ug/kg	SW846 8260B
Carbon disulfide	11 J	12	ug/kg	SW846 8260B
Carbon tetrachloride	ND	12	ug/kg	SW846 8260B
Chlorobenzene	ND	12	ug/kg	SW846 8260B
Dibromochloromethane	ND	12	ug/kg	SW846 8260B
Chloroethane	ND	23	ug/kg	SW846 8260B
Chloroform	ND	12	ug/kg	SW846 8260B
Chloromethane	ND	23	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	12	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	12	ug/kg	SW846 8260B
1,1-Dichloroethene	ND	12	ug/kg	SW846 8260B
1,2-Dichloroethene	ND	12	ug/kg	SW846 8260B
(total)				
1,2-Dichloropropane	ND	12	ug/kg	SW846 8260B
cis-1,3-Dichloropropene	ND	12	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	12	ug/kg	SW846 8260B
Ethylbenzene	ND	12	ug/kg	SW846 8260B
2-Hexanone	ND	47	ug/kg	SW846 8260B
Methylene chloride	ND	12	ug/kg	SW846 8260B
4-Methyl-2-pentanone	ND	47	ug/kg	SW846 8260B
Styrene	ND	12	ug/kg	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	12	ug/kg	SW846 8260B
Tetrachloroethene	40 B	12	ug/kg	SW846 8260B
Toluene	ND	12	ug/kg	SW846 8260B
1,1,1-Trichloroethane	ND	12	ug/kg	SW846 8260B

Reviewed

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 **Tetra Tech BUS, Inc** PAGE 10
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA02

Sample #: 003 Date Sampled: 10/27/98 08:42 Date Received: 10/28/98 Matrix: SOLID

Volatile Organics by GC/MS

Reviewed

1,1,2-Trichloroethane	ND	12	ug/kg	SW846 8260B
Trichloroethene	ND	12	ug/kg	SW846 8260B
Vinyl chloride	ND	23	ug/kg	SW846 8260B
Xylenes (total)	ND	12	ug/kg	SW846 8260B

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Volatile Organics by GC/MS

Reviewed

Acetone	ND	46	ug/kg	SW846 8260B
Benzene	ND	11	ug/kg	SW846 8260B
Bromodichloromethane	ND	11	ug/kg	SW846 8260B
Bromoform	ND	11	ug/kg	SW846 8260B
Bromomethane	ND	23	ug/kg	SW846 8260B
2-Butanone	ND	46	ug/kg	SW846 8260B
Carbon disulfide	ND	11	ug/kg	SW846 8260B
Carbon tetrachloride	ND	11	ug/kg	SW846 8260B
Chlorobenzene	ND	11	ug/kg	SW846 8260B
Dibromochloromethane	ND	11	ug/kg	SW846 8260B
Chloroethane	ND	23	ug/kg	SW846 8260B
Chloroform	ND	11	ug/kg	SW846 8260B
Chloromethane	ND	23	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	11	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	11	ug/kg	SW846 8260B
1,1-Dichloroethene	ND	11	ug/kg	SW846 8260B
1,2-Dichloroethene	ND	11	ug/kg	SW846 8260B
(total)				
1,2-Dichloropropane	ND	11	ug/kg	SW846 8260B
cis-1,3-Dichloropropene	ND	11	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	11	ug/kg	SW846 8260B
Ethylbenzene	ND	11	ug/kg	SW846 8260B
2-Hexanone	ND	46	ug/kg	SW846 8260B
Methylene chloride	ND	11	ug/kg	SW846 8260B
4-Methyl-2-pentanone	ND	46	ug/kg	SW846 8260B
Styrene	ND	11	ug/kg	SW846 8260B

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 **Tetra Tech HUS, Inc** **PAGE 11**
 NAWC WARMINSTER, PENNSYLVANIA **Date Reported: 11/09/98**
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: W-1B-WA02

Sample #: 003 Date Sampled: 10/27/98 08:42 Date Received: 10/28/98 Matrix: SOLID

Volatile Organics by GC/MS

1,1,2,2-Tetrachloroethane	ND	11	ug/kg	SW846 8260B
Tetrachloroethene	21 B	11	ug/kg	SW846 8260B
Toluene	ND	11	ug/kg	SW846 8260B
1,1,1-Trichloroethane	ND	11	ug/kg	SW846 8260B
1,1,2-Trichloroethane	ND	11	ug/kg	SW846 8260B
Trichloroethene	ND	11	ug/kg	SW846 8260B
Vinyl chloride	ND	23	ug/kg	SW846 8260B
Xylenes (total)	ND	11	ug/kg	SW846 8260B

Reviewed

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Semivolatile Organic Compounds by GC/MS

Acenaphthene	ND	690	ug/kg	SW846 8270C
Acenaphthylene	ND	690	ug/kg	SW846 8270C
Anthracene	ND	690	ug/kg	SW846 8270C
Benzo (a) anthracene	54 J	690	ug/kg	SW846 8270C
Benzo (b) fluoranthene	ND	690	ug/kg	SW846 8270C
Benzo (k) fluoranthene	ND	690	ug/kg	SW846 8270C
Benzo (ghi) perylene	ND	690	ug/kg	SW846 8270C
Benzo (a) pyrene	ND	690	ug/kg	SW846 8270C
bis (2-Chloroethoxy) methane	ND	690	ug/kg	SW846 8270C
bis (2-Chloroethyl) ether	ND	690	ug/kg	SW846 8270C
2,2'-oxybis (1-Chloropropane)	ND	690	ug/kg	SW846 8270C
bis (2-Ethylhexyl) phthalate	1200	690	ug/kg	SW846 8270C
4-Bromophenyl phenyl ether	ND	690	ug/kg	SW846 8270C
Butyl benzyl phthalate	ND	690	ug/kg	SW846 8270C
4-Chloroaniline	ND	690	ug/kg	SW846 8270C
4-Chloro-3-methylphenol	ND	690	ug/kg	SW846 8270C
2-Chloronaphthalene	ND	690	ug/kg	SW846 8270C
2-Chlorophenol	ND	690	ug/kg	SW846 8270C
4-Chlorophenyl phenyl ether	ND	690	ug/kg	SW846 8270C

Reviewed

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 **Tetra Tech NUS, Inc** PAGE 14
 NAWC WARMINSTER, PENNSYLVANIA **Date Reported:** 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA03

Sample #: 004 Date Sampled: 10/27/98 08:52 Date Received: 10/28/98 Matrix: SOLID

Barium	49.8	28.3	mg/kg	SW846 6010B
Beryllium	0.34 B	0.71	mg/kg	SW846 6010B
Calcium	8610	708	mg/kg	SW846 6010B
Cobalt	4.2 B	7.1	mg/kg	SW846 6010B
Copper	6.7	3.5	mg/kg	SW846 6010B
Iron	12700	14.2	mg/kg	SW846 6010B
Potassium	840	708	mg/kg	SW846 6010B
Magnesium	2530	708	mg/kg	SW846 6010B
Manganese	307 B	2.1	mg/kg	SW846 6010B
Sodium	56.3 B	708	mg/kg	SW846 6010B
Nickel	5.7	5.7	mg/kg	SW846 6010B
Vanadium	11.4	7.1	mg/kg	SW846 6010B
Zinc	21.0 B	2.8	mg/kg	SW846 6010B

Mercury in Solid Waste (Manual Cold-Vapor)

Review d

Mercury	ND	0.14	mg/kg	SW846 7471A
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B Estimated result. Result is less than RL.

N Spiked analyte recovery is outside stated control limits.

Organochlorine Pesticides

Aldrin	ND	2.4	ug/kg	SW846 8081A
alpha-BHC	ND	2.4	ug/kg	SW846 8081A
beta-BHC	ND	2.4	ug/kg	SW846 8081A
delta-BHC	ND	2.4	ug/kg	SW846 8081A
gamma-BHC (Lindane)	ND	2.4	ug/kg	SW846 8081A
alpha-Chlordane	ND	2.4	ug/kg	SW846 8081A
gamma-Chlordane	ND	2.4	ug/kg	SW846 8081A
4,4'-DDD	13	2.4	ug/kg	SW846 8081A
4,4'-DDE	13	2.4	ug/kg	SW846 8081A
4,4'-DDT	ND	2.4	ug/kg	SW846 8081A
Dieldrin	3.1	2.4	ug/kg	SW846 8081A
Endosulfan I	ND	2.4	ug/kg	SW846 8081A
Endosulfan II	ND	2.4	ug/kg	SW846 8081A
Endrin ketone	ND	2.4	ug/kg	SW846 8081A
Endosulfan sulfate	ND	2.4	ug/kg	SW846 8081A
Endrin	ND	2.4	ug/kg	SW846 8081A

In Review

Reviewed
11/9/98

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C3J290162 Tetra Tech **RUS, Inc** PAGE 16
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA03

Sample #: 004 Date Sampled: 10/27/98 08:52 Date Received: 10/28/98 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
1,1-Dichloroethene	ND	11	ug/kg	SW846 8260B	
1,2-Dichloroethene (total)	ND	11	ug/kg	SW846 8260B	
1,2-Dichloropropane	ND	11	ug/kg	SW846 8260B	
cis-1,3-Dichloropropene	ND	11	ug/kg	SW846 8260B	
trans-1,3-Dichloropropene	ND	11	ug/kg	SW846 8260B	
Ethylbenzene	ND	11	ug/kg	SW846 8260B	
2-Hexanone	ND	43	ug/kg	SW846 8260B	
Methylene chloride	ND	11	ug/kg	SW846 8260B	
4-Methyl-2-pentanone	ND	43	ug/kg	SW846 8260B	
Styrene	ND	11	ug/kg	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	11	ug/kg	SW846 8260B	
Tetrachloroethene	4.7 J,B	11	ug/kg	SW846 8260B	
Toluene	4.7 J	11	ug/kg	SW846 8260B	
1,1,1-Trichloroethane	ND	11	ug/kg	SW846 8260B	
1,1,2-Trichloroethane	ND	11	ug/kg	SW846 8260B	
Trichloroethene	ND	11	ug/kg	SW846 8260B	
Vinyl chloride	ND	22	ug/kg	SW846 8260B	
Xylenes (total)	ND	11	ug/kg	SW846 8260B	

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					Reviewed
Acenaphthene	ND	120000	ug/kg	SW846 8270C	
Acenaphthylene	ND	120000	ug/kg	SW846 8270C	
Anthracene	ND	120000	ug/kg	SW846 8270C	
Benzo(a)anthracene	ND	120000	ug/kg	SW846 8270C	
Benzo(b)fluoranthene	ND	120000	ug/kg	SW846 8270C	
Benzo(k)fluoranthene	ND	120000	ug/kg	SW846 8270C	
Benzo(ghi)perylene	ND	120000	ug/kg	SW846 8270C	
Benzo(a)pyrene	ND	120000	ug/kg	SW846 8270C	
bis(2-Chloroethoxy) methane	ND	120000	ug/kg	SW846 8270C	
bis(2-Chloroethyl) ether	ND	120000	ug/kg	SW846 8270C	

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 Tetra Tech NUS, Inc PAGE 18
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA03
 Sample #: 004 Date Sampled: 10/27/98 08:52 Date Received: 10/28/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS					Reviewed
Naphthalene	ND	120000	ug/kg	SW846 8270C	
2-Nitroaniline	ND	570000	ug/kg	SW846 8270C	
3-Nitroaniline	ND	570000	ug/kg	SW846 8270C	
4-Nitroaniline	ND	570000	ug/kg	SW846 8270C	
Nitrobenzene	ND	120000	ug/kg	SW846 8270C	
2-Nitrophenol	ND	120000	ug/kg	SW846 8270C	
4-Nitrophenol	ND	570000	ug/kg	SW846 8270C	
N-Nitrosodi-n-propylamine	ND	120000	ug/kg	SW846 8270C	
N-Nitrosodiphenylamine	ND	120000	ug/kg	SW846 8270C	
Pentachlorophenol	ND	570000	ug/kg	SW846 8270C	
Phenanthrene	ND	120000	ug/kg	SW846 8270C	
Phenol	ND	120000	ug/kg	SW846 8270C	
Pyren	ND	120000	ug/kg	SW846 8270C	
1,2,4-Trichlorobenzene	ND	120000	ug/kg	SW846 8270C	
2,4,5-Trichlorophenol	ND	120000	ug/kg	SW846 8270C	
2,4,6-Trichlorophenol	ND	120000	ug/kg	SW846 8270C	
3-Methylphenol & 4-Methylphenol	ND	120000	ug/kg	SW846 8270C	
2-Methyl-4,6-dinitrophenol	ND	570000	ug/kg	SW846 8270C	
Dibenz(a,h)anthracene	ND	120000	ug/kg	SW846 8270C	
Carbazole	ND	120000	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	70.6	t	MCANW 160.3 MOD	

Client Sample ID: W-1B-WA04
 Sample #: 005 Date Sampled: 10/27/98 10:27 Date Received: 10/28/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	15.9	1.3	mg/kg	SW846 6010B

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 Tetra Tech HUS, Inc PAGE 19
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA04

Sample #: 005 Date Sampled: 10/27/98 10:27 Date Received: 10/28/98 Matrix: SOLID

Arsenic	1.5	1.3	mg/kg	SW846 6010B
Cadmium	3.4	0.63	mg/kg	SW846 6010B
Chromium	554	1.3	mg/kg	SW846 6010B
Lead	31.6	0.38	mg/kg	SW846 6010B
Antimony	0.92 <i>EN*</i>	1.3	mg/kg	SW846 6010B
Selenium	ND	0.63	mg/kg	SW846 6010B
Thallium	3.9	1.3	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals

Aluminum	14500	25.2	mg/kg	SW846 6010B
Barium	86.2	25.2	mg/kg	SW846 6010B
Beryllium	1.7	0.63	mg/kg	SW846 6010B
Calcium	7380	629	mg/kg	SW846 6010B
Cobalt	16.3	6.3	mg/kg	SW846 6010B
Copper	27.4	3.1	mg/kg	SW846 6010B
Iron	41300	12.6	mg/kg	SW846 6010B
Potassium	3300	629	mg/kg	SW846 6010B
Magnesium	4260	629	mg/kg	SW846 6010B
Manganese	327 <i>H</i>	1.9	mg/kg	SW846 6010B
Sodium	141 <i>B</i>	629	mg/kg	SW846 6010B
Nickel	28.7	5	mg/kg	SW846 6010B
Vanadium	18.7	6.3	mg/kg	SW846 6010B
Zinc	127 <i>H</i>	2.5	mg/kg	SW846 6010B

Reviewed

Mercury in Solid Waste (Manual Cold-Vapor)

Mercury	ND	0.13	mg/kg	SW846 7471A
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Reviewed

N Spiked analyte recovery is outside stated control limits.

B Estimated result. Result is less than RL.

Organochlorine Pesticides

Aldrin	ND	2.1	ug/kg	SW846 8081A
alpha-BHC	ND	2.1	ug/kg	SW846 8081A
beta-BHC	ND	2.1	ug/kg	SW846 8081A
delta-BHC	ND	2.1	ug/kg	SW846 8081A
gamma-BHC (Lindane)	ND	2.1	ug/kg	SW846 8081A
alpha-Chlordane	ND	2.1	ug/kg	SW846 8081A

In Review

Reviewed
11/9/98

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS, Inc PAGE 20

Lot #: C6J290162 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98

Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: **W-1B-WA04**

Sample #: 005 Date Sampled: 10/27/98 10:27 Date Received: 10/28/98 Matrix: SOLID

Organochlorine Pesticides

In Review
Reviewed
11/9/98

gamma-Chlordane	ND	2.1	ug/kg	SW846 8081A
4,4'-DDD	29	2.1	ug/kg	SW846 8081A
4,4'-DDE	6.4	2.1	ug/kg	SW846 8081A
4,4'-DDT	ND	2.1	ug/kg	SW846 8081A
Dieldrin	ND	2.1	ug/kg	SW846 8081A
Endosulfan I	ND	2.1	ug/kg	SW846 8081A
Endosulfan II	ND	2.1	ug/kg	SW846 8081A
Endrin ketone	ND	2.1	ug/kg	SW846 8081A
Endosulfan sulfate	ND	2.1	ug/kg	SW846 8081A
Endrin	ND	2.1	ug/kg	SW846 8081A
Endrin aldehyde	ND	2.1	ug/kg	SW846 8081A
Heptachlor	ND	2.1	ug/kg	SW846 8081A
Heptachlor epoxide	ND	2.1	ug/kg	SW846 8081A
Toxaphene	ND	84	ug/kg	SW846 8081A
Methoxychlor	ND	21	ug/kg	SW846 8081A

Results and reporting limits have been adjusted for dry weight.

PCBs

Reviewed

Aroclor 1016	ND	42	ug/kg	SW846 8082
Aroclor 1221	ND	42	ug/kg	SW846 8082
Aroclor 1232	ND	42	ug/kg	SW846 8082
Aroclor 1242	72	42	ug/kg	SW846 8082
Aroclor 1248	ND	42	ug/kg	SW846 8082
Aroclor 1254	ND	42	ug/kg	SW846 8082
Aroclor 1260	ND	42	ug/kg	SW846 8082

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS

Reviewed

Acetone	5.6 J	20	ug/kg	SW846 8260B
Benzene	ND	5.1	ug/kg	SW846 8260B
Bromodichloromethane	ND	5.1	ug/kg	SW846 8260B
Bromoform	ND	5.1	ug/kg	SW846 8260B
Bromomethane	ND	10	ug/kg	SW846 8260B

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 Tetra Tech NUS, Inc PAGE 22
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA04

Sample #: 005 Date Sampled: 10/27/98 10:27 Date Received: 10/28/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Reviewed

Acenaphthylene	ND	420	ug/kg	SW846 8270C
Anthracene	ND	420	ug/kg	SW846 8270C
Benzo(a)anthracene	ND	420	ug/kg	SW846 8270C
Benzo(b)fluoranthene	ND	420	ug/kg	SW846 8270C
Benzo(k)fluoranthene	ND	420	ug/kg	SW846 8270C
Benzo(ghi)perylene	ND	420	ug/kg	SW846 8270C
Benzo(a)pyrene	ND	420	ug/kg	SW846 8270C
bis(2-Chloroethoxy) methane	ND	420	ug/kg	SW846 8270C
bis(2-Chloroethyl) ether	ND	420	ug/kg	SW846 8270C
2,2'-oxybis(1-Chloropropane)	ND	420	ug/kg	SW846 8270C
bis(2-Ethylhexyl) phthalate	130 J	420	ug/kg	SW846 8270C
4-Bromophenyl phenyl ether	ND	420	ug/kg	SW846 8270C
Butyl benzyl phthalate	ND	420	ug/kg	SW846 8270C
4-Chloroaniline	ND	420	ug/kg	SW846 8270C
4-Chloro-3-methylphenol	ND	420	ug/kg	SW846 8270C
2-Chloronaphthalene	ND	420	ug/kg	SW846 8270C
2-Chlorophenol	ND	420	ug/kg	SW846 8270C
4-Chlorophenyl phenyl ether	ND	420	ug/kg	SW846 8270C
Chrysene	ND	420	ug/kg	SW846 8270C
Dibenzofuran	ND	420	ug/kg	SW846 8270C
Di-n-butyl phthalate	ND	420	ug/kg	SW846 8270C
1,2-Dichlorobenzene	ND	420	ug/kg	SW846 8270C
1,3-Dichlorobenzene	ND	420	ug/kg	SW846 8270C
1,4-Dichlorobenzene	ND	420	ug/kg	SW846 8270C
3,3'-Dichlorobenzidine	ND	2000	ug/kg	SW846 8270C
2,4-Dichlorophenol	ND	420	ug/kg	SW846 8270C
Diethyl phthalate	ND	420	ug/kg	SW846 8270C
2,4-Dimethylphenol	ND	420	ug/kg	SW846 8270C
Dimethyl phthalate	ND	420	ug/kg	SW846 8270C
Di-n-octyl phthalate	ND	420	ug/kg	SW846 8270C
2,4-Dinitrophenol	ND	2000	ug/kg	SW846 8270C
2,4-Dinitrotoluene	ND	420	ug/kg	SW846 8270C
2,6-Dinitrotoluene	ND	420	ug/kg	SW846 8270C

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 **Tetra Tech HUB, Inc** **PAGE 24**
 NAWC WARMINSTER, PENNSYLVANIA **Date Reported: 11/09/98**
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA04

Sample #: 005 Date Sampled: 10/27/98 10:27 Date Received: 10/28/98 Matrix: SOLID

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	79.5		MCWW 160.3 MOD	

Client Sample ID: W-1B-WA05

Sample #: 006 Date Sampled: 10/27/98 10:47 Date Received: 10/28/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed

Silver	4.3	1.3	mg/kg	SW846 6010B
Arsenic	3.6	1.3	mg/kg	SW846 6010B
Cadmium	1.6	0.67	mg/kg	SW846 6010B
Chromium	153	1.3	mg/kg	SW846 6010B
Lead	17.7	0.4	mg/kg	SW846 6010B
Antimony	0.59 BF*	1.3	mg/kg	SW846 6010B
Selenium	ND	0.67	mg/kg	SW846 6010B
Thallium	2.6	1.3	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals Reviewed

Aluminum	18400	26.7	mg/kg	SW846 6010B
Barium	82.4	26.7	mg/kg	SW846 6010B
Beryllium	0.80	0.67	mg/kg	SW846 6010B
Calcium	3030	668	mg/kg	SW846 6010B
Cobalt	11.7	6.7	mg/kg	SW846 6010B
Copper	14.4	3.3	mg/kg	SW846 6010B
Iron	28600	13.4	mg/kg	SW846 6010B
Potassium	1200	668	mg/kg	SW846 6010B
Magnesium	1870	668	mg/kg	SW846 6010B
Manganese	142 B	2	mg/kg	SW846 6010B
Sodium	90.1 B	668	mg/kg	SW846 6010B
Nickel	13.9	5.3	mg/kg	SW846 6010B
Vanadium	35.5	6.7	mg/kg	SW846 6010B
Zinc	60.9 B	2.7	mg/kg	SW846 6010B

Mercury in Solid Waste (Manual Cold-Vapor)				Reviewed
Mercury	0.12	0.13	mg/kg	SW846 7471A

QUANTERRA INCORPORATED PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the customer.

Lot #: C8J290162 **Tetra Tech HUS, Inc** PAGE 25
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA05

Sample #: 006 Date Sampled: 10/27/98 10:47 Date Received: 10/28/98 Matrix: SOLID

Mercury in Solid Waste (Manual Cold-Vapor)

Reviewed

N Spiked analyte recovery is outside stated control limits.

B Estimated result. Result is less than RL.

Organochlorine Pesticides

Aldrin	ND	2.3	ug/kg	SW846 8081A
alpha-BHC	ND	2.3	ug/kg	SW846 8081A
beta-BHC	ND	2.3	ug/kg	SW846 8081A
delta-BHC	ND	2.3	ug/kg	SW846 8081A
gamma-BHC (Lindane)	ND	2.3	ug/kg	SW846 8081A
alpha-Chlordane	ND	2.3	ug/kg	SW846 8081A
gamma-Chlordane	ND	2.3	ug/kg	SW846 8081A
4,4'-DDD	ND	2.3	ug/kg	SW846 8081A
4,4'-DDE	ND	2.3	ug/kg	SW846 8081A
4,4'-DDT	ND	2.3	ug/kg	SW846 8081A
Dieldrin	ND	2.3	ug/kg	SW846 8081A
Endosulfan I	ND	2.3	ug/kg	SW846 8081A
Endosulfan II	ND	2.3	ug/kg	SW846 8081A
Endrin ketone	ND	2.3	ug/kg	SW846 8081A
Endosulfan sulfate	ND	2.3	ug/kg	SW846 8081A
Endrin	ND	2.3	ug/kg	SW846 8081A
Endrin aldehyde	ND	2.3	ug/kg	SW846 8081A
Heptachlor	ND	2.3	ug/kg	SW846 8081A
Heptachlor epoxide	ND	2.3	ug/kg	SW846 8081A
Toxaphene	ND	89	ug/kg	SW846 8081A
Methoxychlor	ND	23	ug/kg	SW846 8081A

In Review
Reviewed
11/19/98

Results and reporting limits have been adjusted for dry weight.

PCBs

Aroclor 1016	ND	44	ug/kg	SW846 8082
Aroclor 1221	ND	44	ug/kg	SW846 8082
Aroclor 1232	ND	44	ug/kg	SW846 8082
Aroclor 1242	110	44	ug/kg	SW846 8082
Aroclor 1248	ND	44	ug/kg	SW846 8082

Reviewed

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the user.

Lot #: C8J290162 Tetra Tech HUS, Inc PAGE 29
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-WA05

Sample #: 006 Date Sampled: 10/27/98 10:47 Date Received: 10/28/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

2,4,6-Trichlorophenol	ND	440	ug/kg	SW846 8270C	Reviewed
3-Methylphenol & 4-Methylphenol	ND	440	ug/kg	SW846 8270C	
2-Methyl-4,6-dinitrophenol	ND	2100	ug/kg	SW846 8270C	
Dibenz(a,h)anthracene	ND	440	ug/kg	SW846 8270C	
Carbazole	ND	440	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis

Total Residue as Percent Solids	74.9			MCAW 160.3 MOD	Review d
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Client Sample ID: W-1B-102798

Sample #: 007 Date Sampled: 10/27/98 10:47 Date Received: 10/28/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	21.5	1.3	mg/kg	SW846 6010B	Reviewed
Arsenic	4.0	1.3	mg/kg	SW846 6010B	
Cadmium	5.8	0.66	mg/kg	SW846 6010B	
Chromium	651	1.3	mg/kg	SW846 6010B	
Lead	26.5	0.4	mg/kg	SW846 6010B	
Antimony	0.86 BB*	1.3	mg/kg	SW846 6010B	
Selenium	ND	0.66	mg/kg	SW846 6010B	
Thallium	3.4	1.3	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals

Aluminum	13600	26.6	mg/kg	SW846 6010B	Reviewed
Barium	84.8	26.6	mg/kg	SW846 6010B	
Beryllium	0.71	0.66	mg/kg	SW846 6010B	
Calcium	9230	664	mg/kg	SW846 6010B	
Cobalt	12.8	6.6	mg/kg	SW846 6010B	

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 **Tetra Tech NUS, Inc** PAGE 30
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: W-1B-102798

Sample #: 007 Date Sampled: 10/27/98 10:47 Date Received: 10/28/98 Matrix: SOLID

Copper	36.6	3.3	mg/kg	SW846 6010B
Iron	32800	13.3	mg/kg	SW846 6010B
Potassium	984	664	mg/kg	SW846 6010B
Magnesium	2040	664	mg/kg	SW846 6010B
Manganese	420 B	2	mg/kg	SW846 6010B
Sodium	80.9 B	664	mg/kg	SW846 6010B
Nickel	16.3	5.3	mg/kg	SW846 6010B
Vanadium	28.9	6.6	mg/kg	SW846 6010B
Zinc	125 N	2.7	mg/kg	SW846 6010B

Mercury in Solid Waste (Manual Cold-Vapor)

Mercury	0.08	0.13	mg/kg	SW846 7471A	Reviewed
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N Spiked analyte recovery is outside stated control limits.

B Estimated result. Result is less than RL.

Organochlorine Pesticides

Aldrin	ND	2.3	ug/kg	SW846 8081A
alpha-BHC	ND	2.3	ug/kg	SW846 8081A
beta-BHC	ND	2.3	ug/kg	SW846 8081A
delta-BHC	ND	2.3	ug/kg	SW846 8081A
gamma-BHC (Lindane)	ND	2.3	ug/kg	SW846 8081A
alpha-Chlordane	ND	2.3	ug/kg	SW846 8081A
gamma-Chlordane	ND	2.3	ug/kg	SW846 8081A
1,1'-DDE	33	2.3	ug/kg	SW846 8081A
1,1'-DDE	18	2.3	ug/kg	SW846 8081A
1,1'-DDT	8.4	2.3	ug/kg	SW846 8081A
Dieldrin	ND	2.3	ug/kg	SW846 8081A
Endosulfan I	ND	2.3	ug/kg	SW846 8081A
Endosulfan II	ND	2.3	ug/kg	SW846 8081A
Endrin ketone	ND	2.3	ug/kg	SW846 8081A
Endosulfan sulfate	ND	2.3	ug/kg	SW846 8081A
Endrin	ND	2.3	ug/kg	SW846 8081A
Endrin aldehyde	ND	2.3	ug/kg	SW846 8081A
Heptachlor	ND	2.3	ug/kg	SW846 8081A
Heptachlor epoxide	ND	2.3	ug/kg	SW846 8081A
Toxaphene	ND	89	ug/kg	SW846 8081A

In Review

Reviewed
11/9/98
VJB

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 **Tetra Tech HUS, Inc** **PAGE 31**
 NAWC WARMINSTER, PENNSYLVANIA **Date Reported: 11/09/98**
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: W-1B-102798

Sample #: 007 Date Sampled: 10/27/98 10:47 Date Received: 10/28/98 Matrix: SOLID

Organochlorine Pesticides

Methoxychlor	ND	23	ug/kg	SW846 8081A
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In Review
[Signature]

Results and reporting limits have been adjusted for dry weight.

PCBs

Aroclor 1016	ND	44	ug/kg	SW846 8082
Aroclor 1221	ND	44	ug/kg	SW846 8082
Aroclor 1232	ND	44	ug/kg	SW846 8082
Aroclor 1242	150	44	ug/kg	SW846 8082
Aroclor 1248	ND	44	ug/kg	SW846 8082
Aroclor 1254	ND	44	ug/kg	SW846 8082
Aroclor 1260	ND	44	ug/kg	SW846 8082

R viewed

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS

Acetone	9.6 J	24	ug/kg	SW846 8260B
Benzene	ND	6.0	ug/kg	SW846 8260B
Bromodichloromethane	ND	6.0	ug/kg	SW846 8260B
Bromoform	ND	6.0	ug/kg	SW846 8260B
Bromomethane	ND	12	ug/kg	SW846 8260B
2-Butanone	ND	24	ug/kg	SW846 8260B
Carbon disulfide	ND	6.0	ug/kg	SW846 8260B
Carbon tetrachloride	ND	6.0	ug/kg	SW846 8260B
Chlorobenzene	ND	6.0	ug/kg	SW846 8260B
Dibromochloromethane	ND	6.0	ug/kg	SW846 8260B
Chloroethane	ND	12	ug/kg	SW846 8260B
Chloroform	ND	6.0	ug/kg	SW846 8260B
Chloromethane	ND	12	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	6.0	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	6.0	ug/kg	SW846 8260B
1,1-Dichloroethene	ND	6.0	ug/kg	SW846 8260B
1,2-Dichloroethene	ND	6.0	ug/kg	SW846 8260B
(total)				
1,2-Dichloropropane	ND	6.0	ug/kg	SW846 8260B

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech EOS, Inc PAGE 32
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Lot #: C8J290162 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-102798

Sample #: 007 Date Sampled: 10/27/98 10:47 Date Received: 10/28/98 Matrix: SOLID

Volatile Organics by GC/MS				Reviewed
cis-1,3-Dichloropropene	ND	6.0	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	6.0	ug/kg	SW846 8260B
Ethylbenzene	ND	6.0	ug/kg	SW846 8260B
2-Hexanone	ND	24	ug/kg	SW846 8260B
Methylene chloride	ND	6.0	ug/kg	SW846 8260B
4-Methyl-2-pentanone	ND	24	ug/kg	SW846 8260B
Styrene	ND	6.0	ug/kg	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	6.0	ug/kg	SW846 8260B
Tetrachloroethane	4.0 J,B	6.0	ug/kg	SW846 8260B
Toluene	2.9 J	6.0	ug/kg	SW846 8260B
1,1,1-Trichloroethane	ND	6.0	ug/kg	SW846 8260B
1,1,2-Trichloroethane	ND	6.0	ug/kg	SW846 8260B
Trichloroethane	ND	6.0	ug/kg	SW846 8260B
Vinyl chloride	ND	12	ug/kg	SW846 8260B
Xylenes (total)	ND	6.0	ug/kg	SW846 8260B

ND = Not detected. Result is less than RL.

RL = Reporting Limit. Reporting limits have been adjusted for dry weight.

BL = Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Semivolatile Organic Compounds by GC/MS				Reviewed
Acenaphthene	ND	440	ug/kg	SW846 8270C
Acenaphthylene	ND	440	ug/kg	SW846 8270C
Anthracene	ND	440	ug/kg	SW846 8270C
Benzo(a)anthracene	ND	440	ug/kg	SW846 8270C
Benzo(b)fluoranthene	ND	440	ug/kg	SW846 8270C
Benzo(k)fluoranthene	ND	440	ug/kg	SW846 8270C
Benzo(ghi)perylene	ND	440	ug/kg	SW846 8270C
Benzo(a)pyrene	ND	440	ug/kg	SW846 8270C
bis(2-Chloroethoxy) methane	ND	440	ug/kg	SW846 8270C
bis(2-Chloroethyl) ether	ND	440	ug/kg	SW846 8270C
2,2'-oxybis(1-Chloropropane)	ND	440	ug/kg	SW846 8270C
bis(2-Ethylhexyl) phthalate	980	440	ug/kg	SW846 8270C
4-Bromophenyl phenyl ether	ND	440	ug/kg	SW846 8270C

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: CBJ290162 **Tetra Tech NUS, Inc** PAGE 33
NAWC WARMINSTER, PENNSYLVANIA **Date Reported:** 11/09/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-102798

Sample #: 007 Date Sampled: 10/27/98 10:47 Date Received: 10/28/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Reviewed

Butyl benzyl phthalate	ND	440	ug/kg	SW846 8270C
4-Chloroaniline	ND	440	ug/kg	SW846 8270C
4-Chloro-3-methylphenol	ND	440	ug/kg	SW846 8270C
2-Chloronaphthalene	ND	440	ug/kg	SW846 8270C
2-Chlorophenol	ND	440	ug/kg	SW846 8270C
4-Chlorophenyl phenyl ether	ND	440	ug/kg	SW846 8270C
Chrysene	ND	440	ug/kg	SW846 8270C
Dibenzofuran	ND	440	ug/kg	SW846 8270C
Di-n-butyl phthalate	ND	440	ug/kg	SW846 8270C
1,2-Dichlorobenzene	ND	440	ug/kg	SW846 8270C
1,3-Dichlorobenzene	ND	440	ug/kg	SW846 8270C
1,4-Dichlorobenzene	ND	440	ug/kg	SW846 8270C
3,3'-Dichlorobenzidine	ND	2100	ug/kg	SW846 8270C
2,4-Dichlorophenol	ND	440	ug/kg	SW846 8270C
Diethyl phthalate	ND	440	ug/kg	SW846 8270C
2,4-Dimethylphenol	ND	440	ug/kg	SW846 8270C
Dimethyl phthalate	ND	440	ug/kg	SW846 8270C
Di-n-octyl phthalate	ND	440	ug/kg	SW846 8270C
2,4-Dinitrophenol	ND	2100	ug/kg	SW846 8270C
2,4-Dinitrotoluene	ND	440	ug/kg	SW846 8270C
2,6-Dinitrotoluene	ND	440	ug/kg	SW846 8270C
Fluoranthene	ND	440	ug/kg	SW846 8270C
Fluorene	ND	440	ug/kg	SW846 8270C
Hexachlorobenzene	ND	440	ug/kg	SW846 8270C
Hexachlorobutadiene	ND	440	ug/kg	SW846 8270C
Hexachlorocyclopentadiene	ND	2100	ug/kg	SW846 8270C
Hexachloroethane	ND	440	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	ND	440	ug/kg	SW846 8270C
Isophorone	ND	440	ug/kg	SW846 8270C
2-Methylnaphthalene	ND	440	ug/kg	SW846 8270C
2-Methylphenol	ND	440	ug/kg	SW846 8270C
Naphthalene	ND	440	ug/kg	SW846 8270C
2-Nitroaniline	ND	2100	ug/kg	SW846 8270C
3-Nitroaniline	ND	2100	ug/kg	SW846 8270C
4-Nitroaniline	ND	2100	ug/kg	SW846 8270C
Nitrobenzene	ND	440	ug/kg	SW846 8270C

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 **Tetra Tech EUS, Inc** PAGE 34
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-1B-102798

Sample #: 007 Date Sampled: 10/27/98 10:47 Date Received: 10/28/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Reviewed

2-Nitrophenol	ND	440	ug/kg	SW846 8270C
4-Nitrophenol	ND	2100	ug/kg	SW846 8270C
N-Nitrosodi-n-propylamine	ND	440	ug/kg	SW846 8270C
N-Nitrosodiphenylamine	ND	440	ug/kg	SW846 8270C
Pentachlorophenol	ND	2100	ug/kg	SW846 8270C
Phenanthrene	ND	440	ug/kg	SW846 8270C
Phenol	ND	440	ug/kg	SW846 8270C
Pyrene	ND	440	ug/kg	SW846 8270C
1,2,4-Trichlorobenzene	ND	440	ug/kg	SW846 8270C
2,4,5-Trichlorophenol	ND	440	ug/kg	SW846 8270C
2,4,6-Trichlorophenol	ND	440	ug/kg	SW846 8270C
o-Methylphenol & 4-Methylphenol	ND	440	ug/kg	SW846 8270C
2-Methyl-4,6-dinitrophenol	ND	2100	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	ND	440	ug/kg	SW846 8270C
Carbazole	ND	440	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis
 Total Residue as
 Percent Solids

75.3

±

MCWW 160.3 MOD

Reviewed

Client Sample ID: W-EB-102798

Sample #: 008 Date Sampled: 10/27/98 14:30 Date Received: 10/28/98 Matrix: WATER

Trace Inductively Coupled Plasma (ICP) Metals

Reviewed

Silver	ND	5	ug/L	SW846 6010B
Arsenic	ND	10	ug/L	SW846 6010B
Cadmium	ND	2	ug/L	SW846 6010B
Chromium	ND	10	ug/L	SW846 6010B
Lead	ND	3	ug/L	SW846 6010B

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 Tetra Tech HUS, Inc PAGE 35
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-RB-102798

Sample #: 008 Date Sampled: 10/27/98 14:30 Date Received: 10/28/98 Matrix: WATER

Antimony	ND	10	ug/L	SW846 6010B
Selenium	ND	5	ug/L	SW846 6010B
Thallium	ND	10	ug/L	SW846 6010B

Inductively Coupled Plasma (ICP) Metals

Reviewed

Aluminum	ND	200	ug/L	SW846 6010B
Barium	ND	200	ug/L	SW846 6010B
Beryllium	ND	5	ug/L	SW846 6010B
Calcium	18.9 B	5000	ug/L	SW846 6010B
Cobalt	ND	50	ug/L	SW846 6010B
Copper	ND	25	ug/L	SW846 6010B
Iron	9.8 B	100	ug/L	SW846 6010B
Potassium	ND	5000	ug/L	SW846 6010B
Magnesium	ND	5000	ug/L	SW846 6010B
Manganese	ND	15	ug/L	SW846 6010B
Sodium	ND	5000	ug/L	SW846 6010B
Nickel	ND	40	ug/L	SW846 6010B
Vanadium	ND	50	ug/L	SW846 6010B
Zinc	ND	20	ug/L	SW846 6010B

Mercury in Liquid Waste (Manual Cold-Vapor)

Reviewed

Mercury	ND	0.2	ug/L	SW846 7470A
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B Estimated result. Result is less than RL.

Organochlorine Pesticides

alpha-BHC	ND	0.050	ug/L	SW846 8081A
beta-BHC	ND	0.050	ug/L	SW846 8081A
delta-BHC	ND	0.050	ug/L	SW846 8081A
gamma-BHC (Lindane)	ND	0.050	ug/L	SW846 8081A
Heptachlor	ND	0.050	ug/L	SW846 8081A
Aldrin	ND	0.050	ug/L	SW846 8081A
Heptachlor epoxide	ND	0.050	ug/L	SW846 8081A
Endosulfan I	ND	0.050	ug/L	SW846 8081A
Dieldrin	ND	0.050	ug/L	SW846 8081A
4,4'-DDE	ND	0.050	ug/L	SW846 8081A
Endrin	ND	0.050	ug/L	SW846 8081A

In Review
Reviewed
VK
11/9/98

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 Tetra Tech NUS, Inc PAGE 36
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-RB-102798

Sample #: 008 Date Sampled: 10/27/98 14:30 Date Received: 10/28/98 Matrix: WATER

Organochlorine Pesticides

Endrin ketone	ND	0.050	ug/L	SW846 8081A
Endrin aldehyde	ND	0.050	ug/L	SW846 8081A
Endosulfan II	ND	0.050	ug/L	SW846 8081A
4,4'-DDD	ND	0.050	ug/L	SW846 8081A
Endosulfan sulfate	ND	0.050	ug/L	SW846 8081A
4,4'-DDT	ND	0.050	ug/L	SW846 8081A
Methoxychlor	ND	0.50	ug/L	SW846 8081A
alpha-Chlordane	ND	0.050	ug/L	SW846 8081A
gamma-Chlordane	ND	0.050	ug/L	SW846 8081A
Toxaphene	ND	2.0	ug/L	SW846 8081A

In Review
Reviewed
11/9/98

PCBs

Aroclor 1016	ND	1.0	ug/L	SW846 8082
Aroclor 1221	ND	1.0	ug/L	SW846 8082
Aroclor 1232	ND	1.0	ug/L	SW846 8082
Aroclor 1242	ND	1.0	ug/L	SW846 8082
Aroclor 1248	ND	1.0	ug/L	SW846 8082
Aroclor 1254	ND	1.0	ug/L	SW846 8082
Aroclor 1260	ND	1.0	ug/L	SW846 8082

Reviewed

Volatile Organics by GC/MS

Acetone	4.3 J	20	ug/L	SW846 8260B
Benzene	ND	5.0	ug/L	SW846 8260B
Bromodichloromethane	ND	5.0	ug/L	SW846 8260B
Bromoform	ND	5.0	ug/L	SW846 8260B
Bromomethane	ND	10	ug/L	SW846 8260B
2-Butanone	ND	20	ug/L	SW846 8260B
Carbon disulfide	ND	5.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/L	SW846 8260B
Chlorobenzene	ND	5.0	ug/L	SW846 8260B
Dibromochloromethane	ND	5.0	ug/L	SW846 8260B
Chloroethane	ND	10	ug/L	SW846 8260B
Chloroform	8.6	5.0	ug/L	SW846 8260B
Chloromethane	ND	10	ug/L	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/L	SW846 8260B

Reviewed

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J290162 **Tetra Tech NUS, Inc** PAGE 37
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-EB-102798

Sample #: 008 Date Sampled: 10/27/98 14:30 Date Received: 10/28/98 Matrix: WATER

Volatile Organics by GC/MS

1,2-Dichloroethane	ND	5.0	ug/L	SW846 8260B	Reviewed
1,1-Dichloroethene	ND	5.0	ug/L	SW846 8260B	
1,2-Dichloroethene (total)	ND	5.0	ug/L	SW846 8260B	
1,2-Dichloropropane	ND	5.0	ug/L	SW846 8260B	
cis-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B	
trans-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B	
Ethylbenzene	ND	5.0	ug/L	SW846 8260B	
2-Hexanone	ND	20	ug/L	SW846 8260B	
Methylene chloride	3.9 J	5.0	ug/L	SW846 8260B	
4-Methyl-2-pentanone	ND	20	ug/L	SW846 8260B	
Styrene	ND	5.0	ug/L	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L	SW846 8260B	
Tetrachloroethene	ND	5.0	ug/L	SW846 8260B	
Toluene	ND	5.0	ug/L	SW846 8260B	
1,1,1-Trichloroethane	ND	5.0	ug/L	SW846 8260B	
1,1,2-Trichloroethane	ND	5.0	ug/L	SW846 8260B	
Trichloroethene	ND	5.0	ug/L	SW846 8260B	
Vinyl chloride	ND	10	ug/L	SW846 8260B	
Xylenes (total)	ND	5.0	ug/L	SW846 8260B	

J Estimation result. Result is less than RL.

Semivolatile Organic Compounds by GC/MS

Acenaphthene	ND	10	ug/L	SW846 8270C	Reviewed
Acenaphthylene	ND	10	ug/L	SW846 8270C	
Anthracene	ND	10	ug/L	SW846 8270C	
Benzo (a) anthracene	ND	10	ug/L	SW846 8270C	
Benzo (a) pyrene	ND	10	ug/L	SW846 8270C	
Benzo (b) fluoranthene	ND	10	ug/L	SW846 8270C	
Benzo (k) fluoranthene	ND	10	ug/L	SW846 8270C	
Benzo (ghi) perylene	ND	10	ug/L	SW846 8270C	
bis (2-Chloroethoxy) methane	ND	10	ug/L	SW846 8270C	
bis (2-Chloroethyl) ether	ND	10	ug/L	SW846 8270C	
bis (2-Ethylhexyl) phthalate	ND	10	ug/L	SW846 8270C	

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C3J290162 Tetra Tech NUS, Inc PAGE 38
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/09/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-RB-102798

Sample #: 008 Date Sampled: 10/27/98 14:30 Date Received: 10/28/98 Matrix: WATER

Semivolatile Organic Compounds by GC/MS

Reviewed

4-Bromophenyl phenyl ether	ND	10	ug/L	SW846 8270C
Butyl benzyl phthalate	ND	10	ug/L	SW846 8270C
Carbazole	ND	10	ug/L	SW846 8270C
4-Chloroaniline	ND	10	ug/L	SW846 8270C
4-Chloro-3-methylphenol	ND	10	ug/L	SW846 8270C
2-Chloronaphthalene	ND	10	ug/L	SW846 8270C
2-Chlorophenol	ND	10	ug/L	SW846 8270C
4-Chlorophenyl phenyl ether	ND	10	ug/L	SW846 8270C
Chrysene	ND	10	ug/L	SW846 8270C
Dibenz (a, h) anthracene	ND	10	ug/L	SW846 8270C
Dibenzofuran	ND	10	ug/L	SW846 8270C
1,2-Dichlorobenzene	ND	10	ug/L	SW846 8270C
1,3-Dichlorobenzene	ND	10	ug/L	SW846 8270C
1,4-Dichlorobenzene	ND	10	ug/L	SW846 8270C
3,3'-Dichlorobenzidine	ND	50	ug/L	SW846 8270C
2,4-Dichlorophenol	ND	10	ug/L	SW846 8270C
Diethyl phthalate	ND	10	ug/L	SW846 8270C
2,4-Dimethylphenol	ND	10	ug/L	SW846 8270C
Dimethyl phthalate	ND	10	ug/L	SW846 8270C
Di-n-butyl phthalate	ND	10	ug/L	SW846 8270C
Di-n-octyl phthalate	ND	10	ug/L	SW846 8270C
2,4-Dinitrophenol	ND	50	ug/L	SW846 8270C
4,6-Dinitro-2-methylphenol	ND	50	ug/L	SW846 8270C
2,4-Dinitrotoluene	ND	10	ug/L	SW846 8270C
2,6-Dinitrotoluene	ND	10	ug/L	SW846 8270C
Fluoranthene	ND	10	ug/L	SW846 8270C
Fluorene	ND	10	ug/L	SW846 8270C
Hexachlorobenzene	ND	10	ug/L	SW846 8270C
Hexachlorobutadiene	ND	10	ug/L	SW846 8270C
Hexachlorocyclopentadiene	ND	50	ug/L	SW846 8270C
Hexachloroethane	ND	10	ug/L	SW846 8270C
Indeno (1,2,3-cd) pyrene	ND	10	ug/L	SW846 8270C
Isophorone	ND	10	ug/L	SW846 8270C
2-Methylnaphthalene	ND	10	ug/L	SW846 8270C

(Continued on next page)

ATTACHMENT 2

Summary of Analytical Results
And
Comparison to Risk Screening Data

**Summary of Analytical Results
And
Comparison to Risk Screening Data
Characterization Samples – Excavation 1B
NAWC, Warminster**

Substance	Range of Detections ¹	Previous Range of Detections ¹	Previously Selected as COPC / Risk Result ²	Industrial RBC ¹ Cancer 1E-6 NonCar. 0.01	Recommended For Verification Sampling
Silver	0.53-406	2.1-389	Y/N	1,000	N
Arsenic	ND-3.8	1.7-8.8	N/N (< Bckgnd)	3.8	N
Cadmium	0.66-62.2	0.59-699	Y/Y	200	existing PRG
Chromium	9.5-11,000	10.3-18,100	Y/Y	310,000	existing PRG
Lead	17.7-41.7	3.7-430	N/N	1,000	N
Antimony	0.38-7.9	88.3-376	Y/Y	82	existing PRG
Selenium	ND	ND	---	1,000	N
Thallium	1.3-19.7	ND	---	14	Y
Aluminum	480-16,000	2,910-33,500	Y/N	20,000	N
Barium	29.5-234	57.5-375	N/N	14,000	N
Beryllium	ND-1.7	0.35-1.5	Y/N	410	N
Cobalt	4.2-53.2	11.1-64.1	N/N	12,000	N
Copper	6.7-435	1.7-462	Y/N	8,200	N
Manganese	108-810	347-2,630	Y/N	4,100	N
Nickel	5.7-37.7	10.7-57.6	N/N	4,100	N
Vanadium	1.2-32.2	8-66.6	Y/N	1,400	N
Zinc	21-1,750	11.8-1,950	N/N	61,000	N
Mercury	ND-1.7	0.095-3.5	Y/N	61	N
Benzo(a)anthracene	ND-54	88-5,400	Y/N	7,800	N
Bis(2-ethylhexyl)phthalate	130-27,000	40-270	N/N	410,000	N
Butylbenzylphthalate	ND-30,000	ND	---	410,000,000	N
Chrysene	ND-87	110-5,700	N/N	780,000	N
1,4-Dichlorobenzene	ND-4,300	ND	---	240,000	N
Fluoranthene	ND-87	160-16,000	N/N	82,000,000	N
Pyrene	ND-73	130-11,000	N/N	61,000,000	N

¹ Units are mg/kg for Inorganics and ug/kg for Organics

² Previous selection of COPC was based on Residential exposure at 1E-6 and HI of 0.01 (Removal Evaluation Report, Appendix E). Y indicates Yes, N indicates No. Risk result is based on Industrial Exposure risk assessment results.

**Summary of Analytical Results
And
Comparison to Risk Screening Data
Characterization Samples – Excavation 1B
NAWC, Warminster**

Substance	Range of Detections ¹	Previous Range of Detections ¹	Previously Selected as COPC / Risk Result ²	Industrial RBC ¹ Cancer 1E-6 NonCar. 0.01	GW Criteria EPA/ PADEP ³	Recommended For Verification Sampling
Acetone	4.3 J - 90	ND – 270	N / N	20,000,000	16,000 / 1,000,000	N
Bromomethane	ND – 3.7 J	-----	-----	290,000	200 / 1,000	N
Carbon Disulfide	9.3 – 26	-----	-----	20,000,000	32,000 / 410,000	N
1,2-Dichloroethene	ND – 3.9 J	-----	-----	4,100,000	400 / 7,000	N
Tetrachloroethene	3.6 J,B - 40 B	ND – 6	N / N	110,000	60 / 500	N
Toluene	2.6 J - 7.5 J	-----	-----	41,000,000	12,000 / 100,000	N
4,4-DDD	13 – 33	26 – 69	N / N	24,000	16,000 / 270	N
4,4-DDE	13 – 55	4.4 – 13	N / N	17,000	54,000 / 130	N
4,4-DDT	ND – 8.4	15 – 240	N / N	17,000	32,000 / 170	N
Dieldrin	ND – 3.1	-----	-----	360	4 / 16	N
Aroclor 1242	72 – 1,400	-----	-----	2,900	1,000 / 520	N
Aroclor 1260	ND - 660	490 – 1,400	Y / N	2,900	1,000 / 110	N

³ Groundwater protection based on EPA SSLs at 20 DAF, 1996; PADEP Title 25 Non-residential 100xGWMSC, 1997.

APPENDIX A2

6883-5.30-030



TETRA TECH NUS, INC.

600 Clark Avenue, Suite 3 ■ King of Prussia, PA 19406-1433
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C-51-11-8-54

November 25, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

Subject: Verification Sample Results, Site 2A, Area A
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter presents the findings of the most recent verification sampling and analysis conducted at excavation 2A at NAWC Warminster. Four samples were collected from the sidewalls of the subject excavation on November 19, 1998. The samples were collected from the southern portion of the excavation where it had been extended through the base access road (see attachment 1 for sample logs). The samples were collected to verify the removal of material that contained concentrations of Lead and Antimony above the clean-up goals of 1,000 mg/kg and 50 mg/kg respectively. The laboratory completed analysis for Cadmium, Chromium, Lead, Antimony, and Thallium (see Attachment 2 for Laboratory Analytical Reports). The data has not undergone a complete validation review.

The analytical results were compared to the clean-up goals. No sample contained concentrations of any compound above established clean-up goals. The highest Lead concentration identified was 25.3 mg/kg and the highest Antimony concentration was 0.82 mg/kg. These concentrations are well below the clean-up goals (1,000 mg/kg and 50 mg/kg respectively).

It is recommended that no further excavation be performed in this area.

It should be noted that although the clean-up goals had been attained for the subsurface or floor area of the excavation, (see TtNUS October 29, 1998 letter C-51-10-8-77) the Navy directed the RAC to remove additional soil in the area of previous sample VS-2A-09F. This removal was completed on November 19, 1998. No additional sampling was performed in this area as clean-up goals had already been attained for the floor area of the excavation.

Respectively:

Garth Glenn
Project Manager

GG/ejc

C-51-11-8-54

Mr. Lonnie Monaco

Naval Facilities Engineering Command (NAVFACENGCOM)

November 25, 1998 – Page 2

C: Tom Ames (NAVFACENGCOM)
Tim McEntee (NAVFACENGCOM)
Steve Lehman (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
Neil Teamerson (TtNUS)
Jeff Orient (TtNUS)

ATTACHMENT 1

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Warmaster

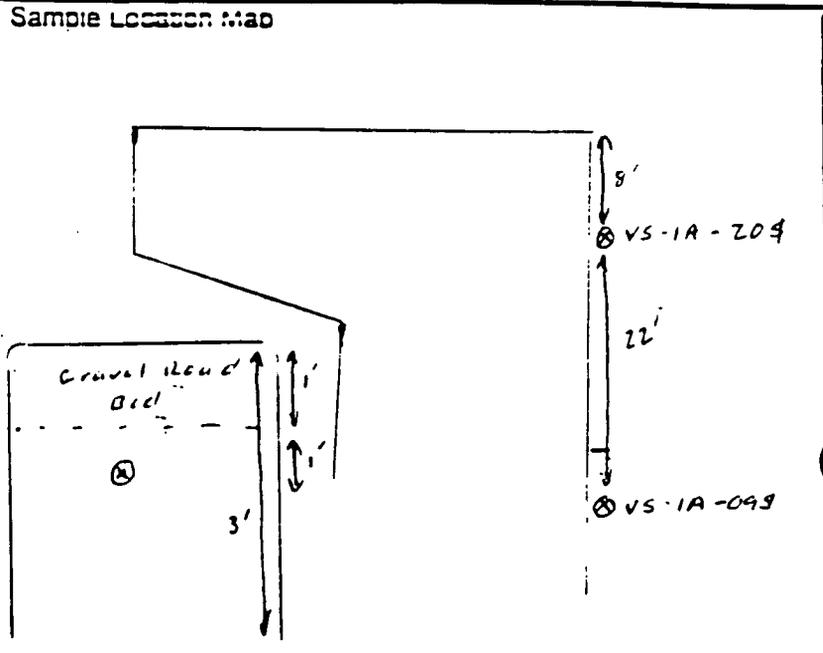
Project Site Number CTO 252

Source Number VS-2A-209

Source Location Site 2A

Sample Method:	Composite Sample Data		
	Sample	Time	Color and Description
<u>S.S. Truval</u>			
Depth Sampled: <u>9-12"</u>			
Sample Date & Time: <u>11/14/98 1035</u>			
Sampled by: <u>Don Whalen</u>			
Signatures(s):			
Sample Type			
<input checked="" type="checkbox"/> Low Concentration			
<input type="checkbox"/> High Concentration			
<input checked="" type="checkbox"/> Grab			
<input type="checkbox"/> Composite			
<input type="checkbox"/> Grab - Composite			
Sample Data			
Color		Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
<u>Brown</u>		<u>clayey silt damp</u>	

Analysis	Preservative:
<input type="checkbox"/> TCL VOAs	dark, 4°C
<input type="checkbox"/> TCL SVOAs	dark, 4°C
<input type="checkbox"/> TCL Pests/PCBs	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> Lead, Antimony	4°C



Observations and Notes

Duplicate sample taken:

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

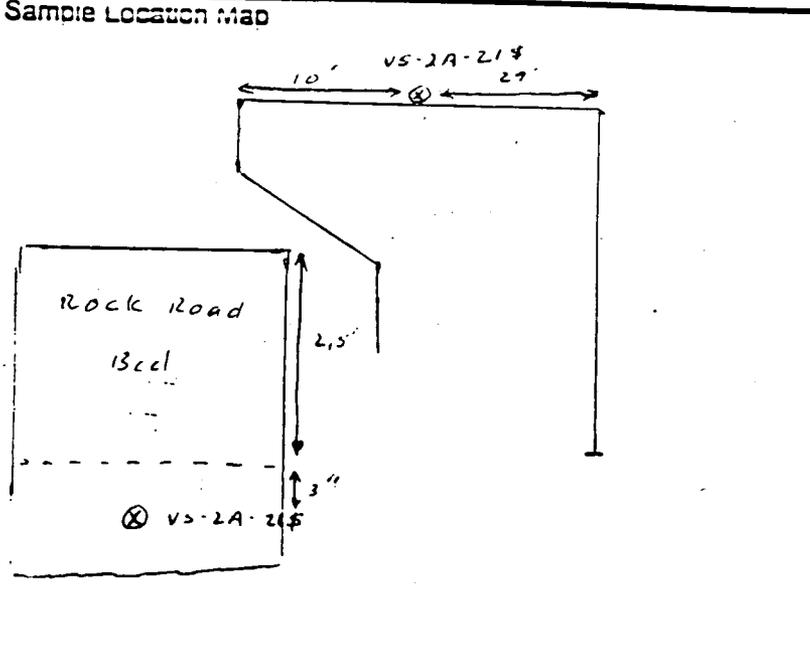
Project Site Name NAWC Warmaster

Project Site Number CTO 252

Source Number VS-2A-21E

Source Location Site 2A

Sample Method: <i>Shovelless steel Trowel</i>	Composite Sample Data		
Depth Sampled: <i>3 - 6"</i>	Sample	Time	Color and Description
Sample Date & Time: <i>11/19/98 1045</i>			
Sampled by: <i>Don Whitten</i>			
Signature(s):			
Sample Type			
<input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
Sample Data			
Color		Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
<i>Red Brown</i>		<i>Silty clay</i>	
Analysis			
Preservative:			
<input type="checkbox"/> TCL VOA's	dark, 4°C		
<input type="checkbox"/> TCL SVOA's	dark, 4°C		
<input type="checkbox"/> TCL PesuPCBs	dark, 4°C		
<input type="checkbox"/> TAL Metals	4°C		
<input type="checkbox"/> Cyanide	4°C		
<input checked="" type="checkbox"/> Lead Antimony	4°C		



Observations and Notes

Duplicate sample taken:

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Westminster

Project Site Number CTO 252

Source Number VS-2A-22 \$

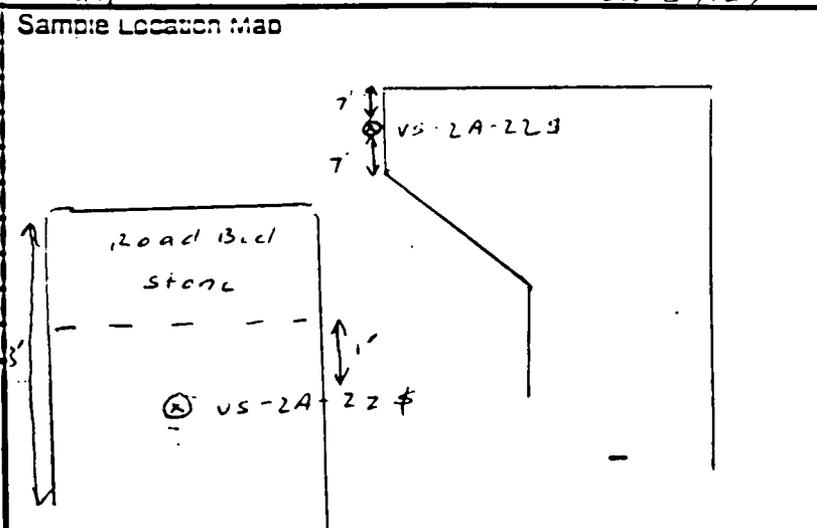
Source Location Site 2A

Sample Method:	Composite Sample Data		
	Sample	Time	Color and Description
<i>Remains Steel Trowel</i>			
Depth Sampled: <i>9-12"</i>			
Sample Date & Time: <i>11/14/98 1053</i>			
Sampled by: <i>Don Whalen</i>			
Signature(s):			

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Sample Data	
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
<i>Red Brown to Tan</i>	<i>Silty clay with red brown silt stone fragments</i>

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	dark, 4°C
<input type="checkbox"/> TCL SVOA's	dark, 4°C
<input type="checkbox"/> TCL Res/PCBs	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> <i>Lead Antimony</i>	<i>40C</i>



Observations and Notes

Duplicate sample taken:

ATTACHMENT 2

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8K200153 Tetra Tech NUS, Inc PAGE 2
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/24/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: VS-2A-22S					Reviewed
Sample #: 003 Date Sampled: 11/19/98 10:53 Date Received: 11/20/98 Matrix: SOLID					
Trace Inductively Coupled Plasma (ICP) Metals					
Cadmium	0.10 B	0.23	mg/kg	SW846 6010B	
Chromium	23.1	0.59	mg/kg	SW846 6010B	
Lead	16.4	0.35	mg/kg	SW846 6010B	
Antimony	0.82 BN	1.2	mg/kg	SW846 6010B	
Thallium	ND	1.2	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	85.3		%	MCAWW 160.3 MOD	

Client Sample ID: VS-2A-23S
 Sample #: 004 Date Sampled: 11/19/98 11:02 Date Received: 11/20/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Cadmium	0.10 B	0.23	mg/kg	SW846 6010B	
Chromium	20.2	0.57	mg/kg	SW846 6010B	
Lead	25.3	0.34	mg/kg	SW846 6010B	
Antimony	0.47 BN	1.1	mg/kg	SW846 6010B	
Thallium	ND	1.1	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	87.3		%	MCAWW 160.3 MOD	

Client Sample ID: VS-1B-13S
 Sample #: 005 Date Sampled: 11/19/98 13:48 Date Received: 11/20/98 Matrix: SOLID

(Continued on next page)

Duplicate



TETRA TECH NUS, INC.

600 Clark Avenue, Suite 3 • King of Prussia, PA 19406-1433
(610) 491-9688 • FAX (610) 491-9645 • www.tetrattech.com

C-51-11-8-30

November 12, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

Subject: Evaluation of Site 2 Soil Data, Area A
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter presents the results of the risk evaluation of soil data collected at Site 2 in Area A of the subject facility. In addition to presenting the results of the risk evaluation, recommendations are offered regarding the need for additional excavations within the area. These recommendations supplement those presented in the Tetra Tech NUS (TtNUS) letter dated October 29, 1998 (C-51-10-8-77) which presented the preliminary results of the verification sampling from excavation 2A.

A risk evaluation, as requested by the EPA, was completed for Site 2 using the data presented in the Removal Site Evaluation Report (RSER) (Brown & Root Environmental, April 1998), the data collected during the June and October 1998 supplemental investigations, and the results of the October 1998 verification sampling. The analytical results for these investigations were combined into one database for evaluation. Before the data was evaluated the sample locations and depths were reviewed and the sample results for soil that had been excavated during the removals at Sites 2A, 2B, and 2C were removed from consideration. Figures 1 and 2 show the sample locations that were included in the risk evaluation. Attachment 1 presents a summary of the analytical results for each sample. The data has not undergone a complete validation. Analytical result reports, sample logs, and boring logs are presented in the Phase III RI (Brown & Root Environmental, November 1996), the TtNUS July 21 1998 letter (C-51-7-8-20) regarding subsurface soils, the TtNUS July 28 1998 letter (C-51-7-8-39) regarding surface soils, and the TtNUS letter dated October 29 1998 (C-51-10-8-77) regarding verification and supplemental investigation sample results.

The risk evaluation was prepared as a revision or an update to the risk assessment presented in the RSER. Surface and subsurface soils were evaluated separately. Risks were estimated for potential industrial (site worker) and residential risk exposure scenarios. Site 2 has been identified for industrial use in the approved re-use plan. The results of the risk evaluation are presented in Attachment 2.

Findings

The estimated industrial exposure cancer risk posed by surface soils is 1.27E-05. This is within the risk range of 1E-04 to 1E-06 considered to be acceptable by EPA and PADEP. The total of all non-carcinogenic Hazard Quotients (HQs) for the industrial exposure scenario results in a Hazard Index (HI) of 1.29. This exceeds the EPA benchmark of 1.0 indicating that additional evaluation of specific target organ

C-51-11-8-30
Mr. Lonnie Monaco
Naval Facilities Engineering Command
November 12, 1998 - Page 2

HQs is required. As presented in Attachment 2, no total target organ specific HQs result with an HI greater than or equal to 1.0, indicating that adverse health effects are not anticipated from Contaminant of Potential Concern (COPC) exposure.

The estimated industrial exposure cancer risk posed by subsurface soils is $1.14E-05$. This is within the risk range of $1E-04$ to $1E-06$ considered to be acceptable by EPA and PADEP. The total of all non-carcinogenic HQs for the industrial exposure scenario equals an HI of 0.7. This is below the EPA benchmark of 1.0, indicating that adverse health effects are not anticipated.

Estimated residential cancer risks were slightly elevated above estimated industrial risks but they remain within the $1E-05$ risk range. Residential non-cancer HIs exceeded EPA's benchmark of 1.0 (see Attachment 2 for details).

Lead risks were also evaluated using both an industrial (site worker) and residential scenario. The risks were evaluated by applying the EPA approved Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (EPA, 1996) and the IEUBK Lead Model. The site worker model predicts fetal blood lead levels of no greater than 7.07 ug/dl and 5.79 ug/dl in 95% of a population exposed to contact with Site 2 surface and subsurface soils respectively. Both of these predicted levels are below the 10-ug/dl benchmark protection level used by EPA to evaluate risks during the initial risk evaluation. Estimated residential blood lead levels exceed the EPA benchmark protection level used to evaluate site data (see Attachment 2 for details).

Recommendations

The results of the risk evaluation indicate that no unacceptable human health risks associated with industrial uses of Site 2 exist. It is recommended that no additional removal actions be taken within this area.

In regard to the current removal actions, it is recommended that the preliminary recommendations presented in the October 29, 1998 letter be accepted as final. Specifically, it is recommended that the southern wall of the excavation adjacent to the access road be further excavated to remove the waste layer and shallow soils (less than 2 feet in depth) identified to contain elevated levels of lead. At the completion of this excavation verification samples should be collected and analyzed for lead only. The analytical results should be compared to the PRG for lead and statistically evaluated to determine attainment of the clean-up goals.

Respectfully,



Garth Glenn
Project Manager

GG/nfs

c: Tom Ames (NAVFACENGCOM)
Tim McEntee (NAVFACENGCOM)
Steve Lehman (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
Neil Teamerson (TtNUS)
Jeff Orient (TtNUS)

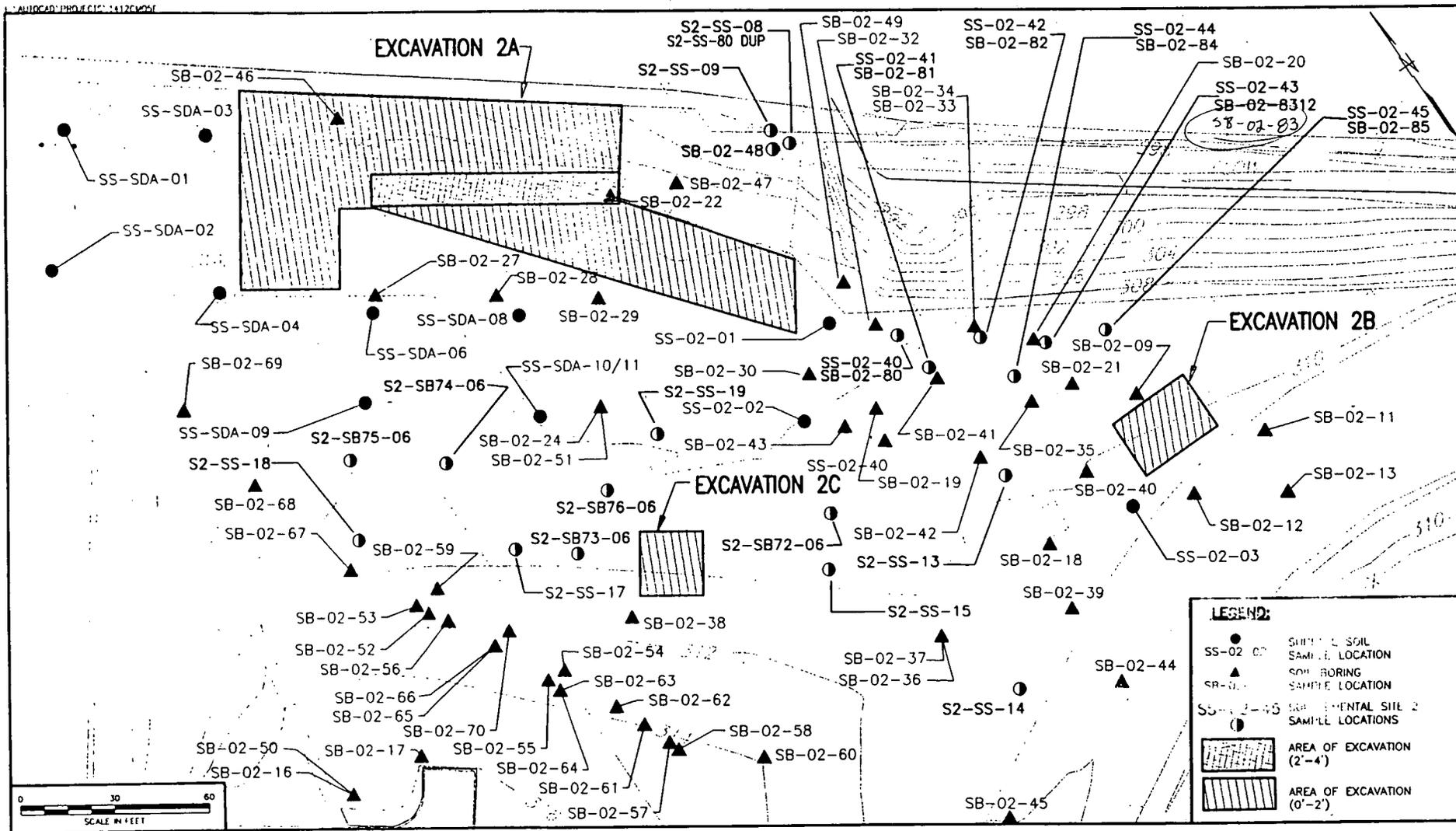
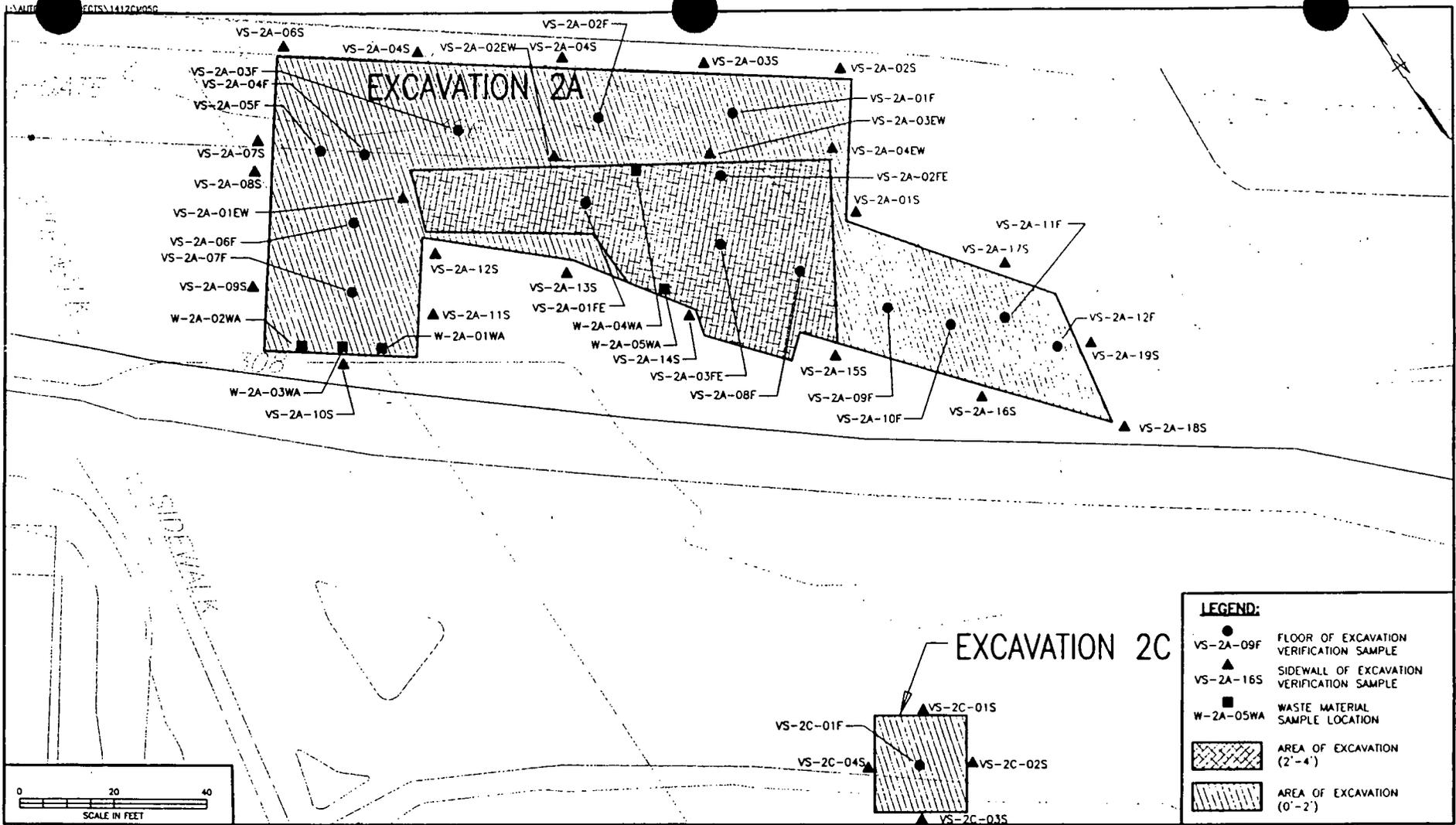


FIGURE 1

AREA OF EXCAVATION
 AREA A - SITE 2
 ANNAPOLIS, MARYLAND





AREA OF EXCAVATION
 AREA A - SITE 2
 NAWC, WARMINSTER, PA
 09/24/1998

FIGURE 2

ATTACHMENT 1

**Summary of Analytical Results
Site 2, NAWC Warminster**

(Portions of this data set are not validated).
(Footnotes may not be accurate for all data.)

**SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA**

SAMPLE I.D.: LOCATION:	S2-SS-08	S2-SS-08-DUP	S2-SS-09	S2-SS-13	S2-SS-14	S2-SS-15	S2-SS-17	S2-SS-17-DUP
INORGANICS	mg/kg							
Aluminum	12300	10400	11300	9090	10400	12500	11000	13200
Antimony	3.3 J	0.38 L	2.2 L	0.28 L	0.39 L	0.58 L	0.63 L	4.8 J
Arsenic	7.2 K	3.3 K	4.9 K	7.5 K	4.3 K	3.6 K	3.4 K	6.6 K
Barium	452 L	96.5 L	173 L	75.5 L	74.7 L	118 L	92.4 L	222 L
Beryllium	0.93	1.2	0.75	0.93	1	1	1.4	0.92
Cadmium	8.8 K	2.3 K	6.9 K	1.8 K	1.7 K	1 U	2 K	10 K
Calcium	5920	4650	6210	6890	5250	4100	4840	5750
Chromium	58	35.5	44	36.3	26.1	52.9	43.3	51.5
Cobalt	12.4 K	12.9	9.7	11	10.8	11.3	12.1	12.1 K
Copper	729	62.5	187	17.6	16.2	27.5	46.7	393
Iron	30800	17900	21100	20400	20000	18900	20600	38000
Lead	431 J	61.1 J	253 J	49.6 J	25.2 J	29.4 J	44.3 J	468 J
Magnesium	3160	4590	2400	8840	4970	4870	4620	3250
Manganese	1020 J	557 J	909 J	441 J	609 J	472 J	533 J	933 J
Mercury	0.53 L	0.18 L	0.38 L	0.34 L	0.11 UL	1.1 L	0.14 L	0.36 L
Nickel	47	17.5	23.4	19.5	18.1	17.4	19.7	40.6
Potassium	1150	1910	1210	2340	1670	1760	2140	1200
Selenium	1.3 K	0.79 U	0.89 K	0.75 U	1.2 K	0.85 U	0.8 U	1.6 K
Silver	58.4	3.1	7.6	1.2	1.3	2.8	3.4	17.1
Sodium	183 J	174 J	124 J	268 J	154 J	1870 J	299 J	195 J
Thallium	1.2 UL	1 U	1.3	1	1.3	1.1 U	1 U	1.4
Vanadium	46.4	23.5	38.3	29.7	28.9	30.9	25.4	43.7
Zinc	933 J	154 J	558 J	129 J	72.8 J	102 J	120 J	970 J

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SS-08	S2-SS-08-DUP	S2-SS-09	S2-SS-13	S2-SS-14	S2-SS-15	S2-SS-17	S2-SS-17-DUP
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,2,4-Trichlorobenzene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
1,2-Dichlorobenzene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
1,3-Dichlorobenzene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
1,4-Dichlorobenzene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2,2'-Oxybis(1-chloropropane)	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2,4,5-Trichlorophenol	1100 U	900 U	960 U	850 U	910 U	970 U	900 U	1000 U
2,4,6-Trichlorophenol	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2,4-Dichlorophenol	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2,4-Dimethylphenol	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2,4-Dinitrophenol	1100 U	900 U	960 U	850 U	910 U	970 U	900 U	1000 U
2,4-Dinitrotoluene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2,6-Dinitrotoluene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2-Chloronaphthalene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2-Chlorophenol	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2-Methylnaphthalene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2-Methylphenol	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
2-Nitroaniline	1100 U	900 U	960 U	850 U	910 U	970 U	900 U	1000 U
2-Nitrophenol	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
3,3'-Dichlorobenzidine	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
3-Nitroaniline	1100 U	900 U	960 U	850 U	910 U	970 U	900 U	1000 U
4,6-Dinitro-2-methylphenol	1100 U	900 U	960 U	850 U	910 U	970 U	900 U	1000 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SS-08	S2-SS-08-DUP	S2-SS-09	S2-SS-13	S2-SS-14	S2-SS-15	S2-SS-17	S2-SS-17-DUP
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4-Bromophenyl-phenylether	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
4-Chloro-3-methylphenol	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
4-Chloroaniline	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
4-Chlorophenyl Phenyl Ether	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
4-Methylphenol	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
4-Nitroaniline	1100 U	900 U	960 U	850 U	910 U	970 U	900 U	1000 U
4-Nitrophenol	1100 U	900 U	960 U	850 U	910 U	970 U	900 U	1000 U
Acenaphthene	44 J	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Acenaphthylene	62 J	360 U	150 J	340 U	220 J	380 U	360 U	53 J
Anthracene	130 J	360 U	160 J	62 J	150 J	380 U	360 U	82 J
Benzo(a)anthracene	580	130 J	1200	320 J	1000	190 J	200 J	370 J
Benzo(a)pyrene	540	150 J	1600	370	1000	280 J	250 J	460
Benzo(b)fluoranthene	890	180 J	2500	640	1500	360 J	300 J	690
Benzo(g,h,i)perylene	180 J	360 U	100 J	340 U	75 J	380 U	360 U	410 U
Benzo(k)fluoranthene	540	150 J	1200	440	640	290 J	240 J	520
Bis(2-chloroethoxy)methane	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Bis(2-chloroethyl)ether	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Bis(2-ethylhexyl)phthalate	120 J	360 U	150 J	340 U	360 U	380 U	360 U	140 J
Butylbenzylphthalate	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Carbazole	100 J	360 U	71 J	340 U	48 J	380 U	360 U	410 U
Chrysene	690	170 J	1400	430	1200	270 J	260 J	490
Di-n-butylphthalate	47 J	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Di-n-octylphthalate	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Dibenz(a,h)anthracene	60 J	360 U	110 J	340 U	120 J	380 U	360 U	410 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SS-08	S2-SS-08-DUP	S2-SS-09	S2-SS-13	S2-SS-14	S2-SS-15	S2-SS-17	S2-SS-17-DUP
LOCATION:								
SEMIVOLATILES	ug/kg							
Dibenzofuran	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Diethylphthalate	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Dimethylphthalate	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Fluoranthene	1300	210 J	1800	810	1400	450	390	830
Fluorene	50 J	360 U	380 U	340 U	58 J	380 U	360 U	410 U
Hexachlorobenzene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Hexachlorobutadiene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Hexachlorocyclopentadiene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Hexachloroethane	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Indeno(1,2,3-cd)pyrene	190 J	59 J	410	100 J	310 J	73 J	78 J	120 J
Isophorone	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
N-Nitroso-di-n-propylamine	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
N-Nitrosodiphenylamine (1)	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Naphthalene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Nitrobenzene	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Pentachlorophenol	1100 U	900 U	960 U	850 U	910 U	970 U	900 U	1000 U
Phenanthrene	600	66 J	480	360	570	120 J	150 J	280 J
Phenol	430 U	360 U	380 U	340 U	360 U	380 U	360 U	410 U
Pyrene	790	160 J	1500	540	1300	350 J	290 J	590
PESTICIDES	ug/kg							
Aroclor-1016	43 U	36 U	38 U	34 U	180 U	38 U	36 U	41 U
Aroclor-1221	87 U	73 U	77 U	69 U	370 U	78 U	73 U	83 U
Aroclor-1232	43 U	36 U	38 U	34 U	180 U	38 U	36 U	41 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.: LOCATION:	S2-SS-08	S2-SS-08-DUP	S2-SS-09	S2-SS-13	S2-SS-14	S2-SS-15	S2-SS-17	S2-SS-17-DUP
PESTICIDES	ug/kg							
Aroclor-1242	43 U	36 U	38 U	34 U	180 U	38 U	36 U	41 U
Aroclor-1248	43 U	36 U	38 U	34 U	180 U	38 U	36 U	41 U
Aroclor-1254	140	69	38 U	56	590	64	85	140
Aroclor-1260	43 U	36 U	110	34 U	180 U	38 U	36 U	41 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SS-18	S2-SS-19	SS-02-02	SS-02-03	SS-02-40	SS-02-41	SS-02-42	SS-02-43
LOCATION:								
INORGANICS	mg/kg							
Aluminum	9730	13600	11800	12900	n/a	n/a	n/a	n/a
Antimony	0.4 L	0.45 J	10.7 J	7 UJ	0.44 BN	0.19 BN	1.4 N	0.2 BN
Arsenic	3.8 K	5.7 K	6.1	13.1	n/a	n/a	n/a	n/a
Barium	79.3 L	99 L	237	66.7	n/a	n/a	n/a	n/a
Beryllium	0.91	1.2	0.72 K	1.3 K	n/a	n/a	n/a	n/a
Cadmium	1.8 K	1.6 K	9.3	0.5 U	0.14 B	0.23 U	6	0.7
Calcium	3620	5560	11900	18800	n/a	n/a	n/a	n/a
Chromium	51.4	45.7	36.3	42.9	n/a	n/a	n/a	n/a
Cobalt	11	12.9 K	8.3 K	14.4 K	n/a	n/a	n/a	n/a
Copper	27	28.2	584	47.9	28.3	8.3	1410	28.4
Cyanide	n/a	n/a	0.57 UL	0.52 UL	n/a	n/a	n/a	n/a
Iron	17700	24600	21200	34400	n/a	n/a	n/a	n/a
Lead	31.5 J	34.7 J	401	65.3	27.3 E	13.3 E	994 E	125 E
Magnesium	3340	5440	7450	13200	n/a	n/a	n/a	n/a
Manganese	585 J	618 J	973	682	n/a	n/a	n/a	n/a
Mercury	0.11 UL	0.62 L	0.81	0.12 B	n/a	n/a	n/a	n/a
Nickel	13.3	20	23.2 B	25.4 B	n/a	n/a	n/a	n/a
Potassium	1200	2590	734	2140	n/a	n/a	n/a	n/a
Selenium	0.81 U	0.79 UL	0.6 UJ	0.5 UJ	n/a	n/a	n/a	n/a
Silver	2.7	2.3	13.1 J	1.6 B	0.54 U	0.57 U	0.36 B	0.57 U
Sodium	292 J	527 J	242 B	285	n/a	n/a	n/a	n/a
Thallium	1 U	1.1	0.6 U	0.5 UJ	n/a	n/a	n/a	n/a
Vanadium	24.1	33.4	25.8	56.9	n/a	n/a	n/a	n/a
Zinc	100 J	89.7 J	1220	117	110	30.3	4800	227

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.: LOCATION:	S2-SS-18	S2-SS-19	SS-02-02	SS-02-03	SS-02-40	SS-02-41	SS-02-42	SS-02-43
VOLATILES	ug/kg							
1,2,4-Trichlorobenzene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
1,2-Dichlorobenzene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
1,3-Dichlorobenzene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
1,4-Dichlorobenzene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
SEMIVOLATILES	ug/kg							
2,2'-Oxybis(1-chloropropane)	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
2,4,5-Trichlorophenol	920 U	900 U	890 U	850 U	n/a	n/a	n/a	n/a
2,4,6-Trichlorophenol	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
2,4-Dichlorophenol	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
2,4-Dimethylphenol	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
2,4-Dinitrophenol	920 U	900 U	890 U	850 U	n/a	n/a	n/a	n/a
2,4-Dinitrotoluene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
2,6-Dinitrotoluene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
2-Chloronaphthalene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
2-Chlorophenol	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
2-Methylnaphthalene	370 U	360 U	370 U	46 J	n/a	n/a	n/a	n/a
2-Methylphenol	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
2-Nitroaniline	920 U	900 U	890 U	850 U	n/a	n/a	n/a	n/a
2-Nitrophenol	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
3,3'-Dichlorobenzidine	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
3-Nitroaniline	920 U	900 U	890 U	850 U	n/a	n/a	n/a	n/a
4,6-Dinitro-2-methylphenol	920 U	900 U	890 U	850 U	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SS-18	S2-SS-19	SS-02-02	SS-02-03	SS-02-40	SS-02-41	SS-02-42	SS-02-43
LOCATION:								
SEMIVOLATILES	ug/kg							
4-Bromophenyl-phenylether	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
4-Chloro-3-methylphenol	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
4-Chloroaniline	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
4-Chlorophenyl Phenyl Ether	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
4-Methylphenol	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
4-Nitroaniline	920 U	900 U	890 U	850 U	n/a	n/a	n/a	n/a
4-Nitrophenol	920 U	900 U	890 U	850 U	n/a	n/a	n/a	n/a
Acenaphthene	370 U	360 U	130 J	43 J	n/a	n/a	n/a	n/a
Acenaphthylene	370 U	360 U	64 J	350 U	n/a	n/a	n/a	n/a
Anthracene	51 J	65 J	490	160 J	n/a	n/a	n/a	n/a
Benzo(a)anthracene	270 J	270 J	1600	770	n/a	n/a	n/a	n/a
Benzo(a)pyrene	250 J	1000	1300	730	n/a	n/a	n/a	n/a
Benzo(b)fluoranthene	370	410	1900	1200	n/a	n/a	n/a	n/a
Benzo(g,h,i)perylene	370 U	540	840	500	n/a	n/a	n/a	n/a
Benzo(k)fluoranthene	330 J	350 J	490	420	n/a	n/a	n/a	n/a
Bis(2-chloroethoxy)methane	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Bis(2-chloroethyl)ether	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Bis(2-ethylhexyl)phthalate	370 U	360 U	100 B	100 B	n/a	n/a	n/a	n/a
Butylbenzylphthalate	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Carbazole	370 U	85 J	190 J	140 J	n/a	n/a	n/a	n/a
Chrysene	340 J	380	1400	880	n/a	n/a	n/a	n/a
Di-n-butylphthalate	370 U	360 U	61 J	350 U	n/a	n/a	n/a	n/a
Di-n-octylphthalate	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Dibenz(a,h)anthracene	370 U	360 U	240 J	37 J	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D. LOCATION:	S2-SS-18	S2-SS-19	SS-02-02	SS-02-03	SS-02-40	SS-02-41	SS-02-42	SS-02-43
SEMIVOLATILES	ug/kg							
Dibenzofuran	370 U	360 U	73 J	41 J	n/a	n/a	n/a	n/a
Diethylphthalate	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Dimethylphthalate	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Fluoranthene	500	560	2400	1700	n/a	n/a	n/a	n/a
Fluorene	370 U	360 U	140 J	67 J	n/a	n/a	n/a	n/a
Hexachlorobenzene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Hexachlorobutadiene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Hexachlorocyclopentadiene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Hexachloroethane	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Indeno(1,2,3-cd)pyrene	78 J	280 J	790	470	n/a	n/a	n/a	n/a
Isophorone	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
N-Nitroso-di-n-propylamine	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
N-Nitrosodiphenylamine (1)	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Naphthalene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Nitrobenzene	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Pentachlorophenol	920 U	900 U	890 U	850 U	n/a	n/a	n/a	n/a
Phenanthrene	240 J	280 J	1400	990	n/a	n/a	n/a	n/a
Phenol	370 U	360 U	370 U	350 U	n/a	n/a	n/a	n/a
Pyrene	370	690	2600	1500	n/a	n/a	n/a	n/a
VOLATILES	ug/kg							
1,1,1-Trichloroethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
1,1,2,2-Tetrachloroethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
1,1,2-Trichloroethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SS-18	S2-SS-19	SS-02-02	SS-02-03	SS-02-40	SS-02-41	SS-02-42	SS-02-43
LOCATION:								
VOLATILES	ug/kg							
1,1-Dichloroethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
1,1-Dichloroethene	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
1,2-Dichloroethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
1,2-Dichloroethene (Total)	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
1,2-Dichloropropane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
2-Butanone	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
2-Hexanone	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
4-Methyl-2-pentanone	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Acetone	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Benzene	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Bromodichloromethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Bromoform	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Bromomethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Carbon Disulfide	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Carbon Tetrachloride	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Chlorobenzene	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Chloroethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Chloroform	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Chloromethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Dibromochloromethane	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Ethylbenzene	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Methylene Chloride	n/a	n/a	5 B	10 U	n/a	n/a	n/a	n/a
Styrene	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Tetrachloroethene	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SS-18	S2-SS-19	SS-02-02	SS-02-03	SS-02-40	SS-02-41	SS-02-42	SS-02-43
LOCATION:								
VOLATILES	ug/kg							
Toluene	n/a	n/a	11 U	2 J	n/a	n/a	n/a	n/a
Trichloroethene	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Vinyl Chloride	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
Xylene (Total)	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
cis-1,3-Dichloropropene	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
trans-1,3-Dichloropropene	n/a	n/a	11 U	10 U	n/a	n/a	n/a	n/a
PESTICIDES	ug/kg							
4,4'-DDD	n/a	n/a	3.7 U	3.5 U	n/a	n/a	n/a	n/a
4,4'-DDE	n/a	n/a	3.7 U	3.5 U	n/a	n/a	n/a	n/a
4,4'-DDT	n/a	n/a	3.7 U	4.9 J	n/a	n/a	n/a	n/a
Aldrin	n/a	n/a	1.9 U	1.8 U	n/a	n/a	n/a	n/a
Alpha-BHC	n/a	n/a	1.9 U	1.8 U	n/a	n/a	n/a	n/a
Alpha-Chlordane	n/a	n/a	4.6 J	1.8 U	n/a	n/a	n/a	n/a
Aroclor-1016	37 U	72 U	37 U	35 U	n/a	n/a	n/a	n/a
Aroclor-1221	74 U	150 U	74 U	71 U	n/a	n/a	n/a	n/a
Aroclor-1232	37 U	72 U	37 U	35 U	n/a	n/a	n/a	n/a
Aroclor-1242	37 U	72 U	37 U	35 U	n/a	n/a	n/a	n/a
Aroclor-1248	37 U	72 U	37 U	35 U	n/a	n/a	n/a	n/a
Aroclor-1254	110	490	160 J	67 J	n/a	n/a	n/a	n/a
Aroclor-1260	37 U	72 U	37 U	35 U	n/a	n/a	n/a	n/a
Beta-BHC	n/a	n/a	1.9 U	1.8 U	n/a	n/a	n/a	n/a
Delta-BHC	n/a	n/a	1.9 U	1.8 U	n/a	n/a	n/a	n/a
Dieldrin	n/a	n/a	3.7 U	3.5 U	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SS-18	S2-SS-19	SS-02-02	SS-02-03	SS-02-40	SS-02-41	SS-02-42	SS-02-43
LOCATION:								
PESTICIDES	ug/kg							
Endosulfan I	n/a	n/a	1.9 U	1.8 U	n/a	n/a	n/a	n/a
Endosulfan II	n/a	n/a	3.7 U	3.5 U	n/a	n/a	n/a	n/a
Endosulfan Sulfate	n/a	n/a	3.7 U	3.5 U	n/a	n/a	n/a	n/a
Endrin	n/a	n/a	16 J	3.5 U	n/a	n/a	n/a	n/a
Endrin Aldehyde	n/a	n/a	3.7 U	3.5 U	n/a	n/a	n/a	n/a
Endrin Ketone	n/a	n/a	3.7 U	3.5 U	n/a	n/a	n/a	n/a
Gamma-BHC (Lindane)	n/a	n/a	2.3 J	3.4 J	n/a	n/a	n/a	n/a
Gamma-Chlordane	n/a	n/a	1.9 U	1.8 U	n/a	n/a	n/a	n/a
Heptachlor	n/a	n/a	1.9 U	1.8 U	n/a	n/a	n/a	n/a
Heptachlor Epoxide	n/a	n/a	1.9 U	1.8 U	n/a	n/a	n/a	n/a
Methoxychlor	n/a	n/a	19 U	18 U	n/a	n/a	n/a	n/a
Toxaphene	n/a	n/a	190 U	180 U	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-02-44	SS-02-45	SS-SDA-01	SS-SDA-02	SS-SDA-03	SS-SDA-04	SS-SDA-08	SS-SDA-09
LOCATION:								
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	n/a	n/a	17800	16900	19800	15700	14700	14000
Antimony	0.43 BN	0.38 BN	7.8 UJ	8.1 UJ	7.3 UJ	7.9 UJ	7.8 UJ	7.9 J
Arsenic	n/a	n/a	4.3	3.1 L	7.8	5	4 L	5.3
Barium	n/a	n/a	58.4	47	58.6	101	97.9	163
Beryllium	n/a	n/a	0.78 K	0.63 K	0.74 K	1.4 K	1.4 K	1 K
Cadmium	0.23 U	0.83	2.8 B	0.58 U	2.1 B	0.56 U	0.56 U	5.8
Calcium	n/a	n/a	1050	1120	1350	1140	1730	9040
Chromium	n/a	n/a	126	19.1	116	20.4	22.7	81.1
Cobalt	n/a	n/a	14.4 K	12.1 K	12 K	10.7 K	13.2 K	10.4 K
Copper	15	20.4	12.3	7.7	14.2	8.9	21	141
Cyanide	n/a	n/a	0.55 UL	0.58 UL	0.55 UL	0.59 UL	0.58 UL	0.58 UL
Iron	n/a	n/a	21100	17500	29100	16700	26100	29000
Lead	11.2 E	32.6 E	17.1	9.4	15.4	15.8	22.5	212
Magnesium	n/a	n/a	2260	1900	2430	2430	3360	4710
Manganese	n/a	n/a	586	862	426	919	1040	643
Mercury	n/a	n/a	0.16 B	0.16 B	0.23 B	0.25 B	0.31 B	0.19 B
Nickel	n/a	n/a	14.1 B	11.4 B	13.8 B	13.9 B	14.8 B	21.2 B
Potassium	n/a	n/a	994	684	828	978	1890	951
Selenium	n/a	n/a	0.56 UJ	0.58 UJ	0.52 UJ	0.56 UJ	0.56 UJ	0.56 UJ
Silver	0.58 U	0.19 B	0.86 B	0.77 UJ	2.3 B	0.75 UJ	0.75 B	7.7 J
Sodium	n/a	n/a	85.4 B	96.5 B	78.5 B	88.9 B	126 B	122 B
Thallium	n/a	n/a	0.56 U	0.58 U	0.52 UJ	0.56 U	0.56 UJ	0.56 UJ
Vanadium	n/a	n/a	31.8	26.5	40.9	25.5	29.7	28.3
Zinc	37.1	75	39.6	25.2	42.7	40.8	47.2	507

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-02-44	SS-02-45	SS-SDA-01	SS-SDA-02	SS-SDA-03	SS-SDA-04	SS-SDA-08	SS-SDA-09
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,2,4-Trichlorobenzene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
1,2-Dichlorobenzene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
1,3-Dichlorobenzene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
1,4-Dichlorobenzene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2,2'-Oxybis(1-chloropropane)	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2,4,5-Trichlorophenol	n/a	n/a	870 U	930 U	900 U	960 U	940 U	910 U
2,4,6-Trichlorophenol	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2,4-Dichlorophenol	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2,4-Dimethylphenol	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2,4-Dinitrophenol	n/a	n/a	870 U	930 U	900 U	960 U	940 U	910 U
2,4-Dinitrotoluene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2,6-Dinitrotoluene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2-Chloronaphthalene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2-Chlorophenol	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2-Methylnaphthalene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2-Methylphenol	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
2-Nitroaniline	n/a	n/a	870 U	930 U	900 U	960 U	940 U	910 U
2-Nitrophenol	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
3,3'-Dichlorobenzidine	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
3-Nitroaniline	n/a	n/a	870 U	930 U	900 U	960 U	940 U	910 U
4,6-Dinitro-2-methylphenol	n/a	n/a	870 U	930 U	900 U	960 U	940 U	910 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-02-44	SS-02-45	SS-SDA-01	SS-SDA-02	SS-SDA-03	SS-SDA-04	SS-SDA-08	SS-SDA-09
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4-Bromophenyl-phenylether	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
4-Chloro-3-methylphenol	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
4-Chloroaniline	n/a	n/a	360 UJ	380 UJ	370 UJ	400 UJ	390 UJ	380 U
4-Chlorophenyl Phenyl Ether	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
4-Methylphenol	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
4-Nitroaniline	n/a	n/a	870 U	930 U	900 U	960 U	940 U	910 U
4-Nitrophenol	n/a	n/a	870 U	930 U	900 U	960 U	940 U	910 U
Acenaphthene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	120 J
Acenaphthylene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	62 J
Anthracene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	420
Benzo(a)anthracene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	1600
Benzo(a)pyrene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	1400
Benzo(b)fluoranthene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	2700
Benzo(g,h,i)perylene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	1500
Benzo(k)fluoranthene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	390
Bis(2-chloroethoxy)methane	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Bis(2-chloroethyl)ether	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Bis(2-ethylhexyl)phthalate	n/a	n/a	81 B	92 B	79 B	75 B	95 B	130 B
Butylbenzylphthalate	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Carbazole	n/a	n/a	360 U	380 U	370 U	400 U	390 U	130 J
Chrysene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	1700
Di-n-butylphthalate	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Di-n-octylphthalate	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Dibenz(a,h)anthracene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	73 J

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-02-44	SS-02-45	SS-SDA-01	SS-SDA-02	SS-SDA-03	SS-SDA-04	SS-SDA-08	SS-SDA-09
LOCATION:								
SEMIVOLATILES	ug/kg							
Dibenzofuran	n/a	n/a	360 U	380 U	370 U	400 U	390 U	69 J
Diethylphthalate	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Dimethylphthalate	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Fluoranthene	n/a	n/a	360 U	380 U	370 U	400 U	43 J	2600
Fluorene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	140 J
Hexachlorobenzene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Hexachlorobutadiene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Hexachlorocyclopentadiene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Hexachloroethane	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Indeno(1,2,3-cd)pyrene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	930
Isophorone	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
N-Nitroso-di-n-propylamine	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
N-Nitrosodiphenylamine (1)	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Naphthalene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Nitrobenzene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Pentachlorophenol	n/a	n/a	870 U	930 U	900 U	960 U	940 U	910 U
Phenanthrene	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Phenol	n/a	n/a	360 U	380 U	370 U	400 U	390 U	380 U
Pyrene	n/a	n/a	360 U	380 U	370 U	400 U	40 J	380 U
VOLATILES	ug/kg							
1,1,1-Trichloroethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
1,1,2,2-Tetrachloroethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
1,1,2-Trichloroethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-02-44	SS-02-45	SS-SDA-01	SS-SDA-02	SS-SDA-03	SS-SDA-04	SS-SDA-08	SS-SDA-09
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1-Dichloroethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
1,1-Dichloroethene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
1,2-Dichloroethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
1,2-Dichloroethene (Total)	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
1,2-Dichloropropane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
2-Butanone	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
2-Hexanone	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 UJ
4-Methyl-2-pentanone	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 UJ
Acetone	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Benzene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Bromodichloromethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Bromoform	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Bromomethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Carbon Disulfide	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Carbon Tetrachloride	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Chlorobenzene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 UJ
Chloroethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Chloroform	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Chloromethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Dibromochloromethane	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Ethylbenzene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 UJ
Methylene Chloride	n/a	n/a	11 U	12 U	11 U	9 B	12 U	4 B
Styrene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 UJ
Tetrachloroethene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 UJ

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-02-44	SS-02-45	SS-SDA-01	SS-SDA-02	SS-SDA-03	SS-SDA-04	SS-SDA-08	SS-SDA-09
LOCATION:								
VOLATILES	ug/kg							
Toluene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 UJ
Trichloroethene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Vinyl Chloride	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
Xylene (Total)	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 UJ
cis-1,3-Dichloropropene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
trans-1,3-Dichloropropene	n/a	n/a	11 U	12 U	11 U	11 U	12 U	11 U
PESTICIDES	ug/kg							
4,4'-DDD	n/a	n/a	3.6 U	3.8 U	3.7 U	4 U	3.9 U	3.8 U
4,4'-DDE	n/a	n/a	3.6 U	3.8 U	3.7 U	4 U	3.9 U	3.8 U
4,4'-DDT	n/a	n/a	3.6 U	3.8 U	3.7 U	4 U	3.9 U	4.2 J
Aldrin	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	1.9 U
Alpha-BHC	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	1.9 U
Alpha-Chlordane	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	1.60
Aroclor-1016	n/a	n/a	36 U	38 U	37 U	40 U	39 U	38 U
Aroclor-1221	n/a	n/a	73 U	78 U	76 U	80 U	79 U	76 U
Aroclor-1232	n/a	n/a	36 U	38 U	37 U	40 U	39 U	38 U
Aroclor-1242	n/a	n/a	36 U	38 U	37 U	40 U	39 U	38 U
Aroclor-1248	n/a	n/a	36 U	38 U	37 U	40 U	39 U	38 U
Aroclor-1254	n/a	n/a	36 U	38 U	37 U	40 U	26 J	3700
Aroclor-1260	n/a	n/a	36 U	38 U	37 U	40 U	39 U	38 U
Beta-BHC	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	1.9 U
Delta-BHC	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	1.9 U
Dieldrin	n/a	n/a	3.6 U	3.8 U	3.7 U	4 U	3.9 U	3.2 J

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-02-44	SS-02-45	SS-SDA-01	SS-SDA-02	SS-SDA-03	SS-SDA-04	SS-SDA-08	SS-SDA-09
LOCATION:								
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Endosulfan I	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	1.9 U
Endosulfan II	n/a	n/a	3.6 U	3.8 U	3.7 U	4 U	3.9 U	3.8 U
Endosulfan Sulfate	n/a	n/a	3.6 U	3.8 U	3.7 U	4 U	3.9 U	3.8 U
Endrin	n/a	n/a	3.6 U	3.8 U	3.7 U	4 U	7.3	370 J
Endrin Aldehyde	n/a	n/a	3.6 U	3.8 U	3.7 U	4 U	3.9 U	3.8 U
Endrin Ketone	n/a	n/a	3.6 U	3.8 U	3.7 U	4 U	3.9 U	3.8 U
Gamma-BHC (Lindane)	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	2.4 J
Gamma-Chlordane	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	11 J
Heptachlor	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	1.9 U
Heptachlor Epoxide	n/a	n/a	1.8 U	2 U	1.9 U	2 U	2 U	1.9 U
Methoxychlor	n/a	n/a	18 U	20 U	19 U	20 U	20 U	19 U
Toxaphene	n/a	n/a	180 U	200 U	190 U	200 U	200 U	190 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-SDA-10	SS-SDA-10-DUP	VS-2A-01S	VS-2A-02S	VS-2A-03S	VS-2A-04S	VS-2A-05S	VS-2A-06S
LOCATION:								
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	16500	18300	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	8.2 UJ	8.8 UJ	4.9 N	1.3 N	4.9 N	0.89 BN	8.5 N	0.47 BN
Arsenic	5.7	5.9	n/a	n/a	n/a	n/a	n/a	n/a
Barium	53	43.8	n/a	n/a	n/a	n/a	n/a	n/a
Beryllium	0.73 K	0.68 K	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	0.59 U	0.63 U	20.3	0.61	6.7	0.94	15	0.26 N
Calcium	1240	886	n/a	n/a	n/a	n/a	n/a	n/a
Chromium	21.7	24.2	n/a	n/a	n/a	n/a	n/a	n/a
Cobalt	10.8 K	10.3 K	n/a	n/a	n/a	n/a	n/a	n/a
Copper	14.9	14.9	386	9.7	121	8.2	315	5.7
Cyanide	0.59 UL	0.6 UL	n/a	n/a	n/a	n/a	n/a	n/a
Iron	22700	25200	n/a	n/a	n/a	n/a	n/a	n/a
Lead	12.5	9	420	19.5	261	12.8	449	13.7 N
Magnesium	2660	2790	n/a	n/a	n/a	n/a	n/a	n/a
Manganese	364	337	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	0.11 B	0.06 B	n/a	n/a	n/a	n/a	n/a	n/a
Nickel	14.3 B	13.7 B	n/a	n/a	n/a	n/a	n/a	n/a
Potassium	818	952	n/a	n/a	n/a	n/a	n/a	n/a
Selenium	0.59 UJ	0.63 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Silver	0.78 UJ	0.84 UJ	13.7	0.6 U	5.2	0.59 U	16.4	0.6 U
Sodium	92.1 B	92.2 B	n/a	n/a	n/a	n/a	n/a	n/a
Thallium	0.59 U	0.63 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Vanadium	36.6	40.6	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	33.5	30.7	688	41.1	377	30.2	1130	32.2

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-SDA-10	SS-SDA-10-DUP	VS-2A-01S	VS-2A-02S	VS-2A-03S	VS-2A-04S	VS-2A-05S	VS-2A-06S
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,2,4-Trichlorobenzene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2-Dichlorobenzene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
1,3-Dichlorobenzene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
1,4-Dichlorobenzene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2,2'-Oxybis(1-chloropropane)	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2,4,5-Trichlorophenol	950 U	1000 U	n/a	n/a	n/a	n/a	n/a	n/a
2,4,6-Trichlorophenol	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2,4-Dichlorophenol	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2,4-Dimethylphenol	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2,4-Dinitrophenol	950 U	1000 U	n/a	n/a	n/a	n/a	n/a	n/a
2,4-Dinitrotoluene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2,6-Dinitrotoluene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Chloronaphthalene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Chlorophenol	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Methylnaphthalene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Methylphenol	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Nitroaniline	950 U	1000 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Nitrophenol	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
3,3'-Dichlorobenzidine	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
3-Nitroaniline	950 U	1000 U	n/a	n/a	n/a	n/a	n/a	n/a
4,6-Dinitro-2-methylphenol	950 U	1000 U	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-SDA-10	SS-SDA-10-DUP	VS-2A-01S	VS-2A-02S	VS-2A-03S	VS-2A-04S	VS-2A-05S	VS-2A-06S
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4-Bromophenyl-phenylether	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
4-Chloro-3-methylphenol	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
4-Chloroaniline	390 UJ	410 UJ	n/a	n/a	n/a	n/a	n/a	n/a
4-Chlorophenyl Phenyl Ether	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
4-Methylphenol	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
4-Nitroaniline	950 U	1000 U	n/a	n/a	n/a	n/a	n/a	n/a
4-Nitrophenol	950 U	1000 U	n/a	n/a	n/a	n/a	n/a	n/a
Acenaphthene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Acenaphthylene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Anthracene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Benzo(a)anthracene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Benzo(a)pyrene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Benzo(b)fluoranthene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Benzo(g,h,i)perylene	390 U	410 U	3100	400 U	970	390 U	400	410 U
Benzo(k)fluoranthene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Bis(2-chloroethoxy)methane	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Bis(2-chloroethyl)ether	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Bis(2-ethylhexyl)phthalate	110 B	1800	n/a	n/a	n/a	n/a	n/a	n/a
Butylbenzylphthalate	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Carbazole	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Chrysene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Di-n-butylphthalate	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Di-n-octylphthalate	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Dibenz(a,h)anthracene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.: LOCATION:	SS-SDA-10	SS-SDA-10-DUP	VS-2A-01S	VS-2A-02S	VS-2A-03S	VS-2A-04S	VS-2A-05S	VS-2A-06S
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dibenzofuran	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Diethylphthalate	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Dimethylphthalate	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Fluoranthene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Fluorene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Hexachlorobenzene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Hexachlorobutadiene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Hexachlorocyclopentadiene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Hexachloroethane	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Indeno(1,2,3-cd)pyrene	390 U	410 U	4300	49 J	1300	390 U	540	410 U
Isophorone	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
N-Nitroso-di-n-propylamine	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
N-Nitrosodiphenylamine (1)	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Naphthalene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Nitrobenzene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Pentachlorophenol	950 U	1000 U	n/a	n/a	n/a	n/a	n/a	n/a
Phenanthrene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Phenol	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
Pyrene	390 U	410 U	n/a	n/a	n/a	n/a	n/a	n/a
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1,1-Trichloroethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,1,2,2-Tetrachloroethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,1,2-Trichloroethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-SDA-10	SS-SDA-10-DUP	VS-2A-01S	VS-2A-02S	VS-2A-03S	VS-2A-04S	VS-2A-05S	VS-2A-06S
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1-Dichloroethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,1-Dichloroethene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2-Dichloroethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2-Dichloroethene (Total)	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2-Dichloropropane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Butanone	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Hexanone	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
4-Methyl-2-pentanone	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Acetone	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Benzene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Bromodichloromethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Bromoform	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Bromomethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Carbon Disulfide	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Carbon Tetrachloride	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Chlorobenzene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Chloroethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Chloroform	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Chloromethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Dibromochloromethane	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Methylene Chloride	4 B	8 B	n/a	n/a	n/a	n/a	n/a	n/a
Styrene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Tetrachloroethene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-SDA-10	SS-SDA-10-DUP	VS-2A-01S	VS-2A-02S	VS-2A-03S	VS-2A-04S	VS-2A-05S	VS-2A-06S
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Toluene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Trichloroethene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Vinyl Chloride	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Xylene (Total)	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
cis-1,3-Dichloropropene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
trans-1,3-Dichloropropene	12 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4,4'-DDD	3.9 U	4.1 U	n/a	n/a	n/a	n/a	n/a	n/a
4,4'-DDE	3.9 U	4.1 U	n/a	n/a	n/a	n/a	n/a	n/a
4,4'-DDT	3.9 U	4.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Aldrin	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Alpha-BHC	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Alpha-Chlordane	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1016	39 U	41 U	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1221	80 U	83 U	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1232	39 U	41 U	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1242	39 U	41 U	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1248	39 U	41 U	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1254	11 J	41 U	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1260	39 U	41 U	n/a	n/a	n/a	n/a	n/a	n/a
Beta-BHC	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Delta-BHC	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Dieldrin	3.9 U	4.1 U	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SS-SDA-10	SS-SDA-10-DUP	VS-2A-01S	VS-2A-02S	VS-2A-03S	VS-2A-04S	VS-2A-05S	VS-2A-06S
LOCATION:								
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Endosulfan I	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Endosulfan II	3.9 U	4.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Endosulfan Sulfate	3.9 U	4.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Endrin	3.9 U	4.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Endrin Aldehyde	3.9 U	4.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Endrin Ketone	3.9 U	4.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Gamma-BHC (Lindane)	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Gamma-Chlordane	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Heptachlor	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Heptachlor Epoxide	2 U	2.1 U	n/a	n/a	n/a	n/a	n/a	n/a
Methoxychlor	20 U	21 U	n/a	n/a	n/a	n/a	n/a	n/a
Toxaphene	200 U	210 U	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	VS-2A-07S	VS-2A-08S	VS-2A-09S	VS-2A-10S	VS-2A-11S	VS-2A-12S	VS-2A-12S-DUP	VS-2A-13S
LOCATION:								
INORGANICS	mg/kg	mg/kg						
Antimony	0.99 BN	0.77 BN	0.8 BN	11.1 N	1.3 N	0.39 BN	0.59 BN	0.96 BN
Cadmium	0.51 N	0.78 N	0.21 B	26.1	1.1	0.06 B	0.27	1.2
Copper	23.4	12.9	10.2	1280	20	10.6	10.5	16.1
Lead	17.2 N	25.7 N	11.8	6650	28 E	4.4	13.2	59.9
Silver	0.6 U	0.59 U	0.56 U	90.7	0.33 B	0.57 U	0.14 B	0.26 BN
Zinc	37.2	63.1	23	3000	337	16.2	35.7	59.8
SEMIVOLATILES	ug/kg	ug/kg						
Benzo(g,h,i)perylene	55 J	2000	500	510	n/a	n/a	n/a	n/a
Indeno(1,2,3-cd)pyrene	72 J	2500	440	550	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	VS-2A-14S	VS-2A-15S	VS-2A-15S-DUP	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-18S-DUP	VS-2A-19S
LOCATION:								
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Antimony	4.7 N	0.3 BN	0.38 BN	0.87 BN	10.8 N*	0.8 BN	1.1 BN	0.63 BN
Cadmium	6.9	0.21 U	0.23 U	0.3	11.1	0.43	0.47	0.79
Copper	155	17.2 N	17.2 N	38.8 N	281 N	35.5 N*	27.5 N*	25.9 N*
Lead	295	8 *	6.3 *	22.6 *	340 *	35.2 BN	42.5 BN	38.2 BN
Silver	7.3	0.53 UN	0.56 UN	0.97 N*	9.5 N*	0.31 B	0.5 B	0.57 B
Zinc	434	28.5 N	29.6 N	80.1 N	626 N	87.4	113	83.5
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Benzo(g,h,i)perylene	n/a	1900	2200	380 U	250 J	530	64 J	440
Indeno(1,2,3-cd)pyrene	n/a	2200	2600	380 U	330 J	690	69 J	480

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	W-2A-01WA	W-2A-02WA	W-2A-03WA	---	---	---	---	---
LOCATION:								
INORGANICS	mg/kg	mg/kg	mg/kg					
Antimony	1.7 N*	33.7 N*	198 N*					
Cadmium	1.7	47.1	59.3					
Copper	98 N*	13600 N	5410 N					
Lead	383 *	856 *	7350 *					
Silver	12.8 N*	126 N*	210 N*					
Zinc	147	1730 N	3160 N					

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

NOTES:

- J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
- U -- Value is a non-detected result as reported by the laboratory.
- UJ -- Non-detected result is considered estimated due to exceedance of technical quality control criteria.
- UL -- Non-detected result is considered biased low due to exceedance of technical quality control criteria.
- UR -- Non-detected result is considered unusable due to exceedance of technical quality control criteria.
- L -- Positive result is considered biased low due to exceedance of technical quality control criteria.
- K -- Positive result is considered biased high due to exceedance of technical quality control criteria.
- B -- Positive result is considered to be an artifact of blank contamination, and should not be considered present.
- R -- Positive result is considered unusable due to exceedance of technical quality control criteria.
- n/a -- No result is available/applicable for this parameter in this sample.
- ND -- Value is a non-detected result as reported by the laboratory. Detection limit not available.

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SB71-08	S2-SB71-08-DUP	S2-SB72-06	S2-SB73-06	S2-SB74-06	S2-SB75-06	S2-SB76-06	SB-02-03
LOCATION:								
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	5340	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	19 L	n/a	n/a	n/a	n/a	n/a	6420	7950 J
Arsenic	37 K	n/a	n/a	n/a	n/a	n/a	0.32 UL	6.7 U
Barium	129	n/a	n/a	n/a	n/a	n/a	1.8 K	3 B
Beryllium	0.48 B	n/a	n/a	n/a	n/a	n/a	136	78.3
Cadmium	1.1 UL	n/a	n/a	n/a	n/a	n/a	1	0.78
Calcium	4560	n/a	n/a	n/a	n/a	n/a	1 UL	1.7 K
Chromium	18.8 K	n/a	n/a	n/a	n/a	n/a	499	5140
Cobalt	6	n/a	n/a	n/a	n/a	n/a	6.4 K	11.9
Copper	31.7	n/a	n/a	n/a	n/a	n/a	15	6.6
Iron	11100	n/a	n/a	n/a	n/a	n/a	18.7	14.5 J
Lead	82.6	n/a	n/a	n/a	n/a	n/a	9330	10300
Magnesium	2040	n/a	n/a	n/a	n/a	n/a	3.1	43.8 J
Manganese	328 K	n/a	n/a	n/a	n/a	n/a	1410	2980
Mercury	0.13 U	n/a	n/a	n/a	n/a	n/a	1190 K	522
Nickel	10	n/a	n/a	n/a	n/a	n/a	0.12 U	0.04 U
Potassium	540	n/a	n/a	n/a	n/a	n/a	16.8	8.2 L
Selenium	0.78 K	n/a	n/a	n/a	n/a	n/a	414	59.1
Silver	1.5 L	n/a	n/a	n/a	n/a	n/a	0.34 U	0.48 UJ
Sodium	313	n/a	n/a	n/a	n/a	n/a	0.7 UL	0.64 U
Thallium	0.72 U	n/a	n/a	n/a	n/a	n/a	104	112
Vanadium	25.9	n/a	n/a	n/a	n/a	n/a	0.65 U	0.48 U
Zinc	107 J	n/a	n/a	n/a	n/a	n/a	13.2	16.4
							17.1 J	89.8 J

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE ID	S2-SB71-08	S2-SB71-08-DUP	S2-SB72-08	S2-SB73-06	S2-SB74-06	S2-SB75-06	S2-SB76-06	SB-02-03
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,2,4-Trichlorobenzene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 UJ
1,2-Dichlorobenzene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
1,3-Dichlorobenzene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
1,4-Dichlorobenzene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2,2'-Oxybis(1-chloropropane)	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2,4,5-Trichlorophenol	1100 U	n/a	1000 U	1000 U	950 U	890 U	970 U	970 U
2,4,6-Trichlorophenol	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2,4-Dichlorophenol	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2,4-Dimethylphenol	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2,4-Dinitrophenol	1100 U	n/a	1000 U	1000 U	950 U	890 U	970 U	970 UJ
2,4-Dinitrotoluene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2,6-Dinitrotoluene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2-Chloronaphthalene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2-Chlorophenol	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2-Methylnaphthalene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2-Methylphenol	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
2-Nitroaniline	1100 U	n/a	1000 U	1000 U	950 U	890 U	970 U	970 U
2-Nitrophenol	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
3,3'-Dichlorobenzidine	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
3-Nitroaniline	1100 U	n/a	1000 U	1000 U	950 U	890 U	970 U	970 U
4,6-Dinitro-2-methylphenol	1100 U	n/a	1000 U	1000 U	950 U	890 U	970 U	970 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SB71-08	S2-SB71-08-DUP	S2-SB72-06	S2-SB73-06	S2-SB74-06	S2-SB75-06	S2-SB76-06	SB-02-03
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4-Bromophenyl-phenylether	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
4-Chloro-3-methylphenol	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
4-Chloroaniline	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
4-Chlorophenyl Phenyl Ether	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
4-Methylphenol	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
4-Nitroaniline	1100 U	n/a	1000 U	1000 U	950 U	890 U	970 U	970 U
4-Nitrophenol	1100 U	n/a	1000 U	1000 U	950 U	890 U	970 U	970 U
Acenaphthene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	170 J
Acenaphthylene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Anthracene	98 J	n/a	410 U	400 U	380 U	350 U	390 U	470
Benzo(a)anthracene	620	n/a	410 U	400 U	380 U	350 U	390 U	1100
Benzo(a)pyrene	640	n/a	410 U	400 U	380 U	350 U	390 U	1000
Benzo(b)fluoranthene	710	n/a	410 U	400 U	380 U	350 U	390 U	1500
Benzo(g,h,i)perylene	140 J	n/a	410 U	400 U	380 U	350 U	390 U	760
Benzo(k)fluoranthene	510	n/a	410 U	400 U	380 U	350 U	390 U	460
Bis(2-chloroethoxy)methane	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Bis(2-chloroethyl)ether	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Bis(2-ethylhexyl)phthalate	430 U	n/a	410 U	800	380 U	350 U	390 U	140 B
Butylbenzylphthalate	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Carbazole	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Chrysene	700	n/a	42 J	400 U	380 U	350 U	390 U	170 J
Di-n-butylphthalate	430 U	n/a	410 U	400 U	380 U	350 U	390 U	1100
Di-n-octylphthalate	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Dibenz(a,h)anthracene	80 J	n/a	410 U	400 U	380 U	350 U	390 U	400 U
			410 U	400 U	380 U	350 U	390 U	400 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SB71-08	S2-SB71-08-DUP	S2-SB72-06	S2-SB73-06	S2-SB74-06	S2-SB75-06	S2-SB76-06	SB-02-03
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dibenzofuran	430 U	n/a	410 U	400 U	380 U	350 U	390 U	88 J
Diethylphthalate	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Dimethylphthalate	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Fluoranthene	1100	n/a	68 J	400 U	380 U	350 U	390 U	1600
Fluorene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	210 J
Hexachlorobenzene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Hexachlorobutadiene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Hexachlorocyclopentadiene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Hexachloroethane	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Indeno(1,2,3-cd)pyrene	320 J	n/a	410 U	400 U	380 U	350 U	390 U	760
Isophorone	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
N-Nitroso-di-n-propylamine	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 UJ
N-Nitrosodiphenylamine (1)	430 U	n/a	410 U	400 U	380 U	350 U	390 U	400 U
Naphthalene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	51 J
Nitrobenzene	430 U	n/a	410 U	400 U	380 U	350 U	390 U	370 U
Pentachlorophenol	1100 U	n/a	1000 U	1000 U	950 U	890 U	970 U	970 U
Phenanthrene	430	n/a	410 U	400 U	380 U	350 U	390 U	120 J
Phenol	430 U	n/a	410 U	400 U	380 U	350 U	390 U	390 U
Pyrene	980	n/a	67 J	400 U	380 U	350 U	390 U	170 J
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1,1-Trichloroethane	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
1,1,2,2-Tetrachloroethane	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
1,1,2-Trichloroethane	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ

APPENDIX A - TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	S2-SB71-08	S2-SB71-08-DUP	S2-SB72-06	S2-SB73-06	S2-SB74-06	S2-SB75-06	S2-SB76-06	SB-02-03
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1-Dichloroethane	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
1,1-Dichloroethene	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
1,2-Dichloroethane	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
1,2-Dichloroethene (Total)	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
1,2-Dichloropropane	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
2-Butanone	26 UJ	22 UJ	21 U	23 U	10 B	n/a	4.5 J	20 J
2-Hexanone	26 UJ	22 UJ	21 U	23 U	22 U	n/a	20 U	12 UJ
4-Methyl-2-pentanone	26 UJ	22 UJ	21 U	23 U	22 U	n/a	20 U	12 UJ
Acetone	31 B	16 B	15 B	23 B	40 B	n/a	18 B	100 B
Benzene	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Bromodichloromethane	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Bromoform	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Bromomethane	13 UJ	11 UJ	10 U	12 U	11 UR	n/a	10 U	12 UJ
Carbon Disulfide	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Carbon Tetrachloride	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Chlorobenzene	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Chloroethane	13 UJ	11 UJ	10 U	12 U	11 U	n/a	10 U	12 UJ
Chloroform	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Chloromethane	13 UJ	11 UJ	10 U	12 U	11 U	n/a	10 U	12 UJ
Dibromochloromethane	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Ethylbenzene	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Methylene Chloride	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	5.1 U	12 UJ
Styrene	6.5 UJ	5.6 UJ	5.2 U	5.9 U	5.5 U	n/a	1.5 J	18 B
Tetrachloroethene	6.5 UJ	5.6 UJ	3.6 J	5.9 U	5.5 U	n/a	5.1 U	12 UJ

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE ID : LOCATION	SB-02-04	SB-02-05	SB-02-06	SB-02-09	SB-02-101298	SB-02-11	SB-02-12	SB-02-13
INORGANICS	mg/kg							
Aluminum	9280 J	6530 J	6720 J	15700	n/a	5490	12900	9930
Antimony	10.1 U	7.6 U	8 U	11 UL	8.2 BN	79.3 L	8.1 UL	8.1 UL
Arsenic	2.5 B	1.5 B	2.1 B	3.8 J	n/a	5.2 K	19.6	4.5
Barium	216	27.2	49.6	105	n/a	188	66.7	90.4
Beryllium	0.46	0.28	0.5	1.3 B	n/a	0.41	1.4	0.89
Cadmium	0.72 U	0.54 U	0.57 U	3.8 B	43	36.7	0.78 K	1.2 K
Calcium	4200	2080	3260	643 B	n/a	49800	13200	4060
Chromium	6.1	4 K	8.3	15.7	n/a	3810	40.8	25
Cobalt	3.5	4.5	8.5	7.2 B	n/a	24.8	13.1	8.2
Copper	7.9 J	4.6 J	12.2 J	10.1	515	254	30.8	19.5
Cyanide	n/a	n/a	n/a	1.8 UL	n/a	n/a	n/a	n/a
Iron	9150	4000	10100	14400	n/a	103000	31100	15400
Lead	2.5 J	1.5 J	3.3 J	96.5 J	93.2 E	53.5 L	32.3 L	63 L
Magnesium	2880	1610	2290	1720 B	n/a	3300	11100	3430
Manganese	146	324	925	718	n/a	552	499	720
Mercury	0.06 U	0.05 U	0.05 U	0.12 U	n/a	0.8	0.05 U	0.1
Nickel	3.1 L	3.6 L	5.8 L	17.1 B	n/a	19.7 L	24.9	12.9 L
Potassium	196	110	419	532 B	n/a	503	2430	753
Selenium	0.72 UJ	0.54 UJ	0.57 UJ	1 UL	n/a	0.6 U	0.58 U	0.58 U
Silver	0.96 U	0.73 U	0.76 U	2.2 U	317	156	0.78 UJ	0.77 U
Sodium	85.1 B	69.3 B	65.8 B	460 B	n/a	110	195	87.7
Thallium	0.72 U	0.54 U	0.57 U	0.41 U	n/a	0.73 B	0.77 B	0.58 U
Vanadium	11.9	5.7	13.7	27.6	n/a	13.3 L	48.5	25.8
Zinc	6.8 J	5.2 J	8.6 J	60	476	155	87.5	61.8

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.: LOCATION:	SB-02-04	SB-02-05	SB-02-06	SB-02-09	SB-02-101298	SB-02-11	SB-02-12	SB-02-13
VOLATILES	ug/kg							
1,2,4-Trichlorobenzene	n/a	360 UJ	n/a	400 U	n/a	580 U	n/a	n/a
1,2-Dichlorobenzene	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
1,3-Dichlorobenzene	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
1,4-Dichlorobenzene	n/a	360 U	n/a	68 J	n/a	580 U	n/a	n/a
SEMIVOLATILES	ug/kg							
2,2'-Oxybis(1-chloropropane)	n/a	360 UJ	n/a	n/a	n/a	580 U	n/a	n/a
2,4,5-Trichlorophenol	n/a	870 U	n/a	960 U	n/a	1400 U	n/a	n/a
2,4,6-Trichlorophenol	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
2,4-Dichlorophenol	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
2,4-Dimethylphenol	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
2,4-Dinitrophenol	n/a	870 UJ	n/a	960 U	n/a	1400 U	n/a	n/a
2,4-Dinitrotoluene	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
2,6-Dinitrotoluene	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
2-Chloronaphthalene	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
2-Chlorophenol	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
2-Methylnaphthalene	n/a	360 U	n/a	110 J	n/a	580 U	n/a	n/a
2-Methylphenol	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
2-Nitroaniline	n/a	870 U	n/a	960 U	n/a	1400 U	n/a	n/a
2-Nitrophenol	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
3,3'-Dichlorobenzidine	n/a	360 UJ	n/a	400	n/a	580 U	n/a	n/a
3-Nitroaniline	n/a	870 UJ	n/a	960 U	n/a	1400 U	n/a	n/a
4,6-Dinitro-2-methylphenol	n/a	870 U	n/a	960 U	n/a	1400 U	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-04	SB-02-05	SB-02-06	SB-02-09	SB-02-101298	SB-02-11	SB-02-12	SB-02-13
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4-Bromophenyl-phenylether	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
4-Chloro-3-methylphenol	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
4-Chloroaniline	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
4-Chlorophenyl Phenyl Ether	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
4-Methylphenol	n/a	360 U	n/a	n/a	n/a	580 U	n/a	n/a
4-Nitroaniline	n/a	870 UJ	n/a	960 U	n/a	1400 U	n/a	n/a
4-Nitrophenol	n/a	870 U	n/a	960 U	n/a	1400 U	n/a	n/a
Acenaphthene	n/a	360 U	n/a	390 J	n/a	580 U	n/a	n/a
Acenaphthylene	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Anthracene	n/a	360 U	n/a	570 J	n/a	580 U	n/a	n/a
Benzo(a)anthracene	n/a	360 U	n/a	1500	n/a	120 J	n/a	n/a
Benzo(a)pyrene	n/a	360 U	n/a	1390	n/a	94 J	n/a	n/a
Benzo(b)fluoranthene	n/a	360 U	n/a	1900	n/a	120 J	n/a	n/a
Benzo(g,h,i)perylene	n/a	360 U	n/a	745 J	n/a	66 J	n/a	n/a
Benzo(k)fluoranthene	n/a	360 U	n/a	965	n/a	580 U	n/a	n/a
Bis(2-chloroethoxy)methane	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Bis(2-chloroethyl)ether	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Bis(2-ethylhexyl)phthalate	n/a	980 J	n/a	130 B	n/a	820 B	n/a	n/a
Butylbenzylphthalate	n/a	360 U	n/a	55	n/a	580 U	n/a	n/a
Carbazole	n/a	360 U	n/a	220 J	n/a	580 U	n/a	n/a
Chrysene	n/a	360 U	n/a	1510 J	n/a	70 J	n/a	n/a
Di-n-butylphthalate	n/a	360 U	n/a	77 J	n/a	64 J	n/a	n/a
Di-n-octylphthalate	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Dibenz(a,h)anthracene	n/a	360 U	n/a	145 J	n/a	580 U	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-04	SB-02-05	SB-02-06	SB-02-09	SB-02-101298	SB-02-11	SB-02-12	SB-02-13
LOCATION:								
SEMIVOLATILES	ug/kg							
Dibenzofuran	n/a	360 U	n/a	169 J	n/a	580 U	n/a	n/a
Diethylphthalate	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Dimethylphthalate	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Fluoranthene	n/a	360 U	n/a	2200	n/a	260 J	n/a	n/a
Fluorene	n/a	360 U	n/a	305 J	n/a	580 U	n/a	n/a
Hexachlorobenzene	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Hexachlorobutadiene	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Hexachlorocyclopentadiene	n/a	360 UJ	n/a	400 U	n/a	580 U	n/a	n/a
Hexachloroethane	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Indeno(1,2,3-cd)pyrene	n/a	360 U	n/a	810	n/a	580 U	n/a	n/a
Isophorone	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
N-Nitroso-di-n-propylamine	n/a	360 UJ	n/a	400 U	n/a	580 U	n/a	n/a
N-Nitrosodiphenylamine (1)	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Naphthalene	n/a	360 U	n/a	170 J	n/a	580 U	n/a	n/a
Nitrobenzene	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Pentachlorophenol	n/a	870 U	n/a	960 U	n/a	62 J	n/a	n/a
Phenanthrene	n/a	360 U	n/a	2350	n/a	120 J	n/a	n/a
Phenol	n/a	360 U	n/a	400 U	n/a	580 U	n/a	n/a
Pyrene	n/a	42 J	n/a	2700 J	n/a	170 J	n/a	n/a
VOLATILES	ug/kg							
1,1,1-Trichloroethane	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
1,1,2,2-Tetrachloroethane	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
1,1,2-Trichloroethane	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-04	SB-02-05	SB-02-06	SB-02-09	SB-02-101298	SB-02-11	SB-02-12	SB-02-13
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1-Dichloroethane	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
1,1-Dichloroethene	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
1,2-Dichloroethane	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
1,2-Dichloroethene (Total)	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
1,2-Dichloropropane	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
2-Butanone	12 U	12 U	11 U	11 U	n/a	12 U	1600 B	27 U
2-Hexanone	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
4-Methyl-2-pentanone	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Acetone	12 U	12 U	11 U	11 U	n/a	89 J	1400 B	170
Benzene	12 U	12 U	11 U	1 J	n/a	12 U	1500 U	27 U
Bromodichloromethane	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Bromoform	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Bromomethane	12 U	12 U	11 U	11 U	n/a	12 U	360 J	27 U
Carbon Disulfide	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Carbon Tetrachloride	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Chlorobenzene	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Chloroethane	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Chloroform	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Chloromethane	12 U	12 U	11 U	11 U	n/a	12 U	810 J	27 U
Dibromochloromethane	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Ethylbenzene	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Methylene Chloride	18 B	12 B	10 B	11 U	n/a	8 B	1300 B	19 B
Styrene	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Tetrachloroethene	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-04	SB-02-05	SB-02-06	SB-02-09	SB-02-101298	SB-02-11	SB-02-12	SB-02-13
LOCATION:								
VOLATILES	ug/kg							
Toluene	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Trichloroethene	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Vinyl Chloride	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
Xylene (Total)	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
cis-1,3-Dichloropropene	12 U	12 U	11 U	11 U	n/a	12 U	1500 U	27 U
trans-1,3-Dichloropropene	12 U	12 U	11 U	97.8 J	n/a	12 U	1500 U	27 U
PESTICIDES	ug/kg							
4,4'-DDD	n/a	3.6 U	n/a	40 U	n/a	45 J	3.6 UJ	n/a
4,4'-DDE	n/a	3.6 U	n/a	40 U	n/a	11 J	3.6 UJ	n/a
4,4'-DDT	n/a	3.6 U	n/a	40 U	n/a	5.8 U	3.6 UJ	n/a
Aldrin	n/a	1.8 U	n/a	20 U	n/a	3.6	1.9 UJ	n/a
Alpha-BHC	n/a	1.8 U	n/a	20 U	n/a	3 U	1.9 UJ	n/a
Alpha-Chlordane	n/a	1.8 U	n/a	20 U	n/a	3 U	1.9 UJ	n/a
Aroclor-1016	n/a	36 U	n/a	400 U	n/a	58 U	36 UJ	n/a
Aroclor-1221	n/a	73 U	n/a	810 U	n/a	120 U	73 UJ	n/a
Aroclor-1232	n/a	36 U	n/a	400 U	n/a	58 U	36 UJ	n/a
Aroclor-1242	n/a	36 U	n/a	400 U	n/a	58 U	36 UJ	n/a
Aroclor-1248	n/a	36 U	n/a	400 U	n/a	58 U	36 UJ	n/a
Aroclor-1254	n/a	36 U	n/a	1150 JP	n/a	58 U	36 UJ	n/a
Aroclor-1260	n/a	36 U	n/a	1600 JP	n/a	550	36 UJ	n/a
Beta-BHC	n/a	1.8 U	n/a	20 U	n/a	3 U	1.9 UJ	n/a
Delta-BHC	n/a	1.8 U	n/a	20 U	n/a	3 U	1.9 UJ	n/a
Dieldrin	n/a	3.6 U	n/a	40 U	n/a	5.8 U	3.6 UJ	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-04	SB-02-05	SB-02-06	SB-02-09	SB-02-101298	SB-02-11	SB-02-12	SB-02-13
LOCATION:								
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Endosulfan I	n/a	1.8 U	n/a	20 U	n/a	3 U	1.9 UJ	n/a
Endosulfan II	n/a	3.6 U	n/a	40 R	n/a	5.8 U	3.6 UJ	n/a
Endosulfan Sulfate	n/a	3.6 U	n/a	40 U	n/a	5.8 U	3.6 UJ	n/a
Endrin	n/a	3.6 U	n/a	40 U	n/a	5.8 U	18 J	n/a
Endrin Aldehyde	n/a	3.6 U	n/a	40 U	n/a	5.8 U	3.6 UJ	n/a
Endrin Ketone	n/a	3.6 U	n/a	40 U	n/a	5.8 U	3.6 UJ	n/a
Gamma-BHC (Lindane)	n/a	1.8 U	n/a	20 UL	n/a	3 U	1.9 UJ	n/a
Gamma Chlordane	n/a	1.8 U	n/a	20 U	n/a	3.4 J	1.9 UJ	n/a
Heptachlor	n/a	1.8 U	n/a	20 U	n/a	3 U	1.9 UJ	n/a
Heptachlor Epoxide	n/a	1.8 U	n/a	20 U	n/a	3.5 J	1.9 UJ	n/a
Methoxychlor	n/a	18 U	n/a	200 U	n/a	30 U	19 UJ	n/a
Toxaphene	n/a	180 U	n/a	2000 U	n/a	300 U	190 UJ	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-16	SB-02-16-DUP	SB-02-17	SB-02-18	SB-02-19	SB-02-19A	SB-02-20	SB-02-21
LOCATION:								
INORGANICS	mg/kg							
Aluminum	8040	7360	8760	14300	5210	13100	7150	11100
Antimony	8.2 UR	7.6 UR	8.7 UR	9.2 UR	11.3 UR	9.4 UR	90.5 L	11.9 L
Arsenic	1.4	1.4	3	4.9	3.5	3.1	3.9	7.3
Barium	32.1	21.6	53.5	61.7	97.2	27.6	147	229
Beryllium	0.4 L	0.33 L	0.76 L	0.74 L	0.32	0.42	0.37	0.65
Cadmium	0.36 UL	0.33 UL	0.38 UL	0.4 UL	0.49 U	0.41 U	17.9	5.9
Calcium	679	696	2410	6190	74000	1720	40100	13500
Chromium	4.8	4.3	11	19	12.4	13.3	3840	54.4
Cobalt	15.8 L	5.5 L	5.1 L	8 L	5 L	6.4	23.7 L	6.5
Copper	16.4	16.1	9.4	12	47.2	13.7	308	211
Cyanide	0.54 U	0.56 U	0.59 U	0.61 U	0.67 U	0.59 U	20.4	0.65 U
Iron	5840 J	4940 J	10300 J	19200 J	8580	13500	99400	22100
Lead	4.8	3	11.8	11.7	56.2 L	8.1 L	40.9 L	776 L
Magnesium	791	749	2350	3940	2190	1840	2110	2820
Manganese	1150	515	403	326	294	241	360	369
Mercury	0.05 U	0.05 U	0.05 U	0.06	0.06 U	0.05 U	0.77	0.98
Nickel	3.3 L	4.3 L	9.1 L	10.5 L	9.7	11.3	18.3	29.3
Potassium	275	208	511	1000	706	599	329	593
Selenium	0.71 UL	0.66 UL	0.75 UL	0.8 UL	0.99 U	0.82 U	0.83 U	0.81 U
Silver	0.89 UL	0.83 UL	0.94 UL	1 UL	2.1 L	1 UL	168	17.1
Sodium	54.7 B	62.9	70.5	90.2	93 B	87.9 B	43.9 B	191
Thallium	0.71 U	0.66 U	0.75 U	0.8 U	0.99 UL	0.82 U	0.83 UL	0.81 U
Vanadium	7.4	6.3	16.6	30.1	16.8 K	23.4	26.5 K	45.6
Zinc	7.2 J	5.7 J	22.7 J	34.9 J	117	21.9	143	1020

**SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA**

SAMPLE I.D.:	SB-02-16	SB-02-16-DUP	SB-02-17	SB-02-18	SB-02-19	SB-02-19A	SB-02-20	SB-02-21
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,2,4-Trichlorobenzene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
1,2-Dichlorobenzene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
1,3-Dichlorobenzene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
1,4-Dichlorobenzene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2,2'-Oxybis(1-chloropropane)	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2,4,5-Trichlorophenol	920 U	910 U	n/a	970 U	1000 U	n/a	n/a	n/a
2,4,6-Trichlorophenol	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2,4-Dichlorophenol	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2,4-Dimethylphenol	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2,4-Dinitrophenol	920 U	910 U	n/a	970 U	1000 U	n/a	n/a	n/a
2,4-Dinitrotoluene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2,6-Dinitrotoluene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2-Chloronaphthalene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2-Chlorophenol	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2-Methylnaphthalene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2-Methylphenol	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
2-Nitroaniline	920 U	910 U	n/a	970 U	1000 U	n/a	n/a	n/a
2-Nitrophenol	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
3,3'-Dichlorobenzidine	380 UJ	370 UJ	n/a	400 UJ	430 UJ	n/a	n/a	n/a
3-Nitroaniline	920 U	910 U	n/a	970 U	1000 U	n/a	n/a	n/a
4,6-Dinitro-2-methylphenol	920 U	910 U	n/a	970 U	1000 U	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-16	SB-02-16-DUP	SB-02-17	SB-02-18	SB-02-19	SB-02-19A	SB-02-20	SB-02-21
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4-Bromophenyl-phenylether	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
4-Chloro-3-methylphenol	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
4-Chloroaniline	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
4-Chlorophenyl Phenyl Ether	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
4-Methylphenol	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
4-Nitroaniline	920 U	910 U	n/a	970 U	1000 U	n/a	n/a	n/a
4-Nitrophenol	920 U	910 U	n/a	970 U	1000 U	n/a	n/a	n/a
Acenaphthene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Acenaphthylene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Anthracene	380 U	370 U	n/a	100 J	430 U	n/a	n/a	n/a
Benzo(a)anthracene	380 U	370 U	n/a	230 J	430 U	n/a	n/a	n/a
Benzo(a)pyrene	380 U	370 U	n/a	190 J	430 U	n/a	n/a	n/a
Benzo(b)fluoranthene	380 U	370 U	n/a	230 J	430 U	n/a	n/a	n/a
Benzo(g,h,i)perylene	380 U	370 U	n/a	110 J	430 U	n/a	n/a	n/a
Benzo(k)fluoranthene	380 U	370 U	n/a	54 J	430 U	n/a	n/a	n/a
Bis(2-chloroethoxy)methane	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Bis(2-chloroethyl)ether	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Bis(2-ethylhexyl)phthalate	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Butylbenzylphthalate	91 J	53 J	n/a	400 U	430 U	n/a	n/a	n/a
Carbazole	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Chrysene	380 U	370 U	n/a	200 J	430 U	n/a	n/a	n/a
Di-n-butylphthalate	380 U	370 U	n/a	400 UJ	430 U	n/a	n/a	n/a
Di-n-octylphthalate	380 UJ	370 UJ	n/a	400 U	430 UJ	n/a	n/a	n/a
Dibenz(a,h)anthracene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-16	SB-02-16-DUP	SB-02-17	SB-02-18	SB-02-19	SB-02-19A	SB-02-20	SB-02-21
LOCATION:								
SEMIVOLATILES	ug/kg							
Dibenzofuran	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Diethylphthalate	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Dimethylphthalate	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Fluoranthene	380 U	370 U	n/a	360 J	430 U	n/a	n/a	n/a
Fluorene	380 U	370 U	n/a	69 J	430 U	n/a	n/a	n/a
Hexachlorobenzene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Hexachlorobutadiene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Hexachlorocyclopentadiene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Hexachloroethane	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Indeno(1,2,3-cd)pyrene	380 U	370 U	n/a	100 J	430 U	n/a	n/a	n/a
Isophorone	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
N-Nitroso-di-n-propylamine	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
N-Nitrosodiphenylamine (1)	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Naphthalene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Nitrobenzene	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Pentachlorophenol	920 U	910 U	n/a	970 U	1000 U	n/a	n/a	n/a
Phenanthrene	380 U	370 U	n/a	380 J	430 U	n/a	n/a	n/a
Phenol	380 U	370 U	n/a	400 U	430 U	n/a	n/a	n/a
Pyrene	380 U	370 U	n/a	420	430 U	n/a	n/a	n/a
VOLATILES	ug/kg							
1,1,1-Trichloroethane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
1,1,2,2-Tetrachloroethane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 UJ	1500 U
1,1,2-Trichloroethane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-16	SB-02-16-DUP	SB-02-17	SB-02-18	SB-02-19	SB-02-19A	SB-02-20	SB-02-21
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1-Dichloroethane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
1,1-Dichloroethene	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
1,2-Dichloroethane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
1,2-Dichloroethene (Total)	11 U	120 UJ	60	12 U	13 U	12 U	12 U	1500 U
1,2-Dichloropropane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
2-Butanone	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
2-Hexanone	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
4-Methyl-2-pentanone	11 U	120 UJ	60 U	12 U	13 U	12 U	12 UJ	1500 U
Acetone	93 B	820 B	740 B	70 B	12 B	15 B	11 B	1500 U
Benzene	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
Bromodichloromethane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
Bromoform	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
Bromomethane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	750 B
Carbon Disulfide	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
Carbon Tetrachloride	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
Chlorobenzene	11 U	120 UJ	60 U	12 U	13 U	12 U	12 UJ	1500 U
Chloroethane	11 UJ	120 UJ	60 UJ	12 UJ	13 UJ	12 UJ	12 U	1500 U
Chloroform	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
Chloromethane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	480 B
Dibromochloromethane	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
Ethylbenzene	11 U	120 UJ	60 U	12 U	13 U	12 U	12 UJ	1500 U
Methylene Chloride	3 B	27 B	17 B	5 B	14 B	12 B	8 B	450 B
Styrene	11 U	120 UJ	60 U	12 U	13 U	12 U	12 UJ	1500 U
Tetrachloroethene	22	36 J	60 U	12 U	2 J	12 U	12 UJ	1500 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D. LOCATION.	SB-02-18	SB-02-16-DUP	SB-02-17	SB-02-18	SB-02-19	SB-02-19A	SB-02-20	SB-02-21
VOLATILES	ug/kg							
Toluene	11 U	120 UJ	60 U	12 U	13 U	12 U	12 UJ	1500 U
Trichloroethene	11 U	120 UJ	60 U	4 J	13 U	12 U	2 J	1500 U
Vinyl Chloride	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
Xylene (Total)	11 U	120 UJ	60 U	12 U	13 U	12 U	12 UJ	1500 U
cis-1,3-Dichloropropene	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
trans-1,3-Dichloropropene	11 U	120 UJ	60 U	12 U	13 U	12 U	12 U	1500 U
PESTICIDES	ug/kg							
4,4'-DDD	38 U	37 U	39 U	4 U	43 U	n/a	n/a	n/a
4,4'-DDE	38 U	37 U	39 U	4 U	43 U	n/a	n/a	n/a
4,4'-DDT	38 U	37 U	39 U	4 U	43 U	n/a	n/a	n/a
Aldrin	2 U	19 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Alpha-BHC	2 U	19 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Alpha-Chlordane	2 U	19 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Aroclor-1016	38 U	37 U	39 U	40 U	43 U	n/a	n/a	n/a
Aroclor-1221	77 U	76 U	79 U	81 U	88 U	n/a	n/a	n/a
Aroclor-1232	38 U	37 U	39 U	40 U	43 U	n/a	n/a	n/a
Aroclor-1242	38 U	37 U	39 U	40 U	43 U	n/a	n/a	n/a
Aroclor-1248	38 U	37 U	39 U	40 U	43 U	n/a	n/a	n/a
Aroclor-1254	38 U	37 U	39 U	40 U	43 U	n/a	n/a	n/a
Aroclor-1260	38 U	37 U	39 U	40 U	43 U	n/a	n/a	n/a
Beta-BHC	2 U	1.9 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Delta-BHC	2 U	1.9 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Dieldrin	3.8 U	3.7 U	3.9 U	4 U	4.3 U	n/a	n/a	n/a

**SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA**

SAMPLE I.D.:	SB-02-16	SB-02-16-DUP	SB-02-17	SB-02-18	SB-02-19	SB-02-19A	SB-02-20	SB-02-21
LOCATION								
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Endosulfan I	2 U	1.9 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Endosulfan II	3.8 U	3.7 U	3.9 U	4 U	4.3 U	n/a	n/a	n/a
Endosulfan Sulfate	3.8 U	3.7 U	3.9 U	4 U	4.3 U	n/a	n/a	n/a
Endrin	3.8 U	3.7 U	3.9 U	4 U	4.3 U	n/a	n/a	n/a
Endrin Aldehyde	3.8 U	3.7 U	3.9 U	4 U	4.3 U	n/a	n/a	n/a
Endrin Ketone	3.8 U	3.7 U	3.9 U	4 U	4.3 U	n/a	n/a	n/a
Gamma-BHC (Lindane)	2 U	1.9 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Gamma-Chlordane	2 U	1.9 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Heptachlor	2 U	1.9 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Heptachlor Epoxide	2 U	1.9 U	2 U	2.1 U	2.2 U	n/a	n/a	n/a
Methoxychlor	20 U	19 U	20 U	21 U	22 U	n/a	n/a	n/a
Toxaphene	200 U	190 U	200 U	210 U	220 U	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-22	SB-02-24	SB-02-24-DUP	SB-02-28	SB-02-29	SB-02-30	SB-02-31A	SB-02-32
LOCATION:								
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	14900	16900	12300	17000	17500	15200	18500	23200
Antimony	8.2 UR	13.3 L	10.2 UR	9.7 UR	7.7 UR	10.4 UR	14.2 J	15.9 J
Arsenic	4.8	1.6	1.6	5.5 L	6.7 L	3.6 L	6.3 L	16.7 L
Barium	44.5	92.6	75.3	85.1	37.9	79.2	62.8	417
Beryllium	0.72	1.7	0.96	1	0.54	1.3	0.72	0.81
Cadmium	0.36 U	0.4 U	0.45 U	0.42 U	0.33 U	0.45 U	0.48 B	293
Calcium	1160	1150	725	1080	437	387	565	11400
Chromium	28.1	15.7	11.2	23.1 K	20.6 K	12.5 K	384 K	166 K
Chromium, Hexavalent	n/a	n/a	n/a	n/a	3.59 L	n/a	n/a	1 UR
Cobalt	6.6	11.3	11	11.7	7.5	13.7	7.6	12.7
Copper	15.3	21.6	19.8	10.7 J	13.5 J	6.5 J	14 J	933 J
Cyanide	0.6 U	0.64 U	0.62 U	0.74 U	0.61 U	0.62 U	0.6 U	0.63 U
Iron	20500	18200	11100	21900 J	21800 J	11500 J	20800	64400 J
Lead	9.6 L	6.8 L	5.2 L	13 B	9.5 B	9.5 B	19.2 B	7.6 L
Magnesium	2400	5050	2320	2320	2450	1470	2360	3300
Manganese	265	368	615	610	220	844	388	1240
Mercury	0.08	0.06 U	0.05 U	0.07 U	0.07	0.05 U	0.06 U	0.51
Nickel	12.4	35.2	14.9	13.1 B	13.5 B	10.9 B	12.2 B	11.1
Potassium	984	1840	917	548	791	316	852	720
Selenium	0.72 U	0.8 U	0.89 U	0.85 UL	0.67 UL	0.9 UL	0.81 UL	0.81 UL
Silver	0.9 UL	1 UL	1.1 UL	1.1 UJ	0.84 UJ	1.1 UJ	1 UJ	9.8 UJ
Sodium	52.1 B	71.5 B	66.1 B	63.4 B	56.5 B	81.4 B	57.4 B	209
Thallium	0.72 U	0.8 U	0.89 U	0.85 UL	0.67 UL	0.9 UL	0.81 UL	0.84 UL
Vanadium	38.9	26.3	17.6	41.7	38	21	37.2	48.5

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-22	SB-02-24	SB-02-24-DUP	SB-02-28	SB-02-29	SB-02-30	SB-02-31A	SB-02-32
LOCATION:								
INORGANICS	mg/kg							
Zinc	41	35.7	16.7	35.6 J	30 J	20.9 J	470 J	2270 J
VOLATILES	ug/kg							
1,2,4-Trichlorobenzene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
1,2-Dichlorobenzene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
1,3-Dichlorobenzene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
1,4-Dichlorobenzene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
SEMIVOLATILES	ug/kg							
2,2'-Oxybis(1-chloropropane)	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2,4,5-Trichlorophenol	n/a	n/a	n/a	n/a	990 U	n/a	n/a	5000 U
2,4,6-Trichlorophenol	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2,4-Dichlorophenol	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2,4-Dimethylphenol	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2,4-Dinitrophenol	n/a	n/a	n/a	n/a	990 U	n/a	n/a	5000 U
2,4-Dinitrotoluene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2,6-Dinitrotoluene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2-Chloronaphthalene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2-Chlorophenol	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2-Methylnaphthalene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2-Methylphenol	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
2-Nitroaniline	n/a	n/a	n/a	n/a	990 U	n/a	n/a	5000 U
2-Nitrophenol	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
3,3'-Dichlorobenzidine	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
3-Nitroaniline	n/a	n/a	n/a	n/a	990 U	n/a	n/a	5000 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-22	SB-02-24	SB-02-24-DUP	SB-02-28	SB-02-29	SB-02-30	SB-02-31A	SB-02-32
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4,6-Dinitro-2-methylphenol	n/a	n/a	n/a	n/a	990 U	n/a	n/a	5000 U
4-Bromophenyl-phenylether	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
4-Chloro-3-methylphenol	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
4-Chloroaniline	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
4-Chlorophenyl Phenyl Ether	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
4-Methylphenol	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
4-Nitroaniline	n/a	n/a	n/a	n/a	990 U	n/a	n/a	5000 U
4-Nitrophenol	n/a	n/a	n/a	n/a	990 U	n/a	n/a	5000 U
Acenaphthene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Acenaphthylene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Anthracene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	370 J
Benzo(a)anthracene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	1800 J
Benzo(a)pyrene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	1400 J
Benzo(b)fluoranthene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	1400 J
Benzo(g,h,i)perylene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	670 J
Benzo(k)fluoranthene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	1100 J
Bis(2-chloroethoxy)methane	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Bis(2-chloroethyl)ether	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Bis(2-ethylhexyl)phthalate	n/a	n/a	n/a	n/a	200 B	n/a	n/a	2100 U
Butylbenzylphthalate	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Carbazole	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Chrysene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	1700 J
Di-n-butylphthalate	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Di-n-octylphthalate	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-22	SB-02-24	SB-02-24-DUP	SB-02-28	SB-02-29	SB-02-30	SB-02-31A	SB-02-32
LOCATION:								
SEMIVOLATILES	ug/kg							
Dibenz(a,h)anthracene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Dibenzofuran	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Diethylphthalate	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Dimethylphthalate	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Fluoranthene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Fluorene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	3200
Hexachlorobenzene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Hexachlorobutadiene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Hexachlorocyclopentadiene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Hexachloroethane	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Indeno(1,2,3-cd)pyrene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Isophorone	n/a	n/a	n/a	n/a	410 U	n/a	n/a	720 J
N-Nitroso-di-n-propylamine	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
N-Nitrosodiphenylamine (1)	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Naphthalene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Nitrobenzene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 U
Pentachlorophenol	n/a	n/a	n/a	n/a	990 U	n/a	n/a	2100 U
Phenanthrene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	5000 U
Phenol	n/a	n/a	n/a	n/a	410 U	n/a	n/a	1100 J
Pyrene	n/a	n/a	n/a	n/a	410 U	n/a	n/a	2100 J
VOLATILES	ug/kg							
1,1,1-Trichloroethane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
1,1,2,2-Tetrachloroethane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 UJ

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-22	SB-02-24	SB-02-24-DUP	SB-02-28	SB-02-29	SB-02-30	SB-02-31A	SB-02-32
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1,2-Trichloroethane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
1,1-Dichloroethane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
1,1-Dichloroethene	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
1,2-Dichloroethane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
1,2-Dichloroethene (Total)	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
1,2-Dichloropropane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
2-Butanone	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
2-Hexanone	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 UJ
4-Methyl-2-pentanone	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 UJ
Acetone	12 U	11 B	4 B	n/a	60	n/a	n/a	15 B
Benzene	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Bromodichloromethane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Bromoform	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Bromomethane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Carbon Disulfide	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Carbon Tetrachloride	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Chlorobenzene	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 UJ
Chloroethane	12 UJ	12 UJ	12 UJ	n/a	11 UJ	n/a	n/a	13 UJ
Chloroform	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Chloromethane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Dibromochloromethane	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Ethylbenzene	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 UJ
Methylene Chloride	8 B	8 B	2 B	n/a	8 B	n/a	n/a	3 B
Styrene	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 UJ

APPENDIX A - TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-22	SB-02-24	SB-02-24-DUP	SB-02-28	SB-02-29	SB-02-30	SB-02-31A	SB-02-32
LOCATION:								
VOLATILES	ug/kg							
Tetrachloroethene	2 J	2 J	12 U	n/a	11 U	n/a	n/a	13 UJ
Toluene	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 UJ
Trichloroethene	2 J	12 U	12 U	n/a	11 U	n/a	n/a	5 J
Vinyl Chloride	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
Xylene (Total)	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 UJ
cis-1,3-Dichloropropene	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
trans-1,3-Dichloropropene	12 U	12 U	12 U	n/a	11 U	n/a	n/a	13 U
PESTICIDES	ug/kg							
4,4'-DDD	4.1 U	n/a	n/a	n/a	4.1 U	n/a	n/a	4.1 U
4,4'-DDE	4.1 U	n/a	n/a	n/a	4.1 U	n/a	n/a	4.1 U
4,4'-DDT	4.1 U	n/a	n/a	n/a	4.1 U	n/a	n/a	16 J
Aldrin	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U
Alpha-BHC	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U
Alpha-Chlordane	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	5.9
Aroclor-1016	41 U	n/a	n/a	n/a	41 U	n/a	n/a	41 U
Aroclor-1221	83 U	n/a	n/a	n/a	83 U	n/a	n/a	83 U
Aroclor-1232	41 U	n/a	n/a	n/a	41 U	n/a	n/a	41 U
Aroclor-1242	41 U	n/a	n/a	n/a	41 U	n/a	n/a	41 U
Aroclor-1248	41 U	n/a	n/a	n/a	41 U	n/a	n/a	110 J
Aroclor-1254	41 U	n/a	n/a	n/a	41 U	n/a	n/a	41 U
Aroclor-1260	41 U	n/a	n/a	n/a	41 U	n/a	n/a	300 J
Beta-BHC	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U
Delta-BHC	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-22	SB-02-24	SB-02-24-DUP	SB-02-28	SB-02-29	SB-02-30	SB-02-31A	SB-02-32
LOCATION:								
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dieldrin	4.1 U	n/a	n/a	n/a	4.1 U	n/a	n/a	4.3 J
Endosulfan I	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U
Endosulfan II	4.1 U	n/a	n/a	n/a	4.1 U	n/a	n/a	8.5 J
Endosulfan Sulfate	4.1 U	n/a	n/a	n/a	4.1 U	n/a	n/a	4.1 U
Endrin	4.1 U	n/a	n/a	n/a	4.1 U	n/a	n/a	20 J
Endrin Aldehyde	4.1 U	n/a	n/a	n/a	4.1 U	n/a	n/a	4.1 U
Endrin Ketone	4.1 U	n/a	n/a	n/a	4.1 U	n/a	n/a	5.5 J
Gamma-BHC (Lindane)	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U
Gamma-Chlordane	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U
Heptachlor	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U
Heptachlor Epoxide	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U
Methoxychlor	2.1 U	n/a	n/a	n/a	2.1 U	n/a	n/a	2.1 U
Toxaphene	210 U	n/a	n/a	n/a	210 U	n/a	n/a	210 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-33	SB-02-33-DUP	SB-02-35	SB-02-36	SB-02-36-DUP	SB-02-38	SB-02-39	SB-02-40
LOCATION:								
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	13200	14900	14600	10900	11100	8730	10200	14100
Antimony	20.8 J	13.7 J	10.4 UR	9.5 UR	9.1 UR	8.4 U	7.9 U	9.4 U
Arsenic	5.8 L	6 L	5.1 L	2.4 L	3.1 L	1.8	9	9.7
Barium	719	419	89.5	118	107	68.8	45	105
Beryllium	1.6	1.1	0.9	1.4	0.82	0.63	0.92	0.92
Cadmium	15.3	9.8	2.5 B	0.41 U	0.65 B	0.37 U	0.34 U	1.9 B
Calcium	42100	39800	14100	4040	7760	1040	47700	3560
Chromium	948 K	265 K	38.6 K	20.8 K	20.3 K	9.6	25.2	32.2
Chromium, Hexavalent	n/a	n/a	n/a	1.61 L	0.95 L	0.93 UR	n/a	1 UR
Cobalt	21	10.7	9.6	11.1	9.3	12.4	8.9	10.1
Copper	712 J	441 J	35.7 J	15.4 J	22.8 J	7.2	26.7	44.5
Cyanide	0.85	2.7	0.62 U	0.6 U	0.56 U	0.56 U	0.53 U	0.59 U
Iron	44500 J	22900 J	21300 J	20000 J	18200 J	22600	14000	16700
Lead	508 J	307 J	94.1 J	24.3 B	43.9 B	11.6	31.9	136
Magnesium	5530	8160	3010	4770	5200	972	29900	2410
Manganese	1760	592	438	275	462	572	365	525
Mercury	0.28	0.64	0.09	0.05 U	0.05 U	0.05 U	0.05 U	0.1
Nickel	113 L	80.8 L	16.8 B	18.2 B	18.3 B	6.9 L	11.8 J	21.3
Potassium	813	939	970	1830	1150	345 B	1900	715 B
Selenium	0.83 UL	0.84 UL	0.9 UL	0.83 UL	0.79 UL	0.73 U	0.69 U	0.82 U
Silver	46.4 J	15.7 J	1.1 UJ	1 UJ	0.99 UJ	0.92 UL	0.86 UL	1 UL
Sodium	391	344	163 B	110 B	132 B	70	233	84.2
Thallium	0.83 UL	0.84 UL	0.9 UL	0.83 UL	0.79 UL	0.73 UL	0.69 UL	0.82 UL
Vanadium	48.8	51.5	31.9	28.2	33.4	15.1	39.5 K	73.3

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-33	SB-02-33-DUP	SB-02-35	SB-02-36	SB-02-36-DUP	SB-02-38	SB-02-39	SB-02-40
LOCATION:								
SEMIVOLATILES	ug/kg							
Dibenz(a,h)anthracene	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	62 J
Dibenzofuran	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	370 J
Diethylphthalate	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
Dimethylphthalate	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
Fluoranthene	1200 J	1800 J	n/a	n/a	n/a	n/a	n/a	1600
Fluorene	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	850
Hexachlorobenzene	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
Hexachlorobutadiene	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
Hexachlorocyclopentadiene	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
Hexachloroethane	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
Indeno(1,2,3-cd)pyrene	630 J	620 J	n/a	n/a	n/a	n/a	n/a	600 J
Isophorone	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
N-Nitroso-di-n-propylamine	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
N-Nitrosodiphenylamine (1)	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
Naphthalene	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	120 J
Nitrobenzene	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
Pentachlorophenol	4700 U	4700 U	n/a	n/a	n/a	n/a	n/a	1000 U
Phenanthrene	530 J	750 J	n/a	n/a	n/a	n/a	n/a	150 J
Phenol	1900 U	1900 U	n/a	n/a	n/a	n/a	n/a	410 U
Pyrene	1300 J	2100	n/a	n/a	n/a	n/a	n/a	150 J
VOLATILES	ug/kg							
1,1,1-Trichloroethane	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
1,1,2,2-Tetrachloroethane	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-33	SB-02-33-DUP	SB-02-35	SB-02-36	SB-02-36-DUP	SB-02-38	SB-02-39	SB-02-40
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1,2-Trichloroethane	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
1,1-Dichloroethane	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
1,1-Dichloroethene	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
1,2-Dichloroethane	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
1,2-Dichloroethene (Total)	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
1,2-Dichloropropane	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
2-Butanone	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
2-Hexanone	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	16
4-Methyl-2-pentanone	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
Acetone	n/a	n/a	n/a	12 UJ	12 UJ	110	110 U	12 U
Benzene	n/a	n/a	n/a	16 B	17 B	49	62 B	56 B
Bromodichloromethane	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
Bromoform	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
Bromomethane	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
Carbon Disulfide	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
Carbon Tetrachloride	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
Chlorobenzene	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
Chloroethane	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
Chloroform	n/a	n/a	n/a	12 UJ	12 UJ	12 UJ	110 UJ	12 UJ
Chloromethane	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
Dibromochloromethane	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
Ethylbenzene	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
Methylene Chloride	n/a	n/a	n/a	3 B	4 B	6 J	13 J	3 J
Styrene	n/a	n/a	n/a	12 UJ	12 UJ	2 J	23 J	3 J
				12 U	12 U	12 U	110 U	12 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-33	SB-02-33-DUP	SB-02-35	SB-02-36	SB-02-36-DUP	SB-02-38	SB-02-39	SB-02-40
LOCATION:								
VOLATILES	ug/kg							
Tetrachloroethene	n/a	n/a	n/a	12 UJ	12 UJ	3 J	110 U	12 U
Toluene	n/a	n/a	n/a	12 UJ	12 UJ	3 J	150	12 U
Trichloroethene	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
Vinyl Chloride	n/a	n/a	n/a	12 UJ	12 U	12 U	110 U	12 U
Xylene (Total)	n/a	n/a	n/a	12 UJ	12 UJ	10 J	38 J	12 U
cis-1,3-Dichloropropene	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
trans-1,3-Dichloropropene	n/a	n/a	n/a	12 UJ	12 UJ	12 U	110 U	12 U
PESTICIDES	ug/kg							
4,4'-DDD	7 J	86 J	n/a	3.9 U	n/a	n/a	n/a	4.1 U
4,4'-DDE	7.9 J	4.8 J	n/a	3.9 U	n/a	n/a	n/a	4.1 U
4,4'-DDT	50	46 J	n/a	3.9 U	n/a	n/a	n/a	4.1 U
Aldrin	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U
Alpha-BHC	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U
Alpha-Chlordane	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U
Aroclor-1016	39 U	39 UJ	n/a	39 U	n/a	n/a	n/a	41 U
Aroclor-1221	78 U	79 UJ	n/a	79 U	n/a	n/a	n/a	5.1 U
Aroclor-1232	39 U	39 UJ	n/a	39 U	n/a	n/a	n/a	41 U
Aroclor-1242	39 U	39 UJ	n/a	39 U	n/a	n/a	n/a	41 U
Aroclor-1248	39 U	39 UJ	n/a	39 U	n/a	n/a	n/a	41 U
Aroclor-1254	39 U	39 UJ	n/a	39 U	n/a	n/a	n/a	41 U
Aroclor-1260	65	82 J	n/a	9 J	n/a	n/a	n/a	41 U
Beta-BHC	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U
Delta-BHC	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-33	SB-02-33-DUP	SB-02-35	SB-02-36	SB-02-36-DUP	SB-02-38	SB-02-39	SB-02-40
LOCATION:								
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dieldrin	3.9 U	3.9 UJ	n/a	3.9 U	n/a	n/a	n/a	4.1 U
Endosulfan I	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U
Endosulfan II	3.9 U	3.9 UJ	n/a	3.9 U	n/a	n/a	n/a	4.1 U
Endosulfan Sulfate	3.9 U	3.9 UJ	n/a	3.9 U	n/a	n/a	n/a	4.1 U
Endrin	3.9 U	4.5 J	n/a	3.9 U	n/a	n/a	n/a	4.3 J
Endrin Aldehyde	3.9 U	3.9 UJ	n/a	3.9 U	n/a	n/a	n/a	4.1 U
Endrin Ketone	3.9 U	3.9 UJ	n/a	3.9 U	n/a	n/a	n/a	4.1 U
Gamma-BHC (Lindane)	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U
Gamma-Chlordane	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U
Heptachlor	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U
Heptachlor Epoxide	2 U	2 UJ	n/a	2 U	n/a	n/a	n/a	2.1 U
Methoxychlor	20 U	20 UJ	n/a	20 U	n/a	n/a	n/a	21 U
Toxaphene	200 U	200 UJ	n/a	200 U	n/a	n/a	n/a	210 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE ID : LOCATION	SB-02-41	SB-02-42	SB-02-43	SB-02-44	SB-02-45	SB-02-46	SB-02-47	SB-02-47A
DIOXINS/FURANS								
1,2,3,4,6,7,8-HpCDD	n/a	n/a	n/a	n/a	n/a	0.06 U	0.35 U	0.17 UJ
1,2,3,4,6,7,8-HpCDF	n/a	n/a	n/a	n/a	n/a	0.1 U	0.18 U	0.058 U
1,2,3,4,7,8,9-HpCDF	n/a	n/a	n/a	n/a	n/a	0.055 U	0.068 U	0.11 U
1,2,3,4,7,8-HxCDD	n/a	n/a	n/a	n/a	n/a	0.075 U	0.06 U	0.24 UJ
1,2,3,4,7,8-HxCDF	n/a	n/a	n/a	n/a	n/a	0.062 U	0.098 U	0.012 U
1,2,3,6,7,8-HxCDD	n/a	n/a	n/a	n/a	n/a	0.08 U	0.072 U	0.062 UJ
1,2,3,6,7,8-HxCDF	n/a	n/a	n/a	n/a	n/a	0.035 U	0.13 U	0.06 U
1,2,3,7,8,9-HxCDD	n/a	n/a	n/a	n/a	n/a	0.075 U	0.12 U	0.055 UJ
1,2,3,7,8,9-HxCDF	n/a	n/a	n/a	n/a	n/a	0.045 U	0.08 U	0.068 U
1,2,3,7,8-PeCDD	n/a	n/a	n/a	n/a	n/a	0.045 U	0.028 U	0.058 U
1,2,3,7,8-PeCDF	n/a	n/a	n/a	n/a	n/a	0.021 U	0.095 U	0.017 U
2,3,4,6,7,8-HxCDF	n/a	n/a	n/a	n/a	n/a	0.12 U	0.09 U	0.014 U
2,3,4,7,8-PeCDF	n/a	n/a	n/a	n/a	n/a	0.058 U	0.032 U	0.03 U
2,3,7,8-Tetrachlorodibenzo-p ran	ng/g n/a	ng/g n/a	ng/g n/a	ng/g n/a	ng/g n/a	ng/g 0.0082 U	ng/g 0.052 U	ng/g 0.035 U
Octachlorodibenzo-p-dioxin	ng/g n/a	ng/g n/a	ng/g n/a	ng/g n/a	ng/g n/a	ng/g 0.28 U	ng/g 0.68 J	ng/g 0.17 J
Octachlorodibenzofuran	ng/g n/a	ng/g n/a	ng/g n/a	ng/g n/a	ng/g n/a	ng/g 0.11 U	ng/g 0.25 U	ng/g 0.062 U
Total Hpcdd	n/a	n/a	n/a	n/a	n/a	0.06 U	0.35 U	0.17 U
Total Hpcdf	n/a	n/a	n/a	n/a	n/a	0.055 U	0.068 U	0.098 U
Total Hxcdd	n/a	n/a	n/a	n/a	n/a	0.075 U	0.06 U	0.24 U
Total Hxcdf	n/a	n/a	n/a	n/a	n/a	0.035 U	0.08 U	0.012 U
Total Pecdd	n/a	n/a	n/a	n/a	n/a	0.045 U	0.028 U	0.058 U
Total Pecdf	n/a	n/a	n/a	n/a	n/a	0.021 U	0.032 U	0.017 U
Total	ug/kg n/a	ug/kg n/a	ug/kg n/a	ug/kg n/a	ug/kg n/a	ug/kg 0.08 U	ug/kg 0.11 U	ug/kg 0.1 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-41	SB-02-42	SB-02-43	SB-02-44	SB-02-45	SB-02-46	SB-02-47	SB-02-47A
LOCATION:								
DIOXINS/FURANS								
Tetrachlorodibenzofuran ug/kg	n/a	n/a	n/a	n/a	n/a	0.0082 U	0.052 U	0.035 U
INORGANICS	mg/kg							
Aluminum	16300	16700	19000	9750	16100	7180	16900	15900
Antimony	9.6 U	8.7 U	9.7 U	8.1 U	9.5 U	7.9 U	9.7 U	8 U
Arsenic	5.1	6.2	6.6	0.85 L	7.4	0.98	10.5	6.2
Barium	87.7	50.8	46.7	89.3	46.7	36.8	255	83.6
Beryllium	1.2	0.72	0.67	1.3	0.5	0.48	0.85	1.1
Cadmium	0.42 U	0.38 U	0.42 U	0.35 U	0.41 U	0.58 B	9.7	2.1 B
Calcium	1020	797	709	2100	815	962	8520	1690
Chromium	18.5	31.7	23.8	15.5	27.6	14.9	108	276
Chromium, Hexavalent	n/a	0.91 UR	n/a	0.92 UR	n/a	1.64	1 U	1 U
Cobalt	5.2	8.3	9	12.7	6	13.5	10.7 L	9.2
Copper	8.1	11.6	12.1	0.99 B	11	6.6	369	29.2
Cyanide	0.61 U	0.54 U	0.62 U	0.56 U	0.58 U	0.58 U	0.62 U	0.93
Iron	15500	20100	23800	24200	24100	6760	50800	18700
Lead	14.7	10.4	10.4	15.2	10.7	4.1	673	90
Magnesium	1900	2270	2480	4190	2340	919	2750	2230
Manganese	127	393	439	529	196	1100	497	151
Mercury	0.06 U	0.05 U	0.05 U	0.05 U	0.05 U	0.06 U	0.06 U	0.06
Nickel	8.1 L	8.5 L	9.2 L	14.6 J	7.2 L	8 K	39.7 K	15.3 K
Potassium	485 B	835	785 B	2690	644 B	347	856	820
Selenium	0.84 U	0.76 U	0.84 U	0.7 U	0.83 U	0.68 U	0.85 U	0.7 U
Silver	1 UL	0.95 UL	1.1 UL	0.88 UL	1 UL	0.86 U	1.6	0.87 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-41	SB-02-42	SB-02-43	SB-02-44	SB-02-45	SB-02-46	SB-02-47	SB-02-47A
LOCATION:								
INORGANICS	mg/kg							
Sodium	55.4	50.4	53.6	126	45	68 B	122 B	59.2 B
Thallium	0.84 UL	0.76 UL	0.84 UL	0.7 UL	0.83 UL	0.68 U	0.85 U	0.7 U
Vanadium	30.5	45.8	42.8	19.9 K	46.6	9.3 L	27.5	28
Zinc	36.4	29	29.5	42.2	31.5	11.1	1890	131
VOLATILES	ug/kg							
1,2,4-Trichlorobenzene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
1,2-Dichlorobenzene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
1,3-Dichlorobenzene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
1,4-Dichlorobenzene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
SEMIVOLATILES	ug/kg							
2,2'-Oxybis(1-chloropropane)	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2,4,5-Trichlorophenol	n/a	1000 U	n/a	n/a	n/a	960 UJ	1100 UJ	1900 UJ
2,4,6-Trichlorophenol	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2,4-Dichlorophenol	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2,4-Dimethylphenol	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2,4-Dinitrophenol	n/a	1000 U	n/a	n/a	n/a	960 UJ	1100 UJ	1900 UJ
2,4-Dinitrotoluene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2,6-Dinitrotoluene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2-Chloronaphthalene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2-Chlorophenol	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2-Methylnaphthalene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2-Methylphenol	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
2-Nitroaniline	n/a	1000 U	n/a	n/a	n/a	960 UJ	1100 UJ	1900 UJ

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-41	SB-02-42	SB-02-43	SB-02-44	SB-02-45	SB-02-46	SB-02-47	SB-02-47A
LOCATION:								
SEMIVOLATILES	ug/kg							
2-Nitrophenol	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
3,3'-Dichlorobenzidine	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
3-Nitroaniline	n/a	1000 U	n/a	n/a	n/a	960 UJ	1100 UJ	1900 UJ
4,6-Dinitro-2-methylphenol	n/a	1000 U	n/a	n/a	n/a	960 UJ	1100 UJ	1900 UJ
4-Bromophenyl-phenylether	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
4-Chloro-3-methylphenol	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
4-Chloroaniline	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
4-Chlorophenyl Phenyl Ether	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
4-Methylphenol	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
4-Nitroaniline	n/a	1000 U	n/a	n/a	n/a	960 UJ	1100 UJ	1900 UJ
4-Nitrophenol	n/a	1000 U	n/a	n/a	n/a	960 UJ	1100 UJ	1900 UJ
Acenaphthene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Acenaphthylene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Anthracene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Benzo(a)anthracene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Benzo(a)pyrene	n/a	420 U	n/a	n/a	n/a	380 UJ	150 J	230 J
Benzo(b)fluoranthene	n/a	420 U	n/a	n/a	n/a	380 UJ	170 J	200 J
Benzo(g,h,i)perylene	n/a	420 U	n/a	n/a	n/a	380 UJ	210 J	320 J
Benzo(k)fluoranthene	n/a	420 U	n/a	n/a	n/a	380 UJ	150 J	100 J
Bis(2-chloroethoxy)methane	n/a	420 U	n/a	n/a	n/a	380 UJ	84 J	140 J
Bis(2-chloroethyl)ether	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Bis(2-ethylhexyl)phthalate	n/a	79 B	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Butylbenzylphthalate	n/a	420 U	n/a	n/a	n/a	380 UJ	52 B	2200 J
Carbazole	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-41	SB-02-42	SB-02-43	SB-02-44	SB-02-45	SB-02-46	SB-02-47	SB-02-47A
LOCATION:								
SEMIVOLATILES	ug/kg							
Chrysene	n/a	420 U	n/a	n/a	n/a	380 UJ	140 J	250 J
Di-n-butylphthalate	n/a	55 B	n/a	n/a	n/a	380 UJ	380 J	4200
Di-n-octylphthalate	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Dibenz(a,h)anthracene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Dibenzofuran	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Diethylphthalate	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Dimethylphthalate	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Fluoranthene	n/a	420 U	n/a	n/a	n/a	380 UJ	270 J	230 J
Fluorene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Hexachlorobenzene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Hexachlorobutadiene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Hexachlorocyclopentadiene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Hexachloroethane	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Indeno(1,2,3-cd)pyrene	n/a	420 U	n/a	n/a	n/a	380 UJ	120 J	100 J
Isophorone	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
N-Nitroso-di-n-propylamine	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
N-Nitrosodiphenylamine (1)	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Naphthalene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Nitrobenzene	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Pentachlorophenol	n/a	1000 U	n/a	n/a	n/a	960 UJ	1100 UJ	1900 UJ
Phenanthrene	n/a	420 U	n/a	n/a	n/a	380 UJ	95 J	770 UJ
Phenol	n/a	420 U	n/a	n/a	n/a	380 UJ	420 UJ	770 UJ
Pyrene	n/a	420 U	n/a	n/a	n/a	380 UJ	220 J	190 J

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-41	SB-02-42	SB-02-43	SB-02-44	SB-02-45	SB-02-46	SB-02-47	SB-02-47A
LOCATION:								
VOLATILES	ug/kg							
1,1,1-Trichloroethane	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
1,1,2,2-Tetrachloroethane	n/a	12 U	n/a	11 U	n/a	12 U	13 UJ	13 U
1,1,2-Trichloroethane	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
1,1-Dichloroethane	n/a	16	n/a	11 U	n/a	12 U	13 U	13 U
1,1-Dichloroethene	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
1,2-Dichloroethane	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
1,2-Dichloroethene (Total)	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
1,2-Dichloropropane	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
2-Butanone	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
2-Hexanone	n/a	12 U	n/a	11 U	n/a	12 U	13 UJ	13 U
4-Methyl-2-pentanone	n/a	12 U	n/a	11 U	n/a	12 U	13 UJ	13 U
Acetone	n/a	17 B	n/a	17 B	n/a	12 U	13 U	2 B
Benzene	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
Bromodichloromethane	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
Bromoform	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
Bromomethane	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
Carbon Disulfide	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
Carbon Tetrachloride	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
Chlorobenzene	n/a	12 U	n/a	11 U	n/a	12 U	13 UJ	13 U
Chloroethane	n/a	12 UJ	n/a	11 UJ	n/a	12 U	13 U	13 U
Chloroform	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
Chloromethane	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-41	SB-02-42	SB-02-43	SB-02-44	SB-02-45	SB-02-46	SB-02-47	SB-02-47A
LOCATION:								
VOLATILES	ug/kg							
Dibromochloromethane	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
Ethylbenzene	n/a	12 U	n/a	11 U	n/a	12 U	13 UJ	13 U
Methylene Chloride	n/a	12 U	n/a	1 J	n/a	2 B	5 B	3 B
Styrene	n/a	12 U	n/a	11 U	n/a	12 U	13 UJ	13 U
Tetrachloroethene	n/a	5 J	n/a	11 U	n/a	12 U	17 J	23
Toluene	n/a	12 U	n/a	11 U	n/a	12 U	2 B	13 U
Trichloroethene	n/a	12 U	n/a	11 U	n/a	12 U	8 J	8 J
Vinyl Chloride	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
Xylene (Total)	n/a	12 U	n/a	11 U	n/a	12 U	13 UJ	13 U
cis-1,3-Dichloropropene	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
trans-1,3-Dichloropropene	n/a	12 U	n/a	11 U	n/a	12 U	13 U	13 U
PESTICIDES	ug/kg							
4,4'-DDD	n/a	4.2 U	4 U	3.6 U	n/a	3.8 UJ	4.2 UJ	3.9 UJ
4,4'-DDE	n/a	4.2 U	4 U	3.6 U	n/a	3.8 UJ	4.2 UJ	3.9 UJ
4,4'-DDT	n/a	4.2 U	4 U	3.6 U	n/a	3.8 UJ	4.2 UJ	3.9 UJ
Aldrin	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Alpha-BHC	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Alpha-Chlordane	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Aroclor-1016	n/a	42 U	40 U	36 U	n/a	38 UJ	42 UJ	39 UJ
Aroclor-1221	n/a	86 U	80 U	73 U	n/a	78 UJ	85 UJ	79 UJ
Aroclor-1232	n/a	42 U	40 U	36 U	n/a	38 UJ	42 UJ	39 UJ
Aroclor-1242	n/a	42 U	40 U	36 U	n/a	38 UJ	42 UJ	39 UJ
Aroclor-1248	n/a	42 U	40 U	36 U	n/a	38 UJ	42 UJ	39 UJ

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-41	SB-02-42	SB-02-43	SB-02-44	SB-02-45	SB-02-46	SB-02-47	SB-02-47A
LOCATION:								
PESTICIDES	ug/kg							
Aroclor-1254	n/a	42 U	40 U	36 U	n/a	38 UJ	42 UJ	11 J
Aroclor-1260	n/a	42 U	40 U	36 U	n/a	38 UJ	42 UJ	39 UJ
Beta-BHC	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Delta-BHC	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Dieldrin	n/a	4.2 U	4 U	3.6 U	n/a	3.8 UJ	4.2 UJ	3.9 UJ
Endosulfan I	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Endosulfan II	n/a	4.2 U	4 U	3.6 U	n/a	3.8 UJ	4.2 UJ	3.9 UJ
Endosulfan Sulfate	n/a	4.2 U	4 U	3.6 U	n/a	3.8 UJ	4.2 UJ	3.9 UJ
Endrin	n/a	4.2 U	4 U	3.6 U	n/a	3.8 UJ	4.2 UJ	3.9 UJ
Endrin Aldehyde	n/a	4.2 U	4 U	3.6 U	n/a	3.8 UJ	4.2 UJ	3.9 UJ
Endrin Ketone	n/a	4.2 U	4 U	3.6 U	n/a	3.8 UJ	4.2 UJ	3.9 UJ
Gamma-BHC (Lindane)	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Gamma-Chlordane	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Heptachlor	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Heptachlor Epoxide	n/a	2.2 U	2 U	1.8 U	n/a	2 UJ	2.1 UJ	2 UJ
Methoxychlor	n/a	22 U	20 U	18 U	n/a	20 UJ	21 UJ	20 UJ
Toxaphene	n/a	220 U	200 U	180 U	n/a	200 UJ	210 UJ	200 UJ

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-48	SB-02-49	SB-02-80	SB-02-81	SB-02-82	SB-02-83	SB-02-8312	SB-02-84
LOCATION:								
DIOXINS/FURANS								
1,2,3,4,6,7,8-HpCDD	0.22 U	0.065 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,4,6,7,8-HpCDF	0.32 U	0.068 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,4,7,8,9-HpCDF	0.065 U	0.07 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,4,7,8-HxCDD	0.085 U	0.04 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,4,7,8-HxCDF	0.03 U	0.078 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,6,7,8-HxCDD	0.055 U	0.088 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,6,7,8-HxCDF	0.15 U	0.078 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,7,8,9-HxCDD	0.035 U	0.055 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,7,8,9-HxCDF	0.11 U	0.1 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,7,8-PeCDD	0.025 U	0.065 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2,3,7,8-PeCDF	0.1 U	0.06 U	n/a	n/a	n/a	n/a	n/a	n/a
2,3,4,6,7,8-HxCDF	0.032 U	0.065 U	n/a	n/a	n/a	n/a	n/a	n/a
2,3,4,7,8-PeCDF	0.045 U	0.035 U	n/a	n/a	n/a	n/a	n/a	n/a
2,3,7,8-Tetrachlorodibenzo-p ran	0.1 U ng/g	0.055 U ng/g	n/a	n/a	n/a	n/a	n/a	n/a
Octachlorodibenzo-p-dioxin	0.53 J ng/g	0.25 J	n/a	n/a	n/a	n/a	n/a	n/a
Octachlorodibenzofuran	0.25 J ng/g	0.032 U	n/a	n/a	n/a	n/a	n/a	n/a
Total Hpcdd	0.22 U	0.065 U	n/a	n/a	n/a	n/a	n/a	n/a
Total Hpcdf	0.065 U	0.068 U	n/a	n/a	n/a	n/a	n/a	n/a
Total Hxcdd	0.035 U	0.04 U	n/a	n/a	n/a	n/a	n/a	n/a
Total Hxcdf	0.03 U	0.065 U	n/a	n/a	n/a	n/a	n/a	n/a
Total Pecdd	0.025 U	0.065 U	n/a	n/a	n/a	n/a	n/a	n/a
Total Pecdf	0.045 U	0.035 U	n/a	n/a	n/a	n/a	n/a	n/a
Total	0.1 U ug/kg	0.055 U	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-48	SB-02-49	SB-02-80	SB-02-81	SB-02-82	SB-02-83	SB-02-8312	SB-02-84
LOCATION:								
DIOXINS/FURANS								
Tetrachlorodibenzofuran ug/kg	0.04 U	0.058 U	n/a	n/a	n/a	n/a	n/a	n/a
INORGANICS								
	mg/kg	mg/kg						
Aluminum	16800	14400	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	9.7 U	9 U	3.1 N	0.37 BN	10.7 N	1.2 BN	18.8 N	0.71 BN
Arsenic	15.5	4.3	n/a	n/a	n/a	n/a	n/a	n/a
Barium	464	70	n/a	n/a	n/a	n/a	n/a	n/a
Beryllium	8.2	0.93	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	25.8	0.39 U	n/a	1.1	10	5.2	116	0.49
Calcium	15700	819	n/a	n/a	n/a	n/a	n/a	n/a
Chromium	76.4	19.2	n/a	n/a	n/a	n/a	n/a	n/a
Chromium, Hexavalent	2.6	0.98 U	n/a	n/a	n/a	n/a	n/a	n/a
Cobalt	12.1	8.8	n/a	n/a	n/a	n/a	n/a	n/a
Copper	4190	12.1	90.8	10	1060	84.3	3540	26
Cyanide	0.61 U	0.58 U	n/a	n/a	n/a	n/a	n/a	n/a
Iron	40100	15800	n/a	n/a	n/a	n/a	n/a	n/a
Lead	978	20.6	111 E	12.1 E	1220 E	48.6 E	2060 E	92.9 E
Magnesium	4050	1770	n/a	n/a	n/a	n/a	n/a	n/a
Manganese	917	489	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	0.23	0.06 U	n/a	n/a	n/a	n/a	n/a	n/a
Nickel	143	11.8 K	n/a	n/a	n/a	n/a	n/a	n/a
Potassium	967	609	n/a	n/a	n/a	n/a	n/a	n/a
Selenium	0.85 K	0.78 U	n/a	n/a	n/a	n/a	n/a	n/a
Silver	49	0.98 U	n/a	0.17 B	21.1	39.6	112	0.58 U

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-48	SB-02-49	SB-02-80	SB-02-81	SB-02-82	SB-02-83	SB-02-8312	SB-02-84
LOCATION:								
INORGANICS	mg/kg							
Sodium	752	69.3 B	n/a	n/a	n/a	n/a	n/a	n/a
Thallium	0.84 U	0.78 U	n/a	n/a	n/a	n/a	n/a	n/a
Vanadium	586	24.2	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	5640	39.2	628	46.4	1280	79.1	3790	101
VOLATILES	ug/kg							
1,2,4-Trichlorobenzene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
1,2-Dichlorobenzene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
1,3-Dichlorobenzene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
1,4-Dichlorobenzene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
SEMIVOLATILES	ug/kg							
2,2'-Oxybis(1-chloropropane)	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2,4,5-Trichlorophenol	20000 UJ	1000 UR	n/a	n/a	n/a	n/a	n/a	n/a
2,4,6-Trichlorophenol	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2,4-Dichlorophenol	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2,4-Dimethylphenol	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2,4-Dinitrophenol	20000 UJ	1000 UR	n/a	n/a	n/a	n/a	n/a	n/a
2,4-Dinitrotoluene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2,6-Dinitrotoluene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2-Chloronaphthalene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2-Chlorophenol	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2-Methylnaphthalene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2-Methylphenol	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
2-Nitroaniline	20000 UJ	1000 UR	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-48	SB-02-49	SB-02-80	SB-02-81	SB-02-82	SB-02-83	SB-02-8312	SB-02-84
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg						
2-Nitrophenol	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
3,3'-Dichlorobenzidine	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
3-Nitroaniline	20000 UJ	1000 UR	n/a	n/a	n/a	n/a	n/a	n/a
4,6-Dinitro-2-methylphenol	20000 UJ	1000 UR	n/a	n/a	n/a	n/a	n/a	n/a
4-Bromophenyl-phenylether	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
4-Chloro-3-methylphenol	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
4-Chloroaniline	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
4-Chlorophenyl Phenyl Ether	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
4-Methylphenol	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
4-Nitroaniline	20000 UJ	1000 UR	n/a	n/a	n/a	n/a	n/a	n/a
4-Nitrophenol	20000 UJ	1000 UR	n/a	n/a	n/a	n/a	n/a	n/a
Acenaphthene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Acenaphthylene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Anthracene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Benzo(a)anthracene	1300 J	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Benzo(a)pyrene	1200 J	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Benzo(b)fluoranthene	1500 J	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Benzo(g,h,i)perylene	1000 J	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Benzo(k)fluoranthene	1000 J	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Bis(2-chloroethoxy)methane	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Bis(2-chloroethyl)ether	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Bis(2-ethylhexyl)phthalate	8100 UJ	120 B	n/a	n/a	n/a	n/a	n/a	n/a
Butylbenzylphthalate	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Carbazole	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-48	SB-02-49	SB-02-80	SB-02-81	SB-02-82	SB-02-83	SB-02-8312	SB-02-84
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg						
Chrysene	1500 J	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Di-n-butylphthalate	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Di-n-octylphthalate	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Dibenz(a,h)anthracene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Dibenzofuran	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Diethylphthalate	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Dimethylphthalate	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Fluoranthene	2800 J	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Fluorene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Hexachlorobenzene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Hexachlorobutadiene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Hexachlorocyclopentadiene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Hexachloroethane	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Indeno(1,2,3-cd)pyrene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Isophorone	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
N-Nitroso-di-n-propylamine	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
N-Nitrosodiphenylamine (1)	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Naphthalene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Nitrobenzene	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Pentachlorophenol	20000 UJ	1000 UR	n/a	n/a	n/a	n/a	n/a	n/a
Phenanthrene	1800 J	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Phenol	8100 UJ	400 UR	n/a	n/a	n/a	n/a	n/a	n/a
Pyrene	2400 J	400 UR	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-48	SB-02-49	SB-02-80	SB-02-81	SB-02-82	SB-02-83	SB-02-8312	SB-02-84
LOCATION:								
VOLATILES	ug/kg	ug/kg						
1,1,1-Trichloroethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,1,2,2-Tetrachloroethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,1,2-Trichloroethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,1-Dichloroethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,1-Dichloroethene	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2-Dichloroethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2-Dichloroethene (Total)	6 J	12 U	n/a	n/a	n/a	n/a	n/a	n/a
1,2-Dichloropropane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Butanone	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
2-Hexanone	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
4-Methyl-2-pentanone	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Acetone	66	3 B	n/a	n/a	n/a	n/a	n/a	n/a
Benzene	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Bromodichloromethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Bromoform	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Bromomethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Carbon Disulfide	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Carbon Tetrachloride	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Chlorobenzene	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Chloroethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Chloroform	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Chloromethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-48	SB-02-49	SB-02-80	SB-02-81	SB-02-82	SB-02-83	SB-02-8312	SB-02-84
LOCATION:								
VOLATILES	ug/kg							
Dibromochloromethane	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Methylene Chloride	4 B	6 B	n/a	n/a	n/a	n/a	n/a	n/a
Styrene	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Tetrachloroethene	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Trichloroethene	2 J	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Vinyl Chloride	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
Xylene (Total)	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
cis-1,3-Dichloropropene	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
trans-1,3-Dichloropropene	14 U	12 U	n/a	n/a	n/a	n/a	n/a	n/a
PESTICIDES	ug/kg							
4,4'-DDD	94 J	4 UJ	n/a	n/a	n/a	n/a	n/a	n/a
4,4'-DDE	82 J	4 UJ	n/a	n/a	n/a	n/a	n/a	n/a
4,4'-DDT	150 J	4 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Aldrin	21 UJ	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Alpha-BHC	21 UJ	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Alpha-Chlordane	21 UJ	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1016	41 UJ	40 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1221	83 UJ	81 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1232	41 UJ	40 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1242	41 UJ	40 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1248	41 UJ	40 UJ	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	SB-02-48	SB-02-49	SB-02-80	SB-02-81	SB-02-82	SB-02-83	SB-02-8312	SB-02-84
LOCATION:								
PESTICIDES	ug/kg	ug/kg						
Aroclor-1254	66 J	40 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Aroclor-1260	41 UJ	40 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Beta-BHC	21 UJ	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Delta-BHC	21 UJ	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Dieldrin	58 J	4 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Endosulfan I	21 UJ	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Endosulfan II	41 UJ	4 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Endosulfan Sulfate	41 UJ	4 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Endrin	41 UJ	4 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Endrin Aldehyde	41 UJ	4 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Endrin Ketone	41 UJ	4 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Gamma-BHC (Lindane)	21 UJ	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Gamma-Chlordane	23 J	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Heptachlor	21 UJ	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Heptachlor Epoxide	21 UJ	2 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Methoxychlor	21 UJ	20 UJ	n/a	n/a	n/a	n/a	n/a	n/a
Toxaphene	210 UJ	200 UJ	n/a	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	TP08-02-03	TP08-02-04	TP08-02-05	VS-2A-01F	VS-2A-01FE	VS-2A-01WE	VS-2A-02F	VS-2A-02FE
LOCATION								
INORGANICS	mg/kg							
Aluminum	15000	16300	16000	n/a	n/a	n/a	n/a	n/a
Antimony	9.4 UR	10.6 UR	9.7 UR	0.88 BN	1.5 N	1 BN	1.2 BN	2.1 N
Arsenic	4.5	5.8	4.4	n/a	n/a	n/a	n/a	n/a
Barium	103	36.4	113	n/a	n/a	n/a	n/a	n/a
Beryllium	1.1	0.64	1.2	n/a	n/a	n/a	n/a	n/a
Cadmium	0.49 L	0.4 UL	0.37 UL	1.7 N	2.1	0.62 N	2.8 N	3.6
Calcium	2520 J	928 J	1950 J	n/a	n/a	n/a	n/a	n/a
Chromium	19	23.8	20.3	n/a	n/a	n/a	n/a	n/a
Cobalt	7.6	8.8	9	n/a	n/a	n/a	n/a	n/a
Copper	22	11.6	16.4	n/a	n/a	12.3	n/a	n/a
Cyanide	1.2 U	1.2 U	1.2 U	n/a	n/a	n/a	n/a	n/a
Iron	16200	22200	14900	n/a	n/a	n/a	n/a	n/a
Lead	33.3 J	8.8 J	27.7 J	21.1 N	72.7	11.4 N	83.9 N	95.6
Magnesium	2820	2590	2440	n/a	n/a	n/a	n/a	n/a
Manganese	481	291	419	n/a	n/a	n/a	n/a	n/a
Mercury	0.05 UL	0.05 UL	0.06 UL	n/a	n/a	n/a	n/a	n/a
Nickel	7.7 K	4.9 K	8.4 K	n/a	n/a	n/a	n/a	n/a
Potassium	520	886	575	n/a	n/a	n/a	n/a	n/a
Selenium	0.35 UJ	0.4 UJ	0.37 UJ	n/a	n/a	n/a	n/a	n/a
Silver	0.89 UL	1 UL	0.92 UL	n/a	n/a	0.61 U	n/a	n/a
Sodium	28.6 B	20.8 B	30.4 B	n/a	n/a	n/a	n/a	n/a
Thallium	0.53 U	0.6 U	0.55 U	n/a	n/a	n/a	n/a	n/a
Vanadium	24	33.7	22	n/a	n/a	n/a	n/a	n/a
Zinc	142	38	108	n/a	n/a	43.8	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	TP08-02-03	TP08-02-04	TP08-02-05	VS-2A-01F	VS-2A-01FE	VS-2A-01WE	VS-2A-02F	VS-2A-02FE
LOCATION:								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,2,4-Trichlorobenzene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
1,2-Dichlorobenzene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
1,3-Dichlorobenzene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
1,4-Dichlorobenzene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2,2'-Oxybis(1-chloropropane)	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
2,4,5-Trichlorophenol	4800 U	n/a	9700 U	n/a	n/a	n/a	n/a	n/a
2,4,6-Trichlorophenol	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
2,4-Dichlorophenol	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
2,4-Dimethylphenol	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
2,4-Dinitrophenol	4800 U	n/a	9700 U	n/a	n/a	n/a	n/a	n/a
2,4-Dinitrotoluene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
2,6-Dinitrotoluene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
2-Chloronaphthalene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
2-Chlorophenol	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
2-Methylnaphthalene	6000	n/a	9800	n/a	n/a	n/a	n/a	n/a
2-Methylphenol	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
2-Nitroaniline	4800 U	n/a	9700 U	n/a	n/a	n/a	n/a	n/a
2-Nitrophenol	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
3,3'-Dichlorobenzidine	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
3-Nitroaniline	4800 U	n/a	9700 U	n/a	n/a	n/a	n/a	n/a
4,6-Dinitro-2-methylphenol	4800 U	n/a	9700 U	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	TP08-02-03	TP08-02-04	TP08-02-05	VS-2A-01F	VS-2A-01FE	VS-2A-01WE	VS-2A-02F	VS-2A-02FE
LOCATION:								
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4-Bromophenyl-phenylether	1900 UJ	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
4-Chloro-3-methylphenol	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
4-Chloroaniline	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
4-Chlorophenyl Phenyl Ether	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
4-Methylphenol	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
4-Nitroaniline	4800 U	n/a	9700 U	n/a	n/a	n/a	n/a	n/a
4-Nitrophenol	4800 U	n/a	9700 UJ	n/a	n/a	n/a	n/a	n/a
Acenaphthene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Acenaphthylene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Anthracene	750 J	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Benzo(a)anthracene	200 J	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Benzo(a)pyrene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Benzo(b)fluoranthene	220 J	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Benzo(g,h,i)perylene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Benzo(k)fluoranthene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Bis(2-chloroethoxy)methane	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Bis(2-chloroethyl)ether	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Bis(2-ethylhexyl)phthalate	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Butylbenzylphthalate	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Carbazole	1900 UJ	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Chrysene	190 J	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Di-n-butylphthalate	1900 UJ	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Di-n-octylphthalate	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Dibenz(a,h)anthracene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	TP08-02-03	TP08-02-04	TP08-02-05	VS-2A-01F	VS-2A-01FE	VS-2A-01WE	VS-2A-02F	VS-2A-02FE
LOCATION:								
SEMIVOLATILES	ug/kg							
Dibenzofuran	1900 U	n/a	880 J	n/a	n/a	n/a	n/a	n/a
Diethylphthalate	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Dimethylphthalate	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Fluoranthene	900 J	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Fluorene	1900 U	n/a	1400 J	n/a	n/a	n/a	n/a	n/a
Hexachlorobenzene	1900 UJ	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Hexachlorobutadiene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Hexachlorocyclopentadiene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Hexachloroethane	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Indeno(1,2,3-cd)pyrene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Isophorone	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
N-Nitroso-di-n-propylamine	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
N-Nitrosodiphenylamine (1)	1900 UJ	n/a	1000 J	n/a	n/a	n/a	n/a	n/a
Naphthalene	700 J	n/a	1000 J	n/a	n/a	n/a	n/a	n/a
Nitrobenzene	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Pentachlorophenol	4800 UJ	n/a	9700 U	n/a	n/a	n/a	n/a	n/a
Phenanthrene	3200 J	n/a	1600 J	n/a	n/a	n/a	n/a	n/a
Phenol	1900 U	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
Pyrene	210 J	n/a	3900 U	n/a	n/a	n/a	n/a	n/a
VOLATILES	ug/kg							
1,1,1-Trichloroethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
1,1,2,2-Tetrachloroethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
1,1,2-Trichloroethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	TP08-02-03	TP08-02-04	TP08-02-05	VS-2A-01F	VS-2A-01FE	VS-2A-01WE	VS-2A-02F	VS-2A-02FE
LOCATION								
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1-Dichloroethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
1,1-Dichloroethene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
1,2-Dichloroethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
1,2-Dichloroethene (Total)	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
1,2-Dichloropropane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
2-Butanone	120 U	12 UJ	1400 U	n/a	n/a	n/a	n/a	n/a
2-Hexanone	120 U	12 UJ	1400 U	n/a	n/a	n/a	n/a	n/a
4-Methyl-2-pentanone	120 U	12 UJ	1400 U	n/a	n/a	n/a	n/a	n/a
Acetone	120 B	2 B	1100 B	n/a	n/a	n/a	n/a	n/a
Benzene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Bromodichloromethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Bromoform	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Bromomethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Carbon Disulfide	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Carbon Tetrachloride	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Chlorobenzene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Chloroethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Chloroform	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Chloromethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Dibromochloromethane	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Methylene Chloride	34 B	19 B	250 B	n/a	n/a	n/a	n/a	n/a
Styrene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Tetrachloroethene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	TP08-02-03	TP08-02-04	TP08-02-05	VS-2A-01F	VS-2A-01FE	VS-2A-01WE	VS-2A-02F	VS-2A-02FE
LOCATION:								
VOLATILES	ug/kg							
Toluene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Trichloroethene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Vinyl Chloride	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
Xylene (Total)	12 J	12 U	430 J	n/a	n/a	n/a	n/a	n/a
cis-1,3-Dichloropropene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
trans-1,3-Dichloropropene	120 U	12 U	1400 U	n/a	n/a	n/a	n/a	n/a
PESTICIDES	ug/kg							
4,4'-DDD	3.8 U	n/a	3.9 UJ	n/a	n/a	n/a	n/a	n/a
4,4'-DDE	3.8 U	n/a	3.9 UJ	n/a	n/a	n/a	n/a	n/a
4,4'-DDT	3.8 U	n/a	3.9 UJ	n/a	n/a	n/a	n/a	n/a
Aldrin	1.9 U	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Alpha-BHC	1.9 U	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Alpha-Chlordane	1.9 U	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Aroclor-1016	38 U	n/a	39 UJ	n/a	n/a	n/a	n/a	n/a
Aroclor-1221	77 U	n/a	79 UJ	n/a	n/a	n/a	n/a	n/a
Aroclor-1232	38 U	n/a	39 UJ	n/a	n/a	n/a	n/a	n/a
Aroclor-1242	38 U	n/a	39 UJ	n/a	n/a	n/a	n/a	n/a
Aroclor-1248	38 U	n/a	39 UJ	n/a	n/a	n/a	n/a	n/a
Aroclor-1254	38 U	n/a	39 UJ	n/a	n/a	n/a	n/a	n/a
Aroclor-1260	38 U	n/a	39 UJ	n/a	n/a	n/a	n/a	n/a
Beta-BHC	1.9 U	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Delta-BHC	2.1 J	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Dieldrin	3.8 U	n/a	3.9 UJ	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I D LOCATION	TP08-02-03	TP08-02-04	TP08-02-05	VS-2A-01F	VS-2A-01FE	VS-2A-01WE	VS-2A-02F	VS-2A-02FE
PESTICIDES	ug/kg							
Endosulfan I	1.9 U	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Endosulfan II	3.8 U	n/a	3.9 UJ	n/a	n/a	n/a	n/a	n/a
Endosulfan Sulfate	3.8 U	n/a	3.9 UJ	n/a	n/a	n/a	n/a	n/a
Endrin	5.8 J	n/a	3.9 UJ	n/a	n/a	n/a	n/a	n/a
Endrin Aldehyde	3.8 U	n/a	3.9 UJ	n/a	n/a	n/a	n/a	n/a
Endrin Ketone	3.8 U	n/a	3.9 UJ	n/a	n/a	n/a	n/a	n/a
Gamma-BHC (Lindane)	1.9 U	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Gamma-Chlordane	1.9 U	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Heptachlor	1.9 U	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Heptachlor Epoxide	1.9 U	n/a	2 UJ	n/a	n/a	n/a	n/a	n/a
Methoxychlor	1.9 U	n/a	20 UJ	n/a	n/a	n/a	n/a	n/a
Toxaphene	190 U	n/a	200 UJ	n/a	n/a	n/a	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.: LOCATION:	VS-2A-02WE	VS-2A-03F	VS-2A-03F-DUP	VS-2A-03FE	VS-2A-04F	VS-2A-05F	VS-2A-05WE	VS-2A-06F
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Antimony	28.9 N	5.5 N	5.4 N	1.7 N	0.81 BN	0.91 BN	0.58 BN	0.92 BN
Cadmium	28.6 N	12.1 N	13.3 N	2.4	0.48 N	0.56 N	0.14 B	1.9
Copper	666	n/a	n/a	n/a	n/a	n/a	9.3	n/a
Lead	624 N	245 N	572 N	66.2	11.2 N	14.6 N	16.2	62
Silver	50.6	n/a	n/a	n/a	n/a	n/a	0.62 U	n/a
Zinc	1560	n/a	n/a	n/a	n/a	n/a	33.7	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	VS-2A-07F	VS-2A-08F	VS-2A-08F-DUP	VS-2A-09F	VS-2A-10F	VS-2A-11F	VS-2A-11F-DUP	VS-2A-12F
LOCATION								
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Antimony	0.63 BN	1.1 BN	1.7 N*	30 N*	30.2 N*	2.6 N*	n/a	0.86 BN
Cadmium	0.4	1.9	2.4	93.5	14.8	3.5	254 BN	0.52
Copper	n/a	n/a	n/a	n/a	n/a	98 N*	n/a	n/a
Lead	21.8	57.4 *	92.6 *	2060 *	811 *	107 BN	3.8 N*	32.8 BN
Silver	n/a	n/a	n/a	n/a	n/a	12.8 N*	9.9	126 N*
Zinc	n/a	n/a	n/a	n/a	n/a	147	n/a	n/a

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL

NAWC WARMINSTER, PENNSYLVANIA

SAMPLE I.D.:	W-2A-04WA	W-2A-05WA	---	---	---	---	---	---
LOCATION:								
INORGANICS	mg/kg	mg/kg						
Antimony	15.6 N*	2.4 N*						
Cadmium	18.9	2.3						
Copper	1030 N	107 N						
Lead	1030 *	241 *						
Silver	66.9 N*	0.11 BN						
Zinc	1390 N	989 N						

SUMMARY OF ANALYTICAL RESULTS FOR AREA 2 SUBSURFACE SOIL
NAWC WARMINSTER, PENNSYLVANIA

NOTES:

- J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
- U -- Value is a non-detected result as reported by the laboratory.
- UJ -- Non-detected result is considered estimated due to exceedance of technical quality control criteria.
- UL -- Non-detected result is considered biased low due to exceedance of technical quality control criteria.
- UR -- Non-detected result is considered unusable due to exceedance of technical quality control criteria.
- L -- Positive result is considered biased low due to exceedance of technical quality control criteria.
- K -- Positive result is considered biased high due to exceedance of technical quality control criteria.
- B -- Positive result is considered to be an artifact of blank contamination, and should not be considered present.
- R -- Positive result is considered unusable due to exceedance of technical quality control criteria.
- n/a -- No result is available/applicable for this parameter in this sample.
- ND -- Value is a non-detected result as reported by the laboratory. Detection limit not available.

ATTACHMENT 2

**Risk Evaluation Tables
Site 2, NAWC Warminster**

Surface Soils

**Table 1-5
Selection of Chemicals of Potential Concern - Site 2 Surface Soil Inorganics
NAWC Warminster, Pennsylvania**

Substance	Site-Related Frequency of Detection	Range of Positive Detections for Site		Maximum Detected In Background	Are Site Results Above Background ?	Applicable Risk-Based Concentration	Chemical Selected as a COPC ?	Representative Concentration For Site Data
		Minimum	Maximum					
Aluminum	17/17	9090	19800	18100	Y	7800	Y	15100
Antimony	22/29	0.28	198	13.6	N	3.1	N	27.4
Arsenic	17/17	3.1	13.1	12.1	Y	0.43	Y	6.51
Barium	17/17	43.8	452	225	Y	550	N	50
Beryllium	17/17	0.63	1.4	1.7	Y	16	N	1.1
Cadmium	32/41	0.26	59.3	0.27	Y	7.8	Y	15.6
Calcium	17/17	886	18800	1910	Y	10000000	N	10000
Chromium	17/17	19.1	126	35.3	Y	39	Y	56
Cobalt	17/17	8.3	14.4	22.1	Y	470	N	12.3
Copper	45/45	5.7	13600	30.6	Y	310	Y	684
Iron	17/17	16700	38000	410500	N	2300	N	25600
Lead	43/43	4.4	7350	96.5	Y	400	Y	783
Magnesium	17/17	1900	13200	4960	Y	4000000	N	6010
Manganese	17/17	337	1040	2010	Y	1100	N	771
Mercury	7/9	0.14	1.1	0.37	Y		N	1.1
Nickel	8/8	13.3	47	21.7	Y	160	N	47
Potassium	17/17	684	2590	3050	Y	35000000	N	1750
Selenium	4/17	0.89	1.6	0.09	N	39	N	0.615
Silver	20/35	0.97	210	1.2	Y	39	Y	64.1
Sodium	9/9	124	1870	86.7	Y	24000000	N	1870
Thallium	5/17	1	1.4	0.42	Y	0.55	Y	0.81
Vanadium	17/17	23.5	56.9	45	Y	55	Y	36.2
Zinc	45/45	16.2	4800	60	Y	2300	Y	826

Notes:

Units are mg/kg for inorganics.

Substances are selected as COPCs if maximum values exceed risk-based screening levels (RBCs) and frequency of detection is greater than 5 percent.

*Minerals that are essential nutrients (calcium, magnesium, sodium, potassium) are compared to Recommended Daily Intakes (RDAs) as screening levels.

Values over 1E+06 are for illustration only to indicate no concentration in soil would exceed the RDA.

The determination of site results exceeding background is based on an overall evaluation of statistical tests presented in a separate table.

RBCs represent concentrations associated with a 10⁻⁶ cancer risk level or a non-cancer hazard index of 0.1.

Applicable RBCs originate from EPA Region 3 RBCs for residential exposure, incidental soil ingestion, inhalation, and dermal exposure, with non-cancer risk adjusted to 0.1 hazard index.

An RBC for lead based on cancer risk or hazard index is not available. The 400 mg/kg EPA residential soil guideline is used as an RBC for soil ingestion (EPA, 1994. Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA

Corrective Action Facilities. OSWER Directive 9355.4-12.)

NA = Background Comparison Tests were Not Applicable because of lack of background data

**Table 1-6
Selection of Chemicals of Potential Concern - Site 2 Surface Soil Organics
NAWC Warminster, Pennsylvania**

Substance	Site-Related Frequency of Detection	Range of Positive Detections for Site Minimum Maximum	Are Site Results Above Background?	Applicable Risk-Based Concentration	Chemicals Selected as a COPC?	Representative Concentration For Site Data
2-Methylnaphthalene	1/17	46 - 46	NA	310000	N	46
4,4'-DDT	2/9	4.2 - 4.9	NA	1900	N	4.9
Acenaphthene	4/17	43 - 130	NA	470000	N	130
Acenaphthylene	6/17	53 - 220	NA	-	Y	181
Alpha-Chlordane	2/9	4.6 - 160	NA	1800	N	160
Anthracene	10/17	51 - 490	NA	2300000	N	258
Aroclor-1254	12/17	11 - 3700	NA	320	Y	951
Aroclor-1260	1/17	110 - 110	NA	320	N	37.5
Benzo(a)anthracene	11/17	130 - 1600	NA	870	Y	844
Benzo(a)pyrene	11/17	150 - 1600	NA	87	Y	942
Benzo(b)fluoranthene	11/17	180 - 2700	NA	870	Y	1540
Benzo(g,h,i)perylene	18/32	55 - 3100	NA	-	Y	715
Benzo(k)fluoranthene	11/17	150 - 1200	NA	870	Y	488
Bis(2-ethylhexyl)phthalate	4/9	120 - 1800	NA	46000	N	1800
Carbazole	7/17	48 - 190	NA	32000	N	177
Chrysene	11/17	170 - 1700	NA	87000	N	950
Di-n-butylphthalate	2/17	47 - 61	NA	780000	N	61
Dibenz(a,h)anthracene	6/17	37 - 240	NA	87	Y	184
Dibenzofuran	3/17	41 - 73	NA	31000	N	73
Dieldrin	1/9	32 - 32	NA	40	N	32
Endrin	3/9	7.3 - 370	NA	2300	N	370
Fluoranthene	12/17	43 - 2600	NA	310000	N	2210
Fluorene	5/17	50 - 140	NA	310000	N	140
Gamma-BHC (Lindane)	3/9	2.3 - 3.4	NA	490	N	3.4
Gamma-Chlordane	1/9	11 - 11	NA	1800	N	11
Indeno(1,2,3-cd)pyrene	23/32	49 - 4300	NA	870	Y	880
Phenanthrene	11/17	66 - 1500	NA	-	Y	678
Pyrene	12/17	40 - 2900	NA	230000	N	1980
Toluene	1/9	2 - 2	NA	1600000	N	2

Notes:

Units are ug/kg for organics.

Substances are selected as COPCs if maximum values exceed risk-based screening levels (RBCs) and frequency of detection is greater than 5 percent

*Minerals that are essential nutrients (calcium, magnesium, sodium, potassium) are compared to Recommended Daily Intakes (RDAs) as screening level

Values over 1E+06 are for illustration only to indicate no concentration in soil would exceed the RDA.

The determination of site results exceeding background is based on an overall evaluation of statistical tests presented in a separate table.

RBCs represent concentrations associated with a 10⁻⁶ cancer risk level or a non-cancer hazard index of 0.1.

Applicable RBCs originate from EPA Region 3 RBCs for residential exposure, incidental soil ingestion, inhalation, and dermal exposure, with non-cancer risk adjusted to 0.1 hazard index.

An RBC for lead based on cancer risk or hazard index is not available. The 400 mg/kg EPA residential soil guideline is used

as an RBC for soil ingestion (EPA, 1994, Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA

Corrective Action Facilities, OSWER Directive 9355.4-12.)

NA = Background Comparison Tests were Not Applicable because of lack of background data.

Table 4-1
 Estimated Noncarcinogenic Risks
 Site Worker - Surface Soils Site 2
 NAWC Warminster PA

Representative Concentration	Substance	Target Organ(s) for Noncarcinogenic COPCs	Estimated Noncarcinogenic Risks Site Worker			
			Ingestion	Dermal Contact	Inhalation of Dusts	Total
181	Acenaphthylene	S, L, RS	NT	NT	NT	NT
951	Aroclor- 1254		4.65E-02	8.71E-02	NT	1.34E-01
844	Benz(a)anthracene		NT	NT	NT	NT
942	Benzo(a)pyrene		NT	NT	NT	NT
1540	Benzo(b)fluoranthene		NT	NT	NT	NT
715	Benzo(g,h,i)perylene		NT	NT	NT	NT
488	Benzo(k)fluoranthene		NT	NT	NT	NT
184	Dibenz(a,h)anthracene		NT	NT	NT	NT
880	Indeno(1,2,3-cd)pyrene		NT	NT	NT	NT
678	Phenanthrene		NT	NT	NT	NT
15100	Aluminum	S K S, K C, K, L C, CNS S S, K, L, CNS C	1.48E-02	1.71E-02	NT	3.18E-02
6.51	Arsenic		2.12E-02	2.23E-02	NT	4.35E-02
15.6	Cadmium		3.05E-02	1.90E-01	1.03E-05	2.21E-01
66	Chromium		2.15E-02	6.72E-01	2.48E-02	7.18E-01
684	Copper		1.67E-02	8.70E-03	NT	2.54E-02
783	Lead		NT	NT	NT	NT
64.1	Silver		1.25E-02	3.91E-03	NT	1.65E-02
0.81	Thallium		1.13E-02	3.53E-03	NT	1.49E-02
36.2	Vanadium		5.06E-03	7.89E-02	NT	8.40E-02
826	Zinc		2.69E-03	3.36E-03	NT	6.06E-03
	Total Risk:		1.83E-01	1.09E+00	2.48E-02	1.29E+00

Notes:

Units for RC are mg/kg.

NT -- No toxicity factor (slope factor or RfD) is applicable for the selected COPCs for this exposure route.

Estimated cancer and noncancer risks assume a Reasonable Maximum Exposure (RME).

The representative concentration is selected as presented in a preceding data evaluation table.

Target Organs: C = Cardiovascular System, S = Skin, K = Kidney, L = Liver, CNS = Central Nervous System, RS = Reproductive System

Table 4-2
Estimated Noncarcinogenic Risks
Residential Child - Surface Soils Site 2
NAWC Warminster PA

Representative Concentration	Substance	Target Organ(s) for Noncarcinogenic COPCs	Estimated Noncarcinogenic Risks Residential Child				
			Ingestion	Dermal Contact	Inhalation of Dusts	Total	
181	Acenaphthylene	S, L, RS	NT	NT	NT	NT	
951	Aroclor-1254		6.08E-01	7.13E-01	NT	1.32E+00	
844	Benz(a)anthracene		NT	NT	NT	NT	
942	Benzo(a)pyrene		NT	NT	NT	NT	
1540	Benzo(b)fluoranthene		NT	NT	NT	NT	
715	Benzo(g,h,i)perylene		NT	NT	NT	NT	
488	Benzo(k)fluoranthene		NT	NT	NT	NT	
184	Dibenz(a,h)anthracene		NT	NT	NT	NT	
880	Indeno(1,2,3-cd)pyrene		NT	NT	NT	NT	
678	Phenanthrene		NT	NT	NT	NT	
15100	Aluminum			1.93E-01	1.40E-01	NT	3.33E-01
6.51	Arsenic		S	2.77E-01	1.83E-01	NT	4.60E-01
15.6	Cadmium		K	3.99E-01	1.56E+00	1.59E-04	1.96E+00
66	Chromium	S, K	2.81E-01	5.50E+00	3.84E-01	6.16E+00	
684	Copper	C, K, L	2.19E-01	7.12E-02	NT	2.90E-01	
783	Lead	C, CNS	NT	NT	NT	NT	
64 1	Silver	S	1.64E-01	3.20E-02	NT	1.96E-01	
0 81	Thallium	S, K, L, CNS	1.48E-01	2.89E-02	NT	1.77E-01	
36 2	Vanadium		6.61E-02	6.46E-01	NT	7.12E-01	
826	Zinc	C	3.52E-02	2.75E-02	NT	6.27E-02	
	Total Risk:		2.39E+00	8.90E+00	3.84E-01	1.17E+01	

Notes:

Units for RC are mg/kg

NT -- No toxicity factor (slope factor or RfD) is applicable for the selected COPCs for this exposure route.

Estimated cancer and noncancer risks assume a Reasonable Maximum Exposure (RME).

The representative concentration is selected as presented in a preceding data evaluation table.

Target Organs: C = Cardiovascular System, S = Skin, K = Kidney, L = Liver, CNS = Central Nervous System, RS = Reproductive System

Table 4-3
Estimated Carcinogenic Risks
Site Worker - Surface Soils Site 2
NAWC Warminster PA

Representative Concentration	Substance	Estimated Cancer Risks Site Worker			
		Ingestion	Dermal Contact	Inhalation of Dusts	Total
181	Acenaphthylene	NT	NT	NT	NT
951	Aroclor-1254	6.65E-07	1.24E-06	2.55E-11	1.91E-06
844	Benzo(a)anthracene	2.15E-07	NT	NT	2.15E-07
942	Benzo(a)pyrene	2.40E-06	NT	3.91E-11	2.40E-06
1540	Benzo(b)fluoranthene	3.93E-07	NT	NT	3.93E-07
715	Benzo(g,h,i)perylene	NT	NT	NT	NT
488	Benzo(k)fluoranthene	1.24E-08	NT	NT	1.24E-08
184	Dibenz(a,h)anthracene	4.69E-07	NT	NT	4.69E-07
880	Indeno(1,2,3-cd)pyrene	2.24E-07	NT	NT	2.24E-07
678	Phenanthrene	NT	NT	NT	NT
15100	Aluminum	NT	NT	NT	NT
6.51	Arsenic	3.41E-06	3.59E-06	1.32E-09	7.00E-06
15.6	Cadmium	NT	NT	1.32E-09	1.32E-09
66	Chromium	NT	NT	3.63E-08	3.63E-08
684	Copper	NT	NT	NT	NT
783	Lead	NT	NT	NT	NT
64.1	Silver	NT	NT	NT	NT
0.81	Thallium	NT	NT	NT	NT
36.2	Vanadium	NT	NT	NT	NT
826	Zinc	NT	NT	NT	NT
Total Risk:		7.79E-06	4.83E-06	3.90E-08	1.27E-05

Notes:

Units for RC are mg/kg.

NT -- No toxicity factor (slope factor or RfD) is applicable for the selected COPCs for this exposure route.

Estimated cancer and noncancer risks assume a Reasonable Maximum Exposure (RME).

The representative concentration is selected as presented in a preceding data evaluation table.

Table 4-4
Estimated Carcinogenic Risks
Lifetime Resident - Surface Soils Site 2
NAWC Warminster PA

Representative Concentration	Substance	Estimated Cancer Risks Site Worker			
		Ingestion	Dermal Contact	Inhalation of Dusts	Total
181	Acenaphthylene	NT	NT	NT	NT
951	Aroclor-1254	2.98E-06	4.12E-06	2.30E-10	7.10E-06
844	Benzo(a)anthracene	9.65E-07	NT	NT	9.65E-07
942	Benzo(a)pyrene	1.08E-05	NT	3.53E-10	1.08E-05
1540	Benzo(b)fluoranthene	1.76E-06	NT	NT	1.76E-06
715	Benzo(g,h,i)perylene	NT	NT	NT	NT
488	Benzo(k)fluoranthene	5.58E-08	NT	NT	5.58E-08
184	Dibenz(a,h)anthracene	2.10E-06	NT	NT	2.10E-06
880	Indeno(1,2,3-cd)pyrene	1.01E-06	NT	NT	1.01E-06
678	Phenanthrene	NT	NT	NT	NT
15100	Aluminum	NT	NT	NT	NT
6.51	Arsenic	1.53E-05	1.19E-05	1.19E-08	2.72E-05
15.6	Cadmium	NT	NT	1.19E-08	1.19E-08
66	Chromium	NT	NT	3.27E-07	3.27E-07
684	Copper	NT	NT	NT	NT
783	Lead	NT	NT	NT	NT
64.1	Silver	NT	NT	NT	NT
0.81	Thallium	NT	NT	NT	NT
36.2	Vanadium	NT	NT	NT	NT
826	Zinc	NT	NT	NT	NT
Total Risk:		3.49E-05	1.60E-05	3.52E-07	5.13E-05

Notes:

Units for RC are mg/kg.

NT -- No toxicity factor (slope factor or RfD) is applicable for the selected COPCs for this exposure route.

Estimated cancer and noncancer risks assume a Reasonable Maximum Exposure (RME).

The representative concentration is selected as presented in a preceding data evaluation table.

Subsurface Soils

Table 1-7
Selection of Chemicals of Potential Concern - Site 2 Subsurface Soil Inorganics
NAWC Warminster, Pennsylvania

Substance	Site-Related Frequency of Detection	Range of Positive Detections for Site		Maximum Detected in Background	Are Site Results Above Background ?	Applicable Risk-Based Concentration	Chemical Selected as a COPC ?	Representative Concentration For Site Data
		Minimum	Maximum					
Aluminum	43/43	5210	23200	18100	Y	7800	Y	13800
Antimony	22/43	1.5	90.5	13.6	Y	3.1	Y	16.8
Arsenic	39/39	0.85	19.6	12.1	Y	0.43	Y	7.4
Barium	43/43	21.6	719	225	Y	550	Y	137
Beryllium	41/41	0.28	8.2	1.7	Y	16	N	1.1
Cadmium	36/62	0.4	293	0.27	Y	7.8	Y	21.7
Calcium	42/42	387	74000	1910	Y	10000000	N	17000
Chromium	43/43	4	3840	35.3	Y	7800	N	195
Cobalt	42/42	3.5	24.8	22.1	Y	470	N	11.1
Copper	55/55	4.6	4190	30.6	Y	310	Y	366
Cyanide	3/34	0.85	20.4	0.6	N	160000	N	0.773
Hexavalent Chromium	4/7	0.95	3.59	-	NA	39	N	3.59
Iron	43/43	4000	103000	410500	N	2300	N	27700
Lead	64/64	1.5	2060	96.5	Y	400	Y	455
Magnesium	42/42	749	29900	4960	Y	4000000	N	3870
Manganese	43/43	127	1760	2010	Y	1100	Y	617
Mercury	13/43	0.06	0.98	0.37	Y	-	Y	0.141
Nickel	36/36	3.1	143	21.7	Y	160	N	26.8
Potassium	37/37	110	2690	3050	Y	35000000	N	1020
Selenium	2/43	0.78	0.85	0.09	N	39	N	0.418
Silver	17/54	1.5	317	1.2	Y	39	Y	48.3
Sodium	21/21	45	752	86.7	Y	24000000	N	226
Vanadium	43/43	5.7	586	45	Y	55	Y	44.7
Zinc	56/56	5.2	5640	60	Y	2300	Y	814

Notes:

Units are mg/kg for inorganics.

Substances are selected as COPCs if maximum values exceed risk-based screening levels (RBCs) and frequency of detection is greater than 5 percent.

*Minerals that are essential nutrients (calcium, magnesium, sodium, potassium) are compared to Recommended Daily Intakes (RDAs) as screening levels.

Values over 1E+06 are for illustration only to indicate no concentration in soil would exceed the RDA.

The determination of site results exceeding background is based on an overall evaluation of statistical tests presented in a separate table.

RBCs represent concentrations associated with a 10⁻⁶ cancer risk level or a non-cancer hazard index of 0.1.

Applicable RBCs originate from EPA Region 3 RBCs for residential exposure, incidental soil ingestion, inhalation, and dermal exposure, with non-cancer risk adjusted to 0.1 hazard index.

An RBC for lead based on cancer risk or hazard index is not available. The 400 mg/kg EPA residential soil guideline is used as an RBC for soil ingestion (EPA, 1994. Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA

Corrective Action Facilities. OSWER Directive 9355.4-12.)

NA = Background Comparison Tests were Not Applicable because of lack of background data.

Table 1-8
Selection of Chemicals of Potential Concern - Site 2 Subsurface Soil Organics
NAWC Warminster, Pennsylvania

Substance	Site-Related Frequency of Detection	Range of Positive Detections for Site		Are Site Results Above Background ?	Applicable Risk-Based Concentration	Chemical Selected as a COPC	Representative For Site Data
		Minimum	Maximum				
1,1-Dichloroethane	1/38	16	16	NA	780000	N	16
1,2-Dichloroethene (Total)	2/33	6	60	NA	70000	N	60
1,4-Dichlorobenzene	1/24	68	68	NA	27000	N	68
2-Butanone	3/36	4.5	20	NA	4700000	N	20
2-Methylnaphthalene	4/24	110	9800	NA	310000	N	1530
3,3'-Dichlorobenzidine	1/24	400	400	NA	1400	N	400
4,4'-DDD	3/25	7	45	NA	2700	N	5.77
4,4'-DDE	3/25	4.8	82	NA	1900	N	6.78
4,4'-DDT	3/25	16	150	NA	1900	N	12.2
4-Methyl-2-pentanone	1/38	110	110	NA	630000	N	68
Acenaphthene	3/24	170	390	NA	470000	N	390
Acetone	5/13	49	170	NA	780000	N	170
Aldrin	1/25	3.6	3.6	NA	38	N	1.64
Alpha-Chlordane	1/25	5.9	5.9	NA	1800	N	1.79
Anthracene	8/24	98	750	NA	2300000	N	563
Aroclor-1248	1/27	110	110	NA	320	N	33.5
Aroclor-1254	3/27	11	1150	NA	320	Y	48.1
Aroclor-1260	5/27	9	1600	NA	320	Y	109
Benz(a)anthracene	12/24	120	1800	NA	870	Y	867
Benzene	1/38	1	1	NA	22000	N	1
Benzo(a)pyrene	11/24	94	1400	NA	87	Y	901
Benzo(b)fluoranthene	12/24	120	1900	NA	870	Y	978
Benzo(g,h,i)perylene	11/24	66	1000	NA		N	632
Benzo(k)fluoranthene	10/24	54	1100	NA	870	Y	680
Bis(2-ethylhexyl)phthalate	3/17	800	2200	NA	46000	N	1830
Bromomethane	1/36	360	360	NA	11000	N	31.8
Butylbenzylphthalate	2/24	53	91	NA	1600000	N	91
Carbazole	3/24	170	340	NA	32000	N	340
Chloromethane	1/37	810	810	NA	49000	N	35.8
Chrysene	13/24	42	1700	NA	87000	N	993
Delta-BHC	1/25	2.1	2.1	NA		N	1.58
Di-n-butylphthalate	4/22	64	4200	NA	780000	N	1300
Dibenz(a,h)anthracene	3/24	62	145	NA	87	Y	145
Dibenzofuran	4/24	88	880	NA	31000	N	650
Dieldrin	2/25	4.3	5.8	NA	40	N	3.34
Endosulfan II	1/24	8.5	8.5	NA	47000	N	2.51
Endrin	5/25	4.3	20	NA	2300	N	5.51
Endrin Ketone	1/25	5.5	5.5	NA	2300	N	3.17
Ethylbenzene	3/38	3	13	NA	780000	N	13
Fluoranthene	13/24	68	3200	NA	310000	N	1610
Fluorene	5/24	69	1400	NA	310000	N	767
Gamma-BHC (Lindane)	1/25	2.5	2.5	NA	490	N	1.6
Gamma-Chlordane	2/25	2.3	3.4	NA	1800	N	1.71
Heptachlor Epoxide	1/25	3.5	3.5	NA	70	N	1.63
Indeno(1,2,3-cd)pyrene	9/24	100	810	NA	870	N	810
Methylene Chloride	5/11	1	23	NA	85000	N	9.19
Naphthalene	5/24	51	1000	NA	310000	N	651
N-Nitrosodiphenyl Amine	1/18	1000	1000	NA	13000	N	925
Pentachlorophenol	1/24	62	62	NA	5300	N	62
Phenanthrene	12/24	95	3200	NA		Y	1260
Pyrene	14/24	42	2700	NA	230000	N	1630
Tetrachloroethene	9/38	2	36	NA	12000	N	36
Toluene	3/34	2	150	NA	1600000	N	89.4
trans-1,3-Dichloropropene	1/38	97.75	97.75	NA	3500	N	69.6
Trichloroethene	8/38	1.6	8	NA	58000	N	8
Xylene (Total)	5/38	1.3	430	NA	16000000	N	47
Octachlorodibenzo-p-dioxin	4/5	0.25	0.68	NA	4.3	N	0.68
Octachlorodibenzofuran	1/5	0.25	0.25	NA	4.3	N	0.25

Notes:

Units are ug/kg for organics.

Substances are selected as COPCs if maximum values exceed risk-based screening levels (RBCs) and frequency of detection is greater than 5 percent

*Minerals that are essential nutrients (calcium, magnesium, sodium, potassium) are compared to Recommended Daily Intakes (RDAs) as screening level

Values over 1E+06 are for illustration only to indicate no concentration in soil would exceed the RDA

The determination of site results exceeding background is based on an overall evaluation of statistical tests presented in a separate table

RBCs represent concentrations associated with a 10⁻⁶ cancer risk level or a non-cancer hazard index of 0.1

Applicable RBCs originate from EPA Region 3 RBCs for residential exposure, incidental soil ingestion, inhalation, and dermal exposure, with non-cancer risk adjusted to 0.1 hazard index.

An RBC for lead based on cancer risk or hazard index is not available. The 400 mg/kg EPA residential soil guideline is used

as an RBC for soil ingestion (EPA, 1994. Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA

Corrective Action Facilities. OSWER Directive 9355.4-12.)

NA = Background Comparison Tests were Not Applicable because of lack of background data

Table 4-5
 Estimated Noncarcinogenic Risks
 Site Worker - Subsurface Soils Site 2
 NAWC Warminster PA

Representative Concentration	Substance	Target Organ(s) for Noncarcinogenic COPCs	Estimated Noncarcinogenic Risks Site Worker			
			Ingestion	Dermal Contact	Inhalation of Dusts	Total
48.1	Aroclor-1254	S, L, RS	2.35E-03	4.41E-03	NT	6.76E-03
109	Aroclor-1260		NT	NT	NT	NT
867	Benz(a)anthracene		NT	NT	NT	NT
901	Benzo(a)pyrene		NT	NT	NT	NT
978	Benzo(b)fluoranthene		NT	NT	NT	NT
632	Benzo(g,h,i)perylene		NT	NT	NT	NT
680	Benzo(k)fluoranthene		NT	NT	NT	NT
1.58	Delta-BHC		NT	NT	NT	NT
145	Dibenz(a,h)anthracene		NT	NT	NT	NT
1260	Phenanthrene		NT	NT	NT	NT
13800	Aluminum		1.35E-02	1.56E-02	NT	2.91E-02
16.8	Antimony	C	4.11E-02	1.28E-01	NT	1.69E-01
7.4	Arsenic	S	2.41E-02	2.54E-02	NT	4.95E-02
137	Barium	C, DS, RS	1.92E-03	5.97E-04	4.73E-05	2.56E-03
21.7	Cadmium	K	4.25E-02	2.65E-01	1.88E-05	3.07E-01
366	Copper	C, K, L	8.95E-03	4.66E-03	NT	1.36E-02
455	Lead	C, CNS	NT	NT	NT	NT
617	Manganese	CNS	1.28E-02	4.01E-03	2.13E-03	1.90E-02
0.141	Mercury	K, CNS	NT	NT	8.10E-08	8.10E-08
48.3	Silver	S	9.45E-03	2.95E-03	NT	1.24E-02
44.7	Vanadium		6.25E-03	9.75E-02	NT	1.04E-01
814	Zinc	C	2.65E-03	3.31E-03	NT	5.97E-03
	Total Risk:		1.66E-01	5.52E-01	2.20E-03	7.19E-01

Notes:

Units for RC are mg/kg.

NT -- No toxicity factor (slope factor or RfD) is applicable for the selected COPCs for this exposure route.

Estimated cancer and noncancer risks assume a Reasonable Maximum Exposure (RME).

The representative concentration is selected as presented in a preceding data evaluation table.

Target Organs: C = Cardiovascular System, S = Skin, K = Kidney, L = Liver, CNS = Central Nervous System, RS = Reproductive System, DS = Digestive System

Table 4-6
 Estimated Noncarcinogenic Risks
 Residential Child - Subsurface Soils Site 2
 NAWC Warminster PA

Representative Concentration	Substance	Target Organ(s) for Noncarcinogenic COPCs	Estimated Noncarcinogenic Risks Residential Child			
			Ingestion	Dermal Contact	Inhalation of Dusts	Total
48.1	Aroclor-1254	S, L, RS	3.07E-02	3.61E-02	NT	6.68E-02
109	Aroclor-1260		NT	NT	NT	NT
867	Benz(a)anthracene		NT	NT	NT	NT
901	Benzo(a)pyrene		NT	NT	NT	NT
978	Benzo(b)fluoranthene		NT	NT	NT	NT
632	Benzo(g,h,i)perylene		NT	NT	NT	NT
680	Benzo(k)fluoranthene		NT	NT	NT	NT
1.58	Delta-BHC		NT	NT	NT	NT
145	Dibenz(a,h)anthracene		NT	NT	NT	NT
1260	Phenanthrene		NT	NT	NT	NT
13800	Aluminum		1.76E-01	1.28E-01	NT	3.04E-01
16.8	Antimony	C	5.37E-01	1.05E+00	NT	1.59E+00
7.4	Arsenic	S	3.15E-01	2.08E-01	NT	5.23E-01
137	Barium	C, DS, RS	2.50E-02	4.89E-03	5.57E-04	3.05E-02
21.7	Cadmium	K	5.55E-01	2.17E+00	2.21E-04	2.72E+00
366	Copper	C, K, L	1.17E-01	3.81E-02	NT	1.55E-01
455	Lead	C, CNS	NT	NT	NT	NT
617	Manganese	CNS	1.68E-01	3.28E-02	2.51E-02	2.26E-01
0.141	Mercury	K, CNS	NT	NT	9.53E-07	9.53E-07
48.3	Silver	S	1.24E-01	2.41E-02	NT	1.48E-01
44.7	Vanadium		8.16E-02	7.98E-01	NT	8.80E-01
814	Zinc	C	3.47E-02	2.71E-02	NT	6.18E-02
	Total Risk:		2.16E+00	4.52E+00	2.59E-02	6.71E+00

Notes:

Units for RC are mg/kg.

NT -- No toxicity factor (slope factor or RfD) is applicable for the selected COPCs for this exposure route.

Estimated cancer and noncancer risks assume a Reasonable Maximum Exposure (RME).

The representative concentration is selected as presented in a preceding data evaluation table.

Target Organs: C = Cardiovascular System, S = Skin, K = Kidney, L = Liver, CNS = Central Nervous System, RS = Reproductive

DS = Digestive System

Tabl 4-7
 Estimated Carcinogenic Risks
 Site Worker - Subsurface Soils Site 2
 NAWC Warminster PA

Representative Concentration	Substance	Estimated Cancer Risks Site Worker			
		Ingestion	Dermal Contact	Inhalation of Dusts	Total
48.1	Aroclor-1254	3.36E-08	6.29E-08	1.70E-12	9.66E-08
109	Aroclor-1260	7.62E-08	1.43E-07	3.85E-12	2.19E-07
867	Benz(a)anthracene	2.21E-07	NT	NT	2.21E-07
901	Benzo(a)pyrene	2.30E-06	NT	4.93E-11	2.30E-06
978	Benzo(b)fluoranthene	2.49E-07	NT	NT	2.49E-07
632	Benzo(g,h,i)perylene	NT	NT	NT	NT
680	Benzo(k)fluoranthene	1.73E-08	NT	NT	1.73E-08
1.58	Delta-BHC	NT	NT	NT	NT
145	Dibenz(a,h)anthracene	3.70E-07	NT	NT	3.70E-07
1260	Phenanthrene	NT	NT	NT	NT
13800	Aluminum	NT	NT	NT	NT
16.8	Antimony	NT	NT	NT	NT
7.4	Arsenic	3.88E-06	4.08E-06	1.97E-09	7.96E-06
137	Barium	NT	NT	NT	NT
21.7	Cadmium	NT	NT	2.41E-09	2.41E-09
366	Copper	NT	NT	NT	NT
455	Lead	NT	NT	NT	NT
617	Manganese	NT	NT	NT	NT
0.141	Mercury	NT	NT	NT	NT
48.3	Silver	NT	NT	NT	NT
44.7	Vanadium	NT	NT	NT	NT
814	Zinc	NT	NT	NT	NT
	Total Risk:	7.15E-06	4.28E-06	4.44E-09	1.14E-05

Notes:

Units for RC are mg/kg.

NT -- No toxicity factor (slope factor or RfD) is applicable for the selected COPCs for this exposure route.

Estimated cancer and noncancer risks assume a Reasonable Maximum Exposure (RME).

The representative concentration is selected as presented in a preceding data evaluation table.

Table 4-8
Estimated Carcinogenic Risks
Lifetime Resident - Subsurface Soils Site 2
NAWC Warminster PA

Representative Concentration	Substance	Estimated Cancer Risks Lifetime Resident			
		Ingestion	Dermal Contact	Inhalation of Dusts	Total
48.1	Aroclor-1254	1.51E-07	2.08E-07	1.16E-11	3.59E-07
109	Aroclor-1260	3.41E-07	4.72E-07	2.64E-11	8.13E-07
867	Benz(a)anthracene	9.91E-07	NT	NT	9.91E-07
901	Benzo(a)pyrene	1.03E-05	NT	3.38E-10	1.03E-05
978	Benzo(b)fluoranthene	1.12E-06	NT	NT	1.12E-06
632	Benzo(g,h,i)perylene	NT	NT	NT	NT
680	Benzo(k)fluoranthene	7.77E-08	NT	NT	7.77E-08
1.58	Delta-BHC	NT	NT	NT	NT
145	Dibenz(a,h)anthracene	1.66E-06	NT	NT	1.66E-06
1260	Phenanthrene	NT	NT	NT	NT
13800	Aluminum	NT	NT	NT	NT
16.8	Antimony	NT	NT	NT	NT
7.4	Arsenic	1.74E-05	1.35E-05	1.35E-08	3.09E-05
137	Barium	NT	NT	NT	NT
21.7	Cadmium	NT	NT	1.65E-08	1.65E-08
366	Copper	NT	NT	NT	NT
455	Lead	NT	NT	NT	NT
617	Manganese	NT	NT	NT	NT
0.141	Mercury	NT	NT	NT	NT
48.3	Silver	NT	NT	NT	NT
44.7	Vanadium	NT	NT	NT	NT
814	Zinc	NT	NT	NT	NT
	Total Risk:	3.20E-05	1.42E-05	3.04E-08	4.62E-05

Notes:

Units for RC are mg/kg.

NT -- No toxicity factor (slope factor or RfD) is applicable for the selected COPCs for this exposure route.

Estimated cancer and noncancer risks assume a Reasonable Maximum Exposure (RME).

The representative concentration is selected as presented in a preceding data evaluation table.

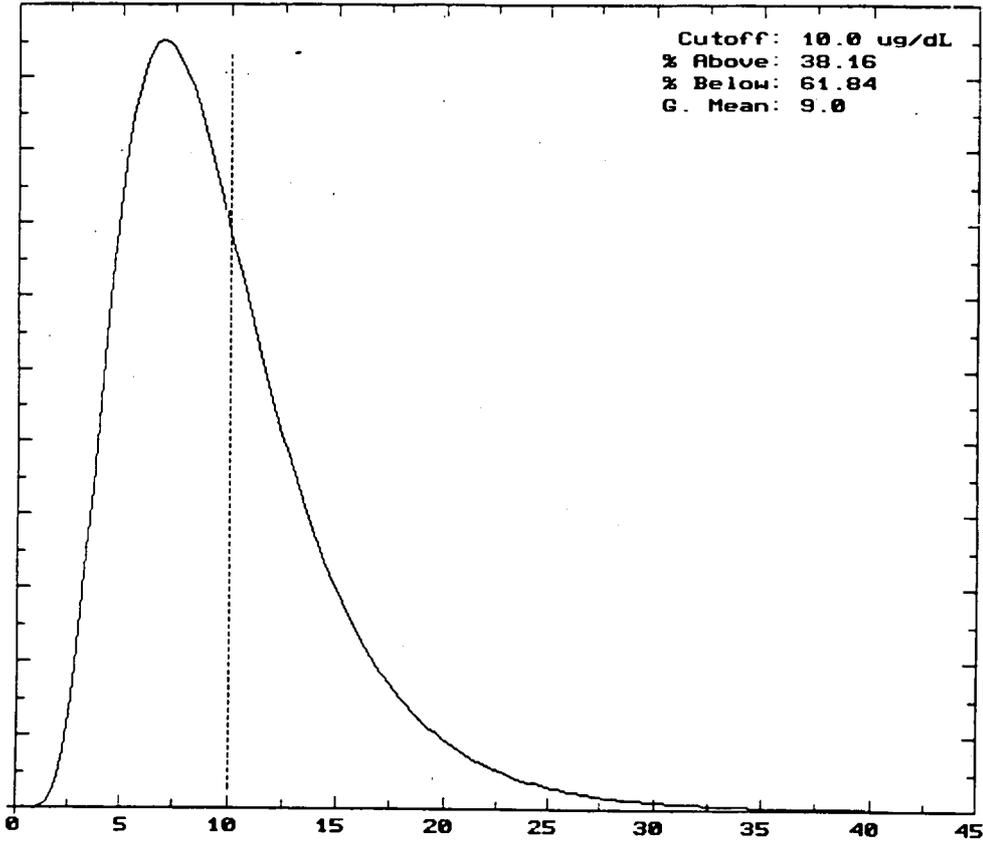
Lead Model Results

ADULT LEAD RISKS FOR NAWC WARMINSTER

AREA / MEDIA	RECEPTOR	CONC. mg/kg	95 Percentile ug/dl Fetal Lead
Area 2 SS	Industrial	783	7.07
Area 2 SB	Industrial	455	5.79

Adult risks are based on EPA, 1996.

Probability Density
Function f(blood Pb)



AD 0.99d

BLOOD LEAD CONCENTRATION (ug/dL)
0 to 84 Months

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.106 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	783.0	783.0
1-2	783.0	783.0
2-3	783.0	783.0
3-4	783.0	783.0
4-5	783.0	783.0
5-6	783.0	783.0
6-7	783.0	783.0

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

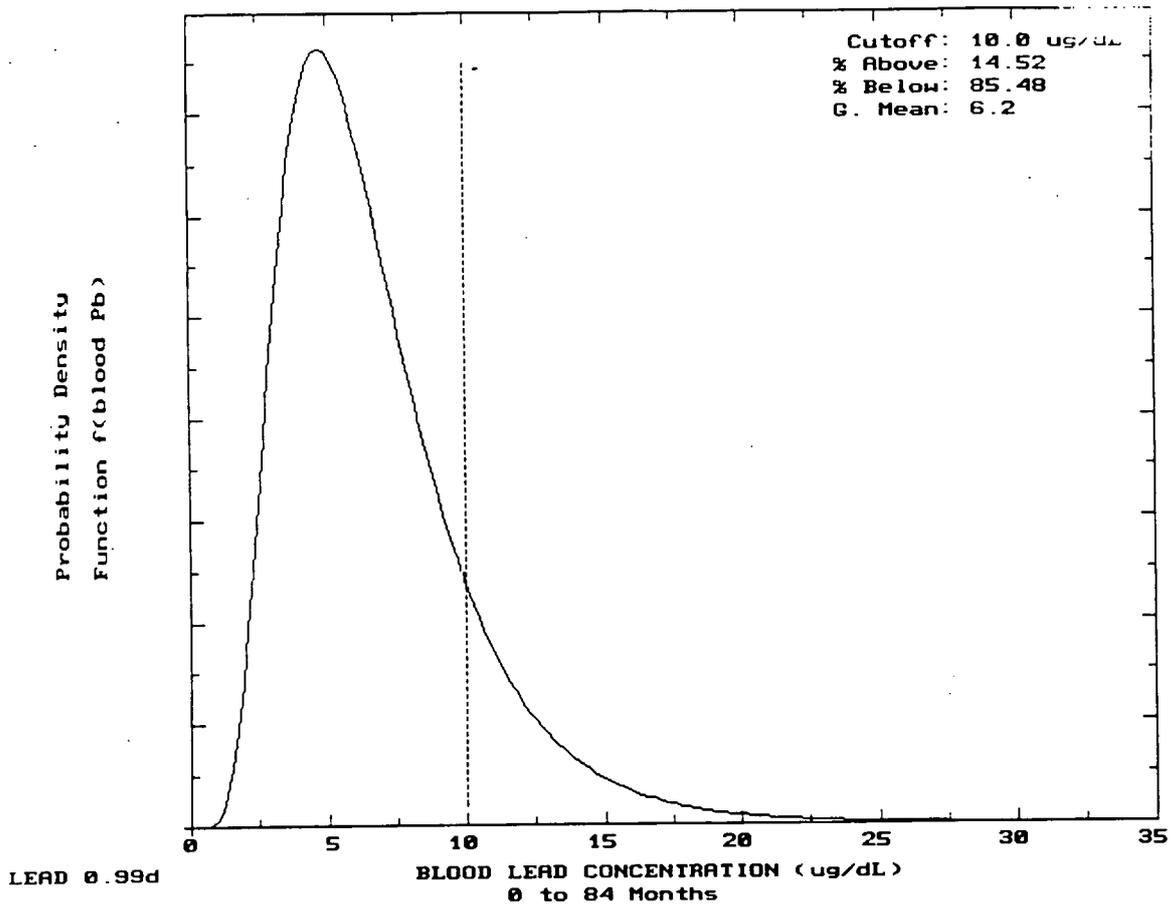
MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	9.8	18.63	16.06
1-2:	11.3	27.73	24.67
2-3:	10.6	28.91	25.41
3-4:	10.2	29.65	26.14
4-5:	8.5	24.19	20.53
5-6:	7.2	22.86	18.90
6-7:	6.4	22.38	18.06

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
------	----------------------	-----------------------	-----------------------	---------------------

-----		-----		-----		-----	
5-1:	2.22	0.32	0.00	0.02			
1-2:	2.25	0.78	0.00	0.03			
2-3:	2.60	0.83	0.00	0.06			
3-4:	2.57	0.87	0.00	0.07			
4-5:	2.63	0.96	0.00	0.07			
5-6:	2.83	1.04	0.00	0.09			
6-7:	3.16	1.07	0.00	0.09			



LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.

Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	455.0	455.0
1-2	455.0	455.0
2-3	455.0	455.0
3-4	455.0	455.0
4-5	455.0	455.0
5-6	455.0	455.0
6-7	455.0	455.0

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	6.8	12.76	10.01				
1-2:	7.7	18.89	15.57				
2-3:	7.3	19.64	15.89				
3-4:	6.9	19.95	16.21				
4-5:	5.8	16.30	12.48				
5-6:	4.9	15.50	11.39				
6-7:	4.4	15.30	10.84				

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
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0.5-1:	2.39	0.35	0.00	0.02
1-2:	2.44	0.84	0.00	0.03
2-3:	2.80	0.90	0.00	0.06
3-4:	2.74	0.93	0.00	0.07
4-5:	2.75	1.01	0.00	0.07
5-6:	2.94	1.08	0.00	0.09
6-7:	3.27	1.10	0.00	0.09



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C-51-10-8-77

October 29, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

Subject: Preliminary Results from Verification and Supplemental Sampling
Area A Site 2
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter presents the results of the most recent verification sampling performed in Area A excavation 2A. The results from the recent Site 2 supplemental sampling effort are also included. Attachment 1 contains sample data summaries and the laboratory analytical reports. The analytical data is complete with exception of selected PAH data for four samples. Sample logs for each sample are presented in Attachment 2. The logs are presented by sample type and location. In reviewing these logs it should be noted that the recorded sample depths are relative to the original ground surface (e.g. for a sample collected from the surface of the 4 foot deep excavation the sample depth was recorded as "4 feet"). Boring logs for the supplemental subsurface sampling are included in this attachment.

No final PRGs have been agreed to by the BCT for this area. However, Lead and Antimony PRGs have been agreed to. EPA has requested that a revised risk screening be performed using the verification and supplemental sampling results combined with the existing Site 2 database along with the data from the Spring supplemental investigation. The purpose of this risk screening is to identify and evaluate the potential risks associated with surface and subsurface soil contamination within the area. The results of that screening will be used to identify final PRGs. Tetra Tech NUS is in the process of compiling the data so that the requested risk screening can be performed. Although this evaluation may be required to fully document the evaluation of the contaminants for all of Site 2, a preliminary review of the data has been performed.

Surface soil verification sample results have been evaluated and compared to available PRGs. Lead and Antimony contamination was identified in only one soil sample in excess of the PRGs (1,000 mg/kg and 50 mg/kg respectively). Sample VS-2A-10S contained Lead at a concentration of 6,650 mg/kg and Antimony at 111 mg/kg. This sample was collected from the excavation wall immediately adjacent to the access road, (see Attachment 3 for a sample location map). The sample was collected from a layer within the wall that contained "brown material, white sand, glass, and blue-green material". A discrete sample of a waste layer containing the "blue-green material" was collected immediately below this sample (1.5 feet below ground surface). This

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Mr. Lonnie Monaco

Naval Facilities Engineering Command (NAVFACENGCOM)

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sample, W-2A-03WA, contained lead at 7,350 mg/kg and Antimony at 193 mg/kg. No other surface samples, soil or waste layers, collected from within the excavation contained levels of Lead or Antimony above the surface PRGs.

A statistical evaluation of the data was performed to determine the calculated Upper 95% Confidence Level (UCL) concentration for each compound for comparison to the individual PRGs as suggested by the PADEP and EPA guidance. The results of this evaluation are shown in Attachment 4. The UCL for Antimony is below the surface PRG, indicating that further excavation based on the presence of this contaminant is not warranted. The UCL for lead exceeds the surface PRG, indicating that the sample results should be evaluated and further excavation areas identified as appropriate. As indicated above, the only exceedances of the Lead PRG were in the southern wall of the excavation that extends to the access road.

Subsurface PRGs for Lead and Antimony have been set at 1,750 mg/kg and 113 mg/kg respectively. No sample exceeded the PRG for Antimony. Only one sample, VS-2A-09F, contained Lead at a concentration greater than the subsurface PRG. This sample contained 2,060 mg/Kg of Lead and was collected from the floor of the western end of the excavation. The sample was collected from an area about 7 feet below ground surface that contained "glass and ash". No other sample from this area contained levels of Lead greater than the PRG. The statistical evaluation of this data is presented in Attachment 4. The UCLs for both Lead and Antimony are below their respective PRGs indicating that further excavation based on these contaminants is not warranted.

As indicated above, a decision regarding the completeness of the removal actions at Site 2A can not be reached until the PRGs are finalized. The above evaluation suggests that Lead contamination present in the southern wall of the excavation at the access road may require further excavation. The data from within the excavation along with other surface and subsurface sample results is being compiled to allow for a risk assessment screening to determine if other compounds present an unacceptable risk. The results of this screening evaluation will be forwarded as soon as it is completed.

Respectfully,



Garth Glenn
Project Manager

GG/ejc

c Tom Ames (NAVFACENGCOM)
Tim McAntee (NAVFACENGCOM)
Steve Lehman (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
Neil Teamerson (B&R Environmental)
Jeff Orient (B&R Environmental)

ATTACHMENT 1

SAMPLE DATA SUMMARY
Surface Soil Samples

Verification Samples – VS, W
Supplemental Investigation Samples - SS

Lot#: C8J150136

Surface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
VS-2A-09S	Silver	ND		
VS-2A-09S	Cadium	0.21	B	
VS-2A-09S	Lead	11.8		
VS-2A-09S	Antimony	0.8	BN	
VS-2A-09S	Copper	10.2		
VS-2A-09S	Zinc	23		
VS-2A-09S	Benzo (ghi) perylene	500		
VS-2A-09S	Indeno (1,2,3-cd)pyrene	440		
VS-2A-10S	Silver	90.7		
VS-2A-10S	Cadmium	26.1		
VS-2A-10S	Lead	6650		
VS-2A-10S	Antimony	111	N	
VS-2A-10S	Copper	1280		
VS-2A-10S	Zinc	3000		
VS-2A-10S	Benzo (ghi) perylene	510		
VS-2A-10S	Indeno (1,2,3-cd)pyrene	550		
VS-2A-11S	Silver	0.33	B	
VS-2A-11S	Cadmium	1.1		
VS-2A-11S	Lead	28	E	
VS-2A-11S	Antimony	1.3	N	
VS-2A-11S	Copper	20		
VS-2A-11S	Zinc	337		
VS-2A-12S	Silver	ND		
VS-2A-12S	Cadmium	0.06	B	
VS-2A-12S	Lead	4.4		
VS-2A-12S	Antimony	0.39	BN	
VS-2A-12S	Copper	10.6		
VS-2A-12S	Zinc	16.2		
VS-2A-13S	Silver	0.26	BN	
VS-2A-13S	Cadmium	1.2		
VS-2A-13S	Lead	59.9		
VS-2A-13S	Antimony	0.96	BN	
VS-2A-13S	Copper	16.1		
VS-2A-13S	Zinc	59.8		

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Surface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
VS-2A-14S	Silver	7.3		
VS-2A-14S	Cadmium	6.9		
VS-2A-14S	Lead	295		
VS-2A-14S	Antimony	4.7	N	
VS-2A-14S	Copper	155		
VS-2A-14S	Zinc	434		
VS-2A-75S	Silver	0.14	B	Duplicate VS-2A-12S
VS-2A-75S	Cadmium	0.27		
VS-2A-75S	Lead	13.2		
VS-2A-75S	Antimony	0.59	BN	
VS-2A-75S	Copper	10.5		
VS-2A-75S	Zinc	35.7		
VS-2A-01S	Silver	13.7		
VS-2A-01S	Cadmium	20.3		
VS-2A-01S	Lead	420		
VS-2A-01S	Antimony	4.9	N	
VS-2A-01S	Copper	386		
VS-2A-01S	Zinc	688		
VS-2A-01S	Benzo (ghi) perylene	3100		
VS-2A-01S	Indeno (1,2,3-cd)pyrene	4300		
VS-2A-02S	Silver	ND		
VS-2A-02S	Cadmium	0.61		
VS-2A-02S	Lead	19.5		
VS-2A-02S	Antimony	1.3	N	
VS-2A-02S	Copper	9.7		
VS-2A-02S	Zinc	41.1		
VS-2A-02S	Benzo (ghi) perylene	ND		
VS-2A-02S	Indeno (1,2,3-cd)pyrene	49	J	
VS-2A-03S	Silver	5.2		
VS-2A-03S	Cadmium	6.7		
VS-2A-03S	Lead	261		
VS-2A-03S	Antimony	4.9	N	
VS-2A-03S	Copper	121		
VS-2A-03S	Zinc	377		
VS-2A-03S	Benzo (ghi) perylene	970		
VS-2A-03S	Indeno (1,2,3-cd)pyrene	1300		

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Surface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
VS-2A-04S	Silver	ND		
VS-2A-04S	Cadmium	0.94		
VS-2A-04S	Lead	12.8		
VS-2A-04S	Antimony	0.89	BN	
VS-2A-04S	Copper	8.2		
VS-2A-04S	Zinc	30.2		
VS-2A-04S	Benzo (ghi) perylene	ND		
VS-2A-04S	Indeno (1,2,3-cd)pyrene	ND		
VS-2A-05S	Silver	16.4		Glass and rock fragments
VS-2A-05S	Cadmium	15		
VS-2A-05S	Lead	449		
VS-2A-05S	Antimony	8.5	N	
VS-2A-05S	Copper	315		
VS-2A-05S	Zinc	1130		
VS-2A-05S	Benzo (ghi) perylene	400		
VS-2A-05S	Indeno (1,2,3-cd)pyrene	540		
VS-2A-06S	Silver	ND		
VS-2A-06S	Cadmium	0.26	N	
VS-2A-06S	Lead	13.7	N	
VS-2A-06S	Antimony	0.47	BN	
VS-2A-06S	Copper	5.7		
VS-2A-06S	Zinc	32.2		
VS-2A-06S	Benzo (ghi) perylene	ND		
VS-2A-06S	Indeno (1,2,3-cd)pyrene	ND		
VS-2A-07S	Silver	ND		
VS-2A-07S	Cadmium	0.51	N	
VS-2A-07S	Lead	17.2	N	
VS-2A-07S	Antimony	0.99	BN	
VS-2A-07S	Copper	23.4		
VS-2A-07S	Zinc	37.2		
VS-2A-07S	Benzo (ghi) perylene	55	J	
VS-2A-07S	Indeno (1,2,3-cd)pyrene	72	J	
VS-2A-08S	Silver	ND		Asphalt and sheetrock
VS-2A-08S	Cadmium	0.78	N	
VS-2A-08S	Lead	25.7	N	
VS-2A-08S	Antimony	0.77	BN	
VS-2A-08S	Copper	12.9		
VS-2A-08S	Zinc	63.1		
VS-2A-08S	Benzo (ghi) perylene	2000		
VS-2A-08S	Indeno (1,2,3-cd)pyrene	2500		

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Surface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
VS-2A-19S	Silver	0.57	B	
VS-2A-19S	Cadmium	0.79		
VS-2A-19S	Lead	38.2	BN*	
VS-2A-19S	Antimony	0.63	BN*	
VS-2A-19S	Copper	25.9	N*	
VS-2A-19S	Zinc	83.5		
VS-2A-19S	Benzo (ghi) perylene	440		
VS-2A-19S	Indeno (1,2,3-cd)pyrene	480		
VS-2A-18S	Silver	0.31	B	
VS-2A-18S	Cadmium	0.43		
VS-2A-18S	Lead	35.2	BN*	
VS-2A-18S	Antimony	0.8	BN*	
VS-2A-18S	Copper	35.5	N*	
VS-2A-18S	Zinc	87.4		
VS-2A-18S	Benzo (ghi) perylene	530		
VS-2A-18S	Indeno (1,2,3-cd)pyrene	690		
VS-2A-77S	Silver	0.5	B	DUPLICATE VS-2A-18S
VS-2A-77S	Cadmium	0.47		
VS-2A-77S	Lead	42.5	BN*	
VS-2A-77S	Antimony	1.1	BN*	
VS-2A-77S	Copper	27.5	N*	
VS-2A-77S	Zinc	113		
VS-2A-77S	Benzo (ghi) perylene	64	J	
VS-2A-77S	Indeno (1,2,3-cd)pyrene	69	J	

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Lot#: C8J160146

Surface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
VS-2A-15S	Silver	ND	N*	
VS-2A-15S	Cadium	ND		
VS-2A-15S	Lead	8	*	
VS-2A-15S	Antimony	0.3	BN*	
VS-2A-15S	Copper	17.2	N	
VS-2A-15S	Zinc	28.5	N	
VS-2A-15S	Benzo (ghi) perylene	1900		
VS-2A-15S	Indeno (1,2,3-cd)pyrene	2200		
VS-2A-16S	Silver	0.97	N*	
VS-2A-16S	Cadmium	0.3		
VS-2A-16S	Lead	22.6	*	
VS-2A-16S	Antimony	0.87	BN*	
VS-2A-16S	Copper	38.8	N	
VS-2A-16S	Zinc	80.1	N	
VS-2A-16S	Benzo (ghi) perylene	ND		
VS-2A-16S	Indeno (1,2,3-cd)pyrene	ND		
VS-2A-17S	Silver	9.5	N*	
VS-2A-17S	Cadmium	11.1		
VS-2A-17S	Lead	340	*	
VS-2A-17S	Antimony	10.8	N*	
VS-2A-17S	Copper	281	N	
VS-2A-17S	Zinc	626	N	
VS-2A-17S	Benzo (ghi) perylene	250	J	
VS-2A-17S	Indeno (1,2,3-cd)pyrene	330	J	
VS-2A-76S	Silver	ND	N*	DUPLICATE VS-2A-15S
VS-2A-76S	Cadmium	ND		
VS-2A-76S	Lead	6.3	*	
VS-2A-76S	Antimony	0.38	BN*	
VS-2A-76S	Copper	17.2	N	
VS-2A-76S	Zinc	29.6	N	
VS-2A-76S	Benzo (ghi) perylene	2200		
VS-2A-76S	Indeno (1,2,3-cd)pyrene	2600		

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Surface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
W-2A-01WA	Silver	12.8	N*	White to black in color
W-2A-01WA	Cadmium	1.7		asphalt and weathered
W-2A-01WA	Lead	383	*	concrete present
W-2A-01WA	Antimony	1.7	N*	
W-2A-01WA	Copper	98	N*	
W-2A-01WA	Zinc	147		
W-2A-02WA	Silver	126	N*	Blue-green with
W-2A-02WA	Cadmium	47.1		black material mixed
W-2A-02WA	Lead	856	*	
W-2A-02WA	Antimony	33.7	N*	
W-2A-02WA	Copper	13600	N	
W-2A-02WA	Zinc	1730	N	
W-2A-03WA	Silver	210	N*	Blue-green with
W-2A-03WA	Cadmium	59.3		oxidized steel and
W-2A-03WA	Lead	7350	*	white fragments mixed
W-2A-03WA	Antimony	198	N*	
W-2A-03WA	Copper	5410	N	
W-2A-03WA	Zinc	3160	N	

Lot#: C8J130129

Surface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
SS-02-40	Silver	ND		
SS-02-40	Cadium	0.14	B	
SS-02-40	Lead	27.3	E	
SS-02-40	Antimony	0.44	BN	
SS-02-40	Copper	28.3		
SS-02-40	Zinc	110		
SS-02-41	Silver	ND		
SS-02-41	Cadmium	ND		
SS-02-41	Lead	13.3	E	
SS-02-41	Antimony	0.19	BN	
SS-02-41	Copper	8.3		
SS-02-41	Zinc	30.3		
SS-02-42	Silver	0.36	B	
SS-02-42	Cadmium	6		
SS-02-42	Lead	994	E	
SS-02-42	Antimony	1.4	N	
SS-02-42	Copper	1410		
SS-02-42	Zinc	4800		
SS-02-43	Silver	ND		
SS-02-43	Cadmium	0.7		
SS-02-43	Lead	125	E	
SS-02-43	Antimony	0.2	BN	
SS-02-43	Copper	28.4		
SS-02-43	Zinc	227		
SS-02-44	Silver	ND		
SS-02-44	Cadmium	ND		
SS-02-44	Lead	11.2	E	
SS-02-44	Antimony	0.43	BN	
SS-02-44	Copper	15		
SS-02-44	Zinc	37.1		
SS-02-45	Silver	0.19	B	
SS-02-45	Cadmium	0.83		
SS-02-45	Lead	32.6	E	
SS-02-45	Antimony	0.38	BN	
SS-02-45	Copper	20.4		
SS-02-45	Zinc	75		

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

SAMPLE DATA SUMMARY
Subsurface Soil Samples

Verification Samples – VS, W
Supplemental Investigation Samples – SB

Lot#: C8J160146

Subsurface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
VS-2A-09F	Cadmium	93.5		Brown to black with glass and ash
VS-2A-09F	Lead	2060	*	
VS-2A-09F	Antimony	30	N*	
VS-2A-10F	Cadmium	14.8		
VS-2A-10F	Lead	811	*	
VS-2A-10F	Antimony	30.2	N*	
VS-2A-72F	Cadmium	2.4		Duplicate VS-2A-08F
VS-2A-72F	Lead	92.6	*	
VS-2A-72F	Antimony	1.7	N*	
W-2A-04WA	Silver	66.9	N*	White to black with orange/yellow material sheetrock, wire, and metal fragments
W-2A-04WA	Cadium	18.9		
W-2A-04WA	Lead	1030	*	
W-2A-04WA	Antimony	15.6	N*	
W-2A-04WA	Copper	1030	N	
W-2A-04WA	Zinc	1390	N	
W-2A-05WA	Silver	0.11	BN*	white to black with sheetrock, ash, brick, and glass mixed
W-2A-05WA	Cadmium	2.3		
W-2A-05WA	Lead	241	*	
W-2A-05WA	Antimony	2.4	N*	
W-2A-05WA	Copper	107	N	
W-2A-05WA	Zinc	989	N	

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Lot#: C8J150136

Subsurface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
VS-2A-05WE	Silver	ND		
VS-2A-05WE	Cadmium	0.14	B	
VS-2A-05WE	Lead	16.2		
VS-2A-05WE	Antimony	0.58	BN	
VS-2A-05WE	Copper	9.3		
VS-2A-05WE	Zinc	33.7		
VS-2A-01FE	Cadmium	2.1		
VS-2A-01FE	Lead	72.7		
VS-2A-01FE	Antimony	1.5	N	
VS-2A-02FE	Cadmium	3.6		
VS-2A-02FE	Lead	95.6		
VS-2A-02FE	Antimony	2.1	N	
VS-2A-03FE	Cadmium	2.4		
VS-2A-03FE	Lead	66.2		
VS-2A-03FE	Antimony	1.7	N	
VS-2A-06F	Cadmium	1.9		
VS-2A-06F	Lead	62		
VS-2A-06F	Antimony	0.92	BN	
VS-2A-07F	Cadmium	0.4		
VS-2A-07F	Lead	21.8		
VS-2A-07F	Antimony	0.63	BN	
VS-2A-01F	Cadmium	1.7	N	
VS-2A-01F	Lead	21.1	N	
VS-2A-01F	Antimony	0.88	BN	
VS-2A-02F	Cadmium	2.8	N	
VS-2A-02F	Lead	83.9	N	
VS-2A-02F	Antimony	1.2	BN	
VS-2A-03F	Cadmium	12.1	N	
VS-2A-03F	Lead	245	N	
VS-2A-03F	Antimony	5.5	N	
VS-2A-04F	Cadmium	0.48	N	
VS-2A-04F	Lead	11.2	N	
VS-2A-04F	Antimony	0.81	BN	

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Surface Soil Site 2

VS-2A-08F	Cadmium	1.9	
VS-2A-08F	Lead	57.4	
VS-2A-08F	Antimony	1.1	BN*

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

SB-02-80	Lead	111	E	
SB-02-80	Antimony	3.1	N	
SB-02-80	Copper	90.8		
SB-02-80	Zinc	628		
SB-02-81	Silver	0.17	B	Ash and glass fill
SB-02-81	Cadmium	1.1		
SB-02-81	Lead	12.1	E	
SB-02-81	Antimony	0.37	BN	
SB-02-81	Copper	10		
SB-02-81	Zinc	46.4		
SB-02-82	Silver	21.1		Concrete, rocks,
SB-02-82	Cadmium	10		asphalt, and ash with
SB-02-82	Lead	1220	E	blue-green material
SB-02-82	Antimony	10.7	N	
SB-02-82	Copper	1060		
SB-02-82	Zinc	1280		
SB-02-83	Silver	39.6		Red sludge, sticky
SB-02-83	Cadmium	5.2		
SB-02-83	Lead	48.6	E	
SB-02-83	Antimony	1.2	BN	
SB-02-83	Copper	84.3		
SB-02-83	Zinc	79.1		
SB-02-84	Silver	ND		Rock and ash
SB-02-84	Cadmium	0.49		fragments
SB-02-84	Lead	92.9	E	
SB-02-84	Antimony	0.71	BN	
SB-02-84	Copper	26		
SB-02-84	Zinc	101		
SB-02-101298	Silver	317		Red sludge taken from
SB-02-101298	Cadmium	43		below SB-02-83
SB-02-101298	Lead	93.2	E	
SB-02-101298	Antimony	8.2	BN	
SB-02-101298	Copper	515		
SB-02-101298	Zinc	476		

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Subsurface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
SB-02-8312	Silver	112		Black and blue-green
SB-02-8312	Cadmium	116		material with ash,
SB-02-8312	Lead	2060	E	brick, and glass
SB-02-8312	Antimony	18.8	N	
SB-02-8312	Copper	3540		
SB-02-8312	Zinc	3790		

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Subsurface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
VS-2A-05F	Cadmium	0.56	N	
VS-2A-05F	Lead	14.6	N	
VS-2A-05F	Antimony	0.91	BN	
VS-2A-74F	Cadmium	13.3	N	Duplicate VS-2A-03F
VS-2A-74F	Lead	572	N	
VS-2A-74F	Antimony	5.4	N	
VS-2A-01WE	Silver	ND		
VS-2A-01WE	Cadmium	0.62	N	
VS-2A-01WE	Lead	11.4	N	
VS-2A-01WE	Antimony	1	BN	
VS-2A-01WE	Copper	12.3		
VS-2A-01WE	Zinc	43.8		
VS-2A-02WE	Silver	50.6		Ash, black, and
VS-2A-02WE	Cadmium	28.6	N	glass fragments
VS-2A-02WE	Lead	624	N	
VS-2A-02WE	Antimony	28.9	N	
VS-2A-02WE	Copper	666		
VS-2A-02WE	Zinc	1560		

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

Lot#: C8J210117

Subsurface Soil Site 2

Sample #	Parameter	Result ⁽¹⁾	Qualifier	Comment
VS-2A-11F	Cadium	3.5		
VS-2A-11F	Lead	107	BN*	
VS-2A-11F	Antimony	2.6	N*	
VS-2A-12F	Cadmium	0.52		
VS-2A-12F	Lead	32.8	BN*	
VS-2A-12F	Antimony	0.86	BN*	
VS-2A-92F	Silver	9.9		
VS-2A-92F	Cadmium	254	BN*	Duplicate VS-2A-11F
VS-2A-92F	Lead	3.8	N*	

⁽¹⁾ Metals results are in mg/kg, organic results are ug/kg

LABORATORY ANALYTICAL REPORTS
(Results are NOT validated)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

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 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech HUS, Inc PAGE 1
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/27/98
 Project Number: CTO NO. 0252

Lot #: C8J210117

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: VS-A-1A-17					
Sample #: 001	Date Sampled: 10/20/98 08:50	Date Received: 10/21/98	Matrix: SOLID		
Trace Inductively Coupled Plasma (ICP) Metals Reviewed					
Cadmium	43.8	0.26	mg/kg	SW846 6010B	
Inorganic Analysis Reviewed					
Total Residue as Percent Solids	78.3		%	MCAW 160.3 MOD	

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: VS-2A-11F
 Sample #: 002 Date Sampled: 10/20/98 10:03 Date Received: 10/21/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed					
Cadmium	3.5	0.26	mg/kg	SW846 6010B	
Lead	107 EN*	0.38	mg/kg	SW846 6010B	
Antimony	2.6 EN*	1.3	mg/kg	SW846 6010B	
Inorganic Analysis Reviewed					
Total Residue as Percent Solids	78.4		%	MCAW 160.3 MOD	

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: VS-2A-12F
 Sample #: 003 Date Sampled: 10/20/98 10:12 Date Received: 10/21/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed					
Cadmium	0.52	0.24	mg/kg	SW846 6010B	
Lead	32.8 EN*	0.36	mg/kg	SW846 6010B	
Antimony	0.86 EN*	1.2	mg/kg	SW846 6010B	
Inorganic Analysis Reviewed					
Total Residue as Percent Solids	84.1		%	MCAW 160.3 MOD	

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J210117
Tetra Tech NUS, Inc
NAWC WARMINSTER, PENNSYLVANIA
Project Number: CTO NO. 0252
Date Reported: 10/27/98
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PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-12F
Sample #: 003 Date Sampled: 10/20/98 10:12 Date Received: 10/21/98 Matrix: SOLID

Inorganic Analysis
Reviewed

Results and reporting limits have been adjusted for dry weight.

mis-labeled should be 92F

Client Sample ID: VS-2A-72F
Sample #: 004 Date Sampled: 10/20/98 10:12 Date Received: 10/21/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals
Cadmium 9.9 0.24 mg/kg SW846 6010B Reviewed
Lead 254 ~~EN*~~ 0.37 mg/kg SW846 6010B
Antimony 3.8 ~~EN*~~ 1.2 mg/kg SW846 6010B

Inorganic Analysis
Total Residue as Percent Solids 81.9 % MCAW 160.3 MOD Reviewed

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: VS-2A-19S
Sample #: 005 Date Sampled: 10/20/98 10:17 Date Received: 10/21/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals
Silver 0.57 B 0.61 mg/kg SW846 6010B Reviewed
Cadmium 0.79 0.24 mg/kg SW846 6010B
Lead 38.2 ~~EN*~~ 0.36 mg/kg SW846 6010B
Antimony 0.63 ~~EN*~~ 1.2 mg/kg SW846 6010B

Inductively Coupled Plasma (ICP) Metals
Copper 25.9 ~~EN*~~ 3 mg/kg SW846 6010B Reviewed
Zinc 83.5 2.4 mg/kg SW846 6010B

B Estimated result. Result is less than RL.

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J210117 Tetra Tech NUS, Inc PAGE 5
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/27/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2C-01F
 Sample #: 008 Date Sampled: 10/20/98 10:55 Date Received: 10/21/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS Reviewed
 Benzo (a) pyrene 250 J 380 ug/kg SW846 8270C

J Estimated result. Result is less than RL.
 Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis Reviewed
 Total Residue as 87.2 % MCAWW 160.3 MOD
 Percent Solids

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: VS-2C-01S
 Sample #: 009 Date Sampled: 10/20/98 11:05 Date Received: 10/21/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS Reviewed
 Benzo (a) pyrene 790 390 ug/kg SW846 8270C

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis Reviewed
 Total Residue as 85.5 % MCAWW 160.3 MOD
 Percent Solids

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: VS-2C-02S
 Sample #: 010 Date Sampled: 10/20/98 11:10 Date Received: 10/21/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS Reviewed
 Benzo(a)pyrene ND 360 ug/kg SW846 8270C

Results and reporting limits have been adjusted for dry weight.

(Continued on next pag)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J210117

Tetra Tech MUS, Inc
NAWC WARMINSTER, PENNSYLVANIA
Project Number: CTO NO. 0252

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Date Reported: 10/27/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: VS-2C-02S

Sample #: 010 Date Sampled: 10/20/98 11:10 Date Received: 10/21/98 Matrix: SOLID

Inorganic Analysis
Total Residue as
Percent Solids

90.8

‡

MCANW 160.3 MOD

Reviewed

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: VS-2C-03S

Sample #: 011 Date Sampled: 10/20/98 11:15 Date Received: 10/21/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS
Benzo (a) pyrene

47 J

390

ug/kg

SW846 8270C

Reviewed

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis
Total Residue as
Percent Solids

85.0

‡

MCANW 160.3 MOD

Reviewed

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: VS-2C-04S

Sample #: 012 Date Sampled: 10/20/98 11:19 Date Received: 10/21/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS
Benzo (a) pyrene

1300

390

ug/kg

SW846 8270C

Reviewed

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis
Total Residue as
Percent Solids

84.7

‡

MCANW 160.3 MOD

Reviewed

Results and reporting limits have been adjusted for dry weight.

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J210117
 Tetra Tech NUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252
 Date Reported: 10/27/98
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PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: VS-2C-10F					
Sample #: 013	Date Sampled: 10/20/98 11:19	Date Received: 10/21/98	Matrix: SOLID		
Semivolatile Organic Compounds by GC/MS					
Benzo(a)pyrene	260 J	360	ug/kg	SW846 8270C	Review d
J Estimated result. Result is less than RL. Results and reporting limits have been adjusted for dry weight.					
Inorganic Analysis					
Total Residue as Percent Solids	91.2		%	MCAW 160.3 MOD	Reviewed
Results and reporting limits have been adjusted for dry weight.					

Client Sample ID: W-RB-102098
 Sample #: 014 Date Sampled: 10/20/98 12:55 Date Received: 10/21/98 Matrix: WATER

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	ND	5	ug/L	SW846 6010B	
Cadmium	ND	2	ug/L	SW846 6010B	
Lead	1.4 B	3	ug/L	SW846 6010B	
Antimony	ND	10	ug/L	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					Reviewed
Copper	ND	25	ug/L	SW846 6010B	
Zinc	1.8 B	20	ug/L	SW846 6010B	

B Estimated result. Result is less than RL.
 Results or reporting limits flagged with a ** have not been corrected for dry weight.

Semivolatile Organic Compounds by GC/MS					Reviewed
Indeno(1,2,3-cd)pyrene	ND	10	ug/L	SW846 8270C	
Benzo(ghi)perylene	ND	10	ug/L	SW846 8270C	
Benzo(a)pyrene	ND	10	ug/L	SW846 8270C	

Results or reporting limits flagged with a ** have not been corrected for dry weight.

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J160146 Tetra Tech NUS, Inc PAGE 1
NAWC WARMINSTER, PENNSYLVANIA
Date Reported: 10/20/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-2A-01WA

Sample #: 001 Date Sampled: 10/15/98 14:27 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	12.8 N*	0.57	mg/kg	SW846 6010B	Reviewed
Cadmium	1.7	0.23	mg/kg	SW846 6010B	
Lead	383 *	0.34	mg/kg	SW846 6010B	
Antimony	1.7 N*	1.1	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals

Copper	98.0 N	2.9	mg/kg	SW846 6010B	Reviewed
Zinc	147 N	2.3	mg/kg	SW846 6010B	

* Relative percent difference (RPD) is outside stated control limits.
 N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis

Total Residue as Percent Solids	87.2			MCAWW 160.3 MOD	Reviewed
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Client Sample ID: W-2A-02WA

Sample #: 002 Date Sampled: 10/15/98 14:32 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	126 N*	0.68	mg/kg	SW846 6010B	Reviewed
Cadmium	47.1	0.27	mg/kg	SW846 6010B	
Lead	856 *	2	mg/kg	SW846 6010B	
Antimony	33.7 N*	1.4	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals

Copper	13600 N	170	mg/kg	SW846 6010B	Reviewed
Zinc	1730 N	13.6	mg/kg	SW846 6010B	

* Relative percent difference (RPD) is outside stated control limits.
 N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis

Total Residue as Percent Solids	73.4			MCAWW 160.3 MOD	Reviewed
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QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS, Inc PAGE 2
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/20/98
 Lot #: C8J160146 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: W-2A-03WA					
Sample #: 003 Date Sampled: 10/15/98 14:36 Date Received: 10/16/98 Matrix: SOLID					
Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	210 N*	0.65	mg/kg	SW846 6010B	
Cadmium	59.3	0.26	mg/kg	SW846 6010B	
Lead	7350 *	9.8	mg/kg	SW846 6010B	
Antimony	198 N*	1.3	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					Reviewed
Copper	5410 N	32.6	mg/kg	SW846 6010B	
Zinc	3160 N	26.1	mg/kg	SW846 6010B	

* Relative percent difference (RPD) is outside stated control limits.
 N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis Reviewed
 Total Residue as t MCAWW 160.3 MOD
 Percent Solids

Client Sample ID: W-2A-04WA
 Sample #: 004 Date Sampled: 10/15/98 15:02 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	66.9 N*	0.73	mg/kg	SW846 6010B	
Cadmium	18.9	0.29	mg/kg	SW846 6010B	
Lead	1030 *	0.87	mg/kg	SW846 6010B	
Antimony	15.6 N*	1.5	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					Reviewed
Copper	1030 N	3.6	mg/kg	SW846 6010B	
Zinc	1390 N	5.8	mg/kg	SW846 6010B	

* Relative percent difference (RPD) is outside stated control limits.
 N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis Reviewed
 Total Residue as t MCAWW 160.3 MOD
 Percent Solids

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS, Inc PAGE 3
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/20/98
 Project Number: CTO NO. 0252

Lot #: C8J160146

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: W-2A-05WA

Sample #: 005 Date Sampled: 10/15/98 15:11 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	0.11 BH*	0.63	mg/kg	SW846 6010B
Cadmium	2.3	0.25	mg/kg	SW846 6010B
Lead	241 *	0.38	mg/kg	SW846 6010B
Antimony	2.4 N*	1.3	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals				Reviewed
Copper	107 N	3.1	mg/kg	SW846 6010B
Zinc	989 N	5	mg/kg	SW846 6010B

* Relative percent difference (RPD) is outside stated control limits.

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	79.9	‡		MCAW 160.3 MOD

Client Sample ID: VS-2A-08F

Sample #: 006 Date Sampled: 10/15/98 15:17 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	1.9	0.25	mg/kg	SW846 6010B
Lead	57.4 *	0.37	mg/kg	SW846 6010B
Antimony	1.1 BH*	1.2	mg/kg	SW846 6010B

* Relative percent difference (RPD) is outside stated control limits.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	81.5	‡		MCAW 160.3 MOD

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

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Lot #: CSJ160146 Tetra Tech NUS, Inc Date Reported: 10/20/98
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

PARAMETER	RESULT	LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-09F

Sample #: 007 Date Sampled: 10/15/98 15:22 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	93.5	1.3	mg/kg	SW846 6010B
Lead	2060 *	1.9	mg/kg	SW846 6010B
Antimony	30.0 N*	6.3	mg/kg	SW846 6010B

* Relative percent difference (RPD) is outside stated control limits.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	79.3		%	MCAWW 160.3 MOD

Client Sample ID: VS-2A-10F

Sample #: 008 Date Sampled: 10/15/98 15:27 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	14.8	0.23	mg/kg	SW846 6010B
Lead	811 *	0.69	mg/kg	SW846 6010B
Antimony	30.2 N*	1.2	mg/kg	SW846 6010B

* Relative percent difference (RPD) is outside stated control limits.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	86.5		%	MCAWW 160.3 MOD

Client Sample ID: VS-2A-15S

Sampl #: 009 Date Sampled: 10/15/98 15:32 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	ND N*	0.53	mg/kg	SW846 6010B
Cadmium	ND	0.21	mg/kg	SW846 6010B
Lead	8.0 *	0.32	mg/kg	SW846 6010B

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J160146 Tetra Tech HUS, Inc PAGE 5
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/20/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: VS-2A-15S					
Sample #: 009 Date Sampled: 10/15/98 15:32 Date Received: 10/16/98 Matrix: SOLID					
Antimony	0.30 BN*	1.1	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					Review d
Copper	17.2 N	2.7	mg/kg	SW846 6010B	
Zinc	28.5 N	2.1	mg/kg	SW846 6010B	

* Relative percent difference (RPD) is outside stated control limits.

N Spiked analyte recovery is outside stated control limits.

Semivolatiles Organic Compounds by GC/MS					
Benzo (ghi) perylene	1900	700	ug/kg	SW846 8270C	Reviewed
Indeno (1,2,3-cd) pyrene	2200	700	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					
Total Residue as Percent Solids	94.0			MCAWW 160.3 MOD	Reviewed

Client Sample ID: VS-2A-16S
 Sample #: 010 Date Sampled: 10/15/98 15:45 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					
Silver	0.97 N*	0.57	mg/kg	SW846 6010B	Reviewed
Cadmium	0.30	0.23	mg/kg	SW846 6010B	
Lead	22.6 *	0.34	mg/kg	SW846 6010B	
Antimony	0.87 BN*	1.1	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					
Copper	38.8 N	2.8	mg/kg	SW846 6010B	Reviewed
Zinc	80.1 N	2.3	mg/kg	SW846 6010B	

* Relative percent difference (RPD) is outside stated control limits.

N Spiked analyte recovery is outside stated control limits.

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J160146 Tetra Tech NUS, Inc PAGE 6
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/20/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-16S

Sample #: 010 Date Sampled: 10/15/98 15:45 Date Received: 10/16/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS				Reviewed
Benzo(ghi)perylene	ND	380	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	ND	380	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	87.8	%		MCAWW 160.3 MOD

Client Sample ID: VS-2A-17S

Sample #: 011 Date Sampled: 10/15/98 15:49 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	9.5 N*	0.56	mg/kg	SW846 6010B
Cadmium	11.1	0.22	mg/kg	SW846 6010B
Lead	340 *	0.34	mg/kg	SW846 6010B
Antimony	10.8 N*	1.1	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals				Reviewed
Copper	281 N	2.8	mg/kg	SW846 6010B
Zinc	626 N	4.5	mg/kg	SW846 6010B

* Relative percent difference (RPD) is outside stated control limits.

N Spiked analyte recovery is outside stated control limits.

Semivolatile Organic Compounds by GC/MS				Reviewed
Benzo(ghi)perylene	250 J	740	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	330 J	740	ug/kg	SW846 8270C

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

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Lot #: C8J160146 Tetra Tech NUS, Inc Date Reported: 10/20/98
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-17S

Sample #: 011 Date Sampled: 10/15/98 15:49 Date Received: 10/16/98 Matrix: SOLID

Inorganic Analysis			Reviewed
Total Residue as Percent Solids	89.1	‡	MCAWW 160.3 MOD

Client Sample ID: VS-2A-72F

Sample #: 012 Date Sampled: 10/15/98 15:49 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	2.4	0.25	mg/kg	SW846 6010B
Lead	92.6 *	0.37	mg/kg	SW846 6010B
Antimony	1.7 N*	1.2	mg/kg	SW846 6010B

* Relative percent difference (RPD) is outside stated control limits.

Inorganic Analysis			Reviewed
Total Residue as Percent Solids	80.3	‡	MCAWW 160.3 MOD

Client Sample ID: VS-2A-76S

Sample #: 013 Date Sampled: 10/15/98 15:49 Date Received: 10/16/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	ND N*	0.56	mg/kg	SW846 6010B
Cadmium	ND	0.23	mg/kg	SW846 6010B
Lead	6.3 *	0.34	mg/kg	SW846 6010B
Antimony	0.38 N*	1.1	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals				Reviewed
Copper	17.2 N	2.8	mg/kg	SW846 6010B
Zinc	29.6 N	2.3	mg/kg	SW846 6010B

* Relative percent difference (RPD) is outside stated control limits.

N Spiked analyte recovery is outside stated control limits.

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J130129

Tetra Tech EOS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

PAGE 3
 Date Reported: 10/20/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: SS-02-42					
Sample #: 005 Date Sampled: 10/12/98 12:20 Date Received: 10/13/98 Matrix: SOLID					
Trace Inductively Coupled Plasma (ICP) Metals					
Silver	0.36 B	0.59	mg/kg	SW846 6010B	Reviewed
Cadmium	6.0	0.24	mg/kg	SW846 6010B	
Lead	994 E	0.71	mg/kg	SW846 6010B	
Antimony	1.4 N	1.2	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					
Copper	1410	5.9	mg/kg	SW846 6010B	Reviewed
Zinc	4800	23.7	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.
 E Matrix interference.
 N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis					
Total Residue as	84.5		%	MCAW 160.3 MOD	Reviewed
Percent Solids					

Client Sample ID: SB-02-82

Sample #: 006 Date Sampled: 10/12/98 12:45 Date Received: 10/13/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					
Silver	21.1	0.59	mg/kg	SW846 6010B	Reviewed
Cadmium	10.0	0.24	mg/kg	SW846 6010B	
Lead	1220 E	1.8	mg/kg	SW846 6010B	
Antimony	10.7 N	1.2	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					
Copper	1060	3	mg/kg	SW846 6010B	Reviewed
Zinc	1280	11.8	mg/kg	SW846 6010B	

E Matrix interference.
 N Spiked analyte recovery is outside stated control limits.

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J130129 Tetra Tech NUS, Inc PAGE 6
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/20/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: SB-02-84

Sample #: 010 Date Sampled: 10/12/98 15:20 Date Received: 10/13/98 Matrix: SOLID

Cadmium	0.49	0.23	mg/kg	SW846 6010B
Lead	92.9 E	0.35	mg/kg	SW846 6010B
Antimony	0.71 BN	1.2	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals				Reviewed
Copper	26.0	2.9	mg/kg	SW846 6010B
Zinc	101	2.3	mg/kg	SW846 6010B

E Matrix interference.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	86.2		‡	MCAWW 160.3 MOD

Client Sample ID: SS-02-45

Sample #: 011 Date Sampled: 10/12/98 15:45 Date Received: 10/13/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	0.19 B	0.57	mg/kg	SW846 6010B
Cadmium	0.83	0.23	mg/kg	SW846 6010B
Lead	32.6 E	0.34	mg/kg	SW846 6010B
Antimony	0.38 BN	1.1	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals				Reviewed
Copper	20.4	2.9	mg/kg	SW846 6010B
Zinc	75.0	2.3	mg/kg	SW846 6010B

B Estimated result. Result is less than RL.

E Matrix interference.

Inorganic Analysis				Review d
Total Residue as Percent Solids	87.6		‡	MCAWW 160.3 MOD

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J130129 Tetra Tech NUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252 PAGE 7
 Date Reported: 10/20/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: SB-02-101298
 Sample #: 012 Date Sampled: 10/12/98 15:45 Date Received: 10/13/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed

Silver	317	0.99	mg/kg	SW846 6010B
Cadmium	43.0	2	mg/kg	SW846 6010B
Lead	93.2 E	3	mg/kg	SW846 6010B
Antimony	8.2 BN	9.9	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals Reviewed

Copper	515	4.9	mg/kg	SW846 6010B
Zinc	476	19.7	mg/kg	SW846 6010B

E Matrix interference.

Inorganic Analysis Reviewed

Total Residue as Percent Solids	50.7	‡	MCAWW 160.3 MOD
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Client Sample ID: SB-02-8312
 Sample #: 013 Date Sampled: 10/12/98 14:35 Date Received: 10/13/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed

Silver	112	0.6	mg/kg	SW846 6010B
Cadmium	116	1.2	mg/kg	SW846 6010B
Lead	2060 E	1.8	mg/kg	SW846 6010B
Antimony	18.8 N	6	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals Reviewed

Copper	3540	14.9	mg/kg	SW846 6010B
Zinc	3790	23.8	mg/kg	SW846 6010B

E Matrix interference.

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis Reviewed

Total Residue as Percent Solids	83.9	‡	MCAWW 160.3 MOD
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QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech MUS, Inc PAGE 2

Lot #: C8J150136 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/19/98
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>	
Client Sample ID: VS-2A-05WE					
Sample #: 003 Date Sampled: 10/14/98 13:40 Date Received: 10/15/98 Matrix: SOLID					
Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	ND	0.62	mg/kg	SW846 6010B	
Cadmium	0.14 B	0.25	mg/kg	SW846 6010B	
Lead	16.2	0.37	mg/kg	SW846 6010B	
Antimony	0.58 B	1.2	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					Reviewed
Copper	9.3	3.1	mg/kg	SW846 6010B	
Zinc	33.7	2.5	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	80.7		%	MCAWW 160.3 MOD

Client Sample ID: VS-2A-01FE
 Sample #: 004 Date Sampled: 10/14/98 15:20 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	2.1	0.24	mg/kg	SW846 6010B
Lead	72.7	0.36	mg/kg	SW846 6010B
Antimony	1.5 N	1.2	mg/kg	SW846 6010B

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	82.6		%	MCAWW 160.3 MOD

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 Tetra Tech NUS, Inc PAGE 3
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/19/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-02FE

Sample #: 005 Date Sampled: 10/14/98 15:25 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	3.6	0.25	mg/kg	SW846 6010B	Reviewed
Lead	95.6	0.37	mg/kg	SW846 6010B	
Antimony	2.1 N	1.2	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis

Total Residue as Percent Solids	80.9			MCAWW 160.3 MOD	Reviewed
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Client Sample ID: VS-2A-03FE

Sample #: 006 Date Sampled: 10/14/98 15:30 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	2.4	0.24	mg/kg	SW846 6010B	Reviewed
Lead	66.2	0.36	mg/kg	SW846 6010B	
Antimony	1.7 N	1.2	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis

Total Residue as Percent Solids	83.6			MCAWW 160.3 MOD	Reviewed
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Client Sample ID: VS-2A-09S

Sample #: 007 Date Sampled: 10/14/98 15:50 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	ND	0.56	mg/kg	SW846 6010B	Reviewed
Cadmium	0.21 B	0.22	mg/kg	SW846 6010B	
Lead	11.8	0.33	mg/kg	SW846 6010B	

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QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 Tetra Tech NUS, Inc PAGE 5
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/19/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-10S
 Sample #: 008 Date Sampled: 10/14/98 16:00 Date Received: 10/15/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS				Reviewed
Benzo(ghi)perylene	510	400	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	550	400	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	82.5	‡		MCAWW 160.3 MOD

Client Sample ID: VS-2A-11S
 Sample #: 009 Date Sampled: 10/14/98 16:10 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	0.33 B	0.56	mg/kg	SW846 6010B
Cadmium	1.1	0.22	mg/kg	SW846 6010B
Lead	28.0	0.34	mg/kg	SW846 6010B
Antimony	1.3 N	1.1	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals				R viewed
Copper	20.0	2.8	mg/kg	SW846 6010B
Zinc	337	2.2	mg/kg	SW846 6010B

B Estimated result. Result is less than RL.

N Spikes analyte recovery is outside stated control limits.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	89.3	‡		MCAWW 160.3 MOD

(Continued on next page)

QUANTERRA INCORPORATED PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

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Lot #: C8J150136 Tetra Tech NUS, Inc Date Reported: 10/19/98
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: VS-2A-12S					
Sample #: 010 Date Sampled: 10/14/98 16:25 Date Received: 10/15/98 Matrix: SOLID					
Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	ND	0.57	mg/kg	SW846 6010B	
Cadmium	0.06 B	0.23	mg/kg	SW846 6010B	
Lead	4.4	0.34	mg/kg	SW846 6010B	
Antimony	0.39 BH	1.1	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					Reviewed
Copper	10.6	2.9	mg/kg	SW846 6010B	
Zinc	16.2	2.3	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	87.7		%	MCAWW 160.3 MOD	

Client Sample ID: VS-2A-13S
 Sample #: 011 Date Sampled: 10/14/98 16:30 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Review d
Silver	0.26 B	0.55	mg/kg	SW846 6010B	
Cadmium	1.2	0.22	mg/kg	SW846 6010B	
Lead	59.9	0.33	mg/kg	SW846 6010B	
Antimony	0.96 BH	1.1	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					Reviewed
Copper	16.1	2.7	mg/kg	SW846 6010B	
Zinc	59.8	2.2	mg/kg	SW846 6010B	

B Estimated result. Result is less than RL.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	91.3		%	MCAWW 160.3 MOD	

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 Tetra Tech NUS, Inc PAGE 7
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/19/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-14S

Sample #: 012 Date Sampled: 10/14/98 16:40 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	7.3	0.59	mg/kg	SW846 6010B
Cadmium	6.9	0.24	mg/kg	SW846 6010B
Lead	295	0.36	mg/kg	SW846 6010B
Antimony	4.7 N	1.2	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals				Reviewed
Copper	155	3	mg/kg	SW846 6010B
Zinc	434	2.4	mg/kg	SW846 6010B

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	84.5		‡	MCAWW 160.3 MOD

Client Sample ID: VS-2A-75S

Sample #: 013 Date Sampled: 10/14/98 16:40 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	0.14 B	0.52	mg/kg	SW846 6010B
Cadmium	0.27	0.21	mg/kg	SW846 6010B
Lead	13.2	0.31	mg/kg	SW846 6010B
Antimony	0.59 BN	1	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals				Reviewed
Copper	10.5	2.6	mg/kg	SW846 6010B
Zinc	35.7	2.1	mg/kg	SW846 6010B

B Estimated result. Result is less than RL.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	95.5		‡	MCAWW 160.3 MOD

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 Tetra Tech NUS, Inc PAGE 8
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/19/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-06F

Sample #: 014 Date Sampled: 10/14/98 16:50 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	1.9	0.23	mg/kg	SW846 6010B
Lead	62.0	0.34	mg/kg	SW846 6010B
Antimony	0.92 BN	1.1	mg/kg	SW846 6010B

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	87.4		%	MCAWW 160.3 MOD

Client Sample ID: VS-2A-07F

Sample #: 015 Date Sampled: 10/14/98 16:55 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Cadmium	0.40	0.23	mg/kg	SW846 6010B
Lead	21.8	0.34	mg/kg	SW846 6010B
Antimony	0.63 BN	1.1	mg/kg	SW846 6010B

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	87.5		%	MCAWW 160.3 MOD

Client Sample ID: VS-2A-01S

Sample #: 016 Date Sampled: 10/14/98 10:05 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	13.7	0.57	mg/kg	SW846 6010B
Cadmium	20.3	0.23	mg/kg	SW846 6010B
Lead	420	0.34	mg/kg	SW846 6010B
Antimony	4.9 N	1.1	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals				Reviewed
Copper	386	2.9	mg/kg	SW846 6010B

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QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 Tetra Tech HUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252 PAGE 9
 Date Reported: 10/19/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: VS-2A-01S					
Sample #: 016 Date Sampled: 10/14/98 10:05 Date Received: 10/15/98 Matrix: SOLID					
zinc	688	4.6	mg/kg	SW846 6010B	
N Spiked analyte recovery is outside stated control limits.					
Semivolatile Organic Compounds by GC/MS					
Benzo (ghi) perylene	3100	750	ug/kg	SW846 8270C	Reviewed
Indeno (1,2,3-cd) pyrene	4300	750	ug/kg	SW846 8270C	
Results and reporting limits have been adjusted for dry weight.					
Inorganic Analysis					
Total Residue as Percent Solids	87.4		%	MCAWW 160.3 MOD	Reviewed

Client Sample ID: VS-2A-02S
 Sample #: 017 Date Sampled: 10/14/98 10:35 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					
Silver	ND	0.6	mg/kg	SW846 6010B	Reviewed
Cadmium	0.61	0.24	mg/kg	SW846 6010B	
Lead	19.5	0.36	mg/kg	SW846 6010B	
Antimony	1.3 N	1.2	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					
Copper	9.7	3	mg/kg	SW846 6010B	Reviewed
Zinc	41.1	2.4	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

Semivolatile Organic Compounds by GC/MS					
Benzo (ghi) perylene	ND	400	ug/kg	SW846 8270C	Reviewed
Indeno (1,2,3-cd) pyrene	49 J	400	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 Tetra Tech NUS, Inc PAGE 10
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/19/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-02S

Sample #: 017 Date Sampled: 10/14/98 10:35 Date Received: 10/15/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS Reviewed

J Estimated result. Result is less than RL.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	83.2		‡	MCAW 160.3 MOD

Client Sample ID: VS-2A-03S

Sample #: 018 Date Sampled: 10/14/98 10:43 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals Reviewed

Silver	5.2	0.57	mg/kg	SW846 6010B
Cadmium	6.7	0.23	mg/kg	SW846 6010B
Lead	261	0.34	mg/kg	SW846 6010B
Antimony	4.9 N	1.1	mg/kg	SW846 6010B

Inductively Coupled Plasma (ICP) Metals Reviewed

Copper	121	2.8	mg/kg	SW846 6010B
Zinc	377	2.3	mg/kg	SW846 6010B

N Spiked analyte recovery is outside stated control limits.

Semivolatile Organic Compounds by GC/MS Reviewed

Benzo(ghi)perylene	970	750	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	1300	750	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	88.1		‡	MCAW 160.3 MOD

(Continued on next page)

QUANTERRA INCORPORATED PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 Tetra Tech HUS, Inc PAGE 11
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/19/98
Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-04S

Sample #: 019 Date Sampled: 10/14/98 10:57 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	ND	0.59	mg/kg	SW846 6010B	R viewed
Cadmium	0.94	0.24	mg/kg	SW846 6010B	
Lead	12.8	0.35	mg/kg	SW846 6010B	
Antimony	0.89 BN	1.2	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals

Copper	8.2	3	mg/kg	SW846 6010B	Reviewed
Zinc	30.2	2.4	mg/kg	SW846 6010B	

Semivolatile Organic Compounds by GC/MS

Benzo(ghi)perylene	ND	390	ug/kg	SW846 8270C	Reviewed
Indeno(1,2,3-cd)pyrene	ND	390	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis

Total Residue as Percent Solids	84.6		%	MCAWW 160.3 MOD	Reviewed
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Client Sample ID: VS-2A-05S

Sample #: 020 Date Sampled: 10/14/98 11:10 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	16.4	0.61	mg/kg	SW846 6010B	Reviewed
Cadmium	15.0	0.24	mg/kg	SW846 6010B	
Lead	449	0.37	mg/kg	SW846 6010B	
Antimony	8.5 N	1.2	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals

Copper	315	3.1	mg/kg	SW846 6010B	Reviewed
Zinc	1130	4.9	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 **Tetra Tech NUS, Inc** **PAGE 12**
 NAWC WARMINSTER, PENNSYLVANIA **Date Reported: 10/19/98**
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: VS-2A-05S

Sample #: 020 Date Sampled: 10/14/98 11:10 Date Received: 10/15/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS					Reviewed
Benzo(ghi)perylene	400	400	ug/kg	SW846 8270C	
Indeno(1,2,3-cd)pyrene	540	400	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	81.7		‡	MCANW 160.3 MOD	

Client Sample ID: VS-2A-06S

Sample #: 021 Date Sampled: 10/14/98 11:23 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	ND	0.61	mg/kg	SW846 6010B	
Cadmium	0.26 N	0.25	mg/kg	SW846 6010B	
Lead	13.7 N	0.37	mg/kg	SW846 6010B	
Antimony	0.47 BN	1.2	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals					Reviewed
Copper	5.7	3.1	mg/kg	SW846 6010B	
Zinc	32.2	2.5	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

Semivolatile Organic Compounds by GC/MS					Reviewed
Benzo(ghi)perylene	ND	410	ug/kg	SW846 8270C	
Indeno(1,2,3-cd)pyrene	ND	410	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	81.5		‡	MCANW 160.3 MOD	

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QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 **Tetra Tech HUS, Inc** **PAGE 13**
 NAWC WARMINSTER, PENNSYLVANIA **Date Reported: 10/19/98**
 Project Number: CTO NO. 0252

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: VS-2A-07S

Sample #: 022 Date Sampled: 10/14/98 11:37 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	ND	0.6	mg/kg	SW846 6010B	Reviewed
Cadmium	0.51 N	0.24	mg/kg	SW846 6010B	
Lead	17.2 N	0.36	mg/kg	SW846 6010B	
Antimony	0.99 BH	1.2	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals

Copper	23.4	3	mg/kg	SW846 6010B	Reviewed
Zinc	37.2	2.4	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

Semivolatile Organic Compounds by GC/MS

Benzo (ghi) perylene	55 J	400	ug/kg	SW846 8270C	Reviewed
Indeno (1,2,3-cd) pyrene	72 J	400	ug/kg	SW846 8270C	

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis

Total Residue as Percent Solids	82.9		%	MCAWW 160.3 MOD	Reviewed
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Client Sample ID: VS-2A-08S

Sample #: 023 Date Sampled: 10/14/98 11:47 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	ND	0.59	mg/kg	SW846 6010B	Reviewed
Cadmium	0.78 N	0.24	mg/kg	SW846 6010B	
Lead	25.7 N	0.35	mg/kg	SW846 6010B	
Antimony	0.77 BH	1.2	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals

Copper	12.9	2.9	mg/kg	SW846 6010B	Reviewed
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(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136
 Tetra Tech EOS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252
 Date Reported: 10/19/98
 PAGE 15

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-02F
 Sample #: 025 Date Sampled: 10/14/98 12:15 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	2.8 N	0.25	mg/kg	SW846 6010B	Reviewed
Lead	83.9 N	0.37	mg/kg	SW846 6010B	
Antimony	1.2 BN	1.2	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis
 Total Residue as Percent Solids 80.3 ± MCAW 160.3 MOD Reviewed

Client Sample ID: VS-2A-03F
 Sample #: 026 Date Sampled: 10/14/98 12:23 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	12.1 N	0.25	mg/kg	SW846 6010B	Reviewed
Lead	245 N	0.38	mg/kg	SW846 6010B	
Antimony	5.5 N	1.3	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis
 Total Residue as Percent Solids 78.9 ± MCAW 160.3 MOD Reviewed

Client Sample ID: VS-2A-04F
 Sample #: 027 Date Sampled: 10/14/98 12:37 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Cadmium	0.48 N	0.22	mg/kg	SW846 6010B	Reviewed
Lead	11.2 N	0.33	mg/kg	SW846 6010B	
Antimony	0.81 BN	1.1	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 **Tetra Tech NUS, Inc** PAGE 16
 NAWC WARMINSTER, PENNSYLVANIA **Date Reported:** 10/19/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-04F

Sample #: 027 Date Sampled: 10/14/98 12:37 Date Received: 10/15/98 Matrix: SOLID

Inorganic Analysis			Reviewed
Total Residue as	91.3	‡	MCAWW 160.3 MOD
Percent Solids			

Client Sample ID: VS-2A-05F

Sample #: 028 Date Sampled: 10/14/98 12:50 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals			Reviewed
Cadmium	0.56 N	0.25	mg/kg SW846 6010B
Lead	14.6 N	0.38	mg/kg SW846 6010B
Antimony	0.91 BN	1.3	mg/kg SW846 6010B

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis			Reviewed
Total Residue as	79.9	‡	MCAWW 160.3 MOD
Percent Solids			

Client Sample ID: VS-2A-74F

Sample #: 029 Date Sampled: 10/14/98 12:50 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals			Reviewed
Cadmium	13.3 N	0.25	mg/kg SW846 6010B
Lead	572 N	0.38	mg/kg SW846 6010B
Antimony	5.4 N	1.3	mg/kg SW846 6010B

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis			Reviewed
Total Residue as	79.8	‡	MCAWW 160.3 MOD
Percent Solids			

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J150136 Tetra Tech NUS, Inc PAGE 17
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/19/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: VS-2A-01WE

Sample #: 030 Date Sampled: 10/14/98 13:15 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	ND	0.61	mg/kg	SW846 6010B	Reviewed
Cadmium	0.62 N	0.24	mg/kg	SW846 6010B	
Lead	11.4 N	0.36	mg/kg	SW846 6010B	
Antimony	1.0 N	1.2	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals

Copper	12.3	3	mg/kg	SW846 6010B	Reviewed
Zinc	43.8	2.4	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis

Total Residue as Percent Solids	82.3			MCAW 160.3 MOD	Reviewed
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Client Sample ID: VS-2A-02WE

Sample #: 031 Date Sampled: 10/14/98 13:25 Date Received: 10/15/98 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals

Silver	50.6	0.64	mg/kg	SW846 6010B	Reviewed
Cadmium	28.6 N	0.26	mg/kg	SW846 6010B	
Lead	624 N	0.39	mg/kg	SW846 6010B	
Antimony	28.9 N	1.3	mg/kg	SW846 6010B	

Inductively Coupled Plasma (ICP) Metals

Copper	666	3.2	mg/kg	SW846 6010B	Reviewed
Zinc	1560	12.9	mg/kg	SW846 6010B	

N Spiked analyte recovery is outside stated control limits.

Inorganic Analysis

Total Residue as Percent Solids	77.6			MCAW 160.3 MOD	Reviewed
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ATTACHMENT 2
Sample and Boring Logs

Verification Samples
Surface Soils
Shallow Excavation Sidewalls
(VS-xx-xxS)

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET

TETRA TECH NUS, INC.



- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Warminster
 Source Number VS-2A-1\$

Project Site Number CTO 225
 Source Location Area A Site 2

Sample Method: <i>Stainless Steel Trowel</i>	Composite Sample Data														
Depth Sampled: <i>6 - 12"</i>	Sample	Time	Color and Description												
Sample Date & Time: <i>10/14/98 1005</i>															
Sampled by: <i>Matt Wolford</i>															
Signature(s): 															
Sample Type <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">Analysis</th> <th style="width: 50%;">Preservative:</th> </tr> <tr> <td><input type="checkbox"/> TCL VOAs</td> <td>dark. 4°C</td> </tr> <tr> <td><input type="checkbox"/> TCL SVOAs</td> <td>dark. 4°C</td> </tr> <tr> <td><input type="checkbox"/> TCL Pest/PCBs</td> <td>dark. 4°C</td> </tr> <tr> <td><input type="checkbox"/> TAL Metals</td> <td>4°C</td> </tr> <tr> <td><input type="checkbox"/> Cyanide</td> <td>4°C</td> </tr> </table>	Analysis	Preservative:	<input type="checkbox"/> TCL VOAs	dark. 4°C	<input type="checkbox"/> TCL SVOAs	dark. 4°C	<input type="checkbox"/> TCL Pest/PCBs	dark. 4°C	<input type="checkbox"/> TAL Metals	4°C	<input type="checkbox"/> Cyanide	4°C	Sample Data		
Analysis	Preservative:														
<input type="checkbox"/> TCL VOAs	dark. 4°C														
<input type="checkbox"/> TCL SVOAs	dark. 4°C														
<input type="checkbox"/> TCL Pest/PCBs	dark. 4°C														
<input type="checkbox"/> TAL Metals	4°C														
<input type="checkbox"/> Cyanide	4°C														
	Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)													
	<i>Brown</i>	<i>Silty clay with trace of sand</i>													
Observations and Notes <input type="checkbox"/> Duplicate sample taken	Sample Location Map 														

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Warrminster

Project Site Number CTO 225

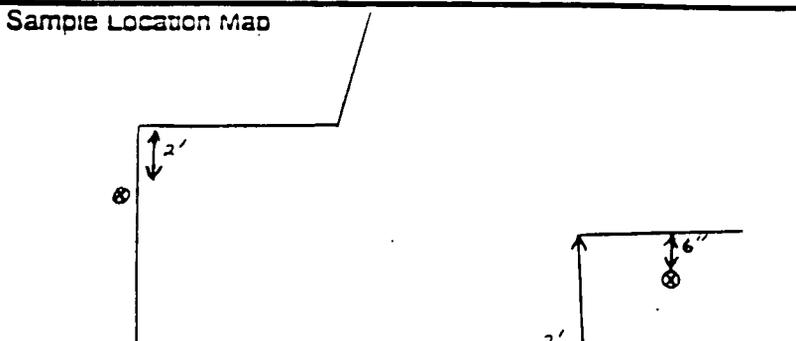
Source Number VS-2A-28

Source Location Area A Site 2

Sample Method: <u>Stainless Steel Trowel</u>	Composite Sample Data		
Depth Sampled: <u>6-12"</u>	Sample	Time	Color and Description
Sample Date & Time: <u>10/14/98 1035</u>			
Sampled by: <u>Matt Woolford</u>			
Signature(s):			

Sample Type			
<input checked="" type="checkbox"/> Low Concentration			
<input type="checkbox"/> High Concentration			
<input checked="" type="checkbox"/> Grab			
<input type="checkbox"/> Composite			
<input type="checkbox"/> Grab - Composite			
	Sample Data		
Analysis	Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
	<u>Brown</u>	<u>clayey silt</u>	

Preservative:	
<input type="checkbox"/> TCL VOA's dark, 4°C	
<input type="checkbox"/> TCL SVOA's dark, 4°C	
<input type="checkbox"/> TCL PesuPCBs dark, 4°C	
<input type="checkbox"/> TAL Metals 4°C	
<input type="checkbox"/> Cyanide 4°C	



Observations and Notes

Duplicate sample taken :

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Warminster

Project Site Number CTO 225

Source Number VS-2A-49

Source Location Area A Site 2

Sample Method: <i>Stainless Steel Trowel</i>	Composite Sample Data		
Depth Sampled: <i>6 + 12"</i>	Sample	Time	Color and Description
Sample Date & Time: <i>10/1/98 1057</i>			
Sampled by: <i>Matt Woolford</i>			
Signature(s):			

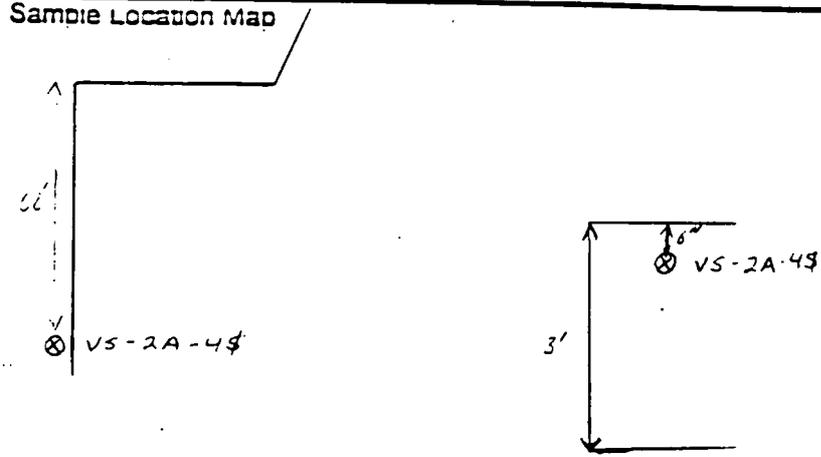
Sample Type

Low Concentration
 High Concentration
 Grab
 Composite
 Grab - Composite

Sample Data

Color	Description: (Sand, Clay, Drv, Moist, Wet, etc.)
<i>Brown</i>	<i>Clayey silt</i>

Analysis	Preservative:
<input type="checkbox"/> TCL VOAs	dark, 4°C
<input type="checkbox"/> TCL SVOAs	dark, 4°C
<input type="checkbox"/> TCL PesuPCBs	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C



Observations and Notes

Duplicate sample taken

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

Surface Soil
 Subsurface Soil
 Sediment
 Lagoon/Pond
 Other _____

Project Site Name NAWC Warminster

Project Site Number CTO 225

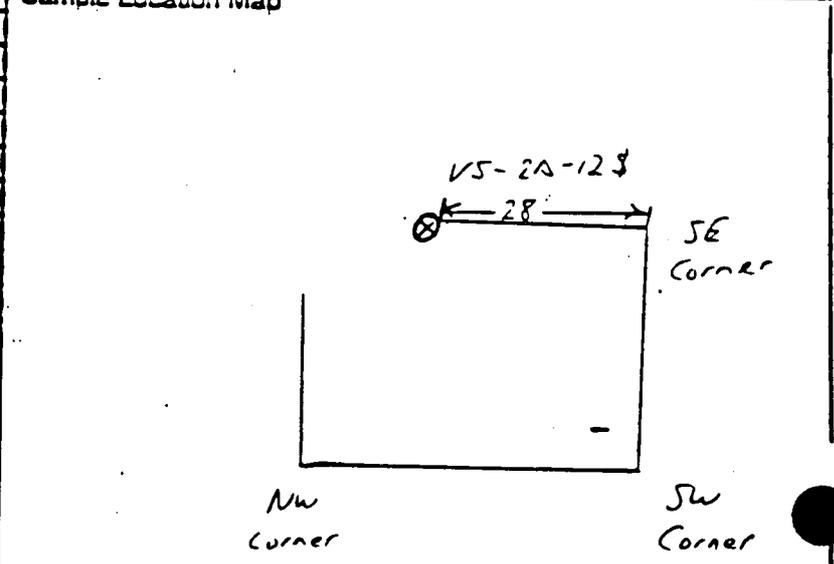
Source Number VS-2A-12\$

Source Location Area A Site 2

Sample Method: <i>stainless steel trowel</i>	Composite Sample Data		
	Sample	Time	Color and Description
Depth Sampled: <i>6-12"</i>			
Sample Date & Time: <i>10/14/98 1625</i>			
Sampled by: <i>Matt Woolford</i>			
Signature(s): <i>Matt Woolford</i>			
Sample Type <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			

Sample Data	
Color	Description: (Sand, Clay, Drv, Moist, Wet, etc.)
<i>red-brown</i>	<i>clay</i>
<i>brown</i>	<i>sand</i>

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	<i>dark 4°C</i>
<input type="checkbox"/> TCL SVOA's	<i>dark 4°C</i>
<input type="checkbox"/> TCL Pests/PCBs	<i>dark 4°C</i>
<input type="checkbox"/> TAL Metals	<i>4°C</i>
<input type="checkbox"/> Cyanide	<i>4°C</i>
<input checked="" type="checkbox"/> Antimony, Cadmium	<i>4°C</i>
<i>Copper Lead Silver</i>	
<i>Zinc</i>	
<input checked="" type="checkbox"/> Indane (1,2,3cd) nurene	<i>4°C</i>
<i>Ban 20 16, 1,1 pentene</i>	



Observations and Notes

Duplicate sample taken:
MS/MSD was collected along with duplicate VS-2A-75\$

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.



- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Warmaster

Project Site Number CTD 225

Source Number VS-2A-148

Source Location Area A Site 2

Sample Method: <i>stainless steel trowel</i>	Composite Sample Data		
Depth Sampled: <i>6-12"</i>	Sample	Time	Color and Description
Sample Date & Time: <i>10/14/98 1640</i>			
Sampled by: <i>Matt Woolford</i>			
Signature(s): <i>Matt Woolford</i>			

Sample Type

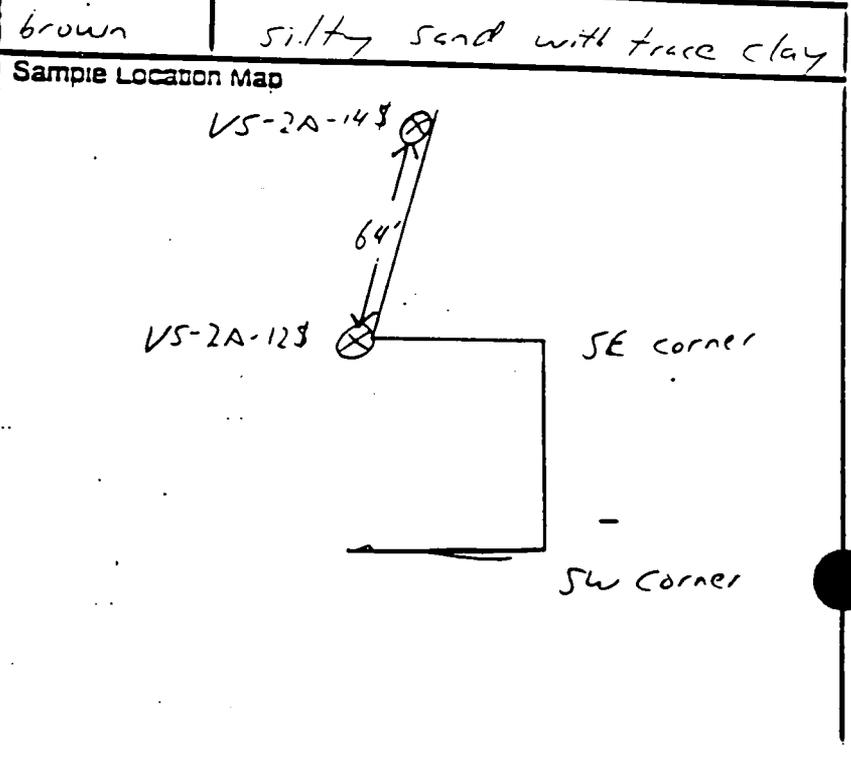
Low Concentration
 High Concentration
 Grab
 Composite
 Grab - Composite

Analysis	Preservative:
<input type="checkbox"/> TCL VOAs	dark, 4°C
<input type="checkbox"/> TCL SVOCs	dark, 4°C
<input type="checkbox"/> TCL Pests/PCBs	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> Antimony, Cadmium, Copper, Lead, Silver, Zinc	4°C
<input checked="" type="checkbox"/> Lindane (1,2,3cd) p,p'-DDE, p,p'-DDE	4°C

Observations and Notes

Duplicate sample taken

Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
<i>brown</i>	<i>silty sand with trace clay</i>



SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET

TETRA TECH NUS, INC.



- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NIAWC WARMINTI

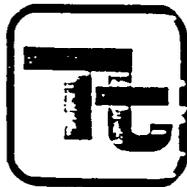
Project Site Number CTO 252

Source Number VS-2A-175

Source Location Area A Site 2

Sample Method:	Composite Sample Data		
<u>Stainless Steel Trowel</u>	Sample	Time	Color and Description
Depth Sampled: <u>6" - 12"</u>			
Sample Date & Time: <u>10/15/98 1549</u>			
Sampled by: <u>Matt Woolford</u>			
Signature(s):			
Sample Type			
<input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
Sample Data			
Analysis		Preservative:	
<input type="checkbox"/> TCL VOAs		<u>dark, 4°C</u>	
<input type="checkbox"/> TCL SVOAs		<u>dark, 4°C</u>	
<input type="checkbox"/> TCL PesuPCBs		<u>dark, 4°C</u>	
<input type="checkbox"/> TAL Metals		<u>4°C</u>	
<input type="checkbox"/> Cyanide		<u>4°C</u>	
Sample Data			
Color		Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
<u>Brown</u>		<u>S. 177 Sand with glass and nails mixed in</u>	
Sample Location Map			
Observations and Notes			
<input type="checkbox"/> Duplicate sample taken :			

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

-
-
-
-
-

Surface Soil
Subsurface Soil
Sediment
Lagoon/Pond
Other _____

Project Site Name NAWC Warmaster

Project Site Number CTO 252

Source Number VS-2A-185

Source Location Area A Site 2

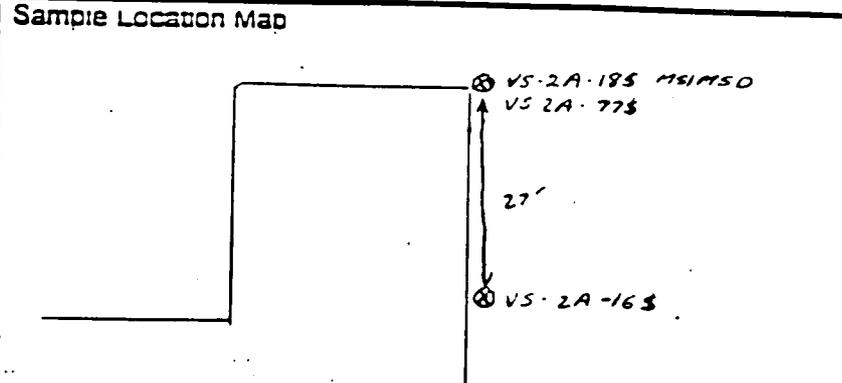
Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
<u>Stainless Steel Trowel</u>			
<u>6-12"</u>			
Sample Date & Time:			
<u>10/20/98 1025</u>			
Sampled by:			
<u>Matt Woolford</u>			
Signature(s):			

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Sample Data

Color	Description: (Sand, Clay, Grv, Moist, Wet, etc.)
<u>Red Brown</u>	<u>Silty clay with rocks and pebbles</u>

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	<u>dark, 4°C</u>
<input type="checkbox"/> TCL SVOA's	<u>dark, 4°C</u>
<input type="checkbox"/> TCL PesuPCBs	<u>dark, 4°C</u>
<input type="checkbox"/> TAL Metals	<u>4°C</u>
<input type="checkbox"/> Cyanide	<u>4°C</u>
<input checked="" type="checkbox"/> SB, Cu, Cd, Pb, Ag, Zn	<u>4°C</u>
<input checked="" type="checkbox"/> Ed. 20. 11/24/98 P1002	<u>4°C</u>
<input checked="" type="checkbox"/> Digital soil technique	



Observations and Notes

Duplicate sample taken: VS-2A-775
MS/MSD

Verification Samples
Subsurface Soils
Shallow excavation floor
(VS-xx-xxF)

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET

TETRA TECH NUS, INC.



- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWE WARMISTEC

Project Site Number CTO 252

Source Number VS-2A-09F

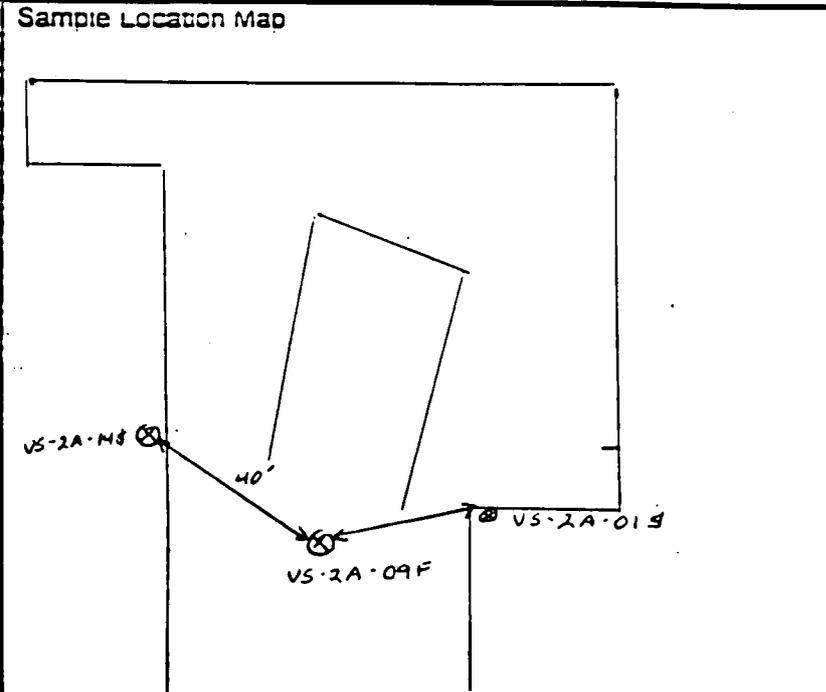
Source Location Area A Site 2

Sample Method:	Composite Sample Data		
<i>Stainless Steel Trowl</i>	Sample	Time	Color and Description
Depth Sampled: <i>2'</i>			
Sample Date & Time: <i>10/15/98 1522</i>			
Sampled by: <i>Matt Woolford</i>			
Signature(s):			

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Sample Data	
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
<i>Brown to Black</i>	<i>Silty Sand with glass and Ash Frag</i>

Analysis	Preservative:
<input type="checkbox"/> TCL VOAs	<i>dark, 4°C</i>
<input type="checkbox"/> TCL SVOAs	<i>dark, 4°C</i>
<input type="checkbox"/> TCL PesuPCBs	<i>dark, 4°C</i>
<input type="checkbox"/> TAL Metals	<i>4°C</i>
<input type="checkbox"/> Cyanide	<i>4°C</i>



Observations and Notes

Duplicate sample taken :

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Warrminster

Project Site Number CTD 252

Source Number VS-2A-11F

Source Location Area A Site 2

Sample Method:	Composite Sample Data		
<u>Stainless steel Trowel</u>	Sample	Time	Color and Description
Depth Sampled: <u>3-4'</u>			
Sample Date & Time: <u>10/20/98 1003</u>			
Sampled by: <u>Matt Wolford</u>			
Signature(s):			
Sample Type			
<input type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
Sample Data			
Analysis		Preservative:	
<input type="checkbox"/> TCL VOA's		<u>Brown</u> <u>Clayey silt</u>	
<input type="checkbox"/> TCL SVOA's		Sample Location Map	
<input type="checkbox"/> TCL Pesticides			
<input type="checkbox"/> TAL Metals			
<input type="checkbox"/> Cyanide			
<input checked="" type="checkbox"/> SB, CD, PB			
Observations and Notes			
<input checked="" type="checkbox"/> Duplicate sample taken: <u>VS-2A-72F</u> <u>MSMSO</u>			

Verification Samples
Subsurface Soils
Deeper excavation sidewalls
(VS-xx-xxWE)

Verification Samples
Subsurface Soils
Deeper excavation floor
(VS-xx-xxFE)

Verification Samples
Waste layer samples
(W-xx-xxWA)

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC WARMISTON

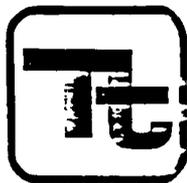
Project Site Number CTD 252

Source Number W-2A-01WA

Source Location Area A Site 2

Sample Method: <i>Stainless Steel Trowel</i>	Composite Sample Data		
Depth Sampled: <i>1.5'</i>	Sample	Time	Color and Description
Sample Date & Time: <i>12/15/98 1427</i>			
Sampled by: <i>Matt Woolford</i>			
Signature(s):			
Sample Type			
<input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
Analysis		Preservative:	
<input type="checkbox"/> TCL VOAs		dark, 4°C	
<input type="checkbox"/> TCL SVOAs		dark, 4°C	
<input type="checkbox"/> TCL Pest/PCBs		dark, 4°C	
<input type="checkbox"/> TAL Metals		4°C	
<input type="checkbox"/> Cyanide		4°C	
Sample Data			
Color		Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
<i>White to Black</i>		<i>A sphalt weathered concrete and sheet rock</i>	
Sample Location Map			
Observations and Notes <input type="checkbox"/> Duplicate sample taken :			

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWL WAINMASTER

Project Site Number CTO 252

Source Number W-2A-05WA

Source Location Area A Site 2

Sample Method: <i>stainless steel trowel</i>	Composite Sample Data		
Depth Sampled: <i>2'</i>	Sample	Time	Color and Description
Sample Date & Time: <i>10/15/98 1511</i>			
Sampled by: <i>Matt Woolford</i>			
Signature(s):			
Sample Type			
<input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
Analysts		Preservative:	
<input type="checkbox"/> TCL VOAs		dark 4°C	
<input type="checkbox"/> TCL SVOAs		dark 4°C	
<input type="checkbox"/> TCL Pest/PCBs		dark 4°C	
<input type="checkbox"/> TAL Metals		4°C	
<input type="checkbox"/> Cyanide		4°C	
Sample Data			
Color		Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
<i>gray white to black</i>		<i>washed concrete sheet rock ash brick and glass</i>	
Sample Location Map			
Observations and Notes			
<input type="checkbox"/> Duplicate sample taken :			

Supplemental Investigation Sampling
Boring Logs
And
Sample Logs
(SB-xx-xx)

BORING LOG

HALLIBURTON NUS

PROJECT: NAWC Warmaster BORING NO.: SR-02-81
 PROJECT NO.: CTO 252 DATE: 10/12/98 DRILLER: BA09
 ELEVATION: _____ FIELD GEOLOGIST: _____
 WATER LEVEL DATA: _____
 (Date, Time & Conditions) _____

SAMPLE NO. & TYPE	DEPTH (ft) OR RUN NO.	BOWLS 6" OR 100 (%)	SAMPLE RECOVERY OR SAMPLE LENGTH	LITHOLOGY CHANGE (1000 FT.)	MATERIAL DESCRIPTION*		REMARKS	
					SOIL DENSITY, CONSISTENCY OR ROCK HARDNESS	COLOR		
SS-02-41	1	6	12			Brown	silty clay with Rock Frag	0.0
		5						
	2	10	1			Lt Brn	silty clay	0.0
		9						
	3	9	12			Brown	silty clay fill material	0.0
		9						
SS-02-80	4	7	5			Brown	silty clay with glassware	0.0
		8						
	5	11	12			Brown	silty clay with fill	0.0
		9						
	6	4	5			Lt Brown	silty clay with fill	0.0
		7						
	7	6	12			Lt Brown	silty clay	0.0
		6						
	8	6	0			Lt Brown	silty clay with Rock Frag	0.0
		6						
	9	4	12			Brown	silty clay	
		4						
	10	4	6			Lt Brown	clayey silty moist	
		7						
	11	6	12			Red Brn	sandy silt	
		50						

REMARKS 1106 Boring was begun
Sample SS-02-4001 was collected 1115
Sample SR-02-9104 was collected 1134
 * See Legend on Back 1150 Boring was complete

BORING 81
 PAGE OF

BORING LOG

HALL BURTON NUS

PROJECT: NAWC WARMISTERS BORING NO.: SB-02-82
 PROJECT NO.: CTO 252 DATE: 10/12/78 DRILLER: B. A. P.
 ELEVATION: _____ FIELD GEOLOGIST: _____
 WATER LEVEL DATA: _____
 (Date, Time & Conditions) _____

SAMPLE NO. & TYPE	DEPTH (ft) OR RUN NO.	BLOWS 6" OR ROD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth, Ft.)	MATERIAL DESCRIPTION*			ROCK I SR. OR UCS	REMARKS		
					SOIL DENSITY: CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION				
SS-02 42	1	6	12"		Brown	Brown	TOP SOIL GLASS FILL		0.0		
		8					GRAVEL FILL MATERIAL				
	2	4	6"		Brown	Brown	GRAVEL FILL MATERIAL		0.0		
		2					SLTY CLAY WITH ASPHALT				
	3	12	3"		Brown	Brown	FILL MATERIAL WITH ASPHALT		0.0		
20		NAILS GRAVEL									
4	8	0					NO RECOVERY				
	5										
5	12	12"			Brown	Black	FILL MATERIAL ASPHALT NAILS		0.0		
	20						ROCKS AND GLASS				
SB-02 82	6	11	6"		White	Brown	FILL MATERIAL CONCRETE ASPHALT		0.0		
		4					BLUE GREEN FRAGMENTS ASH				
	7	4	0						NO RECOVERY		
		2									
	8	4	0						↓		
		9									
	9	4	6"				Black		FILL MATERIAL ASH GLASS		0.0
		8							NAILS BLUE GREEN FILL		
	10	9	0						NO RECOVERY		
		8									
	11	3	0						↓		
		3									
	12	3	0						↓		
		5									
13	2	0					↓				
	3										
14	4	12"			Black	Brown	SLTY CLAY WITH ORGANIC MATERIAL		0.0		
	34						SANDY WET CLAY WITH SS				
					Red	Brown	SANDSTONE AND SANDLITE		0.0		

REMARKS 1315 BORING WAS BEGUN NEEDED TO MOVE LOCATION DUE
TO REFUSAL FROM 1-2 FEET SWISS.

BORING 82

1270 SAMPLE SS-02-42 WAS COLLECTED BY MW

PAGE _____ OF _____

* See Legend on Back. 1245 SAMPLE SB-02-82 WAS COLLECTED BY MW
1300 BORING WAS COMPLETED.

BORING LOG

HALLIBURTON NUS

PROJECT: NAWC Westminster BORING NO.: SB-02-84
 PROJECT NO.: CTO 252 DATE: 10/2/98 DRILLER: RAAB
 ELEVATION: _____ FIELD GEOLOGIST: _____
 WATER LEVEL DATA: _____
 (Date, Time & Conditions) _____

SAMPLE NO. & TYPE	DEPTH (R.L. OR RUN NO.)	BLOWS 6" OR 100 (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth, Ft.)	MATERIAL DESCRIPTION*			ROCK STR. OR USCS	REMARKS
					SOIL DENSITY: CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
SS-02 44	1	7	12"			Brown	Top Soil 2" Sandstone		0.0
		9			Red Brown	Silty Clay Fill			
	2	7	0				Asphalt		0.0
		13							
	3	14	12		Black	Black	Asphalt		0.0
		5			Red Brown	Silty Clay Fill			
SB-02 84	4	9	9			Red	Silty clay with ash		0.0
		10			Brown	and rock fragments			
	5	10	12			Red	Silty clay with ash		0.0
		13			Brown	and rock fragments			
	6	10	4			Red	SANDSTONE plug at		0.0
		9			Brown	end of shot			
	7	5	12			Black	Sandstone sandy clay		0.0
		3			LT Brown				
	8	1	2			Brown	Silty clay wet		0.0
		2							
	9	1	4			Black	Ash glass cinder		0.0
		2			Brown	material			
	10	1	0						0.0
		2							
	11	2	12"			Black	Ash glass cinder		0.0
		2			Brown	clayey silt			
	12	6	6			Red	Sandstone with spherulite		0.0
		14			Brown	fragments			

REMARKS 1500 Boring was 6090
1509 Sample SB-02-84
1520 Sample SB-02-84

BORING 84
 PAGE _____ OF _____

* See Legend on Back

Supplemental Investigation Sampling
Surface soil samples
(SS-xx-xx)

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name Former NAAC Westminster

Project Site Number CTO 252 883-8311

Source Number Site 2

Source Location 55-02-41

Sample Method: <i>Split spoon / stainless steel hand trowel</i>	Composite Sample Data						
Depth Sampled: <i>6-12"</i>	Sample	Time	Color and Description				
Sample Date & Time: <i>10/12/98 1115</i>							
Sampled by: <i>Matt Woolford</i>							
Signature(s): <i>Matt Woolford</i>							
Sample Type <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite							
Analysis <input type="checkbox"/> TCL VOA's <input type="checkbox"/> TCL SVOA's <input type="checkbox"/> TCL Pest/PCBs <input type="checkbox"/> TAL Metals <input type="checkbox"/> Cyanides <input checked="" type="checkbox"/> Antimony Lead Zinc <i>Cadmium Chromium</i> <i>Copper</i>	Preservative: <input type="checkbox"/> dark 4°C <input type="checkbox"/> dark 4°C <input type="checkbox"/> dark 4°C <input type="checkbox"/> 4°C <input type="checkbox"/> 4°C <input type="checkbox"/> 4°C	Sample Data <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Color</td> <td style="border: none;"> Description: (Sand, Clay, Dry, Moist, Wet, etc.)</td> </tr> <tr> <td style="border: none;"><i>brown</i></td> <td style="border: none;"><i>silty clay with rock fragments</i></td> </tr> </table>		Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	<i>brown</i>	<i>silty clay with rock fragments</i>
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)						
<i>brown</i>	<i>silty clay with rock fragments</i>						
Sample Location Map							

Observations and Notes

Duplicate sample taken:
PID Reading 0.0 ppm

X Fence line

ATTACHMENT 3
Sample Location Figures
(Field Maps)

CALCULATION WORKSHEET

Order No. 1918 (01-91)

PAGE ____ OF ____

CLIENT

JOB NUMBER

SUBJECT

BASED ON

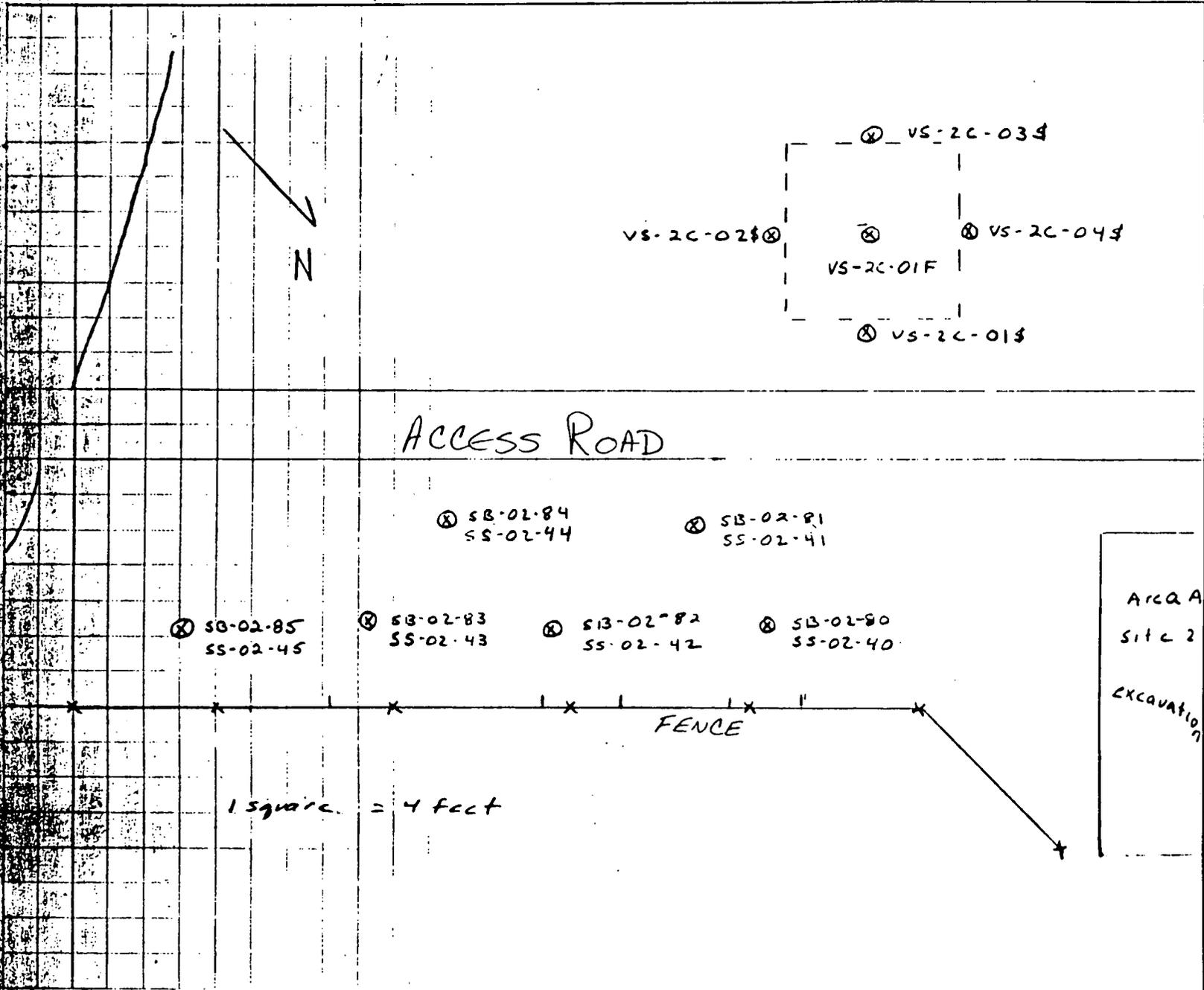
DRAWING NUMBER

BY

CHECKED BY

APPROVED BY

DATE



ATTACHMENT 4
Statistical Analysis of Verification Sample Results
Surface Soil
Subsurface Soil

TABLE

RME EXPOSURE POINT CONCENTRATION AND STATISTICAL DISTRIBUTION OF COPCS IN SOIL
 AREA A, SITE 2A, SURFACE SOIL DATA
 NAWC WARMINSTER, PENNSYLVANIA

Substance	Number of Sample Results	Degrees of Freedom	Statistical Distribution of Site Data	Results of Shapiro-Wilk or Shapiro-Francia Distribution Tests			Table Value for μ (Lognorm.) or σ (Normal)	Standard Deviation or Log Standard Deviation	Arithmetic Mean of All Site Results	Upper 95 % Confidence Limit (UCL) on Mean	Maximum Positive Site Concentration	Representative Concentration (Lower of UCL vs Max)
				W-norm	W-lognorm	W-Table						
Antimony	22	21	nonparametric (assumed lognorm.)	0.4204	0.8457	0.911	3.6971	1.76	17.7	48.4	198	48.4
Lead	22	21	nonparametric (assumed lognorm.)	0.4147	0.891	0.911	4.1959	2.06	787	4810	7350	4810

Notes:

Units are mg/kg

Number of sample results excludes rejected data or blank-qualified data. Duplicates are consolidated into one result. Non-detected results are treated as present at one-half the detection limit in all calculations.

Statistical distribution of data is determined using Shapiro-Wilk test for $n \leq 50$, Shapiro-Francia test for $n > 50$. Statistical significance level is 0.05.

For $N > 10$, a normal distribution is assumed if the test statistic W-norm is \geq than the reference value (W-table), and W-norm. $>$ W-lognorm.

For $N \geq 10$, a lognormal distribution is assumed if the test statistic W-lognorm. is \geq the reference value (W-table), and W-lognorm. \geq W-norm. A lognormal distribution is assumed if neither distribution is \geq the reference value.

*For $N < 10$, the maximum concentration is selected as the representative concentration, although the fitted distribution type is shown for information only.

H-values and standard deviations of log-transformed data are used to calculate the UCL if data are assumed to be lognormally distributed. Student's T-values and standard deviations are used for normally distributed data.

Arithmetic mean includes positive detections and non-detected results (detection limits are divided by two).

The representative concentration is selected as the lower of the 95 % UCL on the mean and the maximum positive site concentration.

samples:
VS-2A-01S
VS-2A-02S
VS-2A-03S
VS-2A-04S
VS-2A-05S
VS-2A-06S
VS-2A-07S
VS-2A-08S
VS-2A-09S
VS-2A-10S
VS-2A-11S
VS-2A-12S
VS-2A-12S-DUP
VS-2A-13S
VS-2A-14S
VS-2A-15S
VS-2A-15S-DUP
VS-2A-16S
VS-2A-17S
VS-2A-18S
VS-2A-18S-DUP
VS-2A-19S
W-2A-01WA
W-2A-02WA
W-2A-03WA

TABLE

RME EXPOSURE POINT CONCENTRATION AND STATISTICAL DISTRIBUTION OF COPCS IN SOIL
 AREA A, SITE 2A, SUBSURFACE SOIL DATA
 NAWC WARMINSTER, PENNSYLVANIA

Substance	Number of Sample Results	Degrees of Freedom	Statistical Distribution of Site Data	Results of Shapiro-Wilk or Shapiro-Francia Distribution Tests			Table Value for Mean (Lognorm. or (as Normal)	Standard Deviation of Log Standard Deviation	Arithmetic Mean of All Site Results	Upper 95 % Confidence Limit (UCL) on Mean	Maximum Positive Site Concentration	Representative Concentration (Lower of UCL vs Max)
				W-norm	W-lognorm	W-Table						
Antimony	20	19	nonparametric (assumed lognorm.)	0.5783	0.809	0.905	3.0861	1.34	6.48	14.7	30.2	14.7
Lead	20	19	lognormal	0.6094	0.925	0.905	3.4964	1.59	291	1090	2060	1090

Notes:

Units are mg/kg

Number of sample results excludes rejected data or blank-qualified data. Duplicates are consolidated into one result. Non-detected results are treated as present at one-half the detection limit in all calculations.

Statistical distribution of data is determined using Shapiro-Wilk test for $n \leq 50$, Shapiro-Francia test for $n > 50$. Statistical significance level is 0.05.

For $N > 10$, a normal distribution is assumed if the test statistic W-norm is \geq than the reference value (W-table), and W-norm. $>$ W-lognorm.

For $N \geq 10$, a lognormal distribution is assumed if the test statistic W-lognorm is \geq the reference value (W-table), and W-lognorm. \geq W-norm. A lognormal distribution is assumed if neither distribution is \geq the reference value.

*For $N < 10$, the maximum concentration is selected as the representative concentration, although the fitted distribution type is shown for information only.

H-values and standard deviations of log-transformed data are used to calculate the UCL if data are assumed to be lognormally distributed. Student's T-values and standard deviations are used for normally distributed data.

Arithmetic mean includes positive detections and non-detected results (detection limits are divided by two).

The representative concentration is selected as the lower of the 95 % UCL on the mean and the maximum positive site concentration.

samples:
VS-2A-01F
VS-2A-01FE
VS-2A-01WE
VS-2A-02F
VS-2A-02FE
VS-2A-02WE
VS-2A-03F
VS-2A-03F-DUP
VS-2A-03FE
VS-2A-04F
VS-2A-05F
VS-2A-05WE
VS-2A-06F
VS-2A-07F
VS-2A-08F
VS-2A-08F-DUP
VS-2A-09F
VS-2A-10F
VS-2A-11F
VS-2A-11F-DUP
VS-2A-12F
W-2A-04WA
W-2A-05WA



TETRA TECH NUS, INC.

600 Clark Avenue, Suite 3 ■ King of Prussia, PA 19406-1433
(610) 491-9688 ■ FAX (610) 491-9645 ■ www.tetrattech.com

C-51-12-8-52

December 28, 1998

~~Project Number 6883~~

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

Subject: Verification Sample Results, Excavation 2B
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

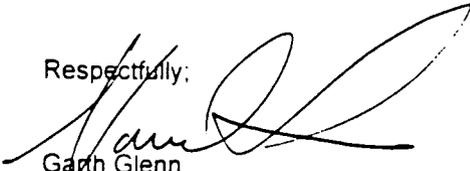
Dear Mr. Monaco:

Tetra Tech NUS (TtNUS) sampled the subject excavation on December 17, 1998. Three samples were collected and analyzed for Benzo(a)anthracene and Indeno(1,2,3-cd)pyrene. These samples were collected to supplement the samples collected on November 19 that were analyzed for full Target Compound List (TCL) and Target Analyte List (TAL) parameters. The verification samples were collected from the one-foot depth interval on the sidewalls of the excavation. Analytical reports are attached to this letter. The results have not undergone a full data quality validation.

The results were compared to the clean-up goals established for each compound. All results are well below the clean-up goals. The maximum Benzo(a)anthracene concentration identified was 380 ug/kg. The clean-up goal for this compound is 2,300 ug/kg. The maximum concentration of Indeno(1,2,3,-cd)pyrene identified (estimated) was 280J ug/kg. The clean-up goal for this compound is 1,100 ug/kg.

It is recommended that no further sampling or excavation be conducted in this area. It is further recommended that the excavation be filled with clean backfill material.

Respectfully:


Garth Glenn
Project Manager

GG/ejc

C: Tom Ames (NAVFACENGCOM)
Steve Lehman (NAVFACENGCOM)
Darius Ostrauskas (EPA Region 3)

April Flipse (PADEP)
Jeff Orient (TtNUS)
Neil Teamerson (TtNUS)

0885-6.24-024

TRANSMITTAL FORM
Foster Wheeler Environmental Corporation

TO: Steve Lehman
Tom Ames

FROM: John Magee
FWENC

DATE: 12/2/98

SUBJECT: NAWC Warminster

The following item(s) are transmitted:

<u>Items:</u>	<u>For:</u>	<u>By:</u>
Revisions	Review*	Courier
<input checked="" type="checkbox"/> Copies	Comments*	Pick-Up
Others	<input checked="" type="checkbox"/> Information	Mail
_____	Use	<input checked="" type="checkbox"/> Hand Delivery
_____	Other	Other
	_____	_____

* If for review and/or comment, date return requested: _____

No. of Copies	Page Nos.	Item Description	Rev. No.
1	N/A	Analytical data for Site 2B	

Additional Comments/Instructions/Notes:

Sample S2BWC201 is oily gravel material collected 2-1/2 ft below grade

Sample S2BWC202 is black asphalt-like material collected 5-1/2 ft below grade

Signature:


Date:
12/2/98

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

SBWVC201

Lab Name: CHEMTECHContract: FOSTER WHEELER ENVIRONMENTALProject No.: 9804NJ

Site: _____

Location: _____

Group: S2BWC20Matrix: (soil/water) SOILLab Sample ID: 060843Sample wt/vol: 5.0 (g/mL) GLab File ID: M8249.DLevel: (low/med) LOWDate Received: 11/20/98% Moisture: not dec. 13Date Analyzed: 11/20/98GC Column: RTX624 ID: 0.53 (mm)Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Concentration Units:

CAS No.	Compound	(ug/L or ug/Kg)	ug/Kg	Q
75-71-8	Dichlorodifluoromethane		1.9	U
74-87-3	Chloromethane		3.8	U
75-01-4	Vinyl Chloride		2.1	U
74-83-9	Bromomethane		4.3	U
75-00-3	Chloroethane		5.7	U
107-02-8	Acrolein		5.7	U
75-69-4	Trichlorofluoromethane		1.3	U
75-35-4	1,1-Dichloroethene		2.2	U
67-64-1	Acetone		5.7	U
75-15-0	Carbon Disulfide		5.7	U
75-09-2	Methylene Chloride		1.1	U
156-60-5	trans-1,2-Dichloroethene		4.9	U
107-13-1	Acrylonitrile		5.7	U
75-34-4	1,1-Dichloroethane		1.5	U
590-20-7	2,2-Dichloropropane		1.1	U
156-60-5	cis-1,2-dichloroethene		2	U
74-97-5	Bromochloromethane		2	U
67-66-3	Chloroform		1.4	U
71-55-6	1,1,1-Trichloroethane		1	U
108-05-4	Vinyl Acetate		5.7	U
78-93-3	2-Butanone		5.7	U
56-23-5	Carbon Tetrachloride		4.6	U
563-58-6	1,1-Dichloropropene		1.3	U
71-43-2	Benzene		1.1	U
107-06-2	1,2-Dichloroethane		1.1	U
79-01-6	Trichloroethene		3	U
78-87-5	1,2-Dichloropropane		3.9	U
74-95-3	Dibromomethane		1.7	U
75-27-4	Bromodichloromethane		1.1	U
110-07-3	2-Chloroethyl Vinyl Ether		5.7	U
10061-01-5	cis-1,3-Dichloropropene		1.1	U
108-88-3	Toluene		1.4	U
10061-02-6	trans-1,3-Dichloropropene		1.1	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

S2BWC201

Lab Name: CHEMTECH Contract: FOSTER WHEELER ENVIRONMENTAL

Project No.: 9804NJ Site: _____ Location: _____ Group: S2BWC20

Matrix: (soil/water) SOIL Lab Sample ID: O60843

Sample wt/vol: 5.0 (g/mL) G Lab File ID: M8249.D

Level: (low/med) LOW Date Received: 11/20/98

% Moisture: not dec. 13 Date Analyzed: 11/20/98

GC Column: RTX624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Concentration Units:

CAS No.	Compound	Concentration Units:		Q
		(ug/L or ug/Kg)	ug/Kg	
79-00-5	1,1,2-Trichloroethane	1.6		U
108-10-1	4-Methyl-2-Pentanone	5.7		U
127-18-4	Tetrachloroethene	1.3		U
142-28-9	1,3-Dichloropropane	1.4		U
124-48-1	Dibromochloromethane	0.8		U
106-93-4	1,2-Dibromoethane	1.8		U
591-78-6	2-Hexanone	5.7		U
108-90-7	Chlorobenzene	1.3		U
630-20-6	1,1,1,2-Tetrachloroethane	1.4		U
100-41-4	Ethylbenzene	1.3		U
1330-20-7	m&p-xylenes	2.6		U
95-47-6	o-xylene	1.4		U
100-42-5	Styrene	0.2		U
75-25-2	Bromoform	0.6		U
98-82-8	isopropylbenzene	1.5		U
108-86-1	Bromobenzene	1.1		U
79-34-5	1,1,2,2-Tetrachloroethane	1.8		U
96-18-4	1,2,3-Trichloropropane	2.9		U
103-65-1	n-Propylbenzene	1.5		U
95-49-8	2-Chlorotoluene	1.3		U
106-43-4	4-Chlorotoluene	1.1		U
108-67-8	1,3,5-Trimethylbenzene	1.8		U
98-06-6	tert-Butylbenzene	1.4		U
95-63-6	1,2,4-Trimethylbenzene	1.8		U
135-98-8	sec-Butylbenzene	1.4		U
541-73-1	1,3-Dichlorobenzene	1.4		U
99-87-6	4-Isopropyltoluene	1		U
106-46-7	1,4-Dichlorobenzene	1.4		U
95-50-1	1,2-Dichlorobenzene	1.1		U
104-51-8	n-Butylbenzene	2		U
96-12-8	1,2-Dibromo-3-chloropropane	5.7		U
120-82-1	1,2,4-Trichlorobenzene	1.4		U
87-68-3	Hexachlorobutadiene	1.1		U

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

S2BWC201

Lab Name: CHEMTECH Contract: FOSTER WHEELER ENVIRONMENTAL
 Project No. 9804 Site: _____ Location: _____ Group: S2BWC20
 Matrix: (soil/water) SOIL Lab Sample ID: O60843
 Sample wt/vol: 5.0 (g/mL) G Lab File ID: M8249.D
 Level: (low/med) LOW Date Received: 11/20/98
 % Moisture: not dec. 13 Date Analyzed: 11/20/98
 GC Column: RTX624 ID: 0.53 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0 Concentration Units: (ug/L or ug/Kg) ug/Kg

CAS Number	Compound Name	RT	Est. Conc.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

18
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

S2BWC201

Lab Name: CHEMTECH Contract: FOSTER WHEELER ENVIRONMENTAL
 Project No.: 9804NJ Site: _____ Location: WARMINGTOWN Group: S2BWC201
 Matrix: (soil/water) SOIL Lab Sample ID: O60843
 Sample wt/vol: 30.1 (g/mL) G Lab File ID: B2550.D
 Level: (low/med) LOW Date Received: 11/20/98
 % Moisture: 12 decanted: (Y/N): N Date Extracted: 11/20/98
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/21/98
 Injection Volume: 2.0 (uL) Dilution Factor: 1.0
 GPC Cleanup: (Y/N) N pH: _____

Concentration Units:

CAS No.	Compound	(ug/L or ug/Kg)	ug/Kg	Q
111-44-4	bis(2-Chloroethyl)ether	380		U
108-60-1	2,2'-oxybis(1-Chloropropane)	380		U
95-50-1	1,2-Dichlorobenzene	380		U
541-73-1	1,3-Dichlorobenzene	380		U
106-46-7	1,4-Dichlorobenzene	380		U
621-64-7	n-Nitroso-di-n-propylamine	380		U
67-72-1	Hexachloroethane	380		U
98-95-3	Nitrobenzene	380		U
78-59-1	Isophorone	380		U
111-91-1	bis(2-Chloroethoxy)methane	380		U
120-82-1	1,2,4-Trichlorobenzene	380		U
91-20-3	Naphthalene	380		U
106-47-8	4-Chloroaniline	740		U
87-68-3	Hexachlorobutadiene	380		U
91-57-6	2-Methylnaphthalene	380		U
77-47-4	Hexachlorocyclopentadiene	380		U
91-58-7	2-Chloronaphthalene	380		U
88-74-4	2-Nitroaniline	1900		U
131-11-3	Dimethylphthalate	380		U
208-96-8	Acenaphthylene	380		U
606-20-2	2,6-Dinitrotoluene	380		U
99-09-2	3-Nitroaniline	1900		U
83-32-9	Acenaphthene	380		U
132-64-9	Dibenzofuran	380		U
121-14-2	2,4-Dinitrotoluene	380		U
84-66-2	Diethylphthalate	380		U
7005-72-3	4-Chlorophenyl-phenylether	380		U
86-73-7	Fluorene	380		U
100-01-6	4-Nitroaniline	1900		U
86-30-6	N-Nitrosodiphenylamine	380		U
122-66-7	1,2-Diphenylhydrazine	380		U
101-55-3	4-Bromophenyl-phenylether	380		U
118-74-1	Hexachlorobenzene	380		U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

S2BWC201

Lab Name: CHEMTECH CONSULTING GRUP. Contract:

Lab Code: CHEM Case No.: SAS No.: SDG No.: 9804P

Matrix: (soil/water) SOIL Lab Sample ID: 30843

Sample wt/vol: 30.4 (g/ml) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N Date received: 11/20/98

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/20/98

Concentrated Extract Volume: 10000 (uL) Date analyzed: 11/21/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/Kg Q

319-84-6	alpha-BHC	1.9	U
319-85-7	beta-BHC	1.9	U
319-86-8	delta-BHC	1.9	U
58-89-9	gamma-BHC (Lincane)	1.9	U
76-44-8	Heptachlor	1.9	U
309-00-2	Aldrin	1.9	U
1024-57-3	Heptachlor epoxide	1.9	U
959-96-8	Endosulfan I	20	P
60-57-1	Dieldrin	3.7	U
72-55-9	4,4'-DDE	3.7	U
72-20-8	Endrin	3.7	U
33213-65-9	Endosulfan II	3.7	U
72-54-8	4,4'-DDD	3.7	U
1031-07-8	Endosulfan sulfate	3.7	U
50-29-3	4,4'-DDT	3.7	U
72-43-5	Methoxychlor	19	U
53494-70-5	Endrin ketone	3.7	U
7421-35-3	Endrin aldehyde	3.7	U
5103-71-9	alpha-Chlordane	1.9	U
5103-74-2	gamma-Chlordane	1.9	U
8001-35-2	Toxaphene	190	U
12674-11-2	Aroclor-1016	37	U
11104-28-2	Aroclor-1221	75	U
11141-16-5	Aroclor-1232	37	U
53469-21-9	Aroclor-1242	37	U
12672-29-6	Aroclor-1248	37	U
11097-69-1	Aroclor-1254	37	U
11096-82-5	Aroclor-1260	180	P

PESTICIDE ORGANICS ANALYSIS DATA SHEET

S2BWC201

Lab Name: CHEMTECH CONSULTING GRUP. Contract:

Lab Code: CHEM

Case No.:

SAS No.:

SDG No.: 9804PP

Matrix: (soil/water) SOIL

Lab Sample ID: 60843P

Sample wt/vol: 30.2 (g/ml) G

Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N

Date received: 11/20/98

Extraction: (SepF/Cont/Sonc) SONC

Date Extracted: 11/20/98

Concentrated Extract Volume: 10000 (uL)

Date analyzed: 11/22/98

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	ug/Kg
12674-11-2-----	Aroclor-1016	38	U
11104-28-2-----	Aroclor-1221	75	U
11141-16-5-----	Aroclor-1232	38	U
53469-21-9-----	Aroclor-1242	38	U
12672-29-6-----	Aroclor-1245	38	U
11097-69-1-----	Aroclor-1254	38	U
11096-82-5-----	Aroclor-1260	110	E

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

S2BWC201DL

Lab Name: CHEMTECH CONSULTING GRUP. Contract:

Lab Code: CHEM Case No.: SAS No.: SDG No.: 9804PP

Matrix: (soil/water) SOIL Lab Sample ID: 60843PD

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N Date received: 11/20/98

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/20/98

Concentrated Extract Volume: 10000 (uL) Date analyzed: 11/22/98

Injection Volume: 1.0 (uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
12674-11-2-----	Aroclor-1016	380	U
11104-28-2-----	Aroclor-1221	750	U
11141-16-5-----	Aroclor-1232	380	U
53469-21-9-----	Aroclor-1242	380	U
12672-29-6-----	Aroclor-1248	380	U
11097-69-1-----	Aroclor-1254	380	U
11096-82-5-----	Aroclor-1260	160	D

Handwritten notes:
S, D, W
in
420

PRELIMINARY RESULTS

METAL ANALYSIS DATA SHEET

EPA SAMPLE NO.

S2BWC201

Client: FOSTER WHEELER

Lab Name: CHEMTECH CONSULTING GROUP

Project No.: 9804NJ

SDG No.:

Matrix (soil/water): Soil

Lab Sample ID: 60843

Level (low/med):

Date Received: 11/23/98

% Solids: 87.52

Analyte	ConC. mg/Kg
Aluminum	7252.933
Antimony	0.223
Arsenic	6.057
Barium	48.135
Beryllium	0.682
Cadmium	0.000
Calcium	10705.348
Chromium	18.062
Cobalt	8.317
Copper	23.877
Iron	17542.731
Lead	68.834
Magnesium	5752.250
Manganese	447.365
Mercury	<0.1143
Nickel	13.971
Potassium	1173.768
Selenium	0.000
Silver	0.000
Sodium	354.149
Thalium	1.310
Vanadium	29.671
Zinc	63.928

13 23 111 NA DC

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments: _____

CHEMTECH**LABORATORY REPORT****REPORT OF ANALYSES**

FOSTER WHEELER ENVIRONMENTAL
 ONE OXFORD VALLEY
 SUITE 200
 LANGHORNE, PA 19047-
 ATTN: MEG WATSON

DATE: 11/23/98

PROJECT # 9804 NJ

SAMPLE NUMBER- 60845
 DATE SAMPLED- 11/19/98
 DATE RECEIVED- 11/20/98
 DELIVERED BY- FEDEX

SAMPLE ID- S2BWC201
 TIME SAMPLED- 0915 SAMPLER- CHEM
 TIME RECEIVED- 0945
 RECEIVED BY- AP SAMPLE MATRIX- WW

Page 1 of 1

ANALYSIS	METHOD	ANALYSIS		BY	RESULT	UNITS
		DATE	TIME			
CHEMICAL OXYGEN DEMAND	EPA 410.2	11/20/98		HSP	1348	mg/L
NITROGEN, AMMONIA	EPA 350.1	11/20/98		HP	<0.1	mg/L
OIL & GREASE	EPA 413.1	11/21/98		HCP	9.60	mg/L
SOLIDS, TOTAL	EPA 160.2	11/20/98		HCP	643	mg/L

COMMENTS: THE MATRIX IS ASTM LEACHATE.

LABORATORY DIRECTOR



CHEMTECH**LABORATORY REPORT**

REPORT OF ANALYSES

FOSTER WHEELER ENVIRONMENTAL
 ONE OXFORD VALLEY
 SUITE 200
 LANGHORNE, PA 19047-
 Attn: MEG WATSON

DATE: 11/23/98

PROJECT # 9804 NJ

SAMPLE NUMBER- 60843
 DATE SAMPLED- 11/19/98
 DATE RECEIVED- 11/20/98
 DELIVERED BY- FEDEX

SAMPLE ID- S2BWC201
 TIME SAMPLED- 0915 SAMPLER- CLIENT
 TIME RECEIVED- 0945
 RECEIVED BY- AP SAMPLE MATRIX- SO

Page 1 of 1

ANALYSIS	METHOD	ANALYSIS			RESULT UNITS
		DATE	TIME	BY	
IGNITIBILITY	1010	11/20/98		HCP	>100 Degree C
OIL & GREASE	413.1	11/21/98		HCP	32.9 mg/Kg
TOTAL PETROLEUM HYDROCARBONS	418.1	11/21/98		SPS	2488 mg/Kg
CORROSIVITY	Y9045	11/20/98		HSP	7.90 pH Unit
SULFIDE-REACTIVITY	9030	11/20/98		SPS	< 53.0 mg/kg
CYANIDE-REACTIVITY	9010	11/20/98		SPS	<1.05 mg/Kg
TOTAL VOLATILE SOLIDS	160.4	11/20/98		HCP	12085 mg/kg
SOLIDS, PERCENT	160.3	11/21/98		SBS	87.52 %
PAINT FILTER TEST	9095	11/20/98		HCP	<1.0 mL/kg

LABORATORY DIRECTOR



1D
TCLP HERBICIDE ORGANICS ANALYSIS DATA SHEET

REP. SAMPLE NO.

52BWC201

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68D20041

Lab Code: CHEM Case No.: SAS No.: SDG No.: 9804TH

Matrix: (soil/water) WATER Lab Sample ID: 60843

Sample wt/vol: 50 (g/ml) ML Lab File ID: _____

% Moisture: decanted: (Y/N) Date received: 11/20/98

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 11/22/98

Concentrated Extract Volume: 10000 (uL) Date analyzed: 11/23/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
94-75-7-----	2,4-D	5.0	U
93-72-1-----	SILVEX	5.0	U
93-76-5-----	2,4,5-T	5.0	U

1D
TCLP PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

S2BWC201

Lab Name: CHEMTECH CONSULTING GRUP. Contract:

Lab Code: CHEM Case No.: SAS No.: SDG No.: 9804TP

Matrix: (soil/water) WATER Lab Sample ID: 60843T

Sample wt/vol: 50 (g/ml) ML Lab File ID: _____

% Moisture: decanted: (Y/N) Date received: 11/20/98

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 11/22/98

Concentrated Extract Volume: 10000 (uL) Date analyzed: 11/23/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
---------	----------	--	---

58-89-9-----	gamma-BHC (Lindane) _____	1.0	U
76-44-8-----	Heptachlor _____	1.0	U
1024-57-3-----	Heptachlor epoxide _____	1.0	U
72-20-8-----	Endrin _____	2.0	U
72-43-5-----	Methoxychlor _____	10	U
5103-71-9-----	Chlordane _____	20	U
8001-35-2-----	Toxaphene _____	100	U

PRELIMINARY RESULTS

TCLP METAL ANALYSIS DATA SHEET

EPA SAMPLE NO.

Client: FOSTER WHEELER

S2BWC201

Lab Name: CHEMTECH CONSULTING GROUP

Project No.: 9804NJ

SDG No.:

Matrix (soil/water) Water

Lab Sample ID: 60843

Level (low/med):

Date Received: 11/23/98

% Solids:

CAS No.	Analyte	Conc. UG/L
7440-38-2	Arsenic	6.330
7440-39-3	Barium	188.130
7440-43-9	Cadmium	0.490
7440-47-3	Chromium	0.260
7439-92-1	Lead	61.050
7439-97-6	Mercury	<0.20
7782-49-2	Selenium	8.910
7440-02-0	Nickel	15.820
7440-50-8	Copper	0.000
7440-66-6	Zinc	36.100
7440-22-4	Silver	0.680

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

IA
 VOLATILE ORGANICS ANALYSIS DATA SHEET

S2BWC202

Lab Name: CHEMTECHContract: FOSTER WHEELER ENVIRONMENTALProject No.: 9804NJ

Site: _____

Location: _____

Group: S2BWC20Matrix: (soil/water) SOILLab Sample ID: O60844Sample wt/vol: 5.0 (g/mL) GLab File ID: M8250.DLevel: (low/med) LOWDate Received: 11/20/98% Moisture: not dec. 3Date Analyzed: 11/20/98GC Column: RTX624ID: 0.53 (mm)Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Concentration Units:

CAS No.	Compound	(ug/L or ug/Kg)	ug/Kg	Q
75-71-8	Dichlorodifluoromethane		1.7	U
74-87-3	Chloromethane		3.4	U
75-01-4	Vinyl Chloride		1.9	U
74-83-9	Bromomethane		3.9	U
75-00-3	Chloroethane		5.2	U
107-02-8	Acrolein		5.2	U
75-69-4	Trichlorofluoromethane		1.2	U
75-35-4	1,1-Dichloroethene		2	U
67-64-1	Acetone		5.2	U
75-15-0	Carbon Disulfide		5.2	U
75-09-2	Methylene Chloride		1	U
156-60-5	trans-1,2-Dichloroethene		4.4	U
107-13-1	Acrylonitrile		5.2	U
75-34-4	1,1-Dichloroethane		1.3	U
590-20-7	2,2-Dichloropropane		1	U
156-60-5	cis-1,2-dichloroethene		1.8	U
74-97-5	Bromochloromethane		1.8	U
67-66-3	Chloroform		1.2	U
71-55-6	1,1,1-Trichloroethane		0.9	U
108-05-4	Vinyl Acetate		5.2	U
78-93-3	2-Butanone		5.2	U
56-23-5	Carbon Tetrachloride		4.1	U
563-58-6	1,1-Dichloropropene		1.2	U
71-43-2	Benzene		1	U
107-06-2	1,2-Dichloroethane		1	U
79-01-6	Trichloroethene		2.7	U
78-87-5	1,2-Dichloropropane		3.5	U
74-95-3	Dibromomethane		1.5	U
75-27-4	Bromodichloromethane		1	U
110-07-3	2-Chloroethyl Vinyl Ether		5.2	U
10061-01-5	cis-1,3-Dichloropropene		1	U
108-88-3	Toluene		1.3	U
10061-02-6	trans-1,3-Dichloropropene		1	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

S2BWC202

Lab Name: CHEMTECHContract: FOSTER WHEELER ENVIRONMENTALProject No.: 9804NJ

Site: _____

Location: _____

Group: S2BWC20

Matrix: (soil/water)

SOILLab Sample ID: O60844

Sample wt/vol:

5.0 (g/mL) GLab File ID: M8250.D

Level: (low/med)

LOWDate Received: 11/20/98

% Moisture: not dec.

3Date Analyzed: 11/20/98GC Column: RTX624ID: 0.53 (mm)Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Concentration Units:

CAS No.	Compound	(ug/L or ug/Kg)	ug/Kg	Q
79-00-5	1,1,2-Trichloroethane	1.4		U
108-10-1	4-Methyl-2-Pentanone	5.2		U
127-18-4	Tetrachloroethene	1.1		U
142-28-9	1,3-Dichloropropane	1.2		U
124-48-1	Dibromochloromethane	0.7		U
106-93-4	1,2-Dibromoethane	1.6		U
591-78-6	2-Hexanone	5.2		U
108-90-7	Chlorobenzene	1.1		U
630-20-6	1,1,1,2-Tetrachloroethane	1.2		U
100-41-4	Ethylbenzene	1.1		U
1330-20-7	m&p-xylenes	2.4		U
95-47-6	o-xylene	1.2		U
100-42-5	Styrene	0.2		U
75-25-2	Bromoform	0.5		U
98-82-8	isopropylbenzene	1.3		U
108-86-1	Bromobenzene	1		U
79-34-5	1,1,2,2-Tetrachloroethane	1.6		U
96-18-4	1,2,3-Trichloropropane	2.6		U
103-65-1	n-Propylbenzene	7.2		
95-49-8	2-Chlorotoluene	1.1		U
106-43-4	4-Chlorotoluene	1		U
108-67-8	1,3,5-Trimethylbenzene	1.6		U
98-06-6	tert-Butylbenzene	3.6		
95-63-6	1,2,4-Trimethylbenzene	5.5		
135-98-8	sec-Butylbenzene	14		
541-73-1	1,3-Dichlorobenzene	1.2		U
99-87-6	4-Isopropyltoluene	2.8		
106-46-7	1,4-Dichlorobenzene	1.2		U
95-50-1	1,2-Dichlorobenzene	1		U
104-51-8	n-Butylbenzene	21		
96-12-8	1,2-Dibromo-3-chloropropane	5.2		U
120-82-1	1,2,4-Trichlorobenzene	1.2		U
87-68-3	Hexachlorobutadiene	1		U

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

S2BWC202

Lab Name: CHEMTECH Contract: FOSTER WHEELER ENVIRONMENTAL
 Project No. 9804 Site: _____ Location: _____ Group: S2BWC20
 Matrix: (soil/water) SOIL Lab Sample ID: O60844
 Sample wt/vol: 5.0 (g/mL) G Lab File ID: M8250.D
 Level: (low/med) LOW Date Received: 11/20/98
 % Moisture: not dec. 3 Date Analyzed: 11/20/98
 GC Column: RTX624 ID: 0.53 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Concentration Units:

Number TICs found: 10 (ug/L or ug/Kg) ug/Kg

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 108-08-7	Pentane, 2,4-dimethyl-	10.77	94	J
2. 565-59-3	Pentane, 2,3-dimethyl-	12.65	140	J
3. 590-73-8	Hexane, 2,2-dimethyl-	13.24	850	J
4. 592-13-2	Hexane, 2,5-dimethyl-	14.84	210	J
5. 589-43-5	Hexane, 2,4-dimethyl-	14.97	290	J
6. 583-48-2	Hexane, 3,4-dimethyl-	16.49	76	J
7. 16747-26-5	Hexane, 2,2,4-trimethyl-	16.64	220	J
8. 1678-92-8	Cyclohexane, propyl-	22.23	80	J
9. 493-02-7	Naphthalene, decahydro-, tra	26.14	200	J
10. 2958-76-1	Naphthalene, decahydro-2-met	27.90	120	J
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
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25.				
26.				
27.				
28.				
29.				
30.				

1D

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

S2BWC202

Lab Name: CHEMTECH CONSULTING GRUP. Contract:

Lab Code: CHEM

Case No.:

SAS No.:

SDG No.: 9804P

Matrix: (soil/water) SOIL

Lab Sample ID: 60844

Sample wt/vol: 30.9 (g/ml) G

Lab File ID: _____

% Moisture: 3 decanted: (Y/N) N

Date received: 11/20/98

Extraction: (SepF/Cont/Sonc) SONC

Date Extracted: 11/20/98

Concentrated Extract Volume: 10000 (uL)

Date analyzed: 11/21/98

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	3.5	P
60-57-1	Dieldrin	3.3	U
72-55-9	4,4'-DDE	3.3	U
72-20-8	Endrin	3.3	U
33213-65-9	Endosulfan II	3.3	U
72-54-8	4,4'-DDD	3.3	U
1031-07-8	Endosulfan sulfate	3.3	U
50-29-3	4,4'-DDT	3.3	U
72-43-5	Methoxychlor	17	U
53494-70-5	Endrin ketone	3.3	U
7421-36-3	Endrin aldehyde	3.3	U
5103-71-9	alpha-Chlordane	1.7	U
5103-74-2	gamma-Chlordane	1.7	U
6001-35-2	Toxaphene	170	U
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	63	U

1D
 PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

S2BWC202

Lab Name: CHEMTECH CONSULTING GRUP. Contract:

Lab Code: CHEM

Case No.:

SAS No.:

SDG No.: 9804PP

Matrix: (soil/water) SOIL

Lab Sample ID: 60244P

Sample wt/vol: 30.9 (g/ml) G

Lab File ID: _____

% Moisture: 3 decanted: (Y/N) N

Date received: 11/20/98

Extraction: (SepF/Cont/Sonc) SONC

Date Extracted: 11/20/98

Concentrated Extract Volume: 10000 (uL)

Date analyzed: 11/22/98

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	ug/Kg
12674-11-2-----	Aroclor-1016	33	U
11104-28-2-----	Aroclor-1221	67	U
11141-16-5-----	Aroclor-1232	33	U
53469-21-9-----	Aroclor-1242	33	U
12672-29-6-----	Aroclor-1248	33	U
11097-69-1-----	Aroclor-1254	33	U
11096-82-5-----	Aroclor-1260	83	U

PRELIMINARY RESULTS

METAL ANALYSIS DATA SHEET

Client: FOSTER WHEELER

Lab Name: CHEMTECH CONSULTING GROUP

Project No.: 9804NJ

Matrix (soil/water) Soil

Level (low/med):

% Solids: 96.81

EPA SAMPLE NO.

S2BWC202

SDG No.:

Lab Sample ID: 60844

Date Received: 11/23/98

Analyte	ConC. mg/Kg
Aluminum	3268.581
Antimony	0.065
Arsenic	1.500
Barium	21.879
Beryllium	0.321
Cadmium	0.018
Calcium	80351.446
Chromium	4.448
Cobalt	2.917
Copper	16.516
Iron	5355.750
Lead	16.409
Magnesium	53292.177
Manganese	171.966
Mercury	<0.098
Nickel	13.218
Potassium	537.175
Selenium	0.155
Silver	0.000
Sodium	287.373
Thalium	0.720
Vanadium	11.647
Zinc	36.447

Color Before:

Clarity

Before:

Texture:

Color After:

Clarity

After:

Artifacts:

Comments:

CHEMTECH**LABORATORY REPORT**

REPORT OF ANALYSES

FOSTER WHEELER ENVIRONMENTAL
 ONE OXFORD VALLEY
 SUITE 200
 LANGHORNE, PA 19047-
 Attn: MEG WATSON

DATE: 11/23/98

PROJECT # 9804 NJ

SAMPLE NUMBER- 60846
 DATE SAMPLED- 11/19/98
 DATE RECEIVED- 11/20/98
 DELIVERED BY- FEDEX

SAMPLE ID- S2BWC202
 TIME SAMPLED- 0930 SAMPLER- CHEM
 TIME RECEIVED- 0945
 RECEIVED BY- AP SAMPLE MATRIX- WW

Page 1 of 1

ANALYSIS	METHOD	ANALYSIS			RESULT UNITS
		DATE	TIME	BY	
CHEMICAL OXYGEN DEMAND	EPA 410.2	11/20/98		HSP	526 mg/L
NITROGEN, AMMONIA	EPA 350.1	11/20/98		HP	<0.1 mg/L
OIL & GREASE	EPA 413.1	11/21/98		HCP	18.3 mg/L
SOLIDS, TOTAL	EPA 160.2	11/20/98		HCP	695 mg/L

COMMENTS: THE MATRIX IS ASTM LEACHATE.

LABORATORY DIRECTOR



CHEMTECH**LABORATORY REPORT**

REPORT OF ANALYSES

FOSTER WHEELER ENVIRONMENTAL
 ONE OXFORD VALLEY
 SUITE 200
 LANGHORNE, PA 19047-
 Attn: MEG WATSON

DATE: 11/23/98

PROJECT # 9804 NJ

SAMPLE NUMBER- 60844
 DATE SAMPLED- 11/19/98
 DATE RECEIVED- 11/20/98
 DELIVERED BY- FEDEX

SAMPLE ID- S2BWC202
 TIME SAMPLED- 0930 SAMPLER- CLIENT
 TIME RECEIVED- 0945
 RECEIVED BY- AP SAMPLE MATRIX- SO

Page 1 of 1

ANALYSIS	METHOD	ANALYSIS			RESULT UNITS
		DATE	TIME	BY	
IGNITIBILITY	1010	11/20/98		HCP	>100 Degree C
OIL & GREASE	413.1	11/21/98		HCP	54.9 mg/Kg
TOTAL PETROLEUM HYDROCARBONS	418.1	11/21/98		SPS	26188 mg/Kg
CORROSIVITY	Y9045	11/20/98		HSP	7.35 pH Unit
SULFIDE-REACTIVITY	9030	11/20/98		SPS	< 53.0 mg/kg
CYANIDE-REACTIVITY	9010	11/20/98		SPS	<1.05 mg/Kg
TOTAL VOLATILE SOLIDS	160.4	11/20/98		HCP	13111 mg/kg
SOLIDS, PERCENT	160.3	11/21/98		SBS	96.81 %
PAINT FILTER TEST	9095	11/20/98		HCP	<1.0 mL/kg

LABORATORY DIRECTOR

515 Route 9
 Barnegat, New Jersey 08005
 Phone: (609) 693-2111 Fax: (609) 698-0910

110 Route 4
 Englewood, New Jersey 07631
 Phone: (201) 567-6868 Fax: (201) 567-1333

1D
TCLP HERBICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

S2BWC202

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68D20041

Lab Code: CHEM Case No.: SAS No.: SDG No.: 9804TH

Matrix: (soil/water) WATER Lab Sample ID: 60844

Sample wt/vol: 50 (g/ml) ML Lab File ID: _____

% Moisture: decanted: (Y/N) Date received: 11/20/98

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 11/22/98

Concentrated Extract Volume: 10000 (uL) Date analyzed: 11/23/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
94-75-7-----	2,4-D	5.0	U	
93-72-1-----	SILVEX	5.0	U	
93-76-5-----	2,4,5-T	5.0	U	

1D
TCLP PESTICIDE ORGANICS ANALYSIS DATA SHEET

DATA SAMPLE NO.

2015671333202

Lab Name: CHEMTECH CONSULTING GRUP. Contract:

Lab Code: CHEM Case No.: SAS No.: SDG No.: 9804TP

Matrix: (soil/water) WATER Lab Sample ID: 60844T

Sample wt/vol: 50 (g/ml) ML Lab File ID: _____

% Moisture: decanted: (Y/N) Date received: 11/20/98

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 11/22/98

Concentrated Extract Volume: 10000 (uL) Date analyzed: 11/23/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
58-89-9	-----gamma-BHC (Lindane) _____	1.0	U
76-44-8	-----Heptachlor _____	1.0	U
1024-57-3	-----Heptachlor epoxide _____	1.0	U
72-20-8	-----Endrin _____	2.0	U
72-43-5	-----Methoxychlor _____	10	U
5103-71-9	-----Chlordane _____	20	U
8001-35-2	-----Toxaphene _____	100	U

PRELIMINARY RESULTS

TCLP METAL ANALYSIS DATA SHEET

Client: FOSTER WHEELER

EPA SAMPLE NO.

S2BWC202

Lab Name: CHEMTECH CONSULTING GROUP

Project No.: 9804NJ

SDG No.:

Matrix (soil/water) Water

Lab Sample ID: 60844

Level (low/med):

Date Received: 11/23/98

% Solids:

CAS No.	Analyte	Conc. UG/L
7440-38-2	Arsenic	3.930
7440-39-3	Barium	342.120
7440-43-9	Cadmium	0.120
7440-47-3	Chromium	<0.20
7439-92-1	Lead	12.350
7439-97-6	Mercury	<0.20
7782-49-2	Selenium	8.180
7440-02-0	Nickel	14.170
7440-50-8	Copper	0.000
7440-66-6	Zinc	27.280
7440-22-4	Silver	0.630

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:



TETRA TECH NUS, INC.

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(610) 491-9688 • FAX (610) 491-9645 • www.tetrattech.com

C-51-10-8-67

October 27, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

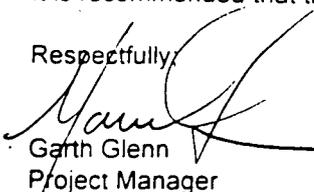
Subject: Verification Sampling Results
Area A Site 2C
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter presents the results of the verification sampling performed in Area A excavation 2C. Tetra Tech NUS (TtNUS) collected four wall samples, a floor sample, and a duplicate sample from the subject excavation on October 20, 1998. All samples were analyzed for Benzo(a)pyrene as specified and agreed to in the Verification Sampling and Analysis Plan (VSAP). All sample results, see attached lab analysis report, indicate that Benzo(a)pyrene is present at concentrations well below the clean-up goal of 78,000 ug/kg. Concentrations ranged from Non-Detected to 1,300 ug/kg. Considering this data, no further excavation or sampling appears to be warranted.

It is recommended that the excavation be backfilled.

Respectfully,


Garth Glenn
Project Manager

GG/ejc

c Tom Ames (NAVFACENGCOM)
Tim McAntee (NAVFACENGCOM)
Steve Lehman (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
Neil Teamerson (B&R Environmental)
Jeff Orient (B&R Environmental)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J210117
 Tetra Tech NUS, Inc
 NAWC WARMINSTER, PENNSYLVANIA
 Project Number: CTO NO. 0252
 Date Reported: 10/27/98

PAGE 5

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	-----------------	-------	-------------------

Client Sample ID: VS-2C-01F
 Sample #: 008 Date Sampled: 10/20/98 10:55 Date Received: 10/21/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS				Reviewed
Benzo (a) pyrene	250 J	380	ug/kg	SW846 8270C

J Estimated result. Result is less than RL.
 Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	87.2		%	MCAW 160.3 MOD

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: VS-2C-01S
 Sample #: 009 Date Sampled: 10/20/98 11:05 Date Received: 10/21/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS				Reviewed
Benzo (a) pyrene	790	390	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	85.5		%	MCAW 160.3 MOD

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: VS-2C-02S
 Sample #: 010 Date Sampled: 10/20/98 11:10 Date Received: 10/21/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS				Reviewed
Benzo (a) pyrene	ND	360	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

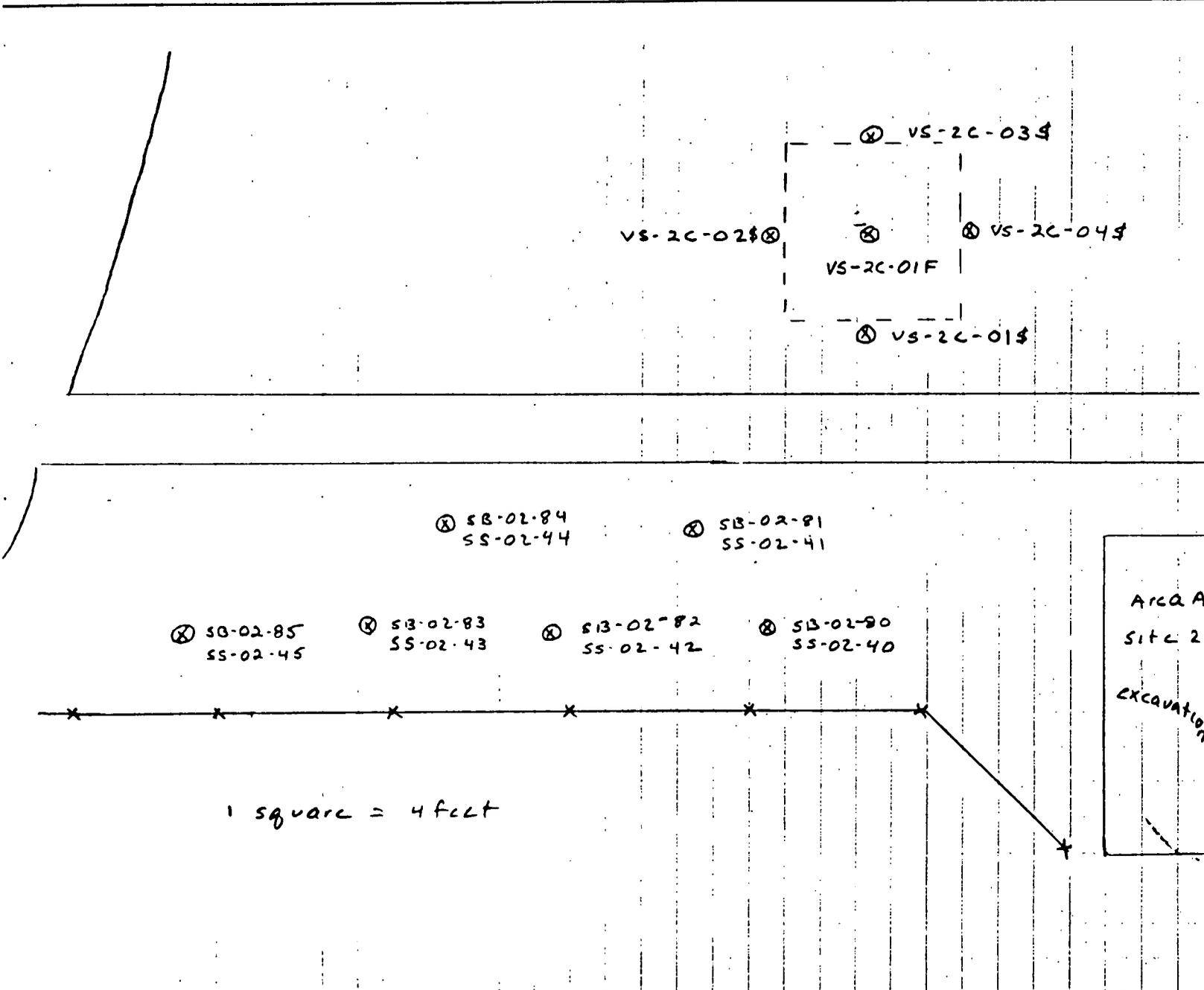
(Continued on next page)

CALCULATION WORKSHEET

Order No. 19116 (01-91)

PAGE _____ OF _____

CLIENT		JOB NUMBER	
SUBJECT		DRAWING NUMBER	
BASED ON	CHECKED BY	APPROVED BY	DATE
BY			



APPENDIX A3



TETRA TECH NUS, INC.

600 Clark Avenue, Suite 2 ■ King of Prussia, PA 19406-1433
(610) 491-9688 ■ FAX (610) 491-9645 ■ www.tetrattech.com

C-51-11-8-34

November 13, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N624272-D-1298
Contract Task Order (CTO) No. 252

Subject: Verification Sampling and Analysis Results for Area A Removal Actions, Site 3
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter presents the findings of the most recent verification sampling and analysis conducted at the subject excavation area at NAWC Warminster. Five samples and a duplicate sample were collected from the sidewalls of excavation 3 on November 6, 1998. The samples were analyzed for Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, and Fluoranthene. The data has not undergone a full validation. Sample result reports and sample logs are presented in Attachment 1.

The sample results were compared to the PRGs as recommended in the Verification Sample and Analysis Results letter dated October 30, 1998 (C-51-10-8-79). No sample contained concentrations of any of the four target compounds in excess of PRGs.

It is recommended that no further excavation be performed at Site 3 and that the area be back-filled.

Respectfully,

A handwritten signature in black ink, appearing to read 'Garth Glenn', written over a horizontal line.

Garth Glenn
Project Manger

GG/nfs

c Tom Ames (NAVFACENGCOM)
Tim McEntee (NAVFACENGCOM)
Steve Lehman (NAVFACENGCOM)
Danus Ostrauskas (EPA Region III)
April Flipse (PADEP)
Neil Teamerson (TINUS)
Jeff Orient (TINUS)

ATTACHMENT 1

Sample Logs
And
Analytical Results Reports

SHEET NO. _____ OF _____

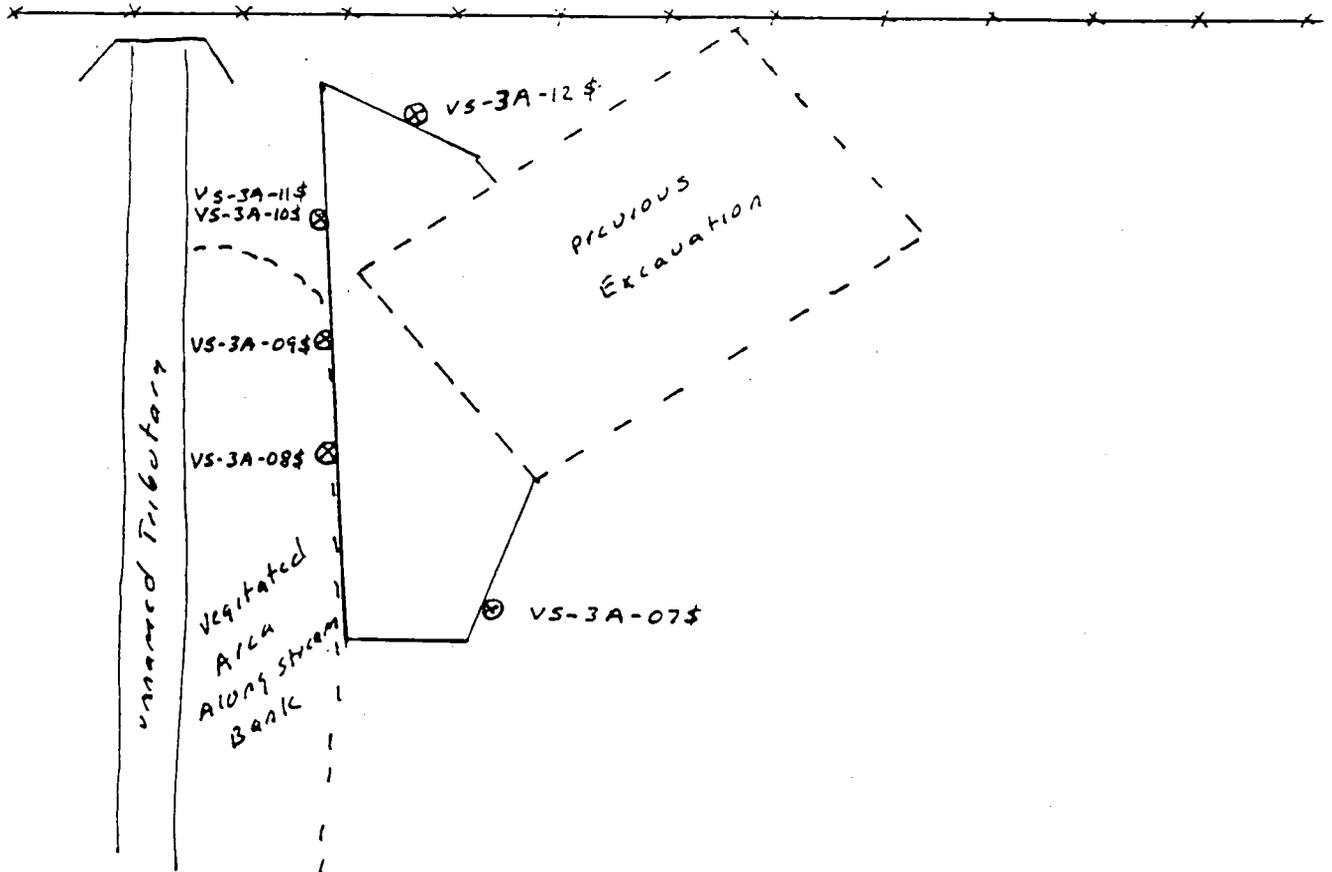
CLIENT _____ JOB NO. _____

SUBJECT _____

BASED ON: _____ DRAWING NO. _____

COMPUTER _____ CHK'D BY _____ APP'D BY _____ DATE _____ 19 _____

Jacksonville Road



SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET

TETRA TECH NUS, INC.



- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name LAKE WINDMILLER

Project Site Number 10002 SITE 2

Source Number LA-2A-075

Source Location LA-2A

Sample Method:	Composite Sample Data		
Depth Sampled:	Sample	Time	Color and Description
10 - 12"			
Sample Date & Time:			
Sampled by:			
Signature(s):			

Sample Type

Low Concentration

High Concentration

Grab

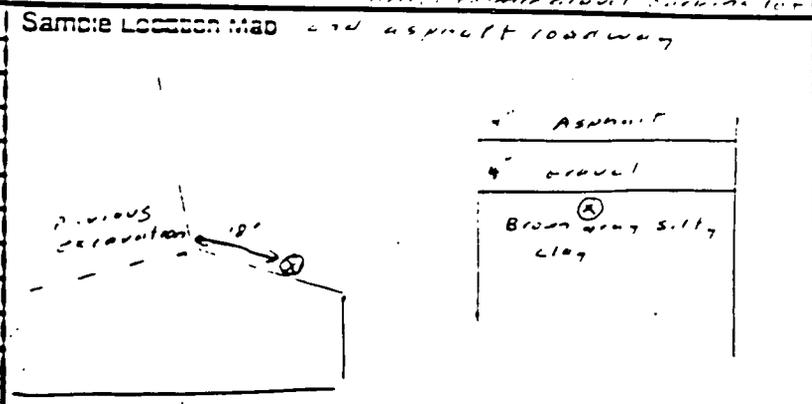
Composite

Grab - Composite

Sample Data

Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
gray brown	silty clay with rock fragments

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	dark 4°C
<input type="checkbox"/> TCL SVOA's	dark 4°C
<input type="checkbox"/> TCL PsevPCBs	dark 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> ARCHIVED BY TETRA TECH NUS, INC. JPL	



Observations and Notes

Duplicate sample taken:

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name DAVE WILMINGTON

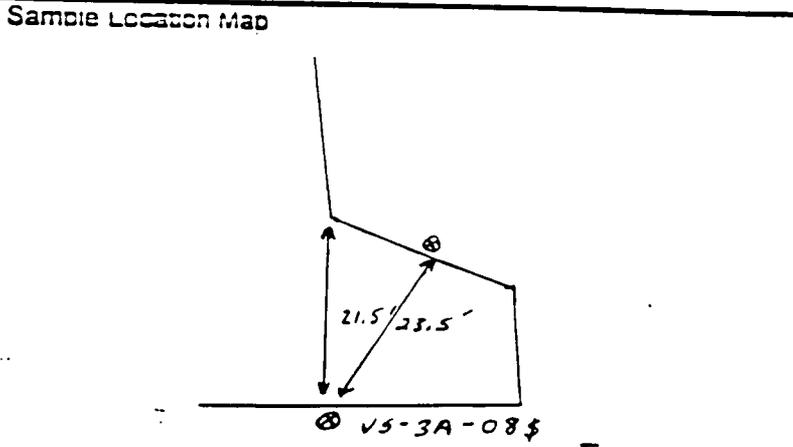
Project Site Number STA 252

Source Number VS-3A-085

Source Location STC 3A

Sample Method:	Composite Sample Data		
<i>Shovelless Steel Trowel</i>	Sample	Time	Color and Description
Depth Sampled: <i>10-12"</i>			
Sample Date & Time: <i>11/6/98 0857</i>			
Sampled by: <i>Chuck Miller</i>			
Signature(s): <i>Chuck Miller</i>			
Sample Type <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
	Sample Data		
	Color	Description: (Sand, Clay, Drv. Moist. Wet, etc.)	
	<i>200 Brown</i>	<i>sandy silt very dry</i>	

Analysis	Preservative:
<input type="checkbox"/> TCL VOAs	dark 4°C
<input type="checkbox"/> TCL SVOAs	dark 4°C
<input type="checkbox"/> TCL Pests/PCBs	dark 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> <i>HAZARDOUS WASTE (W) ANALYSES 3 (3EPCW) SELECT FLUORIDES</i>	<i>4°C</i>



Observations and Notes

Duplicate sample taken

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

Surface Soil
 Subsurface Soil
 Sediment
 Lagoon/Pond
 Other _____

Project Site Name NAVAL AIRMUNICIPAL

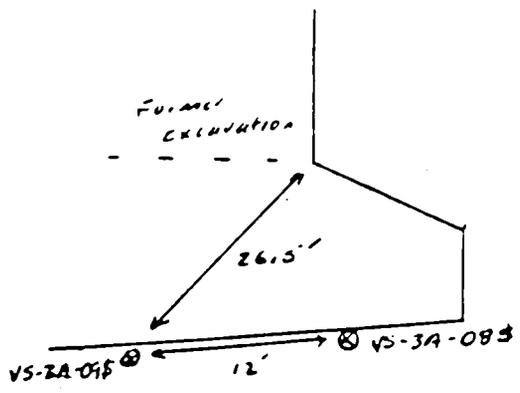
Project Site Number 2TA752

Source Number VS-3A-095

Source Location SITE 3A

Sample Method:	Composite Sample Data		
	Sample	Time	Color and Description
4" stainless steel Trowel			
Depth Sampled: 10-12"			
Sample Date & Time: 11/19/94 0917			
Sampled by: Chuck Meier			
Signature(s): <i>Chuck Meier</i>			
Sample Type <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite	Sample Data		
	Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
Analysis	Preservative:	Red Brown sandy silt very dry rocks and organics mixed in	
<input type="checkbox"/> TCL VOA's	dark 4°C		
<input type="checkbox"/> TCL SVOA's	dark 4°C		
<input type="checkbox"/> TCL Res/PCB's	dark 4°C		
<input type="checkbox"/> TAL Metals	4°C		
<input type="checkbox"/> Cyanide	4°C		
<input checked="" type="checkbox"/> Asbestos (Sediment) Asbestos (Soil) Asbestos (Fly Ash) 40L			

Sample Location Map



Observations and Notes

Duplicate sample taken:

0-1.5'	Red brown sandy silt
1.5-3'	Asphalt rocks

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWL Westminster

Project Site Number TR 257

Source Number VS-3A-10

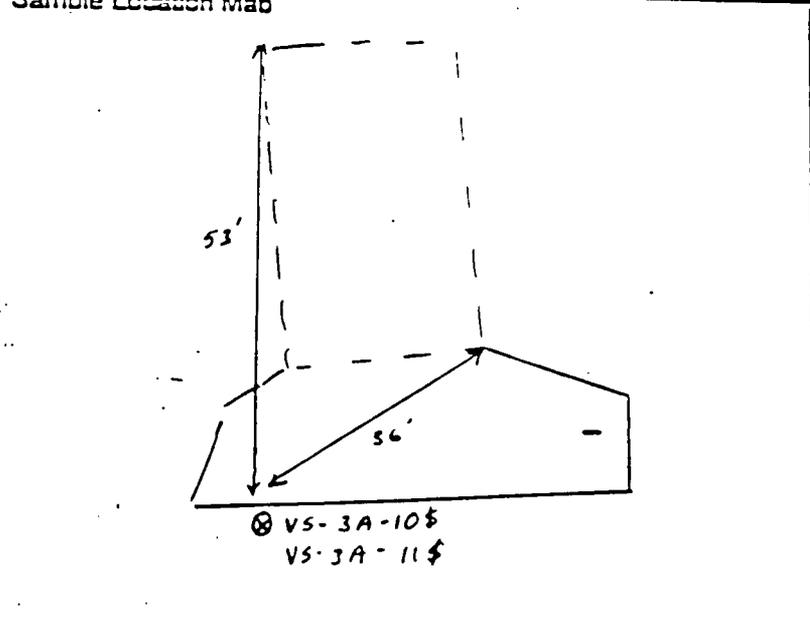
Source Location S.F. #1

Sample Method: <u>Standard Soil Trench</u>	Composite Sample Data		
	Sample	Time	Color and Description
Depth Sampled: <u>10-12"</u>			
Sample Date & Time: <u>11/6/98 0935</u>			
Sampled by: <u>Shank M. ...</u>			
Latitude(s): <u>Shank M. ...</u>			

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Sample Data	
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
<u>Red Brown</u>	<u>Silty sand with rock fragments and light brown clay particles</u>

Analysis	Preservative:
<input type="checkbox"/> TCL VOA's	<u>dark 4°C</u>
<input type="checkbox"/> TCL SVOA's	<u>dark 4°C</u>
<input type="checkbox"/> TCL Pes/PCBs	<u>dark 4°C</u>
<input type="checkbox"/> TAL Metals	<u>4°C</u>
<input type="checkbox"/> Cyanide	<u>4°C</u>
<input checked="" type="checkbox"/> <u>Aspirin, 0.100% methanol</u>	<u>40°C</u>



Observations and Notes

Duplicate sample taken: VS-3A-11\$
Assigned time 0947

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8K070150 Tetra Tech NUS, Inc PAGE 2
NAWC WARMINSTER, PENNSYLVANIA Date Reported: 11/13/98
Project Number: CTO NO. G252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	-----------------	-------	-------------------

Client Sample ID: VS-3A-09S

Sample #: 003 Date Sampled: 11/06/98 09:17 Date Received: 11/07/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS					Reviewed
Fluoranthene	3300	740	ug/kg	SW846 8270C	

J Estimated result. Result is less than RL.
Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	89.2		%	MCAWW 150.3 MOD	

Client Sample ID: VS-3A-10S

Sample #: 004 Date Sampled: 11/06/98 09:35 Date Received: 11/07/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS					Reviewed
Anthracene	67 J	380	ug/kg	SW846 8270C	
Benzo(a)anthracene	390	380	ug/kg	SW846 8270C	
Benzo(a)pyrene	500	380	ug/kg	SW846 8270C	
Fluoranthene	1000	380	ug/kg	SW846 8270C	

J Estimated result. Result is less than RL.
Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	88.0		%	MCAWW 160.3 MOD	

Client Sample ID: VS-3A-11S

Sample #: 005 Date Sampled: 11/06/98 09:47 Date Received: 11/07/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS					Reviewed
Anthracene	120 J	380	ug/kg	SW846 8270C	
Benzo(a)anthracene	470	380	ug/kg	SW846 8270C	
Benzo(a)pyrene	550	380	ug/kg	SW846 8270C	
Fluoranthene	1400	380	ug/kg	SW846 8270C	

J Estimated result. Result is less than RL.

(Continued on next page)

Duplicate



TETRA TECH NUS, INC.

600 Clark Avenue, Suite 3 • King of Prussia, PA 19406-1433
(610) 491-9688 • FAX (610) 491-9645 • www.tetrattech.com

C-51-10-8-79

October 30, 1998

Project Number

Mr. Lonnie Monaco
Naval facilities Engineering Command (NAVFACENGCOM)
Northern Division
Environmental Contracts Division
10 industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN contract No. N624272-D-1298
Contract Tack Order (CTO) No. 252

Subject: Verification Sample Analysis Results for Removal Activities Area A Site 3
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

This letter summarizes the results of the Tetra Tech NUS (TtNUS) post-excavation sampling and analysis performed at the subject site. Six samples were collected from excavation 3A on October 23, 1998 after the completion of the excavation by the Navy RAC (Foster Wheeler). Samples were collected from the excavation side and endwalls on 15 foot centers. Sample locations and descriptions are presented in Attachment 1.

All samples were analyzed for Anthracene, Benzo (a) anthracene, Benzo (a) pyrene, and Fluoranthene. The data has not undergone full data validation review. The laboratory analytical results can be found in Attachment 2. The analytical results were compared to the Preliminary Remediation Goals (PRG) established for the site [Anthracene (540 ug/kg), Benzo (a) anthracene (2,300 ug/kg), Benzo (a) pyrene (2,500 ug/kg) and Fluoranthene (5,000 ug/kg)]. The results were also statistically evaluated to calculate the Upper 95% Confidence Level concentration (UCL) for each compound. The calculated UCLs were compared to compound specific PRGs as outlined in the Verification Sampling and Analysis Plan (VSAP). The results of the statistical evaluation are presented in Attachment 3

A review of the data indicates:

- The PRGs for all four compounds were exceeded in two samples (VS-3A-04S and VS-3A-05S). These samples were collected along the northern endwall and northeastern sidewall of the excavation toward the Jacksonville Road side of the excavation. The samples were taken from one foot BGS. Sample VS-3A-04S consisted of a red-brown sandy silt with rock fragments and organic material. A large portion of the northern end wall contained asphalt chunks. Sample VS-3A-05S consisted of red-brown sandy silt with traces of clay. There were no traces of asphalt along the northeastern sidewall of the excavation
- No PRGs were exceeded in the remaining four samples
- The UCLs for Anthracene (573,000 ug/kg), Benzo (a) anthracene (138,000 ug/kg), Benzo (a) pyrene (64,200 ug/kg), and Fluoranthene (610,000 ug/kg) exceeded the PRGs.

Recommendations

The use of the UCL to determine attainment of clean-up goals may not be appropriate. The relatively low number of samples is not conducive to meaningful statistical evaluation. It is recommended that further evaluation be limited to the comparison of sample analytical results to the PRGs.

Based on the findings of the verification sampling and the above evaluation it is recommended that the Navy further excavate the northern end wall and northeastern corner of the excavation in the areas of sample numbers VS-3A-04S and VS-3A-05S. The excavation should be continued in a northerly direction until the asphalt material has been removed and clean soil is noted. The extent of the further excavation to the northeast should be based on a field decision considering the type and color of material encountered and considering the proximity of Jacksonville Road.

The Navy may want to consider partial back filling to protect the integrity of the exposed storm sewer pipeline and to allow better access for the RAC to the area needing excavation before further work is conducted.

Respectfully;

Garth Glenn
Project Manager

GG/ejc

- c Tom Ames (NAVFACENGCOM)
- Tim McAntee (NAVFACENGCOM)
- Steve Lehman (NAVFACENGCOM)
- Darius Ostrauskas (EPA Region III)
- April Flipse (PADEP)
- Neil Teamerson (B&R Environmental)
- Jeff Orient (B&R Environmental)

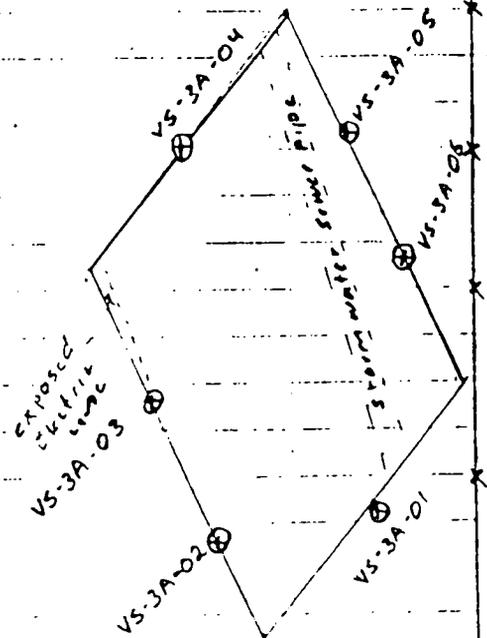
ATTACHMENT 1

CALCULATION WORKSHEET

Order No. 19116 (01-91)

PAGE _____ OF _____

CLIENT		JOB NUMBER	
SUBJECT			
BASED ON		DRAWING NUMBER	
BY	CHECKED BY	APPROVED BY	DATE



Jacksonville Road

Gate 17

ATTACHMENT 1

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWL Warmaster

Project Site Number CTC 252

Source Number VS-3A-02

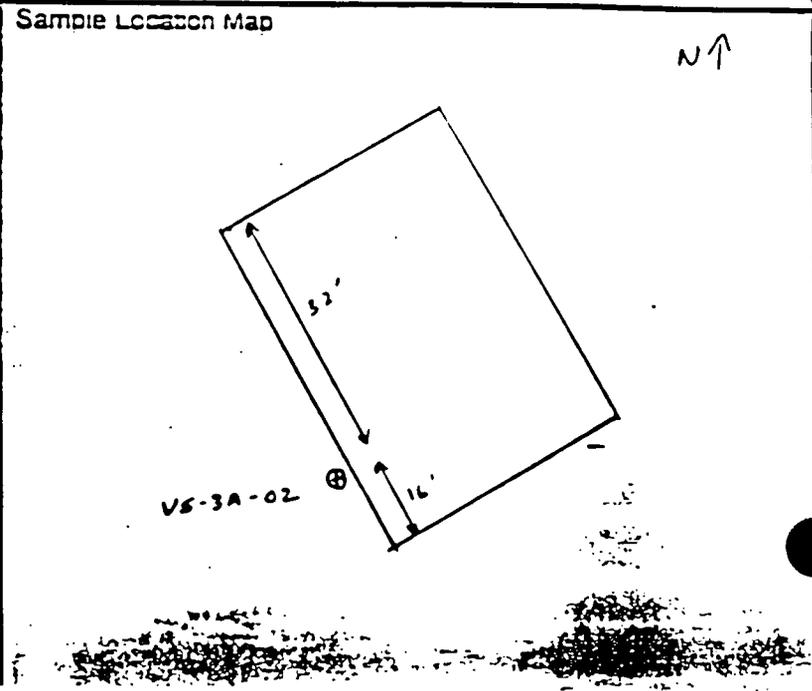
Source Location Area A Site 3

Sample Method: <i>Stainless Steel Trowel</i>	Composite Sample Data		
	Sample	Time	Color and Description
Depth Sampled: <i>6-12"</i>			
Sample Date & Time: <i>10/23/98</i>			
Sampled by: <i>Matt Woolford</i>			
Signature(s):			

- Sample Type**
- Low Concentration
 - High Concentration
 - Grab
 - Composite
 - Grab - Composite

Sample Data	
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)
<i>Brown</i>	<i>Silty clay with rock frag fines and some organics</i>

Analysts	Preservative:
<input type="checkbox"/> TCL VOAs	dark, 4°C
<input type="checkbox"/> TCL SVOCs	dark, 4°C
<input type="checkbox"/> TCL Pesticides	dark, 4°C
<input type="checkbox"/> TAL Metals	4°C
<input type="checkbox"/> Cyanide	4°C
<input checked="" type="checkbox"/> <i>Seawater/Estuarine/Drinking Water/Industrial Effluents</i>	<i>40C</i>



Observations and Notes

Duplicate sample taken:

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET



TETRA TECH NUS, INC.

- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name BAWG Warminster

Project Site Number LEC 252

Source Number VS-3A-045

Source Location Area A Site 3

Sample Method:	Composite Sample Data		
<u>Shimless Steel Trowel</u>	Sample	Time	Color and Description
Depth Sampled: <u>6" - 12"</u>			
Sample Date & Time: <u>10/23/98</u>			
Sampled by: <u>Matt Woolford</u>			
Signature(s):			
Sample Type			
<input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite			
Analysis		Preservative:	
<input type="checkbox"/> TCL VOA's		dark, 4°C	
<input type="checkbox"/> TCL SVOA's		dark, 4°C	
<input type="checkbox"/> TCL Pesticides		dark, 4°C	
<input type="checkbox"/> TAL Metals		4°C	
<input type="checkbox"/> Cyanide		4°C	
<input checked="" type="checkbox"/> <u>Asbestos, Dioxin, Furans</u>		<u>4°C</u>	
Sample Data			
Color		Description: (Sand, Clay, Dry, Moist, Wet, etc.)	
<u>red brown</u>		<u>Sandy silt with rock frag and organics</u>	
Sample Location Map			
Observations and Notes			
<input type="checkbox"/> Duplicate sample taken			

SOLID/SOIL/SEDIMENT SAMPLE LOG SHEET

TETRA TECH NUS, INC.



- Surface Soil
- Subsurface Soil
- Sediment
- Lagoon/Pond
- Other _____

Project Site Name NAWC Wainwright

Project Site Number 670 252

Source Number VS-3A-053

Source Location Area A Site 3

Sample Method:	Composite Sample Data						
	Sample	Time	Color and Description				
Depth Sampled: <u>6" - 12"</u>							
Sample Date & Time: <u>10/23/98</u>							
Sampled by: <u>Matt Woolford</u>							
Signature(s):							
<p style="text-align: center;">Sample Type</p> <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite							
<p>Analysis</p> <input type="checkbox"/> TCL VOAs <input type="checkbox"/> TCL SVOAs <input type="checkbox"/> TCL Pesu/PCBs <input type="checkbox"/> TAL Metals <input type="checkbox"/> Cyanide <input checked="" type="checkbox"/> <u>Asbestos (4000) GARDOLITE</u> <input checked="" type="checkbox"/> <u>3-PPA (a) PHASE FERRICITE 40C</u>		<p>Preservative:</p> <input type="checkbox"/> dark 4°C <input type="checkbox"/> dark 4°C <input type="checkbox"/> dark 4°C <input type="checkbox"/> 4°C <input type="checkbox"/> 4°C					
		<p style="text-align: center;">Sample Data</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;">Color</th> <th>Description: (Sand, Clay, Dry, Moist, Wet, etc.)</th> </tr> <tr> <td><u>red brown</u></td> <td><u>sandy silt with trace clay</u></td> </tr> </table>		Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	<u>red brown</u>	<u>sandy silt with trace clay</u>
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)						
<u>red brown</u>	<u>sandy silt with trace clay</u>						
<p>Sample Location Map</p> <div style="text-align: right;">↑ N</div>							
<p>Observations and Notes</p> <input type="checkbox"/> Duplicate sample taken							

ATTACHMENT 2

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech HUS, Inc PAGE 1

Lot #: C8J240154 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/29/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	-----------------	-------	-------------------

Client Sample ID: VS-3A-01S

Sample #: 001 Date Sampled: 10/23/98 09:15 Date Received: 10/24/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

R viewed

Acenaphthene	ND	380	ug/kg	SW846 8270C
Acenaphthylene	120 J	380	ug/kg	SW846 8270C
Anthracene	140 J	380	ug/kg	SW846 8270C
Benzo (a) anthracene	610	380	ug/kg	SW846 8270C
Benzo (b) fluoranthene	800	380	ug/kg	SW846 8270C
Benzo (k) fluoranthene	590	380	ug/kg	SW846 8270C
Benzo (ghi) perylene	150 J	380	ug/kg	SW846 8270C
Benzo (a) pyrene	650	380	ug/kg	SW846 8270C
Chrysene	730	380	ug/kg	SW846 8270C
Dibenz (a, h) anthracene	63 J	380	ug/kg	SW846 8270C
Fluoranthene	1500	380	ug/kg	SW846 8270C
Fluorene	41 J	380	ug/kg	SW846 8270C
Indeno (1, 2, 3-cd) pyrene	200 J	380	ug/kg	SW846 8270C
Naphthalene	ND	380	ug/kg	SW846 8270C
Phenanthrene	700	380	ug/kg	SW846 8270C
Pyrene	940	380	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

J: Estimated result. Result is less than RL.

Inorganic Analysis
 Total Residue as
 Percent Solids

86.6

±

MCAHW 160.3 MOD

Reviewed

Client Sample ID: VS-3A-02S

Sample #: 002 Date Sampled: 10/23/98 09:22 Date Received: 10/24/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Reviewed

Acenaphthene	ND	760	ug/kg	SW846 8270C
Acenaphthylene	89 J	760	ug/kg	SW846 8270C
Anthracene	220 J	760	ug/kg	SW846 8270C
Benzo (a) anthracene	1200	760	ug/kg	SW846 8270C
Benzo (b) fluoranthene	1300	760	ug/kg	SW846 8270C
Benzo (k) fluoranthene	1000	760	ug/kg	SW846 8270C
Benzo (ghi) perylene	320 J	760	ug/kg	SW846 8270C
Benzo (a) pyrene	1200	760	ug/kg	SW846 8270C

(Continued on next page)

QUANTERRA INCORPORATED
PRELIMINARY DATA SUMMARY

.....
 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J240154 Tetra Tech NUS, Inc PAGE 2
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/29/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	-----------------	-------	-------------------

Client Sample ID: VS-3A-02S

Sample #: 002 Date Sampled: 10/23/98 09:22 Date Received: 10/24/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Chrysene	1100	760	ug/kg	SW846 8270C
Dibenz (a, h) anthracene	99 J	760	ug/kg	SW846 8270C
Fluoranthene	2600	760	ug/kg	SW846 8270C
Fluorene	ND	760	ug/kg	SW846 8270C
Indeno (1, 2, 3-cd) pyrene	380 J	760	ug/kg	SW846 8270C
Naphthalene	ND	760	ug/kg	SW846 8270C
Phenanthrene	520 J	760	ug/kg	SW846 8270C
Pyrene	1700	760	ug/kg	SW846 8270C

Reviewed

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Inorganic Analysis

Total Residue as Percent Solids	87.2	±	MCANW 160.3 MOD
---------------------------------	------	---	-----------------

Reviewed

Client Sample ID: VS-3A-03S

Sample #: 003 Date Sampled: 10/23/98 09:28 Date Received: 10/24/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Acenaphthene	ND	760	ug/kg	SW846 8270C
Acenaphthylene	66 J	760	ug/kg	SW846 8270C
Anthracene	65 J	760	ug/kg	SW846 8270C
Benzo (a) anthracene	340 J	760	ug/kg	SW846 8270C
Benzo (b) fluoranthene	470 J	760	ug/kg	SW846 8270C
Benzo (k) fluoranthene	410 J	760	ug/kg	SW846 8270C
Benzo (ghi) perylene	110 J	760	ug/kg	SW846 8270C
Benzo (a) pyrene	400 J	760	ug/kg	SW846 8270C
Chrysene	430 J	760	ug/kg	SW846 8270C
Dibenz (a, h) anthracene	ND	760	ug/kg	SW846 8270C
Fluoranthene	790	760	ug/kg	SW846 8270C
Fluorene	ND	760	ug/kg	SW846 8270C
Indeno (1, 2, 3-cd) pyrene	130 J	760	ug/kg	SW846 8270C
Naphthalene	ND	760	ug/kg	SW846 8270C
Phenanthrene	330 J	760	ug/kg	SW846 8270C
Pyrene	590 J	760	ug/kg	SW846 8270C

Reviewed

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C8J240154 Tetra Tech EUS, Inc PAGE 3
 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/29/98
 Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	-----------------	-------	-------------------

Client Sample ID: VS-3A-03S

Sample #: 003 Date Sampled: 10/23/98 09:28 Date Received: 10/24/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS Reviewed

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	87.3	‡	MCAW 160.3	MOD

Client Sample ID: VS-3A-04S

Sample #: 004 Date Sampled: 10/23/98 09:43 Date Received: 10/24/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS Reviewed

Acenaphthene	1300 J	3700	ug/kg	SW846 8270C
Acenaphthylene	ND	3700	ug/kg	SW846 8270C
Anthracene	2300 J	3700	ug/kg	SW846 8270C
Benzo (a) anthracene	5700	3700	ug/kg	SW846 8270C
Benzo (b) fluoranthene	7100	3700	ug/kg	SW846 8270C
Benzo (k) fluoranthene	5900	3700	ug/kg	SW846 8270C
Benzo (ghi) perylene	1100 J	3700	ug/kg	SW846 8270C
Benzo (a) pyrene	5700	3700	ug/kg	SW846 8270C
Chrysene	6100	3700	ug/kg	SW846 8270C
Dibenz (a,h) anthracene	380 J	3700	ug/kg	SW846 8270C
Fluoranthene	19000	3700	ug/kg	SW846 8270C
Fluorene	1200 J	3700	ug/kg	SW846 8270C
Indeno (1,2,3-cd) pyrene	1500 J	3700	ug/kg	SW846 8270C
Naphthalene	ND	3700	ug/kg	SW846 8270C
Phenanthrene	14000	3700	ug/kg	SW846 8270C
Pyrene	14000	3700	ug/kg	SW846 8270C

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis				Reviewed
Total Residue as Percent Solids	89.4	‡	MCAW 160.3	MOD

(Continued on next page)

QUANTERRA INCORPORATED

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS, Inc PAGE 4

Lot #: C8J240154 NAWC WARMINSTER, PENNSYLVANIA Date Reported: 10/29/98

Project Number: CTO NO. 0252

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	--------------------	-------	----------------------

Client Sample ID: VS-3A-05S

Sample #: 005 Date Sampled: 10/23/98 09:49 Date Received: 10/24/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Acenaphthene	2000 J	7400	ug/kg	SW846 8270C
Acenaphthylene	ND	7400	ug/kg	SW846 8270C
Anthracene	5400 J	7400	ug/kg	SW846 8270C
Benzo (a) anthracene	13000	7400	ug/kg	SW846 8270C
Benzo (b) fluoranthene	10000	7400	ug/kg	SW846 8270C
Benzo (k) fluoranthene	12000	7400	ug/kg	SW846 8270C
Benzo (ghi) perylene	1600 J	7400	ug/kg	SW846 8270C
Benzo (a) pyrene	9600	7400	ug/kg	SW846 8270C
Chrysene	12000	7400	ug/kg	SW846 8270C
Dibenz (a,h) anthracene	ND	7400	ug/kg	SW846 8270C
Fluoranthene	36000	7400	ug/kg	SW846 8270C
Fluorene	1800 J	7400	ug/kg	SW846 8270C
Indeno (1,2,3-cd) pyrene	2100 J	7400	ug/kg	SW846 8270C
Naphthalene	ND	7400	ug/kg	SW846 8270C
Phenanthrene	22000	7400	ug/kg	SW846 8270C
Pyrene	28000	7400	ug/kg	SW846 8270C

Reviewed

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis

Total Residue as Percent Solids	89.2	‡	MCAFW 160.3 MOD
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Reviewed

Client Sample ID: VS-3A-06S

Sample #: 006 Date Sampled: 10/23/98 09:53 Date Received: 10/24/98 Matrix: SOLID

Semivolatile Organic Compounds by GC/MS

Acenaphthene	ND	380	ug/kg	SW846 8270C
Acenaphthylene	33 J	380	ug/kg	SW846 8270C
Anthracene	100 J	380	ug/kg	SW846 8270C
Benzo (a) anthracene	480	380	ug/kg	SW846 8270C
Benzo (b) fluoranthene	580	380	ug/kg	SW846 8270C
Benzo (k) fluoranthene	590	380	ug/kg	SW846 8270C
Benzo (ghi) perylene	110 J	380	ug/kg	SW846 8270C
Benzo (a) pyrene	490	380	ug/kg	SW846 8270C

Reviewed

(Continued on next page)

ATTACHMENT 3

TABLE

RME EXPOSURE POINT CONCENTRATION AND STATISTICAL DISTRIBUTION OF COPCS IN SOIL
 AREA A, SITE 3A, SOIL DATA
 NAWC WARMINSTER, PENNSYLVANIA

Substance	Number of Sample Results	Degrees of Freedom	Statistical Distribution of Site Data	Results of Shapiro-Wilk or Shapiro-Francia Distribution Tests			Table Value for Tests (Lognorm.) or: T _{0.95} (Normal)	Standard Deviation or Log Standard Deviation	Arithmetic Mean of All Site Results	Upper 95 % Confidence Limit (UCL) on Mean	Maximum Positive Site Concentration	Representative Concentration (Lower of UCL vs Max)
				W-norm.	W-lognorm	W-Table						
Anthracene	6	5	*lognormal	0.7071	0.8589	0.788	7.024	1.82	1370	573000	5400	5400
Benz(a)anthracene	6	5	*lognormal	0.7221	0.8405	0.788	5.5657	1.41	3580	138000	13000	13000
Benzo(a)pyrene	6	5	*lognormal	0.7516	0.8355	0.788	5.1076	1.28	3030	64200	9600	9600
Fluoranthene	6	5	*lognormal	0.7321	0.84	0.788	6.0384	1.54	10200	810000	36000	36000

Notes:

Units are mg/kg
 Number of sample results excludes rejected data or blank-qualified data. Duplicates are consolidated into one result. Non-detected results are treated as present at one-half the detection limit in all calculations.
 Statistical distribution of data is determined using Shapiro-Wilk test for $n \leq 50$, Shapiro-Francia test for $n > 50$. Statistical significance level is 0.05.
 For $N > 10$, a normal distribution is assumed if the test statistic W-norm is \geq than the reference value (W-table), and W-norm. $>$ W-lognorm.
 For $N \geq 10$, a lognormal distribution is assumed if the test statistic W-lognorm. is \geq the reference value (W-table), and W-lognorm. \geq W-norm. A lognormal distribution is assumed if neither distribution is \geq the reference value.
 *For $N < 10$, the maximum concentration is selected as the representative concentration, although the fitted distribution type is shown for information only.
 H-values and standard deviations of log-transformed data are used to calculate the UCL if data are assumed to be lognormally distributed. Student's T-values and standard deviations are used for normally distributed data.
 Arithmetic mean includes positive detections and non-detected results (detection limits are divided by two).
 The representative concentration is selected as the lower of the 95 % UCL on the mean and the maximum positive site concentration.

SAMPLES:
VS-3A-01S
VS-3A-02S
VS-3A-03S
VS-3A-03S-DUP
VS-3A-04S
VS-3A-05S
VS-3A-06S

APPENDIX B

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Field Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Laboratory ID:	C8I030123015	C8I040138010	A8I040132007	A8I040127006	C8I040138011	C8I300117007	C8J020122010
Sample Date:	09/02/98	09/03/98	09/02/98	09/03/98	09/03/98	09/29/98	10/01/98
QC Sample Type:	TB	TB	TB	TB	FB	FB	FB
Duplicate:							
INORGANICS					ug/L	ug/L	ug/L
Aluminum	NA	NA	NA	NA	13.2	U NA	NA
Antimony	NA	NA	NA	NA	1.4	U NA	NA
Arsenic	NA	NA	NA	NA	2	U NA	NA
Barium	NA	NA	NA	NA	0.4	U NA	NA
Beryllium	NA	NA	NA	NA	0.2	U NA	NA
Cadmium	NA	NA	NA	NA	0.4	U NA	0.4 U
Calcium	NA	NA	NA	NA	13.8	B NA	NA
Chromium	NA	NA	NA	NA	1	B NA	1.4
Cobalt	NA	NA	NA	NA	3.2	U NA	NA
Copper	NA	NA	NA	NA	2	U NA	NA
Iron	NA	NA	NA	NA	9.4	U NA	NA
Lead	NA	NA	NA	NA	1.7	1.1 U	NA
Magnesium	NA	NA	NA	NA	17.3	U NA	NA
Manganese	NA	NA	NA	NA	0.18	U NA	NA
Mercury	NA	NA	NA	NA	0.2	U NA	NA
Nickel	NA	NA	NA	NA	8.3	U NA	NA
Potassium	NA	NA	NA	NA	49	U NA	NA
Selenium	NA	NA	NA	NA	3.7	U NA	NA
Silver	NA	NA	NA	NA	0.41	NA	NA
Sodium	NA	NA	NA	NA	26.9	NA	NA
Thallium	NA	NA	NA	NA	4.9	B NA	NA
Vanadium	NA	NA	NA	NA	3.4	U NA	NA
Zinc	NA	NA	NA	NA	5.1	U NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Field Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Laboratory ID:	C8I030123015	C8I040138010	A8I040132007	A8I040127006	C8I040138011	C8I300117007	C8J020122010
Sample Date:	09/02/98	09/03/98	09/02/98	09/03/98	09/03/98	09/29/98	10/01/98
QC Sample Type:	TB	TB	TB	TB	FB	FB	FB
Duplicate:							
SEMIVOLATILES							
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benz(a)anthracene	NA						
Benzo(a)pyrene	NA						
Benzo(b)fluoranthene	NA						
Benzo(g,h,i)perylene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Field Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Laboratory ID:	C8I030123015	C8I040138010	A8I040132007	A8I040127006	C8I040138011	C8I300117007	C8J020122010
Sample Date:	09/02/98	09/03/98	09/02/98	09/03/98	09/03/98	09/29/98	10/01/98
QC Sample Type:	TB	TB	TB	TB	FB	FB	FB
Duplicate:							
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	NA						
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Field Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Laboratory ID:	C8I030123015	C8I040138010	A8I040132007	A8I040127006	C8I040138011	C8I300117007	C8J020122010
Sample Date:	09/02/98	09/03/98	09/02/98	09/03/98	09/03/98	09/29/98	10/01/98
QC Sample Type:	TB	TB	TB	TB	FB	FB	FB
Duplicate:							
VOLATILES	ug/L	ug/L	ug/L	ug/L	ug/L		
1,1,1-Trichloroethane	NA	5	U NA	NA	5	U NA	NA
1,1,2,2-Tetrachloroethane	NA	5	U NA	NA	5	U NA	NA
1,1,2-Trichloroethane	NA	5	U NA	NA	5	U NA	NA
1,1-Dichloroethane	NA	5	U NA	NA	5	U NA	NA
1,1-Dichloroethene	NA	5	U NA	NA	5	U NA	NA
1,2-Dichloroethane	NA	5	U NA	NA	5	U NA	NA
1,2-Dichloroethene (Total)	NA	5	U NA	NA	5	U NA	NA
1,2-Dichloropropane	NA	5	U NA	NA	5	U NA	NA
2-Butanone	NA	2.6	J NA	NA	2	U NA	NA
2-Hexanone	NA	2	U NA	NA	2	U NA	NA
4-Methyl-2-pentanone	NA	2	U NA	NA	2	U NA	NA
Acetone	NA	5.7	J NA	NA	4.9	J NA	NA
Benzene	NA	5	U NA	NA	5	U NA	NA
Bromodichloromethane	NA	5	U NA	NA	5	U NA	NA
Bromoform	NA	5	U NA	NA	5	U NA	NA
Bromomethane	NA	1	U NA	NA	1	U NA	NA
Carbon Disulfide	NA	5	U NA	NA	5	U NA	NA
Carbon Tetrachloride	NA	.5	U NA	NA	5	U NA	NA
Chlorobenzene	NA	5	U NA	NA	5	U NA	NA
Chloroethane	NA	1	U NA	NA	1	U NA	NA
Chloroform	NA	5	U NA	NA	5	U NA	NA
Chloromethane	NA	1	U NA	NA	1	U NA	NA
cis-1,3-Dichloropropene	NA	5	U NA	NA	5	U NA	NA
Dibromochloromethane	NA	5	U NA	NA	5	U NA	NA
Ethylbenzene	NA	5	U NA	NA	5	U NA	NA
Methylene Chloride	NA	5	U NA	NA	5	U NA	NA
Styrene	NA	5	U NA	NA	5	U NA	NA
Tetrachloroethene	NA	5	U NA	NA	5	U NA	NA
Toluene	NA	5	U NA	NA	5	U NA	NA
trans-1,3-Dichloropropene	NA	5	U NA	NA	5	U NA	NA
Trichloroethene	5	U 5	U 5	U 5	U 5	U NA	NA
Vinyl Chloride	NA	1	U NA	NA	1	U NA	NA
Xylene (Total)	NA	5	U NA	NA	5	U NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Field Sample ID:	1TB-090298	1TB-090398	2TB-090298	2TB-090398	FB-090398	FB-092998	FB-100198
Laboratory ID:	C8I030123015	C8I040138010	A8I040132007	A8I040127006	C8I040138011	C8I300117007	C8J020122010
Sample Date:	09/02/98	09/03/98	09/02/98	09/03/98	09/03/98	09/29/98	10/01/98
QC Sample Type:	TB	TB	TB	TB	FB	FB	FB
Duplicate:							
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Field Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Laboratory ID:	C8I030123014	C8I040138012	C8K200150005	C8K200150006	C8K200150007	C8K200150008	C8K200150009
Sample Date:	09/02/98	09/03/98	11/19/98	11/19/98	11/19/98	11/19/98	11/19/98
QC Sample Type:	RB	RB	NM	NM	NM	NM	NM
Duplicate:							
INORGANICS	ug/L	ug/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	NA	13.2	U NA	NA	NA	NA	NA
Antimony	2.4	B 1.4	U 0.76	B 0.62	B 0.86	B 0.87	B 0.54
Arsenic	NA	2	U NA	NA	NA	NA	NA
Barium	NA	0.4	U NA	NA	NA	NA	NA
Beryllium	NA	0.2	U NA	NA	NA	NA	NA
Cadmium	0.4	U 0.4	U 0.05	0.12	0.16	0.11	0.72
Calcium	NA	26.8	B NA	NA	NA	NA	NA
Chromium	0.5	U 0.6	B 24.6	31.4	26.2	24	49.7
Cobalt	NA	3.2	U NA	NA	NA	NA	NA
Copper	NA	2	U NA	NA	NA	NA	NA
Iron	NA	9.4	U NA	NA	NA	NA	NA
Lead	NA	1.3	B 9.4	14.6	13	16.9	11.4
Magnesium	NA	17.3	U NA	NA	NA	NA	NA
Manganese	NA	0.18	B NA	NA	NA	NA	NA
Mercury	NA	0.2	U NA	NA	NA	NA	NA
Nickel	NA	8.3	U NA	NA	NA	NA	NA
Potassium	NA	49	U NA	NA	NA	NA	NA
Selenium	NA	3.7	U NA	NA	NA	NA	NA
Silver	NA	0.4	U NA	NA	NA	NA	NA
Sodium	NA	70.9	NA	NA	NA	NA	NA
Thallium	NA	4.7	U 0.88	0.85	U 0.54	0.92	0.4
Vanadium	NA	3.4	U NA	NA	NA	NA	NA
Zinc	NA	5.1	U NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Field Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Laboratory ID:	C8I030123014	C8I040138012	C8K200150005	C8K200150006	C8K200150007	C8K200150008	C8K200150009
Sample Date:	09/02/98	09/03/98	11/19/98	11/19/98	11/19/98	11/19/98	11/19/98
QC Sample Type:	RB	RB	NM	NM	NM	NM	NM
Duplicate:							
SEMIVOLATILES							
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benz(a)anthracene	NA						
Benzo(a)pyrene	NA						
Benzo(b)fluoranthene	NA						
Benzo(g,h,i)perylene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Field Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Laboratory ID:	C81030123014	C81040138012	C8K200150005	C8K200150006	C8K200150007	C8K200150008	C8K200150009
Sample Date:	09/02/98	09/03/98	11/19/98	11/19/98	11/19/98	11/19/98	11/19/98
QC Sample Type:	RB	RB	NM	NM	NM	NM	NM
Duplicate:							
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	NA						
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Field Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Laboratory ID:	C81030123014	C81040138012	C8K200150005	C8K200150006	C8K200150007	C8K200150008	C8K200150009
Sample Date:	09/02/98	09/03/98	11/19/98	11/19/98	11/19/98	11/19/98	11/19/98
QC Sample Type:	RB	RB	NM	NM	NM	NM	NM
Duplicate:							
VOLATILES	ug/L	ug/L					
1,1,1-Trichloroethane	NA	5	U NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	5	U NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	5	U NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	5	U NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	5	U NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	5	U NA	NA	NA	NA	NA
1,2-Dichloroethene (Total)	NA	5	U NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	5	U NA	NA	NA	NA	NA
2-Butanone	NA	2	U NA	NA	NA	NA	NA
2-Hexanone	NA	2	U NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	2	U NA	NA	NA	NA	NA
Acetone	NA	5.5	J NA	NA	NA	NA	NA
Benzene	NA	5	U NA	NA	NA	NA	NA
Bromodichloromethane	NA	5	U NA	NA	NA	NA	NA
Bromoform	NA	5	U NA	NA	NA	NA	NA
Bromomethane	NA	1	U NA	NA	NA	NA	NA
Carbon Disulfide	NA	5	U NA	NA	NA	NA	NA
Carbon Tetrachloride	NA	5	U NA	NA	NA	NA	NA
Chlorobenzene	NA	5	U NA	NA	NA	NA	NA
Chloroethane	NA	1	U NA	NA	NA	NA	NA
Chloroform	NA	5	U NA	NA	NA	NA	NA
Chloromethane	NA	1	U NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	5	U NA	NA	NA	NA	NA
Dibromochloromethane	NA	5	U NA	NA	NA	NA	NA
Ethylbenzene	NA	5	U NA	NA	NA	NA	NA
Methylene Chloride	NA	5	U NA	NA	NA	NA	NA
Styrene	NA	5	U NA	NA	NA	NA	NA
Tetrachloroethene	NA	5	U NA	NA	NA	NA	NA
Toluene	NA	5	U NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	5	U NA	NA	NA	NA	NA
Trichloroethene	5	U 5	U NA	NA	NA	NA	NA
Vinyl Chloride	NA	1	U NA	NA	NA	NA	NA
Xylene (Total)	NA	5	U NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Field Sample ID:	RB-090298	RB-090398	VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S	VS-1B-17S
Laboratory ID:	C81030123014	C81040138012	C8K200150005	C8K200150006	C8K200150007	C8K200150008	C8K200150009
Sample Date:	09/02/98	09/03/98	11/19/98	11/19/98	11/19/98	11/19/98	11/19/98
QC Sample Type:	RB	RB	NM	NM	NM	NM	NM
Duplicate:							
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-1B-17S-D	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE	
Field Sample ID:	VS-1B-20S	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE	
Laboratory ID:	C8K200150012	C8K200150010	C8K200150011	C8J150136024	C8J150136004	C8J150136016	C8J150136030	
Sample Date:	11/19/98	11/19/98	11/19/98	10/14/98	10/14/98	10/14/98	10/14/98	
QC Sample Type:	NM							
Duplicate:	VS-1B-17S							
INORGANICS	mg/kg							
Aluminum	NA							
Antimony	0.75	B 0.65	B 0.75	B 0.88	B 1.5	L 4.9	L 1	B
Arsenic	NA							
Barium	NA							
Beryllium	NA							
Cadmium	0.69	0.08	0.12	1.7	K 2.1	K 20.3	K 0.62	K
Calcium	NA							
Chromium	54.9	54.5	23.8	NA	NA	NA	NA	
Cobalt	NA							
Copper	NA	NA	NA	NA	NA	386	12.3	
Iron	NA							
Lead	10.4	9.5	16.3	21.1	K 72.7	K 42	K 11.4	K
Magnesium	NA							
Manganese	NA							
Mercury	NA							
Nickel	NA							
Potassium	NA							
Selenium	NA							
Silver	NA	NA	NA	NA	NA	13.7	L 0.05	UL
Sodium	NA							
Thallium	0.4	U 0.4	0.37	U NA	NA	NA	NA	
Vanadium	NA							
Zinc	NA	NA	NA	NA	NA	688	43.8	

REMOVAL VERIFICATION SAMPLE RESULTS

AREA A

NAWC, WARMINSTER

Sample ID:	VS-1B-17S-D	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE
Field Sample ID:	VS-1B-20S	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE
Laboratory ID:	C8K200150012	C8K200150010	C8K200150011	C8J150136024	C8J150136004	C8J150136016	C8J150136030
Sample Date:	11/19/98	11/19/98	11/19/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:	VS-1B-17S						
SEMIVOLATILES						ug/kg	
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benz(a)anthracene	NA						
Benzo(a)pyrene	NA						
Benzo(b)fluoranthene	NA						
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	31	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-1B-17S-D	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE
Field Sample ID:	VS-1B-20S	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE
Laboratory ID:	C8K200150012	C8K200150010	C8K200150011	C8J150136024	C8J150136004	C8J150136016	C8J150136030
Sample Date:	11/19/98	11/19/98	11/19/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:	VS-1B-17S						
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	43	NA
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-1B-17S-D	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE
Field Sample ID:	VS-1B-20S	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE
Laboratory ID:	C8K200150012	C8K200150010	C8K200150011	C8J150136024	C8J150136004	C8J150136016	C8J150136030
Sample Date:	11/19/98	11/19/98	11/19/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:	VS-1B-17S						
VOLATILES							
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	NA						
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-1B-17S-D	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE
Field Sample ID:	VS-1B-20S	VS-1B-18S	VS-1B-19S	VS-2A-01F	VS-2A-01FE	VS-2A-01S	VS-2A-01WE
Laboratory ID:	C8K200150012	C8K200150010	C8K200150011	C8J150136024	C8J150136004	C8J150136016	C8J150136030
Sample Date:	11/19/98	11/19/98	11/19/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:	VS-1B-17S						
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-03F-D	VS-2A-03FE
Field Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-74F	VS-2A-03FE
Laboratory ID:	C8J150136025	C8J150136005	C8J150136017	C8J150136031	C8J150136026	C8J150136029	C8J150136006
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:						VS-2A-03F	
INORGANICS	mg/kg						
Aluminum	NA						
Antimony	1.2	B 2.1	L 1.3	B 28.9	L 5.5	L 5.4	L 1.7
Arsenic	NA						
Barium	NA						
Beryllium	NA						
Cadmium	2.8	K 3.6	K 0.61	K 28.6	K 12.1	K 13.3	K 2.4
Calcium	NA						
Chromium	NA						
Cobalt	NA						
Copper	NA	NA	9.7	666	798	NA	NA
Iron	NA						
Lead	83.9	K 95.6	K 19.5	K 624	K 245	K 572	K 66.2
Magnesium	NA						
Manganese	NA						
Mercury	NA						
Nickel	NA						
Potassium	NA						
Selenium	NA						
Silver	NA	NA	0.05	UL 50.6	L 14.3	L NA	NA
Sodium	NA						
Thallium	NA						
Vanadium	NA						
Zinc	NA	NA	41.1	156	446	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-03F-D	VS-2A-03FE
Field Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-74F	VS-2A-03FE
Laboratory ID:	C8J150136025	C8J150136005	C8J150136017	C8J150136031	C8J150136026	C8J150136029	C8J150136006
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:						VS-2A-03F	
SEMIVOLATILES			ug/kg				
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benz(a)anthracene	NA						
Benzo(a)pyrene	NA						
Benzo(b)fluoranthene	NA						
Benzo(g,h,i)perylene	NA	NA	4	U	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-03F-D	VS-2A-03FE
Field Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-74F	VS-2A-03FE
Laboratory ID:	C8J150136025	C8J150136005	C8J150136017	C8J150136031	C8J150136026	C8J150136029	C8J150136006
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:						VS-2A-03F	
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	NA	NA	49	NA	NA	NA	NA
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-03F-D	VS-2A-03FE
Field Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-74F	VS-2A-03FE
Laboratory ID:	C8J150136025	C8J150136005	C8J150136017	C8J150136031	C8J150136026	C8J150136029	C8J150136006
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:						VS-2A-03F	
VOLATILES							
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	NA						
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-03F-D	VS-2A-03FE
Field Sample ID:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE	VS-2A-03F	VS-2A-74F	VS-2A-03FE
Laboratory ID:	C8J150136025	C8J150136005	C8J150136017	C8J150136031	C8J150136026	C8J150136029	C8J150136006
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:						VS-2A-03F	
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Field Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Laboratory ID:	C8J150136018	C8J150136001	C8J150136027	C8J150136019	C8J150136002	C8J150136028	C8J150136020
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:							
INORGANICS	mg/kg						
Aluminum	NA						
Antimony	4.9	L 1.2	B 0.81	B 0.89	B 7.3	L 0.91	B 8.5
Arsenic	NA						
Barium	NA						
Beryllium	NA						
Cadmium	6.7	K 1.2	K 0.48	K 0.94	K 11.1	K 0.56	K 15
Calcium	NA						
Chromium	NA						
Cobalt	NA						
Copper	121	18.9	NA	8.2	487	NA	315
Iron	NA						
Lead	261	K 54.4	K 11.2	K 12.8	K 268	K 14.6	K 449
Magnesium	NA						
Manganese	NA						
Mercury	NA						
Nickel	NA						
Potassium	NA						
Selenium	NA						
Silver	5.2	L 0.12	L NA	0.05	UL 21.4	L NA	16.4
Sodium	NA						
Thallium	NA						
Vanadium	NA						
Zinc	377	596	NA	30.2	117	NA	113

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Field Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Laboratory ID:	C8J150136018	C8J150136001	C8J150136027	C8J150136019	C8J150136002	C8J150136028	C8J150136020
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:							
SEMIVOLATILES	ug/kg			ug/kg			ug/kg
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3,4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benz(a)anthracene	NA						
Benzo(a)pyrene	NA						
Benzo(b)fluoranthene	NA						
Benzo(g,h,i)perylene	97	NA	NA	39	U	NA	4

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Field Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Laboratory ID:	C8J150136018	C8J150136001	C8J150136027	C8J150136019	C8J150136002	C8J150136028	C8J150136020
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:							
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	13	NA	NA	39	U	NA	54
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS

AREA A

NAWC, WARMINSTER

Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Field Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Laboratory ID:	C8J150136018	C8J150136001	C8J150136027	C8J150136019	C8J150136002	C8J150136028	C8J150136020
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:							
VOLATILES							
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	NA						
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Field Sample ID:	VS-2A-03S	VS-2A-03WE	VS-2A-04F	VS-2A-04S	VS-2A-04WE	VS-2A-05F	VS-2A-05S
Laboratory ID:	C8J150136018	C8J150136001	C8J150136027	C8J150136019	C8J150136002	C8J150136028	C8J150136020
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98
QC Sample Type:	NM						
Duplicate:							
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-08F-D
Field Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-72F
Laboratory ID:	C8J150136003	C8J150136014	C8J150136021	C8J150136015	C8J150136022	C8J160146006	C8J160146012
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98	10/15/98
QC Sample Type:	NM						
Duplicate:							VS-2A-08F
INORGANICS	mg/kg						
Aluminum	NA						
Antimony	0.58	B 0.92	B 0.47	B 0.63	B 0.99	B 1.1	L 1.7
Arsenic	NA						
Barium	NA						
Beryllium	NA						
Cadmium	0.14	K 1.9	K 0.26	K 0.4	K 0.51	K 1.9	2.4
Calcium	NA						
Chromium	NA						
Cobalt	NA						
Copper	9.3	NA	5.7	NA	23.4	NA	NA
Iron	NA						
Lead	16.2	K 62	K 13.7	K 21.8	K 17.2	K 57.4	J 92.6
Magnesium	NA						
Manganese	NA						
Mercury	NA						
Nickel	NA						
Potassium	NA						
Selenium	NA						
Silver	0.05	UL NA	0.05	UL NA	0.05	UL NA	NA
Sodium	NA						
Thallium	NA						
Vanadium	NA						
Zinc	33.7	NA	32.2	NA	37.2	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-08F-D	
Field Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-72F	
Laboratory ID:	C8J150136003	C8J150136014	C8J150136021	C8J150136015	C8J150136022	C8J160146006	C8J160146012	
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98	10/15/98	
QC Sample Type:	NM							
Duplicate:							VS-2A-08F	
SEMIVOLATILES			ug/kg		ug/kg			
1,2,4-Trichlorobenzene	NA							
1,2-Dichlorobenzene	NA							
1,3-Dichlorobenzene	NA							
1,4-Dichlorobenzene	NA							
2,2'-Oxybis(1-chloropropane)	NA							
2,4,5-Trichlorophenol	NA							
2,4,6-Trichlorophenol	NA							
2,4-Dichlorophenol	NA							
2,4-Dimethylphenol	NA							
2,4-Dinitrophenol	NA							
2,4-Dinitrotoluene	NA							
2,6-Dinitrotoluene	NA							
2-Chloronaphthalene	NA							
2-Chlorophenol	NA							
2-Methyl-4,6-dinitrophenol	NA							
2-Methylnaphthalene	NA							
2-Methylphenol	NA							
2-Nitroaniline	NA							
2-Nitrophenol	NA							
3&4-Methylphenol	NA							
3,3'-Dichlorobenzidine	NA							
3-Nitroaniline	NA							
4,6-Dinitro-2-methylphenol	NA							
4-Bromophenyl Phenyl Ether	NA							
4-Chloro-3-methylphenol	NA							
4-Chloroaniline	NA							
4-Chlorophenyl Phenyl Ether	NA							
4-Nitroaniline	NA							
4-Nitrophenol	NA							
Acenaphthene	NA							
Acenaphthylene	NA							
Anthracene	NA							
Benz(a)anthracene	NA							
Benzo(a)pyrene	NA							
Benzo(b)fluoranthene	NA							
Benzo(g,h,i)perylene	NA	NA	41	U	NA	55	J	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-08F-D
Field Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-72F
Laboratory ID:	C8J150136003	C8J150136014	C8J150136021	C8J150136015	C8J150136022	C8J160146006	C8J160146012
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98	10/15/98
QC Sample Type:	NM						
Duplicate:							VS-2A-08F
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	NA	41		U NA	72	J NA	NA
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-08F-D
Field Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-72F
Laboratory ID:	C8J150136003	C8J150136014	C8J150136021	C8J150136015	C8J150136022	C8J160146006	C8J160146012
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98	10/15/98
QC Sample Type:	NM						
Duplicate:							VS-2A-08F
VOLATILES							
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	NA						
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-08F-D
Field Sample ID:	VS-2A-05WE	VS-2A-06F	VS-2A-06S	VS-2A-07F	VS-2A-07S	VS-2A-08F	VS-2A-72F
Laboratory ID:	C8J150136003	C8J150136014	C8J150136021	C8J150136015	C8J150136022	C8J160146006	C8J160146012
Sample Date:	10/14/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98	10/15/98
QC Sample Type:	NM						
Duplicate:							VS-2A-08F
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2A-08S		VS-2A-09S		VS-2A-10F		VS-2A-10S		VS-2A-11F		VS-2A-11F-D		VS-2A-11S	
Field Sample ID:	VS-2A-08S		VS-2A-09S		VS-2A-10F		VS-2A-10S		VS-2A-11F		VS-2A-92F		VS-2A-11S	
Laboratory ID:	C8J150136023		C8J150136007		C8J160146008		C8J150136008		C8J210117002		C8J210117004		C8J150136009	
Sample Date:	10/14/98		10/14/98		10/15/98		10/14/98		10/20/98		10/20/98		10/14/98	
QC Sample Type:	NM		NM		NM		NM		NM		NM		NM	
Duplicate:											VS-2A-11F			
INORGANICS	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Aluminum	NA		NA		NA		NA		NA		NA		NA	
Antimony	0.77	B	0.8	B	30.2	L	111	L	2.6	L	3.8	L	1.3	B
Arsenic	NA		NA		NA		NA		NA		NA		NA	
Barium	NA		NA		NA		NA		NA		NA		NA	
Beryllium	NA		NA		NA		NA		NA		NA		NA	
Cadmium	0.78	K	0.21	K	14.8		26.1	K	3.5		9.9		1.1	K
Calcium	NA		NA		NA		NA		NA		NA		NA	
Chromium	NA		NA		NA		NA		NA		NA		NA	
Cobalt	NA		NA		NA		NA		NA		NA		NA	
Copper	12.9		10.2		NA		128		NA		NA		2	
Iron	NA		NA		NA		NA		NA		NA		NA	
Lead	25.7	K	11.8	K	811	J	665	K	107	J	254	J	28	K
Magnesium	NA		NA		NA		NA		NA		NA		NA	
Manganese	NA		NA		NA		NA		NA		NA		NA	
Mercury	NA		NA		NA		NA		NA		NA		NA	
Nickel	NA		NA		NA		NA		NA		NA		NA	
Potassium	NA		NA		NA		NA		NA		NA		NA	
Selenium	NA		NA		NA		NA		NA		NA		NA	
Silver	0.05	UL	0.04	UL	NA		90.7	L	NA		NA		0.33	L
Sodium	NA		NA		NA		NA		NA		NA		NA	
Thallium	NA		NA		NA		NA		NA		NA		NA	
Vanadium	NA		NA		NA		NA		NA		NA		NA	
Zinc	63.1		23		NA		3		NA		NA		337	

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-10S	VS-2A-11F	VS-2A-11F-D	VS-2A-11S
Field Sample ID:	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-10S	VS-2A-11F	VS-2A-92F	VS-2A-11S
Laboratory ID:	C8J150136023	C8J150136007	C8J160146008	C8J150136008	C8J210117002	C8J210117004	C8J150136009
Sample Date:	10/14/98	10/14/98	10/15/98	10/14/98	10/20/98	10/20/98	10/14/98
QC Sample Type:	NM						
Duplicate:						VS-2A-11F	
SEMIVOLATILES	ug/kg	ug/kg		ug/kg			ug/kg
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benz(a)anthracene	NA						
Benzo(a)pyrene	NA						
Benzo(b)fluoranthene	NA						
Benzo(g,h,i)perylene	2	5	NA	51	NA	NA	28

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-10S	VS-2A-11F	VS-2A-11F-D	VS-2A-11S
Field Sample ID:	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-10S	VS-2A-11F	VS-2A-92F	VS-2A-11S
Laboratory ID:	C8J150136023	C8J150136007	C8J160146008	C8J150136008	C8J210117002	C8J210117004	C8J150136009
Sample Date:	10/14/98	10/14/98	10/15/98	10/14/98	10/20/98	10/20/98	10/14/98
QC Sample Type:	NM						
Duplicate:						VS-2A-11F	
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	25	44	NA	55	NA	NA	32
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-10S	VS-2A-11F	VS-2A-11F-D	VS-2A-11S
Field Sample ID:	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-10S	VS-2A-11F	VS-2A-92F	VS-2A-11S
Laboratory ID:	C8J150136023	C8J150136007	C8J160146008	C8J150136008	C8J210117002	C8J210117004	C8J150136009
Sample Date:	10/14/98	10/14/98	10/15/98	10/14/98	10/20/98	10/20/98	10/14/98
QC Sample Type:	NM						
Duplicate:						VS-2A-11F	
VOLATILES							
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	NA						
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-10S	VS-2A-11F	VS-2A-11F-D	VS-2A-11S
Field Sample ID:	VS-2A-08S	VS-2A-09S	VS-2A-10F	VS-2A-10S	VS-2A-11F	VS-2A-92F	VS-2A-11S
Laboratory ID:	C8J150136023	C8J150136007	C8J160146008	C8J150136008	C8J210117002	C8J210117004	C8J150136009
Sample Date:	10/14/98	10/14/98	10/15/98	10/14/98	10/20/98	10/20/98	10/14/98
QC Sample Type:	NM						
Duplicate:						VS-2A-11F	
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-12S-D	VS-2A-13S	VS-2A-14S	VS-2A-15S	
Field Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-75S	VS-2A-13S	VS-2A-14S	VS-2A-15S	
Laboratory ID:	C8J210117003	C8J150136010	C8J150136013	C8J150136011	C8J150136012	C8J160146009	
Sample Date:	10/20/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98	
QC Sample Type:	NM	NM	NM	NM	NM	NM	
Duplicate:			VS-2A-12S				
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Aluminum	NA	NA	NA	NA	NA	NA	
Antimony	0.86	L 0.39	B 0.59	B 0.96	B 4.7	L 0.3	B
Arsenic	NA	NA	NA	NA	NA	NA	
Barium	NA	NA	NA	NA	NA	NA	
Beryllium	NA	NA	NA	NA	NA	NA	
Cadmium	0.52	0.06	K 0.27	K 1.2	K 6.9	K 0.03	U
Calcium	NA	NA	NA	NA	NA	NA	
Chromium	NA	NA	NA	NA	NA	NA	
Cobalt	NA	NA	NA	NA	NA	NA	
Copper	NA	10.6	10.5	16.1	155	17.2	L
Iron	NA	NA	NA	NA	NA	NA	
Lead	32.8	J 4.4	K 13.2	K 59.9	K 295	K 8	J
Magnesium	NA	NA	NA	NA	NA	NA	
Manganese	NA	NA	NA	NA	NA	NA	
Mercury	NA	NA	NA	NA	NA	NA	
Nickel	NA	NA	NA	NA	NA	NA	
Potassium	NA	NA	NA	NA	NA	NA	
Selenium	NA	NA	NA	NA	NA	NA	
Silver	NA	0.05	UL 0.14	L 0.26	L 7.3	L 0.08	UR
Sodium	NA	NA	NA	NA	NA	NA	
Thallium	NA	NA	NA	NA	NA	NA	
Vanadium	NA	NA	NA	NA	NA	NA	
Zinc	NA	16.2	35.7	59.8	434	28.5	L

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-12S-D	VS-2A-13S	VS-2A-14S	VS-2A-15S
Field Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-75S	VS-2A-13S	VS-2A-14S	VS-2A-15S
Laboratory ID:	C8J210117003	C8J150136010	C8J150136013	C8J150136011	C8J150136012	C8J160146009
Sample Date:	10/20/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:			VS-2A-12S			
SEMIVOLATILES		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA
2-Methyl-4,6-dinitrophenol	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA
4-Bromophenyl Phenyl Ether	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA
4-Chlorophenyl Phenyl Ether	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	31	J 41	J 36	UJ 44	J 19

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-12S-D	VS-2A-13S	VS-2A-14S	VS-2A-15S	
Field Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-75S	VS-2A-13S	VS-2A-14S	VS-2A-15S	
Laboratory ID:	C8J210117003	C8J150136010	C8J150136013	C8J150136011	C8J150136012	C8J160146009	
Sample Date:	10/20/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98	
QC Sample Type:	NM	NM	NM	NM	NM	NM	
Duplicate:			VS-2A-12S				
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	NA	NA	
Bis(2-chloroethyl)ether	NA	NA	NA	NA	NA	NA	
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	
Carbazole	NA	NA	NA	NA	NA	NA	
Chrysene	NA	NA	NA	NA	NA	NA	
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	
Dibenzofuran	NA	NA	NA	NA	NA	NA	
Diethylphthalate	NA	NA	NA	NA	NA	NA	
Dimethylphthalate	NA	NA	NA	NA	NA	NA	
Fluoranthene	NA	NA	NA	NA	NA	NA	
Fluorene	NA	NA	NA	NA	NA	NA	
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	
Hexachloroethane	NA	NA	NA	NA	NA	NA	
Indeno(1,2,3-cd)pyrene	NA	31	J 41	J 36	UJ 5	J 22	
Isophorone	NA	NA	NA	NA	NA	NA	
N-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	
N-Nitrosodiphenylamine (1)	NA	NA	NA	NA	NA	NA	
Naphthalene	NA	NA	NA	NA	NA	NA	
Nitrobenzene	NA	NA	NA	NA	NA	NA	
Pentachlorophenol	NA	NA	NA	NA	NA	NA	
Phenanthrene	NA	NA	NA	NA	NA	NA	
Phenol	NA	NA	NA	NA	NA	NA	
Pyrene	NA	NA	NA	NA	NA	NA	

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-12S-D	VS-2A-13S	VS-2A-14S	VS-2A-15S
Field Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-75S	VS-2A-13S	VS-2A-14S	VS-2A-15S
Laboratory ID:	C8J210117003	C8J150136010	C8J150136013	C8J150136011	C8J150136012	C8J160146009
Sample Date:	10/20/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:			VS-2A-12S			
VOLATILES						
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (Total)	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA
Carbon Disulfide	NA	NA	NA	NA	NA	NA
Carbon Tetrachloride	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA
Vinyl Chloride	NA	NA	NA	NA	NA	NA
Xylene (Total)	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS

AREA A

NAWC, WARMINSTER

Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-12S-D	VS-2A-13S	VS-2A-14S	VS-2A-15S
Field Sample ID:	VS-2A-12F	VS-2A-12S	VS-2A-75S	VS-2A-13S	VS-2A-14S	VS-2A-15S
Laboratory ID:	C8J210117003	C8J150136010	C8J150136013	C8J150136011	C8J150136012	C8J160146009
Sample Date:	10/20/98	10/14/98	10/14/98	10/14/98	10/14/98	10/15/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:			VS-2A-12S			
PESTICIDES/PCBS						
4,4'-DDD	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA
Alpha-BHC	NA	NA	NA	NA	NA	NA
Alpha-Chlordane	NA	NA	NA	NA	NA	NA
Aroclor-1016	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
Beta-BHC	NA	NA	NA	NA	NA	NA
Delta-BHC	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	NA	NA	NA	NA	NA	NA
Endrin Ketone	NA	NA	NA	NA	NA	NA
Gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA
Toxaphene	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-15S-D		VS-2A-16S		VS-2A-17S		VS-2A-18S		VS-2A-18S-D		VS-2A-19S		VS-2A-20S	
Field Sample ID:	VS-2A-76S		VS-2A-16S		VS-2A-17S		VS-2A-18S		VS-2A-77S		VS-2A-19S		VS-2A-20S	
Laboratory ID:	C8J160146013		C8J160146010		C8J160146011		C8J210117006		C8J210117007		C8J210117005		C8K200150001	
Sample Date:	10/15/98		10/15/98		10/15/98		10/20/98		10/20/98		10/20/98		11/19/98	
QC Sample Type:	NM		NM		NM		NM		NM		NM		NM	
Duplicate:	VS-2A-15S								VS-2A-18S					
INORGANICS	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Aluminum	NA		NA		NA		NA		NA		NA		NA	
Antimony	0.38	B	0.87	L	10.8	L	0.8	L	1.1	L	0.63	L	0.56	B
Arsenic	NA		NA		NA		NA		NA		NA		NA	
Barium	NA		NA		NA		NA		NA		NA		NA	
Beryllium	NA		NA		NA		NA		NA		NA		NA	
Cadmium	0.03	U	0.3		11.1		0.43		0.47		0.79		0.12	
Calcium	NA		NA		NA		NA		NA		NA		NA	
Chromium	NA		NA		NA		NA		NA		NA		16.8	
Cobalt	NA		NA		NA		NA		NA		NA		NA	
Copper	17.2	L	38.8	L	281	L	35.5	J	27.5	J	25.9	J	NA	
Iron	NA		NA		NA		NA		NA		NA		NA	
Lead	6.3	J	22.6	J	34	J	35.2	J	42.5	J	38.2	J	18.7	
Magnesium	NA		NA		NA		NA		NA		NA		NA	
Manganese	NA		NA		NA		NA		NA		NA		NA	
Mercury	NA		NA		NA		NA		NA		NA		NA	
Nickel	NA		NA		NA		NA		NA		NA		NA	
Potassium	NA		NA		NA		NA		NA		NA		NA	
Selenium	NA		NA		NA		NA		NA		NA		NA	
Silver	0.09	UR	0.97	L	9.5	L	0.31		0.5		0.57		NA	
Sodium	NA		NA		NA		NA		NA		NA		NA	
Thallium	NA		NA		NA		NA		NA		NA		0.41	U
Vanadium	NA		NA		NA		NA		NA		NA		NA	
Zinc	29.6	L	80.1	L	626	L	87.4		113		83.5		NA	

REMOVAL VERIFICATION SAMPLE RESULTS

AREA A

NAWC, WARMINSTER

Sample ID:	VS-2A-15S-D	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-18S-D	VS-2A-19S	VS-2A-20S
Field Sample ID:	VS-2A-76S	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-77S	VS-2A-19S	VS-2A-20S
Laboratory ID:	C8J160146013	C8J160146010	C8J160146011	C8J210117006	C8J210117007	C8J210117005	C8K200150001
Sample Date:	10/15/98	10/15/98	10/15/98	10/20/98	10/20/98	10/20/98	11/19/98
QC Sample Type:	NM						
Duplicate:	VS-2A-15S				VS-2A-18S		
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benz(a)anthracene	NA						
Benzo(a)pyrene	NA						
Benzo(b)fluoranthene	NA						
Benzo(g,h,i)perylene	22	38	U 25	J 53	J 64	J 44	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2A-15S-D	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-18S-D	VS-2A-19S	VS-2A-20S
Field Sample ID:	VS-2A-76S	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-77S	VS-2A-19S	VS-2A-20S
Laboratory ID:	C8J160146013	C8J160146010	C8J160146011	C8J210117006	C8J210117007	C8J210117005	C8K200150001
Sample Date:	10/15/98	10/15/98	10/15/98	10/20/98	10/20/98	10/20/98	11/19/98
QC Sample Type:	NM						
Duplicate:	VS-2A-15S				VS-2A-18S		
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	26	38	U 33	J 69	J 69	J 48	NA
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-15S-D	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-18S-D	VS-2A-19S	VS-2A-20S
Field Sample ID:	VS-2A-76S	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-77S	VS-2A-19S	VS-2A-20S
Laboratory ID:	C8J160146013	C8J160146010	C8J160146011	C8J210117006	C8J210117007	C8J210117005	C8K200150001
Sample Date:	10/15/98	10/15/98	10/15/98	10/20/98	10/20/98	10/20/98	11/19/98
QC Sample Type:	NM						
Duplicate:	VS-2A-15S				VS-2A-18S		
VOLATILES							
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	NA						
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-15S-D	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-18S-D	VS-2A-19S	VS-2A-20S
Field Sample ID:	VS-2A-76S	VS-2A-16S	VS-2A-17S	VS-2A-18S	VS-2A-77S	VS-2A-19S	VS-2A-20S
Laboratory ID:	C8J160146013	C8J160146010	C8J160146011	C8J210117006	C8J210117007	C8J210117005	C8K200150001
Sample Date:	10/15/98	10/15/98	10/15/98	10/20/98	10/20/98	10/20/98	11/19/98
QC Sample Type:	NM						
Duplicate:	VS-2A-15S				VS-2A-18S		
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Field Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Laboratory ID:	C8K200150002	C8K200150003	C8K200150004	C8L180120001	C8L180120002	C8L180120003	C8J210117008
Sample Date:	11/19/98	11/19/98	11/19/98	12/17/98	12/17/98	12/17/98	10/20/98
QC Sample Type:	NM						
Duplicate:							
INORGANICS	mg/kg	mg/kg	mg/kg				
Aluminum	NA						
Antimony	0.69	B 0.82	B 0.47	B NA	NA	NA	NA
Arsenic	NA						
Barium	NA						
Beryllium	NA						
Cadmium	0.09	0.1	0.1	NA	NA	NA	NA
Calcium	NA						
Chromium	20.8	23.1	20.2	NA	NA	NA	NA
Cobalt	NA						
Copper	NA						
Iron	NA						
Lead	10.1	16.4	25.3	NA	NA	NA	NA
Magnesium	NA						
Manganese	NA						
Mercury	NA						
Nickel	NA						
Potassium	NA						
Selenium	NA						
Silver	NA						
Sodium	NA						
Thallium	0.42	U 0.4	U 0.39	U NA	NA	NA	NA
Vanadium	NA						
Zinc	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Field Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Laboratory ID:	C8K200150002	C8K200150003	C8K200150004	C8L180120001	C8L180120002	C8L180120003	C8J210117008
Sample Date:	11/19/98	11/19/98	11/19/98	12/17/98	12/17/98	12/17/98	10/20/98
QC Sample Type:	NM						
Duplicate:							
SEMIVOLATILES				ug/kg	ug/kg	ug/kg	ug/kg
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benz(a)anthracene	NA	NA	NA	34	J 38	39	U NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	25
Benzo(b)fluoranthene	NA						
Benzo(g,h,i)perylene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS

AREA A

NAWC, WARMINSTER

Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Field Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Laboratory ID:	C8K200150002	C8K200150003	C8K200150004	C8L180120001	C8L180120002	C8L180120003	C8J210117008
Sample Date:	11/19/98	11/19/98	11/19/98	12/17/98	12/17/98	12/17/98	10/20/98
QC Sample Type:	NM						
Duplicate:							
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	NA	NA	NA	22	J 28	J 37	J NA
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Field Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Laboratory ID:	C8K200150002	C8K200150003	C8K200150004	C8L180120001	C8L180120002	C8L180120003	C8J210117008
Sample Date:	11/19/98	11/19/98	11/19/98	12/17/98	12/17/98	12/17/98	10/20/98
QC Sample Type:	NM						
Duplicate:							
VOLATILES							
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	NA						
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Field Sample ID:	VS-2A-21S	VS-2A-22S	VS-2A-23S	VS-2B-01	VS-2B-02	VS-2B-03	VS-2C-01F
Laboratory ID:	C8K200150002	C8K200150003	C8K200150004	C8L180120001	C8L180120002	C8L180120003	C8J210117008
Sample Date:	11/19/98	11/19/98	11/19/98	12/17/98	12/17/98	12/17/98	10/20/98
QC Sample Type:	NM						
Duplicate:							
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2C-01F-D	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S
Field Sample ID:	VS-2C-10F	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S
Laboratory ID:	C8J210117013	C8J210117009	C8J210117010	C8J210117011	C8J210117012	C8J240154001	C8J240154002
Sample Date:	10/20/98	10/20/98	10/20/98	10/20/98	10/20/98	10/23/98	10/23/98
QC Sample Type:	NM						
Duplicate:	VS-2C-01F						
INORGANICS							
Aluminum	NA						
Antimony	NA						
Arsenic	NA						
Barium	NA						
Beryllium	NA						
Cadmium	NA						
Calcium	NA						
Chromium	NA						
Cobalt	NA						
Copper	NA						
Iron	NA						
Lead	NA						
Magnesium	NA						
Manganese	NA						
Mercury	NA						
Nickel	NA						
Potassium	NA						
Selenium	NA						
Silver	NA						
Sodium	NA						
Thallium	NA						
Vanadium	NA						
Zinc	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-2C-01F-D	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S	
Field Sample ID:	VS-2C-10F	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S	
Laboratory ID:	C8J210117013	C8J210117009	C8J210117010	C8J210117011	C8J210117012	C8J240154001	C8J240154002	
Sample Date:	10/20/98	10/20/98	10/20/98	10/20/98	10/20/98	10/23/98	10/23/98	
QC Sample Type:	NM							
Duplicate:	VS-2C-01F							
SEMIVOLATILES	ug/kg							
1,2,4-Trichlorobenzene	NA							
1,2-Dichlorobenzene	NA							
1,3-Dichlorobenzene	NA							
1,4-Dichlorobenzene	NA							
2,2'-Oxybis(1-chloropropane)	NA							
2,4,5-Trichlorophenol	NA							
2,4,6-Trichlorophenol	NA							
2,4-Dichlorophenol	NA							
2,4-Dimethylphenol	NA							
2,4-Dinitrophenol	NA							
2,4-Dinitrotoluene	NA							
2,6-Dinitrotoluene	NA							
2-Chloronaphthalene	NA							
2-Chlorophenol	NA							
2-Methyl-4,6-dinitrophenol	NA							
2-Methylnaphthalene	NA							
2-Methylphenol	NA							
2-Nitroaniline	NA							
2-Nitrophenol	NA							
3&4-Methylphenol	NA							
3,3'-Dichlorobenzidine	NA							
3-Nitroaniline	NA							
4,6-Dinitro-2-methylphenol	NA							
4-Bromophenyl Phenyl Ether	NA							
4-Chloro-3-methylphenol	NA							
4-Chloroaniline	NA							
4-Chlorophenyl Phenyl Ether	NA							
4-Nitroaniline	NA							
4-Nitrophenol	NA							
Acenaphthene	NA	NA	NA	NA	NA	38	U 76	U
Acenaphthylene	NA	NA	NA	NA	NA	12	J 89	J
Anthracene	NA	NA	NA	NA	NA	14	J 22	J
Benz(a)anthracene	NA	NA	NA	NA	NA	61		12
Benzo(a)pyrene	26	J 79	36	U 47	J 13	65		12
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	8		13
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	15	J 32	J

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2C-01F-D	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S	
Field Sample ID:	VS-2C-10F	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S	
Laboratory ID:	C8J210117013	C8J210117009	C8J210117010	C8J210117011	C8J210117012	C8J240154001	C8J240154002	
Sample Date:	10/20/98	10/20/98	10/20/98	10/20/98	10/20/98	10/23/98	10/23/98	
QC Sample Type:	NM							
Duplicate:	VS-2C-01F							
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	59	1	
Bis(2-chloroethoxy)methane	NA							
Bis(2-chloroethyl)ether	NA							
Bis(2-ethylhexyl)phthalate	NA							
Butylbenzylphthalate	NA							
Carbazole	NA							
Chrysene	NA	NA	NA	NA	NA	73	11	
Di-n-butylphthalate	NA							
Di-n-octylphthalate	NA							
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	63	J 99	J
Dibenzofuran	NA							
Diethylphthalate	NA							
Dimethylphthalate	NA							
Fluoranthene	NA	NA	NA	NA	NA	15	26	
Fluorene	NA	NA	NA	NA	NA	41	J 76	U
Hexachlorobenzene	NA							
Hexachlorobutadiene	NA							
Hexachlorocyclopentadiene	NA							
Hexachloroethane	NA							
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	2	J 38	J
Isophorone	NA							
N-Nitroso-di-n-propylamine	NA							
N-Nitrosodiphenylamine (1)	NA							
Naphthalene	NA	NA	NA	NA	NA	38	U 76	U
Nitrobenzene	NA							
Pentachlorophenol	NA							
Phenanthrene	NA	NA	NA	NA	NA	7	52	J
Phenol	NA							
Pyrene	NA	NA	NA	NA	NA	94	17	

REMOVAL VERIFICATION SAMPLE RESULTS

AREA A

NAWC, WARMINSTER

Sample ID:	VS-2C-01F-D	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S
Field Sample ID:	VS-2C-10F	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S
Laboratory ID:	C8J210117013	C8J210117009	C8J210117010	C8J210117011	C8J210117012	C8J240154001	C8J240154002
Sample Date:	10/20/98	10/20/98	10/20/98	10/20/98	10/20/98	10/23/98	10/23/98
QC Sample Type:	NM						
Duplicate:	VS-2C-01F						
VOLATILES							
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	NA						
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-2C-01F-D	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S
Field Sample ID:	VS-2C-10F	VS-2C-01S	VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-3A-01S	VS-3A-02S
Laboratory ID:	C8J210117013	C8J210117009	C8J210117010	C8J210117011	C8J210117012	C8J240154001	C8J240154002
Sample Date:	10/20/98	10/20/98	10/20/98	10/20/98	10/20/98	10/23/98	10/23/98
QC Sample Type:	NM						
Duplicate:	VS-2C-01F						
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-11S-D
Field Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-10S
Laboratory ID:	C8J240154003	C8J240154006	C8K070150001	C8K070150002	C8K070150003	C8K070150005	C8K070150004
Sample Date:	10/23/98	10/23/98	11/06/98	11/06/98	11/06/98	11/06/98	11/06/98
QC Sample Type:	NM						
Duplicate:							VS-3A-11S
INORGANICS							
Aluminum	NA						
Antimony	NA						
Arsenic	NA						
Barium	NA						
Beryllium	NA						
Cadmium	NA						
Calcium	NA						
Chromium	NA						
Cobalt	NA						
Copper	NA						
Iron	NA						
Lead	NA						
Magnesium	NA						
Manganese	NA						
Mercury	NA						
Nickel	NA						
Potassium	NA						
Selenium	NA						
Silver	NA						
Sodium	NA						
Thallium	NA						
Vanadium	NA						
Zinc	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-11S-D
Field Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-10S
Laboratory ID:	C8J240154003	C8J240154006	C8K070150001	C8K070150002	C8K070150003	C8K070150005	C8K070150004
Sample Date:	10/23/98	10/23/98	11/06/98	11/06/98	11/06/98	11/06/98	11/06/98
QC Sample Type:	NM						
Duplicate:							VS-3A-11S
SEMIVOLATILES	ug/kg						
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	76	U 38	U NA	NA	NA	NA	NA
Acenaphthylene	66	J 33	J NA	NA	NA	NA	NA
Anthracene	65	J 1	J 17	J 79	J 21	J 12	J 67
Benz(a)anthracene	34	J 48	9	46	11	47	39
Benzo(a)pyrene	4	J 49	13	63	14	55	5
Benzo(b)fluoranthene	47	J 58	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	11	J 11	J NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-11S-D
Field Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-10S
Laboratory ID:	C8J240154003	C8J240154006	C8K070150001	C8K070150002	C8K070150003	C8K070150005	C8K070150004
Sample Date:	10/23/98	10/23/98	11/06/98	11/06/98	11/06/98	11/06/98	11/06/98
QC Sample Type:	NM						
Duplicate:							VS-3A-11S
Benzo(k)fluoranthene	41	J 59	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	43	J 51	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	76	U 35	J NA	NA	NA	NA	NA
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	79	12	21	13	33	14	1
Fluorene	76	U 28	J NA	NA	NA	NA	NA
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	13	J 14	J NA	NA	NA	NA	NA
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	76	U 38	U NA	NA	NA	NA	NA
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	33	J 46	NA	NA	NA	NA	NA
Phenol	NA						
Pyrene	59	J 92	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-11S-D
Field Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-10S
Laboratory ID:	C8J240154003	C8J240154006	C8K070150001	C8K070150002	C8K070150003	C8K070150005	C8K070150004
Sample Date:	10/23/98	10/23/98	11/06/98	11/06/98	11/06/98	11/06/98	11/06/98
QC Sample Type:	NM						
Duplicate:							VS-3A-11S
VOLATILES							
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	NA						
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-11S-D
Field Sample ID:	VS-3A-03S	VS-3A-06S	VS-3A-07S	VS-3A-08S	VS-3A-09S	VS-3A-11S	VS-3A-10S
Laboratory ID:	C8J240154003	C8J240154006	C8K070150001	C8K070150002	C8K070150003	C8K070150005	C8K070150004
Sample Date:	10/23/98	10/23/98	11/06/98	11/06/98	11/06/98	11/06/98	11/06/98
QC Sample Type:	NM						
Duplicate:							VS-3A-11S
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05	
Field Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05	
Laboratory ID:	C8K070150006	C8J240154007	A8I040132004	A8I040132005	A8I040132006	C8I040138004	A8I040127001	
Sample Date:	11/06/98	10/23/98	09/02/98	09/02/98	09/02/98	09/03/98	09/03/98	
QC Sample Type:	NM							
Duplicate:								
INORGANICS			mg/kg			mg/kg	mg/kg	
Aluminum	NA							
Antimony	NA	NA	0.23	B NA	NA	1.4	L 0.17	UL
Arsenic	NA							
Barium	NA							
Beryllium	NA							
Cadmium	NA	NA	0.05	U NA	NA	11.2	0.17	
Calcium	NA							
Chromium	NA	NA	13.9	NA	NA	266	2	
Cobalt	NA							
Copper	NA							
Iron	NA							
Lead	NA							
Magnesium	NA							
Manganese	NA							
Mercury	NA							
Nickel	NA							
Potassium	NA							
Selenium	NA							
Silver	NA							
Sodium	NA							
Thallium	NA							
Vanadium	NA							
Zinc	NA							

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05
Field Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05
Laboratory ID:	C8K070150006	C8J240154007	A8I040132004	A8I040132005	A8I040132006	C8I040138004	A8I040127001
Sample Date:	11/06/98	10/23/98	09/02/98	09/02/98	09/02/98	09/03/98	09/03/98
QC Sample Type:	NM						
Duplicate:							
SEMIVOLATILES	ug/kg	ug/kg					
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA	15	U	NA	NA	NA	NA
Acenaphthylene	NA	15	U	NA	NA	NA	NA
Anthracene	13	J 15	U	NA	NA	NA	NA
Benz(a)anthracene	65	59	J	NA	NA	NA	NA
Benzo(a)pyrene	79	7	J	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	72	J	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	18	J	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05
Field Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05
Laboratory ID:	C8K070150006	C8J240154007	A8I040132004	A8I040132005	A8I040132006	C8I040138004	A8I040127001
Sample Date:	11/06/98	10/23/98	09/02/98	09/02/98	09/02/98	09/03/98	09/03/98
QC Sample Type:	NM						
Duplicate:							
Benzo(k)fluoranthene	NA	83	J NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA	63	J NA	NA	NA	NA	NA
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA	15	U NA	NA	NA	NA	NA
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	2	11	J NA	NA	NA	NA	NA
Fluorene	NA	15	U NA	NA	NA	NA	NA
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	NA	19	J NA	NA	NA	NA	NA
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA	15	U NA	NA	NA	NA	NA
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA	36	J NA	NA	NA	NA	NA
Phenol	NA						
Pyrene	NA	11	J NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05	
Field Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05	
Laboratory ID:	C8K070150006	C8J240154007	A8I040132004	A8I040132005	A8I040132006	C8I040138004	A8I040127001	
Sample Date:	11/06/98	10/23/98	09/02/98	09/02/98	09/02/98	09/03/98	09/03/98	
QC Sample Type:	NM							
Duplicate:								
VOLATILES			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
1,1,1-Trichloroethane	NA							
1,1,2,2-Tetrachloroethane	NA							
1,1,2-Trichloroethane	NA							
1,1-Dichloroethane	NA							
1,1-Dichloroethene	NA							
1,2-Dichloroethane	NA							
1,2-Dichloroethene (Total)	NA							
1,2-Dichloropropane	NA							
2-Butanone	NA							
2-Hexanone	NA							
4-Methyl-2-pentanone	NA							
Acetone	NA							
Benzene	NA							
Bromodichloromethane	NA							
Bromoform	NA							
Bromomethane	NA							
Carbon Disulfide	NA							
Carbon Tetrachloride	NA							
Chlorobenzene	NA							
Chloroethane	NA							
Chloroform	NA							
Chloromethane	NA							
cis-1,3-Dichloropropene	NA							
Dibromochloromethane	NA							
Ethylbenzene	NA							
Methylene Chloride	NA							
Styrene	NA							
Tetrachloroethene	NA							
Toluene	NA							
trans-1,3-Dichloropropene	NA							
Trichloroethene	NA	NA	5.4	U 1	U 6.8	U 7	U 6	U
Vinyl Chloride	NA							
Xylene (Total)	NA							

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05
Field Sample ID:	VS-3A-12S	VS-3A-20S	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-04	VS-A-1A-05
Laboratory ID:	C8K070150006	C8J240154007	A8I040132004	A8I040132005	A8I040132006	C8I040138004	A8I040127001
Sample Date:	11/06/98	10/23/98	09/02/98	09/02/98	09/02/98	09/03/98	09/03/98
QC Sample Type:	NM						
Duplicate:							
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1A-05-D	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Field Sample ID:	VS-A-1A-25	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Laboratory ID:	C8I040138006	A8I040127003	C8J020122003	C8J020122002	C8J020122001	C8J020122007
Sample Date:	09/03/98	09/03/98	10/01/98	10/01/98	10/01/98	10/01/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:	VS-A-1A-05					
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	NA	NA	NA	NA	NA	NA
Antimony	0.18	B 0.17	B NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA
Cadmium	0.13	0.39	0.05	U 0.08	0.05	U 0.05
Calcium	NA	NA	NA	NA	NA	NA
Chromium	22	46.1	24	21.5	7	7.2
Cobalt	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1A-05-D	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Field Sample ID:	VS-A-1A-25	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Laboratory ID:	C8I040138006	A8I040127003	C8J020122003	C8J020122002	C8J020122001	C8J020122007
Sample Date:	09/03/98	09/03/98	10/01/98	10/01/98	10/01/98	10/01/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:	VS-A-1A-05					
SEMIVOLATILES						
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA
2-Methyl-4,6-dinitrophenol	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA
4-Bromophenyl Phenyl Ether	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA
4-Chlorophenyl Phenyl Ether	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1A-05-D	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Field Sample ID:	VS-A-1A-25	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Laboratory ID:	C8I040138006	A8I040127003	C8J020122003	C8J020122002	C8J020122001	C8J020122007
Sample Date:	09/03/98	09/03/98	10/01/98	10/01/98	10/01/98	10/01/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:	VS-A-1A-05					
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA
Dimethylphthalate	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1A-05-D	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Field Sample ID:	VS-A-1A-25	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Laboratory ID:	C8I040138006	A8I040127003	C8J020122003	C8J020122002	C8J020122001	C8J020122007
Sample Date:	09/03/98	09/03/98	10/01/98	10/01/98	10/01/98	10/01/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:	VS-A-1A-05					
VOLATILES		ug/kg				
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (Total)	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA
Carbon Disulfide	NA	NA	NA	NA	NA	NA
Carbon Tetrachloride	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	6.2	U	NA	NA	NA
Vinyl Chloride	NA	NA	NA	NA	NA	NA
Xylene (Total)	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1A-05-D	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Field Sample ID:	VS-A-1A-25	VS-A-1A-06	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
Laboratory ID:	C8I040138006	A8I040127003	C8J020122003	C8J020122002	C8J020122001	C8J020122007
Sample Date:	09/03/98	09/03/98	10/01/98	10/01/98	10/01/98	10/01/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:	VS-A-1A-05					
PESTICIDES/PCBS						
4,4'-DDD	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA
Alpha-BHC	NA	NA	NA	NA	NA	NA
Alpha-Chlordane	NA	NA	NA	NA	NA	NA
Aroclor-1016	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
Beta-BHC	NA	NA	NA	NA	NA	NA
Delta-BHC	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	NA	NA	NA	NA	NA	NA
Endrin Ketone	NA	NA	NA	NA	NA	NA
Gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA
Toxaphene	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1A-13-D	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25
Field Sample ID:	VS-A-1A-26	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25
Laboratory ID:	C8J020122006	C8J020122005	C8J020122008	C8J020122009	C8J210117001	A8I040127002
Sample Date:	10/01/98	10/01/98	10/01/98	10/01/98	10/20/98	09/03/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:	VS-A-1A-13					
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Aluminum	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA
Cadmium	0.05	U 0.05	U 0.09	4.9	43.8	NA
Calcium	NA	NA	NA	NA	NA	NA
Chromium	11.4	13.4	48.3	842	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-A-1A-13-D	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25
Field Sample ID:	VS-A-1A-26	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25
Laboratory ID:	C8J020122006	C8J020122005	C8J020122008	C8J020122009	C8J210117001	AB1040127002
Sample Date:	10/01/98	10/01/98	10/01/98	10/01/98	10/20/98	09/03/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:	VS-A-1A-13					
SEMIVOLATILES						
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA
2-Methyl-4,6-dinitrophenol	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA
4-Bromophenyl Phenyl Ether	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA
4-Chlorophenyl Phenyl Ether	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1A-13-D	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25
Field Sample ID:	VS-A-1A-26	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25
Laboratory ID:	C8J020122006	C8J020122005	C8J020122008	C8J020122009	C8J210117001	A8I040127002
Sample Date:	10/01/98	10/01/98	10/01/98	10/01/98	10/20/98	09/03/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:	VS-A-1A-13					
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA
Dimethylphthalate	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-A-1A-13-D	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25		
Field Sample ID:	VS-A-1A-26	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25		
Laboratory ID:	C8J020122006	C8J020122005	C8J020122008	C8J020122009	C8J210117001	A8I040127002		
Sample Date:	10/01/98	10/01/98	10/01/98	10/01/98	10/20/98	09/03/98		
QC Sample Type:	NM	NM	NM	NM	NM	NM		
Duplicate:	VS-A-1A-13							
							ug/kg	
VOLATILES								
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA		
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA		
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA		
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA		
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA		
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA		
1,2-Dichloroethene (Total)	NA	NA	NA	NA	NA	NA		
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA		
2-Butanone	NA	NA	NA	NA	NA	NA		
2-Hexanone	NA	NA	NA	NA	NA	NA		
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA		
Acetone	NA	NA	NA	NA	NA	NA		
Benzene	NA	NA	NA	NA	NA	NA		
Bromodichloromethane	NA	NA	NA	NA	NA	NA		
Bromoform	NA	NA	NA	NA	NA	NA		
Bromomethane	NA	NA	NA	NA	NA	NA		
Carbon Disulfide	NA	NA	NA	NA	NA	NA		
Carbon Tetrachloride	NA	NA	NA	NA	NA	NA		
Chlorobenzene	NA	NA	NA	NA	NA	NA		
Chloroethane	NA	NA	NA	NA	NA	NA		
Chloroform	NA	NA	NA	NA	NA	NA		
Chloromethane	NA	NA	NA	NA	NA	NA		
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA		
Dibromochloromethane	NA	NA	NA	NA	NA	NA		
Ethylbenzene	NA	NA	NA	NA	NA	NA		
Methylene Chloride	NA	NA	NA	NA	NA	NA		
Styrene	NA	NA	NA	NA	NA	NA		
Tetrachloroethene	NA	NA	NA	NA	NA	NA		
Toluene	NA	NA	NA	NA	NA	NA		
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA		
Trichloroethene	NA	NA	NA	NA	NA	NA		
Vinyl Chloride	NA	NA	NA	NA	NA	NA		
Xylene (Total)	NA	NA	NA	NA	NA	NA		
						6.4	U	

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1A-13-D	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25
Field Sample ID:	VS-A-1A-26	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16	VS-A-1A-17	VS-A-1A-25
Laboratory ID:	C8J020122006	C8J020122005	C8J020122008	C8J020122009	C8J210117001	A8I040127002
Sample Date:	10/01/98	10/01/98	10/01/98	10/01/98	10/20/98	09/03/98
QC Sample Type:	NM	NM	NM	NM	NM	NM
Duplicate:	VS-A-1A-13					
PESTICIDES/PCBS						
4,4'-DDD	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA
Alpha-BHC	NA	NA	NA	NA	NA	NA
Alpha-Chlordane	NA	NA	NA	NA	NA	NA
Aroclor-1016	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
Beta-BHC	NA	NA	NA	NA	NA	NA
Delta-BHC	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	NA	NA	NA	NA	NA	NA
Endrin Ketone	NA	NA	NA	NA	NA	NA
Gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA
Toxaphene	NA	NA	NA	NA	NA	NA

REMOVAL VERIFICATION SAMPLE RESULTS

AREA A

NAWC, WARMINSTER

Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA	
Field Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA	
Laboratory ID:	C8I030123007	A8I040132001	A8I040132002	A8I040132003	C8I040138001	C8J160146004	C8J160146005	
Sample Date:	09/02/98	09/02/98	09/02/98	09/02/98	09/03/98	10/15/98	10/15/98	
QC Sample Type:	NM							
Duplicate:								
INORGANICS	mg/kg							
Aluminum	NA							
Antimony	8.8	0.7	B 0.76	B 15.2	L 16	L 15.6	L 2.4	L
Arsenic	NA							
Barium	NA							
Beryllium	NA							
Cadmium	46.8	0.24	U 0.23	U 60.5	17.8	18.9	2.3	
Calcium	NA							
Chromium	186	25.9	26.3	46	352	NA	NA	
Cobalt	NA							
Copper	NA	NA	NA	NA	NA	103	L 107	L
Iron	NA							
Lead	NA	NA	NA	NA	NA	103	J 241	J
Magnesium	NA							
Manganese	NA							
Mercury	NA							
Nickel	NA							
Potassium	NA							
Selenium	NA							
Silver	NA	NA	NA	NA	NA	66.9	L 0.11	L
Sodium	NA							
Thallium	NA							
Vanadium	NA							
Zinc	NA	NA	NA	NA	NA	139	L 989	L

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA
Field Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA
Laboratory ID:	C8I030123007	A8I040132001	A8I040132002	A8I040132003	C8I040138001	C8J160146004	C8J160146005
Sample Date:	09/02/98	09/02/98	09/02/98	09/02/98	09/03/98	10/15/98	10/15/98
QC Sample Type:	NM						
Duplicate:							
SEMIVOLATILES							
1,2,4-Trichlorobenzene	NA						
1,2-Dichlorobenzene	NA						
1,3-Dichlorobenzene	NA						
1,4-Dichlorobenzene	NA						
2,2'-Oxybis(1-chloropropane)	NA						
2,4,5-Trichlorophenol	NA						
2,4,6-Trichlorophenol	NA						
2,4-Dichlorophenol	NA						
2,4-Dimethylphenol	NA						
2,4-Dinitrophenol	NA						
2,4-Dinitrotoluene	NA						
2,6-Dinitrotoluene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methyl-4,6-dinitrophenol	NA						
2-Methylnaphthalene	NA						
2-Methylphenol	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
3&4-Methylphenol	NA						
3,3'-Dichlorobenzidine	NA						
3-Nitroaniline	NA						
4,6-Dinitro-2-methylphenol	NA						
4-Bromophenyl Phenyl Ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl Phenyl Ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benz(a)anthracene	NA						
Benzo(a)pyrene	NA						
Benzo(b)fluoranthene	NA						
Benzo(g,h,i)perylene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA
Field Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA
Laboratory ID:	C8I030123007	A8I040132001	A8I040132002	A8I040132003	C8I040138001	C8J160146004	C8J160146005
Sample Date:	09/02/98	09/02/98	09/02/98	09/02/98	09/03/98	10/15/98	10/15/98
QC Sample Type:	NM						
Duplicate:							
Benzo(k)fluoranthene	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl)phthalate	NA						
Butylbenzylphthalate	NA						
Carbazole	NA						
Chrysene	NA						
Di-n-butylphthalate	NA						
Di-n-octylphthalate	NA						
Dibenz(a,h)anthracene	NA						
Dibenzofuran	NA						
Diethylphthalate	NA						
Dimethylphthalate	NA						
Fluoranthene	NA						
Fluorene	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Indeno(1,2,3-cd)pyrene	NA						
Isophorone	NA						
N-Nitroso-di-n-propylamine	NA						
N-Nitrosodiphenylamine (1)	NA						
Naphthalene	NA						
Nitrobenzene	NA						
Pentachlorophenol	NA						
Phenanthrene	NA						
Phenol	NA						
Pyrene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA
Field Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA
Laboratory ID:	C8I030123007	A8I040132001	A8I040132002	A8I040132003	C8I040138001	C8J160146004	C8J160146005
Sample Date:	09/02/98	09/02/98	09/02/98	09/02/98	09/03/98	10/15/98	10/15/98
QC Sample Type:	NM						
Duplicate:							
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg		
1,1,1-Trichloroethane	NA						
1,1,2,2-Tetrachloroethane	NA						
1,1,2-Trichloroethane	NA						
1,1-Dichloroethane	NA						
1,1-Dichloroethene	NA						
1,2-Dichloroethane	NA						
1,2-Dichloroethene (Total)	NA						
1,2-Dichloropropane	NA						
2-Butanone	NA						
2-Hexanone	NA						
4-Methyl-2-pentanone	NA						
Acetone	NA						
Benzene	NA						
Bromodichloromethane	NA						
Bromoform	NA						
Bromomethane	NA						
Carbon Disulfide	NA						
Carbon Tetrachloride	NA						
Chlorobenzene	NA						
Chloroethane	NA						
Chloroform	NA						
Chloromethane	NA						
cis-1,3-Dichloropropene	NA						
Dibromochloromethane	NA						
Ethylbenzene	NA						
Methylene Chloride	NA						
Styrene	NA						
Tetrachloroethene	NA						
Toluene	NA						
trans-1,3-Dichloropropene	NA						
Trichloroethene	8.2	UJ 5	U 5.4	U 6.6	U 9	U NA	NA
Vinyl Chloride	NA						
Xylene (Total)	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA
Field Sample ID:	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08	VS-A-1B-09	VS-A-1B-10	W-2A-04WA	W-2A-05WA
Laboratory ID:	C8I030123007	A8I040132001	A8I040132002	A8I040132003	C8I040138001	C8J160146004	C8J160146005
Sample Date:	09/02/98	09/02/98	09/02/98	09/02/98	09/03/98	10/15/98	10/15/98
QC Sample Type:	NM						
Duplicate:							
PESTICIDES/PCBS							
4,4'-DDD	NA						
4,4'-DDE	NA						
4,4'-DDT	NA						
Aldrin	NA						
Alpha-BHC	NA						
Alpha-Chlordane	NA						
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Beta-BHC	NA						
Delta-BHC	NA						
Dieldrin	NA						
Endosulfan I	NA						
Endosulfan II	NA						
Endosulfan Sulfate	NA						
Endrin	NA						
Endrin Aldehyde	NA						
Endrin Ketone	NA						
Gamma-BHC (Lindane)	NA						
Gamma-Chlordane	NA						
Heptachlor	NA						
Heptachlor Epoxide	NA						
Methoxychlor	NA						
Toxaphene	NA						

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Field Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Laboratory ID:	C8J130129015	C8J210117014	C8J240154008	C8K070150007	C8K200154004	C8L180120004
Sample Date:	10/12/98	10/20/98	10/23/98	11/06/98	11/19/98	12/17/98
QC Sample Type:	RB	RB	RB	RB	RB	RB
Duplicate:						
INORGANICS	ug/L	ug/L			ug/L	
Aluminum	NA	NA	NA	NA	13.3	U NA
Antimony	1.2	U 1.2	U NA	NA	1.6	NA
Arsenic	NA	NA	NA	NA	2	U NA
Barium	NA	NA	NA	NA	0.5	U NA
Beryllium	NA	NA	NA	NA	0.2	U NA
Cadmium	0.3	U 0.3	U NA	NA	0.3	U NA
Calcium	NA	NA	NA	NA	8.7	U NA
Chromium	NA	NA	NA	NA	0.6	U NA
Cobalt	NA	NA	NA	NA	2.7	U NA
Copper	1	U 1	U NA	NA	1.7	U NA
Iron	NA	NA	NA	NA	3.3	U NA
Lead	1.1	1.4	NA	NA	0.97	U NA
Magnesium	NA	NA	NA	NA	20.5	U NA
Manganese	NA	NA	NA	NA	0.7	U NA
Mercury	NA	NA	NA	NA	0.2	U NA
Nickel	NA	NA	NA	NA	6.6	U NA
Potassium	NA	NA	NA	NA	462	U NA
Selenium	NA	NA	NA	NA	2.7	U NA
Silver	0.76	U 0.8	U NA	NA	0.76	U NA
Sodium	NA	NA	NA	NA	10.2	U NA
Thallium	NA	NA	NA	NA	3.4	U NA
Vanadium	NA	NA	NA	NA	3.2	U NA
Zinc	0.85	B 1.8	B NA	NA	1.4	U NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Field Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Laboratory ID:	C8J130129015	C8J210117014	C8J240154008	C8K070150007	C8K200154004	C8L180120004
Sample Date:	10/12/98	10/20/98	10/23/98	11/06/98	11/19/98	12/17/98
QC Sample Type:	RB	RB	RB	RB	RB	RB
Duplicate:						
SEMIVOLATILES	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
1,2,4-Trichlorobenzene	NA	NA	NA	NA	1	U NA
1,2-Dichlorobenzene	NA	NA	NA	NA	1	U NA
1,3-Dichlorobenzene	NA	NA	NA	NA	1	U NA
1,4-Dichlorobenzene	NA	NA	NA	NA	1	U NA
2,2'-Oxybis(1-chloropropane)	NA	NA	NA	NA	1	U NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	1	U NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	1	U NA
2,4-Dichlorophenol	NA	NA	NA	NA	1	U NA
2,4-Dimethylphenol	NA	NA	NA	NA	1	U NA
2,4-Dinitrophenol	NA	NA	NA	NA	5	U NA
2,4-Dinitrotoluene	NA	NA	NA	NA	1	U NA
2,6-Dinitrotoluene	NA	NA	NA	NA	1	U NA
2-Chloronaphthalene	NA	NA	NA	NA	1	U NA
2-Chlorophenol	NA	NA	NA	NA	1	U NA
2-Methyl-4,6-dinitrophenol	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	1	U NA
2-Methylphenol	NA	NA	NA	NA	1	U NA
2-Nitroaniline	NA	NA	NA	NA	5	U NA
2-Nitrophenol	NA	NA	NA	NA	1	U NA
3&4-Methylphenol	NA	NA	NA	NA	1	U NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	5	U NA
3-Nitroaniline	NA	NA	NA	NA	5	U NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	5	U NA
4-Bromophenyl Phenyl Ether	NA	NA	NA	NA	1	U NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	1	U NA
4-Chloroaniline	NA	NA	NA	NA	1	U NA
4-Chlorophenyl Phenyl Ether	NA	NA	NA	NA	1	U NA
4-Nitroaniline	NA	NA	NA	NA	5	U NA
4-Nitrophenol	NA	NA	NA	NA	5	U NA
Acenaphthene	1	U NA	1	U NA	1	U NA
Acenaphthylene	1	U NA	1	U NA	1	U NA
Anthracene	1	U NA	1	U 1	U 1	U NA
Benz(a)anthracene	1	U NA	1	U 1	U 1	U NA
Benzo(a)pyrene	1	U 1	U 1	U 1	U 1	U NA
Benzo(b)fluoranthene	1	U NA	1	U NA	1	U NA
Benzo(g,h,i)perylene	1	U 1	U 1	U NA	1	U 1

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Field Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Laboratory ID:	C8J130129015	C8J210117014	C8J240154008	C8K070150007	C8K200154004	C8L180120004
Sample Date:	10/12/98	10/20/98	10/23/98	11/06/98	11/19/98	12/17/98
QC Sample Type:	RB	RB	RB	RB	RB	RB
Duplicate:						
Benzo(k)fluoranthene	1	U NA	1	U NA	1	U NA
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	1	U NA
Bis(2-chloroethyl)ether	NA	NA	NA	NA	1	U NA
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	1	U NA
Butylbenzylphthalate	NA	NA	NA	NA	1	U NA
Carbazole	NA	NA	NA	NA	1	U NA
Chrysene	1	U NA	1	U NA	1	U NA
Di-n-butylphthalate	NA	NA	NA	NA	1	U NA
Di-n-octylphthalate	NA	NA	NA	NA	1	U NA
Dibenz(a,h)anthracene	1	U NA	1	U NA	1	U NA
Dibenzofuran	NA	NA	NA	NA	1	U NA
Diethylphthalate	NA	NA	NA	NA	1	U NA
Dimethylphthalate	NA	NA	NA	NA	1	U NA
Fluoranthene	1	U NA	1	U 1	U 1	U NA
Fluorene	1	U NA	1	U NA	1	U NA
Hexachlorobenzene	NA	NA	NA	NA	1	U NA
Hexachlorobutadiene	NA	NA	NA	NA	1	U NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	5	U NA
Hexachloroethane	NA	NA	NA	NA	1	U NA
Indeno(1,2,3-cd)pyrene	1	U 1	U 1	U NA	1	U 1
Isophorone	NA	NA	NA	NA	1	U NA
N-Nitroso-di-n-propylamine	NA	NA	NA	NA	1	U NA
N-Nitrosodiphenylamine (1)	NA	NA	NA	NA	1	U NA
Naphthalene	1	U NA	1	U NA	1	U NA
Nitrobenzene	NA	NA	NA	NA	1	U NA
Pentachlorophenol	NA	NA	NA	NA	5	U NA
Phenanthrene	1	U NA	1	U NA	1	U NA
Phenol	NA	NA	NA	NA	1	U NA
Pyrene	1	U NA	1	U NA	1	U NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Field Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Laboratory ID:	C8J130129015	C8J210117014	C8J240154008	C8K070150007	C8K200154004	C8L180120004
Sample Date:	10/12/98	10/20/98	10/23/98	11/06/98	11/19/98	12/17/98
QC Sample Type:	RB	RB	RB	RB	RB	RB
Duplicate:						
VOLATILES					ug/L	
1,1,1-Trichloroethane	NA	NA	NA	NA	5	U NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	5	U NA
1,1,2-Trichloroethane	NA	NA	NA	NA	5	U NA
1,1-Dichloroethane	NA	NA	NA	NA	5	U NA
1,1-Dichloroethene	NA	NA	NA	NA	5	U NA
1,2-Dichloroethane	NA	NA	NA	NA	5	U NA
1,2-Dichloroethene (Total)	NA	NA	NA	NA	5	U NA
1,2-Dichloropropane	NA	NA	NA	NA	5	U NA
2-Butanone	NA	NA	NA	NA	2	U NA
2-Hexanone	NA	NA	NA	NA	2	U NA
4-Methyl-2-pentanone	NA	NA	NA	NA	2	U NA
Acetone	NA	NA	NA	NA	2	U NA
Benzene	NA	NA	NA	NA	5	U NA
Bromodichloromethane	NA	NA	NA	NA	5	U NA
Bromoform	NA	NA	NA	NA	5	U NA
Bromomethane	NA	NA	NA	NA	1	U NA
Carbon Disulfide	NA	NA	NA	NA	5	U NA
Carbon Tetrachloride	NA	NA	NA	NA	5	U NA
Chlorobenzene	NA	NA	NA	NA	5	U NA
Chloroethane	NA	NA	NA	NA	1	U NA
Chloroform	NA	NA	NA	NA	9	NA
Chloromethane	NA	NA	NA	NA	1	U NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	5	U NA
Dibromochloromethane	NA	NA	NA	NA	5	U NA
Ethylbenzene	NA	NA	NA	NA	5	U NA
Methylene Chloride	NA	NA	NA	NA	3.3	J NA
Styrene	NA	NA	NA	NA	5	U NA
Tetrachloroethene	NA	NA	NA	NA	5	U NA
Toluene	NA	NA	NA	NA	5	U NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	5	U NA
Trichloroethene	NA	NA	NA	NA	5	U NA
Vinyl Chloride	NA	NA	NA	NA	1	U NA
Xylene (Total)	NA	NA	NA	NA	5	U NA

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Field Sample ID:	W-RB-101298	W-RB-102098	W-RB-102398	W-RB-110698	W-RB-111998	W-RB-121798
Laboratory ID:	C8J130129015	C8J210117014	C8J240154008	C8K070150007	C8K200154004	C8L180120004
Sample Date:	10/12/98	10/20/98	10/23/98	11/06/98	11/19/98	12/17/98
QC Sample Type:	RB	RB	RB	RB	RB	RB
Duplicate:						
PESTICIDES/PCBS					ug/L	
4,4'-DDD	NA	NA	NA	NA	0.05	U NA
4,4'-DDE	NA	NA	NA	NA	0.05	U NA
4,4'-DDT	NA	NA	NA	NA	0.05	U NA
Aldrin	NA	NA	NA	NA	0.05	U NA
Alpha-BHC	NA	NA	NA	NA	0.05	U NA
Alpha-Chlordane	NA	NA	NA	NA	0.05	U NA
Aroclor-1016	NA	NA	NA	NA	1	U NA
Aroclor-1221	NA	NA	NA	NA	1	UJ NA
Aroclor-1232	NA	NA	NA	NA	1	U NA
Aroclor-1242	NA	NA	NA	NA	1	U NA
Aroclor-1248	NA	NA	NA	NA	1	U NA
Aroclor-1254	NA	NA	NA	NA	1	U NA
Aroclor-1260	NA	NA	NA	NA	1	U NA
Beta-BHC	NA	NA	NA	NA	0.05	U NA
Delta-BHC	NA	NA	NA	NA	0.05	U NA
Dieldrin	NA	NA	NA	NA	0.05	U NA
Endosulfan I	NA	NA	NA	NA	0.05	U NA
Endosulfan II	NA	NA	NA	NA	0.05	U NA
Endosulfan Sulfate	NA	NA	NA	NA	0.05	U NA
Endrin	NA	NA	NA	NA	0.05	U NA
Endrin Aldehyde	NA	NA	NA	NA	0.05	UR NA
Endrin Ketone	NA	NA	NA	NA	0.05	U NA
Gamma-BHC (Lindane)	NA	NA	NA	NA	0.05	U NA
Gamma-Chlordane	NA	NA	NA	NA	0.05	U NA
Heptachlor	NA	NA	NA	NA	0.05	U NA
Heptachlor Epoxide	NA	NA	NA	NA	0.05	U NA
Methoxychlor	NA	NA	NA	NA	0.5	U NA
Toxaphene	NA	NA	NA	NA	2	U NA

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	W-TB-111998	WA-2B-01		WA-2B-02		
Field Sample ID:	W-TB-111998	WA-2B-01		WA-2B-02		
Laboratory ID:	C8K200154001	C8K200154002		C8K200154003		
Sample Date:	11/19/98	11/19/98		11/19/98		
QC Sample Type:	TB	NM		NM		
Duplicate:						
INORGANICS		mg/kg		mg/kg		
Aluminum	NA	142	K	746	K	
Antimony	NA	0.2	B	0.41	B	
Arsenic	NA	0.88		1.6		
Barium	NA	4.4	K	29.3		
Beryllium	NA	0.1	B	0.4	B	
Cadmium	NA	0.19	K	0.08		
Calcium	NA	215		146		
Chromium	NA	1.1		13.1		
Cobalt	NA	0.74	K	4		
Copper	NA	5.9		8.1		
Iron	NA	236	J	114	J	
Lead	NA	17.2		17.1		
Magnesium	NA	135		114		
Manganese	NA	169	J	161	J	
Mercury	NA	0.04	U	0.05		
Nickel	NA	4.9		5.2		
Potassium	NA	57.2	UL	166		
Selenium	NA	0.33	UL	0.33	U	
Silver	NA	0.09	U	0.09	U	
Sodium	NA	84.8		129		
Thallium	NA	0.42	UL	0.68		
Vanadium	NA	38.6	J	18.6	J	
Zinc	NA	59.7	J	47.1	J	

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Sample ID:	W-TB-111998	WA-2B-01	WA-2B-02			
Field Sample ID:	W-TB-111998	WA-2B-01	WA-2B-02			
Laboratory ID:	C8K200154001	C8K200154002	C8K200154003			
Sample Date:	11/19/98	11/19/98	11/19/98			
QC Sample Type:	TB	NM	NM			
Duplicate:						
SEMIVOLATILES		ug/kg	ug/kg			
1,2,4-Trichlorobenzene	NA	33	UJ 4	UJ		
1,2-Dichlorobenzene	NA	33	UJ 4	UJ		
1,3-Dichlorobenzene	NA	33	UJ 4	UJ		
1,4-Dichlorobenzene	NA	33	UJ 4	UJ		
2,2'-Oxybis(1-chloropropane)	NA	33	UJ 4	UJ		
2,4,5-Trichlorophenol	NA	33	UJ 4	UJ		
2,4,6-Trichlorophenol	NA	33	UJ 4	UJ		
2,4-Dichlorophenol	NA	33	UJ 4	UJ		
2,4-Dimethylphenol	NA	33	UJ 4	UJ		
2,4-Dinitrophenol	NA	16	UJ 19	UJ		
2,4-Dinitrotoluene	NA	33	UJ 4	UJ		
2,6-Dinitrotoluene	NA	33	UJ 4	UJ		
2-Chloronaphthalene	NA	33	UJ 4	UJ		
2-Chlorophenol	NA	33	UJ 4	UJ		
2-Methyl-4,6-dinitrophenol	NA	16	UJ 19	UJ		
2-Methylnaphthalene	NA	21	J 53	J		
2-Methylphenol	NA	33	UJ 4	UJ		
2-Nitroaniline	NA	16	UJ 19	UJ		
2-Nitrophenol	NA	33	UJ 4	UJ		
3&4-Methylphenol	NA	33	UJ 4	UJ		
3,3'-Dichlorobenzidine	NA	16	UJ 19	UJ		
3-Nitroaniline	NA	16	UJ 19	UJ		
4,6-Dinitro-2-methylphenol	NA	NA	NA			
4-Bromophenyl Phenyl Ether	NA	33	UJ 4	UJ		
4-Chloro-3-methylphenol	NA	33	UJ 4	UJ		
4-Chloroaniline	NA	33	UJ 4	UJ		
4-Chlorophenyl Phenyl Ether	NA	33	UJ 4	UJ		
4-Nitroaniline	NA	16	UJ 19	UJ		
4-Nitrophenol	NA	16	UJ 19	UJ		
Acenaphthene	NA	33	UJ 4	UJ		
Acenaphthylene	NA	33	UJ 4	UJ		
Anthracene	NA	33	UJ 4	UJ		
Benz(a)anthracene	NA	33	UJ 4	UJ		
Benzo(a)pyrene	NA	33	UJ 4	UJ		
Benzo(b)fluoranthene	NA	33	UJ 4	UJ		
Benzo(g,h,i)perylene	NA	33	UJ 4	UJ		

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	W-TB-111998	WA-2B-01	WA-2B-02		
Field Sample ID:	W-TB-111998	WA-2B-01	WA-2B-02		
Laboratory ID:	C8K200154001	C8K200154002	C8K200154003		
Sample Date:	11/19/98	11/19/98	11/19/98		
QC Sample Type:	TB	NM	NM		
Duplicate:					
Benzo(k)fluoranthene	NA	33	UJ 4	UJ	
Bis(2-chloroethoxy)methane	NA	33	UJ 4	UJ	
Bis(2-chloroethyl)ether	NA	33	UJ 4	UJ	
Bis(2-ethylhexyl)phthalate	NA	33	UJ 4	UJ	
Butylbenzylphthalate	NA	33	UJ 4	UJ	
Carbazole	NA	33	UJ 4	UJ	
Chrysene	NA	33	UJ 4	UJ	
Di-n-butylphthalate	NA	33	UJ 4	UJ	
Di-n-octylphthalate	NA	33	UJ 4	UJ	
Dibenz(a,h)anthracene	NA	33	UJ 4	UJ	
Dibenzofuran	NA	33	UJ 4	UJ	
Diethylphthalate	NA	33	UJ 4	UJ	
Dimethylphthalate	NA	33	UJ 4	UJ	
Fluoranthene	NA	33	UJ 4	UJ	
Fluorene	NA	33	UJ 21	J	
Hexachlorobenzene	NA	33	UJ 4	UJ	
Hexachlorobutadiene	NA	33	UJ 4	UJ	
Hexachlorocyclopentadiene	NA	16	UJ 19	UJ	
Hexachloroethane	NA	33	UJ 4	UJ	
Indeno(1,2,3-cd)pyrene	NA	33	UJ 4	UJ	
Isophorone	NA	33	UJ 4	UJ	
N-Nitroso-di-n-propylamine	NA	33	UJ 4	UJ	
N-Nitrosodiphenylamine (1)	NA	33	UJ 4	UJ	
Naphthalene	NA	33	UJ 4	UJ	
Nitrobenzene	NA	33	UJ 4	UJ	
Pentachlorophenol	NA	16	UJ 19	UJ	
Phenanthrene	NA	33	UJ 43	J	
Phenol	NA	33	UJ 4	UJ	
Pyrene	NA	33	UJ 4	UJ	

REMOVAL VERIFICATION SAMPLE RESULTS
 AREA A
 NAWC, WARMINSTER

Sample ID:	W-TB-111998		WA-2B-01		WA-2B-02			
Field Sample ID:	W-TB-111998		WA-2B-01		WA-2B-02			
Laboratory ID:	C8K200154001		C8K200154002		C8K200154003			
Sample Date:	11/19/98		11/19/98		11/19/98			
QC Sample Type:	TB		NM		NM			
Duplicate:								
VOLATILES	ug/L		ug/kg		ug/kg			
1,1,1-Trichloroethane	5	U	31	UJ	3	U		
1,1,2,2-Tetrachloroethane	5	U	31	UJ	3	U		
1,1,2-Trichloroethane	5	U	31	UJ	3	U		
1,1-Dichloroethane	5	U	31	UJ	3	U		
1,1-Dichloroethene	5	U	31	UJ	3	U		
1,2-Dichloroethane	5	U	31	UJ	3	U		
1,2-Dichloroethene (Total)	5	U	31	UJ	3	U		
1,2-Dichloropropane	5	U	31	UJ	3	U		
2-Butanone	2	UJ	12	UJ	12	U		
2-Hexanone	2	U	12	UJ	12	U		
4-Methyl-2-pentanone	2	U	12	UJ	12	U		
Acetone	3.1	J	13	B	13	B		
Benzene	5	U	31	UJ	3	U		
Bromodichloromethane	5	U	31	UJ	3	U		
Bromoform	5	U	31	UJ	3	U		
Bromomethane	1	U	62	UJ	6	U		
Carbon Disulfide	5	U	31	UJ	3	U		
Carbon Tetrachloride	5	U	31	UJ	3	U		
Chlorobenzene	5	U	31	UJ	3	U		
Chloroethane	1	U	62	UJ	6	U		
Chloroform	9.7		31	UJ	3	U		
Chloromethane	1	U	62	UJ	6	U		
cis-1,3-Dichloropropene	5	U	31	UJ	3	U		
Dibromochloromethane	5	U	31	UJ	3	U		
Ethylbenzene	5	U	31	UJ	3	U		
Methylene Chloride	2.9	J	31	UJ	3	U		
Styrene	5	U	31	UJ	3	U		
Tetrachloroethene	5	U	31	UJ	3	U		
Toluene	5	U	31	UJ	3	U		
trans-1,3-Dichloropropene	5	U	31	UJ	3	U		
Trichloroethene	5	U	31	UJ	3	U		
Vinyl Chloride	1	U	62	UJ	6	U		
Xylene (Total)	5	U	31	UJ	3	U		

REMOVAL VERIFICATION SAMPLE RESULTS

AREA A

NAWC, WARMINSTER

Sample ID:	W-TB-111998	WA-2B-01		WA-2B-02		
Field Sample ID:	W-TB-111998	WA-2B-01		WA-2B-02		
Laboratory ID:	C8K200154001	C8K200154002		C8K200154003		
Sample Date:	11/19/98	11/19/98		11/19/98		
QC Sample Type:	TB	NM		NM		
Duplicate:						
PESTICIDES/PCBS		ug/kg		ug/kg		
4,4'-DDD	NA	19	J	8.5	J	
4,4'-DDE	NA	21	UJ	2.2	J	
4,4'-DDT	NA	21	UJ	2.1	UJ	
Aldrin	NA	21	UJ	2.1	UJ	
Alpha-BHC	NA	21	UJ	2.1	UJ	
Alpha-Chlordane	NA	21	UJ	2.1	UJ	
Aroclor-1016	NA	41	U	4	U	
Aroclor-1221	NA	41	UJ	4	UJ	
Aroclor-1232	NA	41	U	4	U	
Aroclor-1242	NA	41	U	4	U	
Aroclor-1248	NA	41	U	4	U	
Aroclor-1254	NA	41	U	4	U	
Aroclor-1260	NA	41	U	4	U	
Beta-BHC	NA	21	U	2.1	UJ	
Delta-BHC	NA	21	UJ	2.1	UJ	
Dieldrin	NA	21	UJ	2.1	UJ	
Endosulfan I	NA	21	UJ	2.1	UJ	
Endosulfan II	NA	21	UJ	2.1	UJ	
Endosulfan Sulfate	NA	21	UJ	2.1	UJ	
Endrin	NA	21	UJ	2.1	UJ	
Endrin Aldehyde	NA	21	UJ	2.1	UJ	
Endrin Ketone	NA	21	UJ	2.1	UJ	
Gamma-BHC (Lindane)	NA	21	UJ	2.1	UJ	
Gamma-Chlordane	NA	21	UJ	2.1	UJ	
Heptachlor	NA	21	UJ	2.1	UJ	
Heptachlor Epoxide	NA	21	UJ	2.1	UJ	
Methoxychlor	NA	21	UJ	21	UJ	
Toxaphene	NA	83	UJ	81	UJ	

REMOVAL VERIFICATION SAMPLE RESULTS
AREA A
NAWC, WARMINSTER

Data Qualifiers:

- B -- Positive result is considered to be an artifact of blank contamination, and should not be considered present.
- J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
- K -- Positive result is considered biased high due to exceedance of technical quality control criteria.
- L -- Positive result is considered biased low due to exceedance of technical quality control criteria.
- U -- Value is a non-detected result as reported by the laboratory.
- UJ -- Non-detected result is considered estimated due to exceedance of technical quality control criteria.
- UL -- Non-detected result is considered biased low due to exceedance of technical quality control criteria.
- UR -- Non-detected result is considered unusable due to exceedance of technical quality control criteria.
- NA -- No result is available/applicable for this parameter in this sample.

Database source file: S:\GLENNG\252_RES.DBF data retrieved on: 05/24/99



Tetra Tech NUS

INTERNAL CORRESPONDENCE

JAN 27 1999

TO: G. GLENN DATE: JANUARY 8, 1999
FROM: GRETCHEN A. PHIPPS COPIES: DV FILE
SUBJECT: INORGANIC DATA VALIDATION – SELECT METALS
CT0 252 - NAWC WARMINSTER, PENNSYLVANIA
SAMPLE DELIVERY GROUP SDG – BR425

SAMPLES: 1/Aqueous/

W-RB-102098

7/Soils/

VS-2A-11F

VS-2A-72F

VS-2A-12F

VS-2A-18S

VS-2A-77S

VS-2A-19S

VS-A-1A-17

Overview

The sample set SDG BR425, NAWC Warminster, consists of seven (7) soil environmental samples. One (1) rinsate blank (W-RB-102098) was included within this SDG.

Samples designated as F were analyzed for antimony, cadmium and lead. Samples designated as S were analyzed for antimony, cadmium, copper, lead, silver and zinc. Sample VS-A-1A-17 was analyzed for cadmium. The samples were collected by Tetra Tech NUS on October 20, 1998 and analyzed by Quanterra Environmental Services under the Naval Facilities Engineering Service Center (NFESC) Quality Assurance/ Quality Control (QA/QC) criteria. Metals analyses were conducted using SW 846 method 6010B.

Summary

All analytes were analyzed successfully. The findings in this report are based upon a general review of all available data. The data was reviewed based on data completeness, holding times, calibration data, laboratory method/ preparation/ rinsate blanks, interference check sample (ICS) results, matrix spike/matrix spike duplicate results, laboratory duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

All analyses were conducted using Inductively Coupled Plasma (ICP) methodologies.

Areas of concern with respect to data quality are listed below.

Major Problems

None.

Minor Problems

- The following contaminants were detected in the laboratory blanks at the following maximum concentrations:

Samples Affected:	All		
<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level (soil)</u>	<u>Action Level(aqueous)</u>
Lead ⁽²⁾	1.4µg/L	0.70 mg/kg	NA
Zinc ⁽¹⁾	0.252 mg/kg	1.26 mg/kg	NA
Zinc ⁽³⁾	5.070µg/L	NA	25.35µg/L

(1) Maximum concentration present in a soil preparation blank.

(2) Maximum concentration present in a rinsate blank.

(3) Maximum concentration present in an aqueous preparation blank.

An action level of 5X the maximum contaminant level has been used to evaluate the sample data for blank contamination. Samples aliquot, percent solids and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for zinc were qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike/Matrix Spike Duplicate (MS/MSD) Percent Recoveries (%Rs) for antimony and copper affecting the soil matrix were <75% quality control limit. The positive results reported for antimony were qualified as biased low, "L". The positive results reported for copper were qualified as estimated, "J", as a result of conflicting noncompliances.
- The MS/MSD %R for lead affecting the soil matrix was both above and below the 75-125% quality control limit. The positive results reported for lead were qualified as estimated, "J".
- Laboratory duplicate imprecision was noted for lead and copper affecting the soil matrix. The positive results reported for lead and copper were qualified as estimated, "J". The direction of bias could not be determined.
- The ICP Dilution Percent Difference (%D) for lead affecting the soil matrix was >10% quality control limit. The positive results reported for lead were qualified as estimated, "J". The direction of bias could not be determined.

Notes

The Contract Required Detection Limit (CRDL) standards were not analyzed for this SDG.

Sample VS-2A-72F was incorrectly labeled as VS-2A-92F on the EDD table and as VS-2A-75F on the Form 1.

MEMO TO: G. GLENN- PAGE 3
DATE : JANUARY 8, 1999

Executive Summary

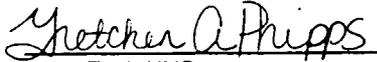
Laboratory Performance: Lead and zinc were present in laboratory/rinsate blanks.

Other Factors Affecting Data Quality: The MS/MSD %Rs for antimony, lead and copper affecting the soil matrix were outside the 75-125 % quality control limit. Laboratory duplicate imprecision was noted for lead and copper affecting the soil matrix. The ICP Serial Dilution %D for lead affecting the soil matrix was > 10% quality control limit.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2-96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Gretchen A. Phipps
Chemist



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support documentation

MEMO TO: G. GLENN- PAGE 4
DATE : JANUARY 8, 1999

Data Qualifier Key:

- U - Value is nondetect as reported by laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low, "L", as a result of technical noncompliances.
- J - Positive result is considered estimated, "J", as a result of technical noncompliances.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER

**SOIL DATA
QUANTERRA
SDG: BR425**

SAMPLE NUMBER:	VS-2A-11F	VS-2A-92F	VS-2A-12F	VS-2A-18S
SAMPLE DATE:	10/20/98	10/20/98	10/20/98	10/20/98
LABORATORY ID:	C8J210117002	C8J210117004	C8J210117003	C8J210117006
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	78.0 %	82.0 %	84.0 %	86.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:		VS-2A-11F		

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	2.6	L	D	3.8	L	D	0.86	L	D	0.80	L	D
CADMIUM	3.5			9.9			0.52			0.43		
COPPER										35.5	J	DF
LEAD	107	J	DFI	254	J	DFI	32.8	J	DFI	35.2	J	DFI
SILVER										0.31		
ZINC										87.4		

Qualifier Codes:

- a - Lab Blank Contamination
- b - Field Blank Contamination
- c - Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- d - MS/MSD Noncompliance
- e - LCS/LCSD Noncompliance
- f - Lab Duplicate Imprecision
- g - Field Duplicate Imprecision
- h - Holding Time Exceedance
- i - ICP Serial Dilution Noncompliance
- j - GFAA PDS - GFAA MSA's $r < 0.995$
- k - ICP Interference - include ICSAB % R's
- l - Instrument Calibration Range Exceedance
- m - Sample Preservation
- n - Internal Standard Noncompliance
- o - Poor Instrument Performance (i.e., base-time drifting)
- p - Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $< CRQL$ for organics)
- q - Other problems (can encompass a number of issues)
- r - Surrogates Recovery Noncompliance
- s - Pesticide/PCB Resolution
- t - % Breakdown Noncompliance for DDT and Endrin.
- u - Pest/PCD % between columns for positive results.
- v - Non-linear calibrations, running $r < 0.995$
(correlation coefficient)



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: G. GLENN DATE: JANUARY 8, 1999
FROM: GRETCHEN A. PHIPPS COPIES: DV FILE
SUBJECT: INORGANIC DATA VALIDATION – SELECT METALS
CT0 252 - NAWC WARMINSTER, PENNSYLVANIA
SAMPLE DELIVERY GROUP SDG – BR424
SAMPLES: 9/Soils/
VS-2A-08F VS-2A-72F VS-2A-10F
VS-2A-15S VS-2A-16S VS-2A-17S
VS-2A-76S VS-2A-04WA W-2A-05WA

Overview

The sample set SDG BR424, NAWC Warminster, consists of nine (9) soil environmental samples.

The samples designated F were analyzed for antimony, cadmium and lead. The samples designated with S and WA were analyzed for antimony, cadmium, copper, lead, silver and zinc. The samples were collected by Tetra Tech NUS on October 15, 1998 and analyzed by Quanterra Environmental Services under the Naval Facilities Engineering Service Center (NFESC) Quality Assurance/ Quality Control (QA/QC) criteria. Metals analyses were conducted using SW 846 method 6010B.

Summary

All analytes were analyzed successfully with exception to those qualified as "UR". The finding in this report are based upon a general review of all available data. The data was review based on data completeness, holding times, calibration data, laboratory method/ preparation blanks, interference check sample (ICS) results, matrix spike/matrix spike duplicate results, laboratory duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

All analyses were conducted using Inductively Coupled Plasma (ICP) methodologies.

Areas of concern with respect to data quality are listed below.

Major Problems

The Matrix Spike/Matrix Spike Duplicate (MS/MSD) Percent Recoveries (%Rs) for copper and silver were <30% quality control limit. The positive result reported for copper and silver were qualified as biased low, "L". The nondetected results reported for silver were qualified as rejected, "UR".

MEMO TO: G. GLENN- PAGE 3
DATE : JANUARY 8, 1999

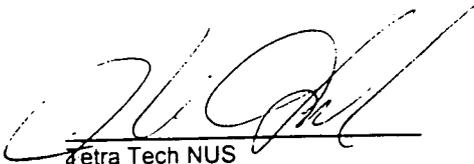
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2-96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Gretchen A. Phipps
Chemist



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support documentation

MEMO TO: G. GLENN- PAGE 4
DATE : JANUARY 8, 1999

Data Qualifier Key:

- U - Value is nondetect as reported by laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low, "L", as a result of technical noncompliances.
- J - Positive result is considered estimated, "J", as a result of technical noncompliances.
- UR - Nondetected result is considered rejected, "UR", as a result of technical noncompliances.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER

**SOIL DATA
QUANTERRA
SDG: BR424**

SAMPLE NUMBER:
SAMPLE DATE:
LABORATORY ID:
QC_TYPE:
% SOLIDS:
UNITS:
FIELD DUPLICATE OF:

VS-2A-08F
10/15/98
C8J160146006
NORMAL
81.0 %
MG/KG

VS-2A-72F
10/15/98
C8J160146012
NORMAL
80.0 %
MG/KG
VS-2A-08F

VS-2A-10F
10/15/98
C8J160146008
NORMAL
86.0 %
MG/KG

VS-2A-15S
10/15/98
C8J160146009
NORMAL
94.0 %
MG/KG

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	1.1	L	D	1.7	L	D	30.2	L	D	0.30	B	A
CADMIUM	1.9			2.4			14.8			0.03	U	
COPPER										17.2	L	D
LEAD	57.4	J	F	92.6	J	F	811	J	F	8.0	J	F
SILVER										0.08	UR	D
ZINC										28.5	L	D

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR424

SAMPLE NUMBER:	VS-2A-76S	VS-2A-16S	VS-2A-17S	W-2A-04WA
SAMPLE DATE:	10/15/98	10/15/98	10/15/98	10/15/98
LABORATORY ID:	C8J160146013	C8J160146010	C8J160146011	C8J160146004
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	89.0 %	88.0 %	89.0 %	69.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:	VS-2A-15S			

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.38	B	A	0.87	L	D	10.8	L	D	15.6	L	D
CADMIUM	0.03	U		0.30			11.1			18.9		
COPPER	17.2	L	D	38.8	L	D	281	L	D	1030	L	D
LEAD	6.3	J	F	22.6	J	F	340	J	F	1030	J	F
SILVER	0.09	UR	D	0.97	L	D	9.5	L	D	66.9	L	D
ZINC	29.6	L	D	80.1	L	D	626	L	D	1390	L	D

Qualifier Codes:

- a - Lab Blank Contamination
- b - Field Blank Contamination
- c - Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- d - MS/MSD Noncompliance
- e - LCS/LCSD Noncompliance
- f - Lab Duplicate Imprecision
- g - Field Duplicate Imprecision
- h - Holding Time Exceedance
- i - ICP Serial Dilution Noncompliance
- j - GFAA PDS - GFAA MSA's $r < 0.995$
- k - ICP Interference - include ICSAB % R's
- l - Instrument Calibration Range Exceedance
- m - Sample Preservation
- n - Internal Standard Noncompliance
- o - Poor Instrument Performance (i.e., base-time drifting)
- p - Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $< CRQL$ for organics)
- q - Other problems (can encompass a number of issues)
- r - Surrogates Recovery Noncompliance
- s - Pesticide/PCB Resolution
- t - % Breakdown Noncompliance for DDT and Endrin.
- u - Pest/PCD % between columns for positive results.
- v - Non-linear calibrations, tuning $r < 0.995$
(correlation coefficient)



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: G. GLENN DATE: JANUARY 8, 1999
FROM: GRETCHEN A. PHIPPS COPIES: DV FILE
SUBJECT: INORGANIC DATA VALIDATION – SELECT METALS
CT0 252 - NAWC WARMINSTER, PENNSYLVANIA
SAMPLE DELIVERY GROUP SDG – BR421

SAMPLES: 1/Aqueous/

W-RB-101298

14/Soils/

SB-02-101298

SB-02-80

SB-02-81

SB-02-82

SB-02-83

SB-02-8312

SB-02-84

SB-03-16

SS-02-40

SS-02-41

SS-02-42

SS-02-43

SS-02-44

SS-02-45

Overview

The sample set SDG BR421, NAWC Warminster, consists of fourteen (14) soil environmental samples. One (1) rinsate blank (W-RB-101298) was included within this SDG.

All samples, with exception to sample SB-03-16, were analyzed for antimony, cadmium, copper, lead, silver and zinc. Sample SB-03-16 was analyzed for lead. The samples were collected by Tetra Tech NUS on October 12, 1998 and analyzed by Quanterra Environmental Services under the Naval Facilities Engineering Service Center (NFESC) Quality Assurance/ Quality Control (QA/QC) criteria. Metals analyses were conducted using SW 846 method 6010B.

Summary

All analytes were analyzed successfully. The findings in this report are based upon a general review of all available data. The data was review based on data completeness, holding times, calibration data, laboratory method/ preparation/ rinsate blanks, interference check sample (ICS) results, matrix spike/matrix spike duplicate results, laboratory duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

All analyses were conducted using Inductively Coupled Plasma (ICP) methodologies.

Areas of concern with respect to data quality are listed below.

Major Problems

None.

Minor Problems

- The following contaminants were detected in the laboratory / rinsate blanks at the following maximum concentrations:

Samples Affected:	All		
<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level (soil)</u>	<u>Action Level(aqueous)</u>
Lead ⁽¹⁾	1.1µg/L	0.55 mg/kg	NA
Zinc ⁽²⁾	0.772 mg/kg	3.86 mg/kg	NA
Zinc ⁽³⁾	1.280µg/L	NA	6.4µg/L

- ⁽¹⁾ Maximum concentration present in rinsate blank.
⁽²⁾ Maximum concentration present in soil preparation blank.
⁽³⁾ Maximum concentration present in aqueous preparation blank.

An action level of 5X the maximum contaminant level has been used to evaluate the sample data for blank contamination. Samples aliquot, percent solids and dilution factors were taken into consideration when evaluating for blank contamination. Positive result < the action level for zinc were qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects. It should be noted that field quality control blanks are not qualified for field blank contamination.

- The Matrix Spike/ Matrix Spike Duplicate (MS/MSD) Percent Recovery (%R) for antimony affecting the soil matrix were <75% quality control limit. The positive results reported for antimony were qualified as biased low, "L".
- The ICP Dilution Percent Difference (%D) for lead affecting the soil matrix was >10% quality control limit. The positive results reported for lead were qualified as estimated, "J". The direction of bias could not be determined.

Notes

The Contract Required Detection Limit (CRDL) standards were not analyzed for within this SDG.

Executive Summary

Laboratory Performance: Lead and zinc were present in laboratory/rinsate blanks.

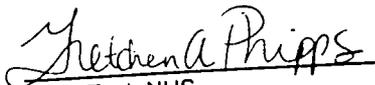
Other Factors Affecting Data Quality: The MS/MSD %Rs for antimony affecting the soil matrix was < 75% quality control limit. The ICP Serial Dilution %D for lead affecting the soil matrix was > 10% quality control limit.

MEMO TO: G. GLENN- PAGE 3
DATE : JANUARY 8, 1999

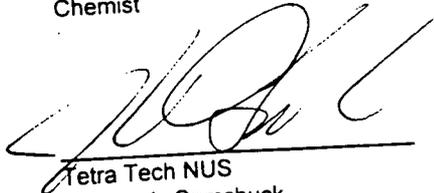
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2-96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Gretchen A. Phipps
Chemist



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support documentation

MEMO TO: G. GLENN- PAGE 4
DATE : JANUARY 8, 1999

Data Qualifier Key:

- U - Value is nondetect as reported by laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low, "L", as a result of technical noncompliances.
- J - Positive result is considered estimated, "J", as a result of technical noncompliances.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR421

SAMPLE NUMBER:	SB-02-101298	SB-02-80	SB-02-81	SB-02-82
SAMPLE DATE:	10/12/98	10/12/98	10/12/98	10/12/98
LABORATORY ID:	C8J130129012	C8J130129002	C8J130129004	C8J130129006
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	51.0 %	89.0 %	83.0 %	85.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	8.2	L	D	3.1	L	D	0.37	L	D	10.7	L	D
CADMIUM	43.0			4.6			1.1			10.0		
COPPER	515			90.8			10.0			1060		
LEAD	93.2	J	I	111	J	I	12.1	J	I	1220	J	I
SILVER	317			3.3			0.17			21.1		
ZINC	476			628			46.4			1280		

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR421

SAMPLE NUMBER:	SS-02-40	SS-02-41	SS-02-42	SS-02-43
SAMPLE DATE:	10/12/98	10/12/98	10/12/98	10/12/98
LABORATORY ID:	C8J130129001	C8J130129003	C8J130129005	C8J130129007
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	93.0 %	87.0 %	84.0 %	88.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.44	L	D	0.19	L	D	1.4	L	D	0.20	L	D
CADMIUM	0.14			0.03	U		6.0			0.70		
COPPER	28.3			8.3			1410			28.4		
LEAD	27.3	J	I	13.3	J	I	994	J	I	125	J	I
SILVER	0.08	U		0.09	U		0.36			0.09	U	
ZINC	110			30.3			4800			227		

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LCS/LCSD Noncompliance
f	=	Lab Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS - GFAA MSA's $r < 0.995$
k	=	ICP Interference - include ICSAB % R's
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
o	=	Poor Instrument Performance (i.e., base-time drifting)
p	=	Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $< CRQL$ for organics)
q	=	Other problems (can encompass a number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin.
u	=	Pest/PCD % between columns for positive results.
v	=	Non-linear calibrations. using $r < 0.995$ (correlation coefficient)



Tetra Tech NUS

INTERNAL CORRESPONDENCE

FEB - 4 1999

PITT-01-9-039

TO: G. GLENN **DATE:** JANUARY 11, 1999
FROM: TERRI L. SOLOMON **COPIES:** DV FILE
SUBJECT: INORGANIC DATA VALIDATION – SELECTED TAL METALS
CTO 252 - NAWC WARMINSTER, WARMINSTER, PENNSYLVANIA
SDG – BR420

SAMPLES: 8/Soils/

VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
VS-A-1A-26	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16

1/Aqueous/

FB-100198

Overview

The sample set for SDG BR420, NAWC Warminster, Warminster, Pennsylvania, consists of eight (8) soil environmental samples and one (1) field blank. One (1) field duplicate pair (VS-A-1A-13 / VS-A-1A-26) was included within this SDG.

The above samples were analyzed for selected (cadmium and chromium) Target Analyte List (TAL) metals. The samples were collected by Tetra Tech NUS on October 1, 1998 and analyzed by Quanterra Environmental Services - Pittsburgh under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using SW-846 method 6010. A CLP-like deliverable was provided.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times, calibration data, laboratory method/preparation blanks, interference check sample (ICS) results, matrix spike / matrix spike duplicate results, post digestion spike results, laboratory duplicate results, field duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

All analyses were conducted using Inductively Coupled Plasma (ICP) methodologies.

Areas of concern with respect to data quality are listed below.

Major Problems – None.

MEMO TO: G. GLENN
DATE: JANUARY 11, 1999 - PAGE 2

PWT-08-039

Notes

A Contract Required Detection Limit (CRDL) sample was not analyzed for this SDG. Therefore, validation compliances could not be evaluated.

The following contaminants were detected in the method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
chromium ⁽¹⁾	0.187 mg/kg	0.935 mg/kg

Samples Affected: All

⁽¹⁾ Maximum concentration found in a soil preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot, percent solids, and dilution factors were taken into consideration when evaluating for blank contamination. No action was taken for chromium since all sample results were greater than the action level.

A comparison of field duplicate pair, VS-A-1A-13 / VS-A-1A-26, is included in Appendix C. However, no validation actions are required as per Region III guidance.

Executive Summary

Laboratory Performance: Chromium was present in the laboratory method/preparation blanks.

Other Factors Affecting Data Quality: None.

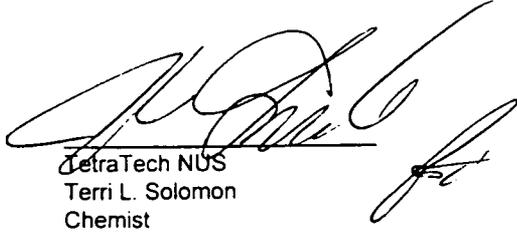
MEMO TO: G. GLENN
DATE: JANUARY 11, 1998 - PAGE 3

PITT-01-9-039

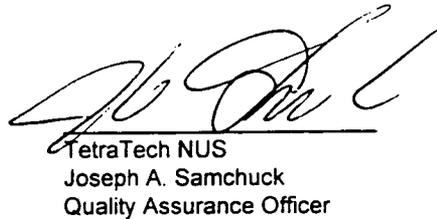
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



TetraTech NUS
Terri L. Solomon
Chemist



TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

Data Qualifier Key: .

U - Value is a nondetect as reported by the laboratory.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR420

SAMPLE NUMBER:	VS-A-1A-09	VS-A-1A-10	VS-A-1A-11	VS-A-1A-13
SAMPLE DATE:	10/01/98	10/01/98	10/01/98	10/01/98
LABORATORY ID:	C8J020122003	C8J020122002	C8J020122001	C8J020122007
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	84.5 %	85.2 %	87.7 %	88.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
CADMIUM	0.05	U		0.08			0.05	U		0.05	U	
CHROMIUM	24.0			21.5			7.0			7.2		

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR420

	VS-A-1A-26	VS-A-1A-14	VS-A-1A-15	VS-A-1A-16								
SAMPLE NUMBER	10/01/98	10/01/98	10/01/98	10/01/98								
SAMPLE DATE	C8J020122006	C8J020122005	C8J020122008	C8J020122009								
LABORATORY ID	NORMAL	NORMAL	NORMAL	NORMAL								
QC_TYPE	87.6 %	87.7 %	90.1 %	90.0 %								
% SOLIDS	MG/KG	MG/KG	MG/KG	MG/KG								
UNITS	VS-A-1A-13											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
CADMIUM	0.05	U		0.05	U		0.09			4.9		
CHROMIUM	11.4			13.4			48.3			842		



Tetra Tech NUS

INTERNAL CORRESPONDENCE

FEB - 4 1999

PITT-01-9-037

TO: G. GLENN DATE: JANUARY 11, 1999
FROM: TERRI L. SOLOMON COPIES: DV FILE
SUBJECT: INORGANIC DATA VALIDATION – SELECTED TAL METALS
CTO 252 - NAWC WARMINSTER, WARMINSTER, PENNSYLVANIA
SDG – BR437

SAMPLES: 12/Soils/

VS-1B-13S	VS-1B-14S	VS-1B-15S	VS-1B-16S
VS-1B-17S	VS-1B-20S	VS-1B-18S	VS-1B-19S
VS-2A-20S	VS-2A-21S	VS-2A-22S	VS-2A-23S

Overview

The sample set for SDG BR437, NAWC Warminster, Warminster, Pennsylvania, consists of twelve (12) soil environmental samples. One (1) field duplicate pair (VS-1B-17S / VS-1B-20S) was included within this SDG.

The above samples were analyzed for selected (antimony, cadmium, chromium, lead and thallium) Target Analyte List (TAL) metals. The samples were collected by Tetra Tech NUS on November 19, 1998 and analyzed by Quanterra Environmental Services - Pittsburgh under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using SW-846 method 6010. A CLP-like deliverable was provided.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times, calibration data, laboratory method/preparation blanks, interference check sample (ICS) results, matrix spike / matrix spike duplicate results, post digestion spike results, laboratory duplicate results, field duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

All analyses were conducted using Inductively Coupled Plasma (ICP) methodologies.

Areas of concern with respect to data quality are listed below.

Major Problems – None.

MEMO TO: G. GLENN
DATE: JANUARY 11, 1999 - PAGE 2

PITT-01-9-037

Minor Problems

- The following contaminants were detected in the method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
antimony	1.5 ug/L	0.75 mg/kg
chromium ⁽¹⁾	0.089 mg/kg	0.445 mg/kg

Samples Affected: All

⁽¹⁾ Maximum concentration found in a soil preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot, percent solids, and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action levels for antimony have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analyte since either the results were greater than the action level or were nondetects.

Notes

A Contract Required Detection Limit (CRDL) sample was not analyzed for this SDG. Therefore, validation compliances could not be evaluated.

The matrix spike / matrix spike duplicate (MS/MSD) percent recoveries (%Rs) for antimony were < 30% quality control limit. No action was taken since all results were qualified due to blank contamination.

A comparison of field duplicate pair, VS-1B-17S / VS-1B-20S, is included in Appendix C. However, no validation actions are required as per Region III guidance.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method/preparation blanks.

Other Factors Affecting Data Quality: The MS / MSD %Rs for antimony were < 30% quality control limit.

MEMO TO: G. GLENN
DATE: JANUARY 11, 1998 - PAGE 3

PITT-01-9-037

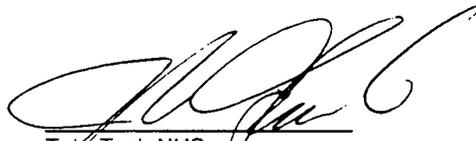
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



TetraTech NUS
Terri L. Solomon
Chemist



TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

Data Qualifier Key: -

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of MS %R and/or ICP Interference.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR437

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

VS-1B-13S
 11/19/98
 C8K200150005
 NORMAL
 83.2 %
 MG/KG

VS-1B-14S
 11/19/98
 C8K200150006
 NORMAL
 80.1 %
 MG/KG

VS-1B-15S
 11/19/98
 C8K200150007
 NORMAL
 83.7 %
 MG/KG

VS-1B-16S
 11/19/98
 C8K200150008
 NORMAL
 86.3 %
 MG/KG

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.76	B	A	0.62	B	A	0.86	B	A	0.87	B	A
CADMIUM	0.05			0.12			0.16			0.11		
CHROMIUM	24.6			31.4			26.2			24.0		
LEAD	9.4			14.6			13.0			16.9		
THALLIUM	0.88			0.85	U		0.54			0.92		

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR437

SAMPLE NUMBER:	VS-1B-17S	VS-1B-20S	VS-1B-18S	VS-1B-19S
SAMPLE DATE:	11/19/98	11/19/98	11/19/98	11/19/98
LABORATORY ID:	C8K200150009	C8K200150012	C8K200150010	C8K200150011
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	85.9 %	85.3 %	85.0 %	92.7 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:		VS-1B-17S		

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.54	B	A	0.75	B	A	0.65	B	A	0.75	B	A
CADMIUM	0.72			0.69			0.08			0.12		
CHROMIUM	49.7			54.9			54.5			23.8		
LEAD	11.4			10.4			9.5			16.3		
THALLIUM	0.40	U		0.40	U		0.40			0.37	U	

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR437

SAMPLE NUMBER:	VS-2A-20S	VS-2A-21S	VS-2A-22S	VS-2A-23S
SAMPLE DATE:	11/19/98	11/19/98	11/19/98	11/19/98
LABORATORY ID:	C8K200150001	C8K200150002	C8K200150003	C8K200150004
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	82.3 %	81.8 %	85.3 %	87.3 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.56	B	A	0.69	B	A	0.82	B	A	0.47	B	A
CADMIUM	0.12			0.09			0.10			0.10		
CHROMIUM	16.8			20.8			23.1			20.2		
LEAD	18.7			10.1			16.4			25.3		
THALLIUM	0.41	U		0.42	U		0.40	U		0.39	U	

Minor Problems

- The following contaminants were detected in the method/preparation/rinsate blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
aluminum ⁽¹⁾	1.407 mg/kg	7.035 mg/kg
antimony ⁽²⁾	1.6 ug/L	0.8 mg/kg
barium	1.0 ug/L	0.5 mg/kg
beryllium	1.1 ug/L	0.55 mg/kg
calcium	112.4 ug/L	56.2 mg/kg
iron ⁽¹⁾	1.443 mg/kg	7.215 mg/kg
magnesium ⁽¹⁾	4.338 mg/kg	21.69 mg/kg
manganese	1.4 ug/L	0.7 mg/kg
sodium ⁽¹⁾	2.948 mg/kg	14.74 mg/kg
zinc	8.8 ug/L	4.4 mg/kg

Samples Affected: All

⁽¹⁾ Maximum concentration present in a soil preparation blank.

⁽²⁾ Maximum concentration present in a rinsate blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot, percent solids, and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action levels for antimony and beryllium have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects. It should be noted that field quality control blanks are not qualified for field blank contamination.

- The interfering analytes calcium and magnesium were present in sample WA-2B-01 at concentrations which were comparable to the levels of calcium and magnesium in the Interference Check Sample (ICS) solution. Several analytes namely antimony, barium, cadmium, cobalt, lead, manganese, potassium, selenium, sodium and thallium were present in the ICS solution at concentrations which exceeded the Instrument Detection Limit (IDL). Interference affects exist for barium, cadmium, cobalt, potassium, selenium and thallium. The positive results reported for barium, cadmium and cobalt were qualified as biased high, "K". The possibility of suppressive affects may be present for potassium, selenium and thallium. The nondetected results reported for potassium, selenium and thallium were qualified as biased low, "UL".
- The matrix spike / matrix spike duplicate (MS/MSD) percent recoveries (%Rs) for aluminum affecting the soil matrix were > 125% quality control limit. The positive results reported for the aforementioned analyte in the affected samples were qualified as biased high, "K".
- The MS/MSD %Rs for manganese, vanadium and zinc affecting the soil matrix were outside the 75-125% quality control limits. The positive results reported for the aforementioned analytes in the affected samples were qualified as estimated, "J", as a result of conflicting noncompliances.
- Laboratory duplicate imprecision (> 35%) was noted for zinc affecting the soil matrix. The positive results reported for the aforementioned analyte in the affected samples were qualified as estimated, "J". The direction of bias could not be determined.

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PITT-01-9-048

- The ICP serial dilution percent differences (%Ds) for iron, manganese and vanadium affecting the soil matrix were > 10% quality control limit. Positive results reported for the aforementioned analytes in the affected samples were qualified as estimated, "J". The direction of bias could not be determined.

Notes

A Contract Required Detection Limit (CRDL) sample was not analyzed for this SDG. Therefore, validation compliances could not be evaluated.

The MS/MSD %Rs for antimony affecting the soil matrix were < 75% quality control limit. However, no validation actions were warranted as the sample results reported for antimony were qualified for blank contamination.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method/preparation blanks.

Other Factors Affecting Data Quality: Antimony was present in the rinsate blank. The interfering analytes calcium and magnesium were present in sample WA-2B-01. The MS / MSD %Rs for aluminum, manganese, vanadium and zinc were outside the 75-125% quality control limits. Laboratory duplicate imprecision (> 35%) was noted for zinc. The ICP Serial Dilution %Ds for iron, manganese and vanadium were > 10% quality control limit.

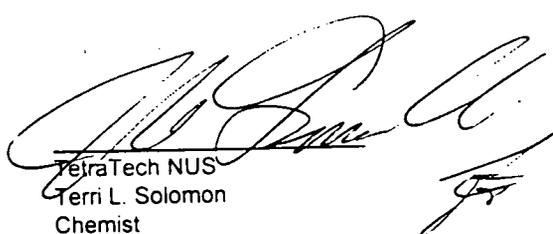
MEMO TO: G. GLENN
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PITT-01-9-048

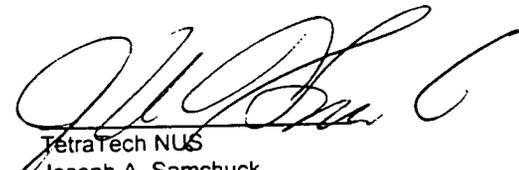
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



TetraTech NUS
Terri L. Solomon
Chemist



TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

Data Qualifier Key:

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- K - Positive result is considered biased high as a result of validation noncompliances.
- UL - Nondetected result is considered biased low as a result of validation noncompliances.
- J - Positive result is considered estimated as a result of validation noncompliances.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR438

SAMPLE NUMBER.	WA-2B-01	WA-2B-02	//	//
SAMPLE DATE:	11/19/98	11/19/98		
LABORATORY ID:	C8K200154002	C8K200154003		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS	80.8 %	82.7 %	100.0 %	100.0 %
UNITS:	MG/KG	MG/KG		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	142	K	D	7460	K	D						
ANTIMONY	0.20	B	B	0.41	B	B						
ARSENIC	0.88			1.6								
BARIUM	4.4	K	K	29.3								
BERYLLIUM	0.10	B	A	0.40	B	A						
CADMIUM	0.19	K	K	0.08								
CALCIUM	215000			1460								
CHROMIUM	1.1			13.1								
COBALT	0.74	K	K	4.0								
COPPER	5.9			8.1								
IRON	2360	J	I	11400	J	I						
LEAD	17.2			17.1								
MAGNESIUM	135000			1140								
MANGANESE	169	J	DI	161	J	DI						
MERCURY	0.04	U		0.05								
NICKEL	4.9			5.2								
POTASSIUM	57.2	UL	K	166								
SELENIUM	0.33	UL	K	0.33	U							
SILVER	0.09	U		0.09	U							
SODIUM	84.8			129								
THALLIUM	0.42	UL	K	0.68								
VANADIUM	38.6	J	DI	18.6	J	DI						
ZINC	59.7	J	DF	47.1	J	DF						



Tetra Tech NUS

INTERNAL CORRESPONDENCE

JAN 11 1999

PITT-01-9-041

TO: G. GLENN DATE: JANUARY 11, 1999
FROM: GRETCHEN A. PHIPPS COPIES: DV FILE
SUBJECT: INORGANIC DATA VALIDATION – SELECT METALS AND TAL METALS
CT0 252 - NAWC WARMINSTER, PENNSYLVANIA
SAMPLE DELIVERY GROUP SDG – BR415
SAMPLES: 5/Soils/
VS-A-1A-04 VS-A-1A-05 VS-A-1A-06
VS-A-1A-25 VS-A-1B-10
2/Aqueous/
FB-090398 RB-090398

Overview

The sample set SDG BR415, NAWC Warminster, consists of five (5) soil environmental samples. One (1) field blank (FB-090398) and one (1) rinsate blank (RB-090398) were included within this SDG.

The soil samples were analyzed for antimony, cadmium and chromium. The aqueous samples were analyzed for Target Analyte List (TAL) metals. The samples were collected by Tetra Tech NUS on September 3, 1998 and analyzed by Quanterra Environmental Services under the Naval Facilities Engineering Service Center (NFESC) Quality Assurance/ Quality Control (QA/QC) criteria. Metals analyses were conducted using SW 846 method 6010B.

Summary

All analytes were analyzed successfully. The findings in this report are based upon a general review of all available data. The data was review based on data completeness, holding times, calibration data, laboratory method/ preparation/field QC blanks, interference check sample (ICS) results, matrix spike/matrix spike duplicate results, laboratory duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

All analyses were conducted using Inductively Coupled Plasma (ICP) methodologies.

Areas of concern with respect to data quality are listed below.

Major Problems

None.

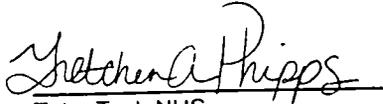
MEMO TO: G. GLENN- PAGE 3
DATE : JANUARY 11, 1999

PITT-01-9-041

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2-96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Gretchen A. Phipps
Chemist



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support documentation

MEMO TO: G. GLENN- PAGE 4
DATE : JANUARY 11, 1999

PITT-01-9-041

Data Qualifier Key:

- U - Value is nondetect as reported by laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low, "L", as a result of technical noncompliances.
- UL - Nondetected result is considered biased low, "UL", as a result of technical noncompliances.

APPENDIX A
Qualified Analytical Results

**CTO252 - NAWC WARMINSTER
WATER DATA
QUANTERRA
SDG: BR415**

SAMPLE NUMBER:
SAMPLE DATE:
LABORATORY ID:
QC_TYPE:
% SOLIDS:
UNITS:
FIELD DUPLICATE OF:

FB-090398
09/03/98
C81040138011
NORMAL
0.0 %
UG/L

RB-090398
09/03/98
C81040138012
NORMAL
0.0 %
UG/L

100.0 %

100.0 %

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	13.2	U		13.2	U							
ANTIMONY	1.4	U		1.4	U							
ARSENIC	2.0	U		2.0	U							
BARIUM	0.40	U		0.40	U							
BERYLLIUM	0.20	U		0.20	U							
CADMIUM	0.40	U		0.40	U							
CALCIUM	13.8	B	A	26.8	B	A						
CHROMIUM	1.0	B	A	0.60	B	A						
COBALT	3.2	U		3.2	U							
COPPER	2.0	U		2.0	U							
IRON	9.4	U		9.4	U							
LEAD	1.7			1.3	B	A						
MAGNESIUM	17.3	U		17.3	U							
MANGANESE	0.18	U		0.18	B	A						
MERCURY	0.20	U		0.20	U							
NICKEL	8.3	U		8.3	U							
POTASSIUM	490	U		490	U							
SELENIUM	3.7	U		3.7	U							
SILVER	0.41			0.40	U							
SODIUM	26.9			70.9								
THALLIUM	4.9	B	A	4.7	U							
VANADIUM	3.4	U		3.4	U							
ZINC	5.1	U		5.1	U							

CTO252 - NAWC WARMINSTER

**SOIL DATA
QUANTERRA
SDG: BR415**

	VS-A-1A-04			VS-A-1A-05			VS-A-1A-25			VS-A-1A-06		
SAMPLE NUMBER	09/03/98			09/03/98			09/03/98			09/03/98		
SAMPLE DATE:	C8I040138004			C8I040138005			C8I040138006			C8I040138007		
LABORATORY ID	NORMAL			NORMAL			NORMAL			NORMAL		
QC_TYPE:	96.6 %			80.0 %			80.0 %			85.0 %		
% SOLIDS:	MG/KG			MG/KG			MG/KG			MG/KG		
UNITS:							VS-A-1A-05					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	1.4	L	C	0.17	UL	C	0.18	B	A	0.17	B	A
CADMIUM	11.2			0.17			0.13			0.39		
CHROMIUM	266			20.0			22.0			46.1		

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LCS/LCSD Noncompliance
f	=	Lab Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS - GFAA MSA's $r < 0.995$
k	=	ICP Interference - include ICSAB % R's
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
o	=	Poor Instrument Performance (i.e., base-time drifting)
p	=	Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $< CRQL$ for organics)
q	=	Other problems (can encompass a number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin.
u	=	Pest/PCD % between columns for positive results.
v	=	Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: G. GLENN DATE: JANUARY 11, 1999
FROM: GRETCHEN A. PHIPPS COPIES: DV FILE
SUBJECT: INORGANIC DATA VALIDATION – SELECT METALS
CT0 252 - NAWC WARMINSTER, PENNSYLVANIA
SAMPLE DELIVERY GROUP SDG – BR422/BR423

SAMPLES: 35/Soils/

VS-2A-01F	VS-2A-01FE	VS-2A-01S
VS-2A-01WE	VS-2A-02F	VS-2A-02-FE
VS-2A-02S	VS-2A-02WE	VS-2A-03F
VS-2A-74F	VS-2A-03FE	VS-2A-03S
VS-2A-03WE	VS-2A-04F	VS-2A-04S
VS-2A-04WE	VS-2A-05F	VS-2A-05S
VS-2A-05WE	VS-2A-06F	VS-2A-06S
VS-2A-07F	VS-2A-07S	VS-2A-08S
VS-2A-09S	VS-2A-10S	VS-2A-11S
VS-2A-12S	VS-2A-75S	VS-2A-13S
VS-2A-14S	SB-03-101398	SB-03-17
SB-03-1707	SB-03-18	

Overview

The sample set SDG BR422/BR423, NAWC Warminster, consists of thirty-five (35) soil environmental samples.

The samples designated with F and FE, with exception of VS-2A-03F, were analyzed for antimony, cadmium and lead. The samples designated with S and WE and sample VS-2A-03F were analyzed for antimony, cadmium, copper, lead, silver and zinc. Samples SB-101398, SB-03-17, SB-03-1707 and SB-03-18 were analyzed for lead. The samples were collected by Tetra Tech NUS on October 13 and 14, 1998 and analyzed by Quanterra Environmental Services under the Naval Facilities Engineering Service Center (NFESC) Quality Assurance/ Quality Control (QA/QC) criteria. Metals analyses were conducted using SW 846 method 6010B.

Summary

All analytes were analyzed successfully. The findings in this report are based upon a general review of all available data. The data was review based on data completeness, holding times, calibration data, laboratory method/ preparation blanks, interference check sample (ICS) results, matrix spike/matrix spike duplicate results, laboratory duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

All analyses were conducted using Inductively Coupled Plasma (ICP) methodologies.

Areas of concern with respect to data quality are listed below.

Major Problems

None.

Minor Problems

- The following contaminants were detected in the laboratory blanks at the following maximum concentrations:

Samples Affected:	All	
	Maximum	Action
<u>Analyte</u>	<u>Concentration</u>	<u>Level (soil)</u>
Antimony	2.4µg/L	1.2 mg/kg
Copper ⁽¹⁾	0.057 mg/kg	0.285 mg/kg
Lead ⁽¹⁾	0.262 mg/kg	1.31 mg/kg
Zinc ⁽¹⁾	0.907 mg/kg	4.535 mg/kg

⁽¹⁾ Maximum concentration present in preparation blank.

An action level of 5X the maximum contaminant level has been used to evaluate the sample data for blank contamination. Samples aliquot, percent solids and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for antimony were qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike/Matrix Spike Duplicate (MS/MSD) Percent Recoveries (%Rs) for antimony and silver were <75% quality control limit. The positive results reported for antimony and silver were qualified as biased low, "L". The nondetected results reported for silver were qualified as biased low, "UL".
- The MS/MSD %Rs for cadmium and lead were >125% quality control limit. The positive results reported for cadmium and lead were qualified as biased high, "K".

Notes

The Contract Required Detection Limit (CRDL) standards were not analyzed for this SDG.

Executive Summary

Laboratory Performance: Antimony, copper, lead and zinc were present in the laboratory blanks.

Other Factors Affecting Data Quality: The MS/MSD %Rs for antimony, cadmium, lead and silver were outside the 75-125% quality control limit.

MEMO TO: G. GLENN- PAGE 4
DATE : JANUARY 11, 1999

Data Qualifier Key:

- U - Value is nondetect as reported by laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low, "L", as a result of technical noncompliances.
- UL - Nondetected result is considered biased low, "UL", as a result of technical noncompliances.
- K - Positive result is considered biased high, "K", as a result of technical noncompliances.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER

**SOIL DATA
QUANTERRA
SDG: BR423**

SAMPLE NUMBER:
SAMPLE DATE:
LABORATORY ID:
QC_TYPE:
% SOLIDS:
UNITS:
FIELD DUPLICATE OF:

VS-2A-01F
10/14/98
C8J150136024
NORMAL
81.0 %
MG/KG

VS-2A-01FE
10/14/98
C8J150136004
NORMAL
83.0 %
MG/KG

VS-2A-01S
10/14/98
C8J150136016
NORMAL
87.0 %
MG/KG

VS-2A-01WE
10/14/98
C8J150136030
NORMAL
82.0 %
MG/KG

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.88	B	A	1.5	L	D	4.9	L	D	1.0	B	A
CADMIUM	1.7	K	D	2.1	K	D	20.3	K	D	0.62	K	D
COPPER							386			12.3		
LEAD	21.1	K	D	72.7	K	D	420	K	D	11.4	K	D
SILVER							13.7	L	D	0.05	UL	D
ZINC							688			43.8		

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR423

SAMPLE NUMBER:	VS-2A-02F	VS-2A-02FE	VS-2A-02S	VS-2A-02WE
SAMPLE DATE:	10/14/98	10/14/98	10/14/98	10/14/98
LABORATORY ID	C8J150136025	C8J150136005	C8J150136017	C8J150136031
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	80.0 %	81.0 %	83.0 %	78.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS	1.2	B	A	2.1	L	D	1.3	B	A	28.9	L	D
ANTIMONY							0.61	K	D	28.6	K	D
CADMIUM	2.8	K		3.6	K					666		
COPPER							9.7					
LEAD	83.9	K	D	95.6	K	D	19.5	K	D	624	K	D
SILVER							0.05	UL	D	50.6	L	D
ZINC							41.1			1560		

CTO252 - NAWC WARMINSTER

**SOIL DATA
QUANTERRA
SDG: BR423**

SAMPLE NUMBER:	VS-2A-03F	VS-2A-74F	VS-2A-03FE	VS-2A-03S
SAMPLE DATE:	10/14/98	10/14/98	10/14/98	10/14/98
LABORATORY ID:	C8J150136026	C8J150136029	C8J150136006	C8J150136018
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	79.0 %	80.0 %	84.0 %	88.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:		VS-2A-03F		

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	5.5	L	D	5.4	L	D	1.7	L	D	4.9	L	D
CADMIUM	12.1	K	D	13.3	K	D	2.4	K	D	6.7	K	D
COPPER	7980									121		
LEAD	245	K	D	572	K	D	66.2	K	D	261	K	D
SILVER	14.3	L	D							5.2	L	D
ZINC	446									377		

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR423

SAMPLE NUMBER
 SAMPLE DATE
 LABORATORY ID
 QC_TYPE:
 % SOLIDS
 UNITS
 FIELD DUPLICATE OF:

VS-2A-03WE
 10/14/98
 C8J150136001
 NORMAL
 83.0 %
 MG/KG

VS-2A-04F
 10/14/98
 C8J150136027
 NORMAL
 91.3 %
 MG/KG

VS-2A-04S
 10/14/98
 C8J150136019
 NORMAL
 85.0 %
 MG/KG

VS-2A-04WE
 10/14/98
 C8J150136002
 NORMAL
 83.0 %
 MG/KG

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	1.2	B	A	0.81	B	A	0.89	B	A	7.3	L	D
CADMIUM	1.2	K	D	0.48	K	D	0.94	K	D	11.1	K	D
COPPER	18.9						8.2			487		
LEAD	54.4	K	D	11.2	K	D	12.8	K	D	268	K	D
SILVER	0.12	L	D				0.05	UL	D	21.4	L	D
ZINC	596						30.2			1170		

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR423

	VS-2A-05F			VS-2A-05S			VS-2A-05WE			VS-2A-06F		
SAMPLE NUMBER:	10/14/98			10/14/98			10/14/98			10/14/98		
SAMPLE DATE:	C8J150136028			C8J150136020			C8J150136003			C8J150136014		
LABORATORY ID:	NORMAL			NORMAL			NORMAL			NORMAL		
QC_TYPE:	80.0 %			82.0 %			81.0 %			87.0 %		
% SOLIDS:	MG/KG			MG/KG			MG/KG			MG/KG		
UNITS:												
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.91	B	A	8.5	L	D	0.58	B	A	0.92	B	A
CADMIUM	0.56	K	D	15.0	K	D	0.14	K	D	1.9	K	D
COPPER				315			9.3					
LEAD	14.6	K	D	449	K	D	16.2	K	D	62.0	K	D
SILVER				16.4	L	D	0.05	UL	D			
ZINC				1130			33.7					

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR423

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

VS-2A-06S
 10/14/98
 C8J150136021
 NORMAL
 81.0 %
 MG/KG

VS-2A-07F
 10/14/98
 C8J150136015
 NORMAL
 87.0 %
 MG/KG

VS-2A-07S
 10/14/98
 C8J150136022
 NORMAL
 83.0 %
 MG/KG

VS-2A-08S
 10/14/98
 C8J150136023
 NORMAL
 85.0 %
 MG/KG

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.47	B	A	0.63	B	A	0.99	B	A	0.77	B	A
CADMIUM	0.26	K	D	0.40	K	D	0.51	K	D	0.78	K	D
COPPER	5.7						23.4			12.9		
LEAD	13.7	K	D	21.8	K	D	17.2	K	D	25.7	K	D
SILVER	0.05	UL	D				0.05	UL	D	0.05	UL	D
ZINC	32.2						37.2			63.1		

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR423

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

VS-2A-09S
 10/14/98
 C8J150136007
 NORMAL
 90.0 %
 MG/KG

VS-2A-10S
 10/14/98
 C8J150136008
 NORMAL
 82.0 %
 MG/KG

VS-2A-11S
 10/14/98
 C8J150136009
 NORMAL
 89.0 %
 MG/KG

VS-2A-12S
 10/14/98
 C8J150136010
 NORMAL
 88.0 %
 MG/KG

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.80	B	A	111	L	D	1.3	B	A	0.39	B	A
CADMIUM	0.21	K	D	26.1	K	D	1.1	K	D	0.06	K	D
COPPER	10.2			1280			20.0			10.6		
LEAD	11.8	K	D	6650	K	D	28.0	K	D	4.4	K	D
SILVER	0.04	UL	D	90.7	L	D	0.33	L	D	0.05	UL	D
ZINC	23.0			3000			337			16.2		

CTO252 - NAWC WARMINSTER

SOIL DATA
 QUANTERRA
 SDG: BR423

SAMPLE NUMBER.
 SAMPLE DATE:
 LABORATORY ID
 QC_TYPE
 % SOLIDS.
 UNITS
 FIELD DUPLICATE OF.

VS-2A-75S
 10/14/98
 C8J150136013
 NORMAL
 95.5 %
 MG/KG
 VS-2A-12S-D

VS-2A-13S
 10/14/98
 C8J150136011
 NORMAL
 91.3 %
 MG/KG

VS-2A-14S
 10/14/98
 C8J150136012
 NORMAL
 84.0 %
 MG/KG

//
 100.0 %

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.59	B	A	0.96	B	A	4.7	L	D			
CADMIUM	0.27	K	D	1.2	K	D	6.9	K	D			
COPPER	10.5			16.1			155					
LEAD	13.2	K	D	59.9	K	D	295	K	D			
SILVER	0.14	L	D	0.26	L	D	7.3	L	D			
ZINC	35.7			59.8			434					

CTO252 - NAWC WARMINSTER

**SOIL DATA
QUANTERRA
SDG: BR422**

SAMPLE NUMBER:
SAMPLE DATE:
LABORATORY ID:
QC_TYPE:
% SOLIDS:
UNITS:
FIELD DUPLICATE OF:

SB-03-17
10/13/98
C8J140115001
NORMAL
85.0 %
MG/KG

SB-03-1707
10/13/98
C8J140115002
NORMAL
90.0 %
MG/KG

SB-03-18
10/13/98
C8J140115003
NORMAL
63.0 %
MG/KG

SB-03-101398
10/13/98
C8J140115004
NORMAL
82.0 %
MG/KG
SB-03-18

	RESULT	QUAL	CODE									
INORGANICS												
LEAD	119	K	D	17.5	K	D	200	K	D	119	K	D

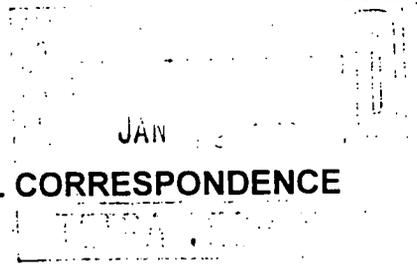
Qualifier Codes:

- a - Lab Blank Contamination
- b - Field Blank Contamination
- c - Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- d - MS/MSD Noncompliance
- e - LCS/LCSD Noncompliance
- f - Lab Duplicate Imprecision
- g - Field Duplicate Imprecision
- h - Holding Time Exceedance
- i - ICP Serial Dilution Noncompliance
- j - GFAA PDS - GFAA MSA's $r < 0.995$
- k - ICP Interference - include ICSAB % R's
- l - Instrument Calibration Range Exceedance
- m - Sample Preservation
- n - Internal Standard Noncompliance
- o - Poor Instrument Performance (i.e., base-time drifting)
- p - Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $< CRQL$ for organics)
- q - Other problems (can encompass a number of issues)
- r - Surrogates Recovery Noncompliance
- s - Pesticide/PCB Resolution
- t - % Breakdown Noncompliance for DDT and Endrin
- u - Pest/PCD % between columns for positive results.
- v - Non-linear calibrations, using $r < 0.995$
(correlation coefficient)



Tetra Tech NUS

INTERNAL CORRESPONDENCE



PITT-01-9-047

TO: G. GLENN DATE: JANUARY 11, 1999
 FROM: GRETCHEN A. PHIPPS COPIES: DV FILE
 SUBJECT: INORGANIC DATA VALIDATION – SELECT METALS
 CT0 252 - NAWC WARMINSTER, PENNSYLVANIA
 SAMPLE DELIVERY GROUP SDG – BR416

SAMPLES: 13/Soils/

VS-A-1A-01	VS-A-1B-06	VS-A-1B-07
VS-A-1B-08	VS-A-1B-09	VS-A-1A-02
VS-A-1A-03	VS-A-1B-01	VS-A-1B-02
VS-A-1B-03	VS-A-1B-04	VS-A-1B-05
VS-A-1B-24		

1/Aqueous/

RB-090298

Overview

The sample set SDG BR416, NAWC Warminster, consists of thirteen (13) soil environmental samples. One (1) rinsate blank (RB-090298) was included within this SDG.

All samples were analyzed for antimony, cadmium and chromium. The samples were collected by Tetra Tech NUS on September 2, 1998 and analyzed by Quanterra Environmental Services under the Naval Facilities Engineering Service Center (NFESC) Quality Assurance/ Quality Control (QA/QC) criteria. Metals analyses were conducted using SW 846 method 6010B.

Summary

All analytes were analyzed successfully. The findings in this report are based upon a general review of all available data. The data was review based on data completeness, holding times, calibration data, laboratory method/ preparation/field QC blanks, interference check sample (ICS) results, matrix spike/matrix spike duplicate results, laboratory duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantation.

All analyses were conducted using Inductively Coupled Plasma (ICP) methodologies.

Areas of concern with respect to data quality are listed below.

Major Problems

None.

MEMO TO: G. GLENN- PAGE 3
DATE : JANUARY 11, 1999

PITT-01-9-047

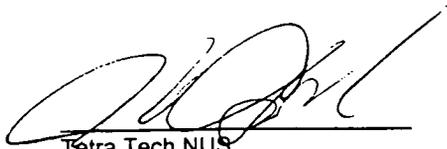
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2-96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Gretchen A. Phipps
Chemist



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support documentation

MEMO TO: G. GLENN- PAGE 4
DATE : JANUARY 11, 1999

PITT-01-9-047

Data Qualifier Key:

- U - Value is nondetect as reported by laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low, "L", as a result of technical noncompliances.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR416

SAMPLE NUMBER	VS-A-1A-01	VS-A-1B-06	VS-A-1B-07	VS-A-1B-08
SAMPLE DATE:	09/02/98	09/02/98	09/02/98	09/02/98
LABORATORY ID	C8I030123011	C8I030123007	C8I030123008	C8I030123009
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	83.0 %	60.0 %	85.0 %	87.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ANTIMONY	0.23	B	A	8.8	L	D	0.70	B	A	0.76	B	A
CADMIUM	0.05	U		46.8			0.24	U		0.23	U	
CHROMIUM	13.9			1860			25.9			26.3		

Qualifier Codes:

- a - Lab Blank Contamination
- b - Field Blank Contamination
- c - Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- d - MS/MSD Noncompliance
- e - LCS/LCSD Noncompliance
- f - Lab Duplicate Imprecision
- g - Field Duplicate Imprecision
- h - Holding Time Exceedance
- i - ICP Serial Dilution Noncompliance
- j - GFAA PDS - GFAA MSA's $r < 0.995$
- k - ICP Interference - include ICSAB % R's
- l - Instrument Calibration Range Exceedance
- m - Sample Preservation
- n - Internal Standard Noncompliance
- o - Poor Instrument Performance (i.e., base-time drifting)
- p - Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $< CRQL$ for organics)
- q - Other problems (can encompass a number of issues)
- r - Surrogates Recovery Noncompliance
- s - Pesticide/PCB Resolution
- t - % Breakdown Noncompliance for DDT and Endrin.
- u - Pest/PCD % between columns for positive results.
- v - Non-linear calibrations, using $r < 0.995$
(correlation coefficient)

MEMO TO: G. GLENN- PAGE 2
DATE : JANUARY 12, 1999

PITT-01-9-055

Minor Problems

- The ICP Serial Dilution Percent Difference (%D) for lead affecting the soil matrix was >10% quality control limit. The positive results reported for lead were qualified as estimated, "J". The direction of bias could not be determined.

Notes

The Contract Required Detection Limit (CRDL) standards were not analyzed for with this SDG.

Executive Summary

Laboratory Performance: None.

Other Factors Affecting Data Quality: The ICP Serial Dilution %D for lead affecting the soil matrix was >10% quality control limit.

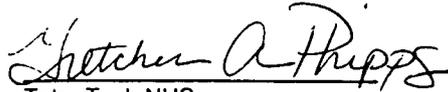
MEMO TO: G. GLENN- PAGE 3
DATE : JANUARY 12, 1999

PITT-01-9-055

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2-96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Gretchen A. Phipps
Chemist



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support documentation

MEMO TO: G. GLENN- PAGE 4
DATE : JANUARY 12, 1999

PITT-01-3-055

Data Qualifier Key:

- U - Value is nondetect as reported by laboratory.
- J - Positive result is considered estimated, "J", as a result of technical noncompliances.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR419

SAMPLE NUMBER:	SB-08-26	SS-08-23	SS-08-24	SS-08-25
SAMPLE DATE:	09/29/98	09/29/98	09/29/98	09/29/98
LABORATORY ID:	C8I300117006	C8I300117002	C8I300117004	C8I300117001
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	88.0 %	91.8 %	91.1 %	91.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
LEAD	1.9	J	I	2100	J	I	487	J	I	125	J	I

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR419

	SS-08-26	SS-08-27										
SAMPLE NUMBER	09/29/98	09/29/98	//	//								
SAMPLE DATE:	C81300117005	C81300117003										
LABORATORY ID.	NORMAL	NORMAL										
QC_TYPE:	90.8 %	92.7 %	100.0 %	100.0 %								
% SOLIDS	MG/KG	MG/KG										
UNITS:												
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
LEAD	164	J	I	1940	J	I						

Qualifier Codes:

a	-	Lab Blank Contamination
b	-	Field Blank Contamination
c	-	Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	-	MS/MSD Noncompliance
e	-	LCS/LCSD Noncompliance
f	-	Lab Duplicate Imprecision
g	-	Field Duplicate Imprecision
h	-	Holding Time Exceedance
i	-	ICP Serial Dilution Noncompliance
j	-	GFAA PDS - GFAA MSA's $r < 0.995$
k	-	ICP Interference - include ICSAB % R's
l	-	Instrument Calibration Range Exceedance
m	-	Sample Preservation
n	-	Internal Standard Noncompliance
o	-	Poor Instrument Performance (i.e., base-time drifting)
p	-	Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $< CRQL$ for organics)
q	-	Other problems (can encompass a number of issues)
r	-	Surrogates Recovery Noncompliance
s	-	Pesticide/PCB Resolution
t	-	% Breakdown Noncompliance for DDT and Endrin.
u	-	Pest/PCD % between columns for positive results.
v	-	Non-linear calibrations, running $r < 0.995$ (correlation coefficient)



Tetra Tech NUS

INTERNAL CORRESPONDENCE

C-PITT-01-9-058

TO: GARTH GLENN

DATE: JANUARY 25, 1999

FROM: SEAN NIXON

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION – SELECTED SEMIVOLATILES
CTO 252 NAWC WARMINSTER
SDG – BR425

SAMPLES: 9/Solid

VS-2A-18S	VS-2A-77S	VS-2A-19S	VS-2C-01F	VS-2C-01S
VS-2C-02S	VS-2C-03S	VS-2C-04S	VS-2C-10F	

1/Aqueous

W-RB-102098

Overview

The sample set for CTO 252 Warminster, SDG BR425, consists of nine (9) solid environmental sample and one (1) aqueous Rinse Blank. The field crew specified samples VS-2C-01F and VS-2A-18S for Matrix Spike/ matrix Spike Duplicate (MS/MSD) analysis. Two field duplicate pairs, samples VS-2A-18S/VS-2A-77S and VS-2C-01F/VS-2C-10F, were included in this Sample Delivery Group (SDG).

The rinse blank was analyzed for benzo(a)pyrene, benzo(g,h,i)perylene, and indeno(123-cd)pyrene. Samples VS-2A-18S, VS-2A-19S, and VS-2A-77S were analyzed for benzo(ghi)perylene and indeno(1,2,3-cd)pyrene. Samples VS-2C-01F, VS-2C-10F, VS-2C-01S, VS-2C-02S, VS-2C-03S, and VS-2C-04S were analyzed for benzo(a)pyrene. The samples were collected by Tetra Tech NUS on October 20, 1998 and analyzed by Quanterra - Pittsburgh under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The semivolatile analyses were conducted according to SW-846 Method 8270C.

Summary

All analytes were successfully analyzed. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, GCMS tuning, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification, detection limits, and Tentatively Identified Compounds (TIC) evaluation.

MEMO TO: GARTH GLENN
DATE: JANUARY 25, 1999 - PAGE 2

C-PITT-01-9-058

Areas of concern with respect to data quality are listed below.

Major Problems

None.

Minor Problems

Poor field duplicate precision was noted the sample pair VS-2A18S/VS-2A-77S for both benzo(g,h,i)perylene (RPD 157%) and indeno(1,2,3)perylene (164%). The positive results in the aforementioned samples were qualified as estimated, J.

Notes

Positive results below the Contract Required Quantitation Limit (CRQL) were qualified as estimated, J.

The electronic data did not report results for the rinse blank analysis. The data reviewer amended the electronic data to reflect the values reported on the Form I.

Field duplicate comparisons are presented in Appendix C. No action was taken for field duplicate pair VS-2C-01F/VS-2C-10F.

Noncompliances were noted in the LCS and MS/MSD analyses for non-target compounds.

Executive Summary

Laboratory Performance: The electronic data did not report results for the rinse blank analysis.

Other Factors Affecting Data Quality: None.

MEMO TO: GARTH GLENN
DATE: JANUARY 25, 1999 - PAGE 3

C-PITT-01-9-058

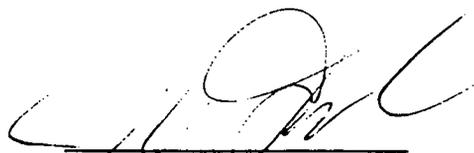
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Sean T. Nixon
Chemist/Data Validator
Tetra Tech NUS



Joseph A. Samchuck
Quality Assurance Officer
Tetra Tech NUS

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

DATA QUALIFIER TABLE:

- U - Value is a nondetect as reported by the laboratory.
- J - Positive result is considered estimated for various technical noncompliances.

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR425

SAMPLE NUMBER:	VS-2A-18S	VS-2A-77S	VS-2A-19S	VS-2C-01F
SAMPLE DATE:	10/20/98	10/20/98	10/20/98	10/20/98
LABORATORY ID:	C8J210117006	C8J210117007	C8J210117005	C8J210117008
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	86.0 %	85.0 %	83.0 %	87.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:		VS-2A-18S		

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BENZO(A)PYRENE										250	J	P
BENZO(G,H,I)PERYLENE	530	J	G	64	J	GP	440					
INDENO(1,2,3-CD)PYRENE	690	J	G	69	J	GP	480					

CTO252 - NAWC WARMINSTER

SOIL DATA
 QUANTERRA
 SDG: BR425

SAMPLE NUMBER:	VS-2C-10F	VS-2C-01S	VS-2C-02S	VS-2C-03S
SAMPLE DATE:	10/20/98	10/20/98	10/20/98	10/20/98
LABORATORY ID:	C8J210117013	C8J210117009	C8J210117010	C8J210117011
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	91.2 %	85.0 %	90.8 %	85.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:	VS-2C-01F			

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BENZO(A)PYRENE	260	J	P	790			360	U		47	J	P



Tetra Tech NUS

FEB 15 1999
INTERNAL CORRESPONDENCE

PITT-01-9-168

TO: MR. G. GLENN DATE: FEBRUARY 11, 1999
FROM: JUSTIN ORBICH COPIES: DV FILE
SUBJECT: ORGANIC DATA VALIDATION – VOA/SVOA/PEST/PCB
CTO252, NAWC WARMINSTER
SDG BR438
SAMPLES: 2/Aqueous
W-RB-111998 W-TB-111998*
2/Solid
WA-2B-01 WA-2B-02

OVERVIEW

The sample set for CTO 252, SDG BR438, Naval Air Warfare Center (NAWC) Warminster consists of one (1) rinsate blank (designated RB), one (1) trip blank (designated TB), and two (2) solid environmental samples. The samples were analyzed for Target Compound List (TCL) volatile, semivolatile, pesticide, and Polychlorinated Biphenyl (PCB) organic compounds. The sample designated (*) was analyzed for TCL volatile organic compounds only. No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech NUS, Inc. on November 19th, 1998 and analyzed by Quanterra. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria, and SW 846 Method 8260B, 8270C, 8081A, and 8082 analytical and reporting protocols.

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until extraction/analysis, GC/MS tuning and system performance, initial and continuing calibration data, laboratory and field quality control blank results, surrogate spike recoveries, Matrix Spike/Matrix Spike Duplicate (MS/MSD) results, Laboratory Control Sample (LCS) results, internal standard performance, and compound identification and quantitation.

Areas of concern are listed below.

Major Problems

- In the pesticide/PCB fraction, the Matrix Spike/Matrix Spike Duplicate (MS/MSD) and the Laboratory Control Sample (LCS) yielded Percent Recoveries (%Rs) below ten percent (10%) for endrin aldehyde. The nondetected results were rejected (UR) for the aforementioned compound.

MEMO TO: MR. G. GLENN
 DATE: FEBRUARY 11, 1999 – PAGE 2

Minor Problems

- The following compounds were detected in the laboratory method and/or field quality control blanks at the maximum concentrations indicated below:

<u>Compound</u>	<u>Concentration</u>	<u>Soil Action Level</u>
Acetone ⁽¹⁾	3.1µg/L	31.0µg/L
Chloroform ⁽¹⁾	9.7µg/L	48.5µg/L
4-Methyl-2-pentanone	1.4µg/kg	7.0µg/kg
Methylene chloride ⁽²⁾	3.3µg/L	33.0µg/L

⁽¹⁾ Trip Blank

⁽²⁾ Rinsate Blank

Sample aliquot, dilution factors, and percent moisture were taken into consideration during the application of the action level. Positive results for acetone reported at concentrations below the action levels were qualified (B) as a result of blank contamination. It should be noted that field quality control blanks are not qualified based on field quality control blank contamination.

- In the volatile fraction, the continuing calibration Percent Differences (%Ds) exceeded the 50% quality control limit for 2-butanone in samples W-TB-111998 and W-RB-111998. The nondetected results were qualified as estimated (UJ). The direction of bias is unknown.
- In the volatile fraction, the surrogate Percent Recovery (%R) exceeded the quality control limit for 1,2-dichloroethane-d4 in sample WA-2B-01. The nondetected results were qualified as estimated (UJ). The direction of bias is unknown.
- In the semivolatile fraction, sample WA-2B-01 and WA-2B-02 were outside the holding time until analysis by eleven (11) days. The positive and nondetected results were qualified as estimated (J) and (UJ), respectively. The direction of bias is unknown.
- In the pesticide/PCB fraction, sample WA-2B-01 and WA-2B-02 were outside the holding time until extraction by eleven (11) days. The positive and nondetected results were qualified as estimated (J) and (UJ), respectively. The direction of bias is unknown.
- In the pesticide fraction, the continuing calibration %Ds on 12-15-98 at 1216 exceeded the 30% quality control limit for 4,4'-DDD, 4,4'-DDT, and methoxychlor. The positive and nondetected results were qualified as estimated (J) and (UJ), in the affected samples.
- In the PCB fraction, the continuing calibration %D on 12-3-98 at 1640 exceeded the quality control limits for AROCLOR-1221. The nondetected results were qualified as estimated (UJ), in the affected samples.
- Several samples contained positive results for compounds below the contract required quantitation limits (CRQL). These results were qualified as estimated (J). The direction of bias is unknown.

Notes

In the volatile fraction, the initial and continuing calibration Percent Relative Standard Deviation (%RSD) and %D exceeded the quality control limit for acetone. No action was warranted due to prior qualification for blank contamination.

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DATE: FEBRUARY 11, 1999 – PAGE 3

In the volatile fraction, the continuing calibration %D exceeded the 25% quality control limit for 2-butanone. No action was warranted since the %D did not exceed 50% and only nondetected results were reported.

In the volatile fraction, the surrogate %Rs exceeded the quality control limits for 1,2-dichloroethane-d4 and 4-bromofluorobenzene. No action was warranted due to prior qualification for blank contamination.

In the volatile fraction, several Matrix Spike/Matrix Spike Duplicate (MS/MSD) %Rs and Relative Percent Differences (RPDs) were outside the quality control limit. No action is warranted on MS/MSD data alone, as per the Functional Guidelines.

In the volatile fraction, several Laboratory Control Sample (LCS) %Rs and RPDs were below the quality control limit. No action is warranted on LCS data alone, as per the Functional Guidelines.

In the volatile fraction, elevated detection limits were reported due to a 5X dilution in samples WA-2B-01 and WA-2B-02.

In the semivolatile fraction, all the surrogate yielded a recovery of zero (0) percent in sample WA-2B-01. No action was warranted due to the aforementioned sample being diluted 40X.

In the semivolatile fraction, the surrogate %R exceeded the quality control limit for nitrobenzene-d5 in sample WA-2B-02. No action was warranted since only one surrogate is outside the quality control limit.

In the semivolatile fraction, the LCS %R exceeded the quality control limit for hexachlorocyclopentadiene. No action is warranted on LCS data alone, as per the Functional Guidelines.

In the semivolatile fraction, all the MS/MSD compounds yielded zero percent (0%) recoveries. No action was warranted due sample WA-2B-01 being diluted 40X.

In the semivolatile fraction, elevated detection limits were reported due to a 40X dilution in sample WA-2B-01.

In the semivolatile fraction, elevated detection limits were reported due to a 10X dilution in sample WA-2B-02.

In the pesticide fraction, several continuing calibration %Ds exceeded the 15% quality control limit. No action was warranted since the %D did not exceed 30% and only nondetected results were reported. Additionally, the %Ds were within the quality control limits on the confirmation column.

In the pesticide/PCB fraction, sample WA-2B-01 yielded surrogate recoveries below ten percent for tetrachloro-m-xylene and decachlorobiphenyl on both columns. No action was warranted since the surrogates in the aforementioned sample were diluted out.

In the pesticide fraction, several MS/MSD exceeded the quality control limit. No action is warranted on MS/MSD data alone, as per the Functional Guidelines.

In the pesticide fraction, several LCS exceeded the quality control limit. No action is warranted on LCS data alone, as per the Functional Guidelines.

In the PCB fraction, several continuing calibration %D exceeded the 15% quality control limit. No action was warranted since the %D did not exceed 30% and only nondetected results were reported. Additionally, the %Ds were within the quality control limits on the confirmation column.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 - PAGE 4

It should be noted in the PCB fraction, the laboratory did not provide the initial and continuing calibration data from the confirmation column.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Several initial and continuing calibration issues were noted in each of the fractions. In the semivolatile and pesticide/PCB fraction, the holding time until extraction was exceeded by eleven (11) days in samples WA-2B-01 and WA-2B-02.

Other Factors Affecting Data Quality: Several MS/MSD %Rs exceeded the quality control limit. Several surrogate %Rs were outside the quality control limit in the volatile, semivolatile, and pesticide fraction. Several LCS %Rs exceeded the quality control limit. Several samples were analyzed at a dilution.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 - PAGE 5

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Evaluation" (February, 1994), as amended for use within EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February, 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS, Inc.

Justin Orbich
Chemist/Data Validator



Tetra Tech NUS, Inc.

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
Qualified Analytical Results

DATA QUALIFIER DEFINITIONS:

- U - Value is a nondetected result as reported by the laboratory and should not be considered present.
- J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.
- UJ - Nondetected result is considered to be estimated as a result of technical noncompliances.

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR438

SAMPLE NUMBER:	WA-2B-01	WA-2B-02		
SAMPLE DATE:	11/19/98	11/19/98	//	//
LABORATORY ID	C8K200154002	C8K200154003		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	81.0 %	83.0 %	100.0 %	100.0 %
UNITS:	UG/KG	UG/KG		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	31	UJ	R	30	U							
1,1,2,2-TETRACHLOROETHANE	31	UJ	R	30	U							
1,1,2-TRICHLOROETHANE	31	UJ	R	30	U							
1,1-DICHLOROETHANE	31	UJ	R	30	U							
1,1-DICHLOROETHENE	31	UJ	R	30	U							
1,2-DICHLOROETHANE	31	UJ	R	30	U							
1,2-DICHLOROETHENE (TOTAL)	31	UJ	R	30	U							
1,2-DICHLOROPROPANE	31	UJ	R	30	U							
2-BUTANONE	120	UJ	R	120	U							
2-HEXANONE	120	UJ	R	120	U							
4-METHYL-2-PENTANONE	120	UJ	R	120	U							
ACETONE	13	B	B	13	B	B						
BENZENE	31	UJ	R	30	U							
BROMODICHLOROMETHANE	31	UJ	R	30	U							
BROMOFORM	31	UJ	R	30	U							
BROMOMETHANE	62	UJ	R	60	U							
CARBON DISULFIDE	31	UJ	R	30	U							
CARBON TETRACHLORIDE	31	UJ	R	30	U							
CHLOROBENZENE	31	UJ	R	30	U							
CHLOROETHANE	62	UJ	R	60	U							
CHLOROFORM	31	UJ	R	30	U							
CHLOROMETHANE	62	UJ	R	60	U							
CIS-1,3-DICHLOROPROPENE	31	UJ	R	30	U							
DIBROMOCHLOROMETHANE	31	UJ	R	30	U							
ETHYLBENZENE	31	UJ	R	30	U							
METHYLENE CHLORIDE	31	UJ	R	30	U							
STYRENE	31	UJ	R	30	U							
TETRACHLOROETHENE	31	UJ	R	30	U							
TOLUENE	31	UJ	R	30	U							
TRANS-1,3-DICHLOROPROPENE	31	UJ	R	30	U							
TRICHLOROETHENE	31	UJ	R	30	U							
VINYL CHLORIDE	62	UJ	R	60	U							
XYLENES, TOTAL	31	UJ	R	30	U							

CTO252 - NAWC WARMINSTER
 WATER DATA
 QUANTERRA
 SDG: BR438

SAMPLE NUMBER:	W-RB-111998	W-TB-111998		
SAMPLE DATE:	11/19/98	11/19/98	//	//
LABORATORY ID:	C8K200154004	C8K200154001		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	100.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	5	U		5	U							
1,1,2,2-TETRACHLOROETHANE	5	U		5	U							
1,1,2-TRICHLOROETHANE	5	U		5	U							
1,1-DICHLOROETHANE	5	U		5	U							
1,1-DICHLOROETHENE	5	U		5	U							
1,2-DICHLOROETHANE	5	U		5	U							
1,2-DICHLOROETHENE (TOTAL)	5	U		5	U							
1,2-DICHLOROPROPANE	5	U		5	U							
2-BUTANONE	20	UJ	C	20	UJ	C						
2-HEXANONE	20	U		20	U							
4-METHYL-2-PENTANONE	20	U		20	U							
ACETONE	20	U		3.1	J	P						
BENZENE	5	U		5	U							
BROMODICHLOROMETHANE	5	U		5	U							
BROMOFORM	5	U		5	U							
BROMOMETHANE	10	U		10	U							
CARBON DISULFIDE	5	U		5	U							
CARBON TETRACHLORIDE	5	U		5	U							
CHLOROENZENE	5	U		5	U							
CHLOROETHANE	10	U		10	U							
CHLOROFORM	9			9.7								
CHLOROMETHANE	10	U		10	U							
CIS-1,3-DICHLOROPROPENE	5	U		5	U							
DIBROMOCHLOROMETHANE	5	U		5	U							
ETHYLBENZENE	5	U		5	U							
METHYLENE CHLORIDE	3.3	J	P	2.9	J	P						
STYRENE	5	U		5	U							
TETRACHLOROETHENE	5	U		5	U							
TOLUENE	5	U		5	U							
TRANS-1,3-DICHLOROPROPENE	5	U		5	U							
TRICHLOROETHENE	5	U		5	U							
VINYL CHLORIDE	10	U		10	U							
XYLENES, TOTAL	5	U		5	U							

CTO252 - NAWC WARMINSTER

SOIL DATA
 QUANTERRA
 SDG: BR438

SAMPLE NUMBER:	WA-2B-01	WA-2B-02		
SAMPLE DATE:	11/19/98	11/19/98	//	//
LABORATORY ID:	C8K200154002	C8K200154003		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	81.0 %	83.0 %	100.0 %	100.0 %
UNITS:	UG/KG	UG/KG		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	33000	UJ	H	4000	UJ	H						
1,2-DICHLOROBENZENE	33000	UJ	H	4000	UJ	H						
1,3-DICHLOROBENZENE	33000	UJ	H	4000	UJ	H						
1,4-DICHLOROBENZENE	33000	UJ	H	4000	UJ	H						
2,2-OXYBIS(1-CHLOROPROPANE)	33000	UJ	H	4000	UJ	H						
2,4,5-TRICHLOROPHENOL	33000	UJ	H	4000	UJ	H						
2,4,6-TRICHLOROPHENOL	33000	UJ	H	4000	UJ	H						
2,4-DICHLOROPHENOL	33000	UJ	H	4000	UJ	H						
2,4-DIMETHYLPHENOL	33000	UJ	H	4000	UJ	H						
2,4-DINITROPHENOL	160000	UJ	H	19000	UJ	H						
2,4-DINITROTOLUENE	33000	UJ	H	4000	UJ	H						
2,6-DINITROTOLUENE	33000	UJ	H	4000	UJ	H						
2-CHLORONAPHTHALENE	33000	UJ	H	4000	UJ	H						
2-CHLOROPHENOL	33000	UJ	H	4000	UJ	H						
2-METHYL-4,6-DINITROPHENOL	160000	UJ	H	19000	UJ	H						
2-METHYLNAPHTHALENE	21000	J	HP	5300	J	H						
2-METHYLPHENOL	33000	UJ	H	4000	UJ	H						
2-NITROANILINE	160000	UJ	H	19000	UJ	H						
2-NITROPHENOL	33000	UJ	H	4000	UJ	H						
3&4-METHYLPHENOL	33000	UJ	H	4000	UJ	H						
3,3'-DICHLOROBENZIDINE	160000	UJ	H	19000	UJ	H						
3-NITROANILINE	160000	UJ	H	19000	UJ	H						
4-BROMOPHENYL PHENYL ETHER	33000	UJ	H	4000	UJ	H						
4-CHLORO-3-METHYLPHENOL	33000	UJ	H	4000	UJ	H						
4-CHLOROANILINE	33000	UJ	H	4000	UJ	H						
4-CHLOROPHENYL PHENYL ETHER	33000	UJ	H	4000	UJ	H						
4-NITROANILINE	160000	UJ	H	19000	UJ	H						
4-NITROPHENOL	160000	UJ	H	19000	UJ	H						
ACENAPHTHENE	33000	UJ	H	4000	UJ	H						
ACENAPHTHYLENE	33000	UJ	H	4000	UJ	H						
ANTHRACENE	33000	UJ	H	4000	UJ	H						
BENZO(A)ANTHRACENE	33000	UJ	H	4000	UJ	H						
BENZO(A)PYRENE	33000	UJ	H	4000	UJ	H						
BENZO(B)FLUORANTHENE	33000	UJ	H	4000	UJ	H						

CTO252 - NAWC WARMINSTER

**SOIL DATA
QUANTERRA
SDG: BR438**

SAMPLE NUMBER:	WA-2B-01	WA-2B-02		
SAMPLE DATE:	11/19/98	11/19/98	//	//
LABORATORY ID:	C8K200154002	C8K200154003		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	81.0 %	83.0 %	100.0 %	100.0 %
UNITS:	UG/KG	UG/KG		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BENZO(G,H,I)PERYLENE	33000	UJ	H	4000	UJ	H						
BENZO(K)FLUORANTHENE	33000	UJ	H	4000	UJ	H						
BIS(2-CHLOROETHOXY)METHANE	33000	UJ	H	4000	UJ	H						
BIS(2-CHLOROETHYL)ETHER	33000	UJ	H	4000	UJ	H						
BIS(2-ETHYLHEXYL)PHTHALATE	33000	UJ	H	4000	UJ	H						
BUTYLBENZYL PHTHALATE	33000	UJ	H	4000	UJ	H						
CARBAZOLE	33000	UJ	H	4000	UJ	H						
CHRYSENE	33000	UJ	H	4000	UJ	H						
DI-N-BUTYL PHTHALATE	33000	UJ	H	4000	UJ	H						
DI-N-OCTYL PHTHALATE	33000	UJ	H	4000	UJ	H						
DIBENZO(A,H)ANTHRACENE	33000	UJ	H	4000	UJ	H						
DIBENZOFURAN	33000	UJ	H	4000	UJ	H						
DIETHYL PHTHALATE	33000	UJ	H	4000	UJ	H						
DIMETHYL PHTHALATE	33000	UJ	H	4000	UJ	H						
FLUORANTHENE	33000	UJ	H	4000	UJ	H						
FLUORENE	33000	UJ	H	2100	J	HP						
HEXACHLOROBENZENE	33000	UJ	H	4000	UJ	H						
HEXACHLOROBUTADIENE	33000	UJ	H	4000	UJ	H						
HEXACHLOROCYCLOPENTADIENE	160000	UJ	H	19000	UJ	H						
HEXACHLOROETHANE	33000	UJ	H	4000	UJ	H						
INDENO(1,2,3-CD)PYRENE	33000	UJ	H	4000	UJ	H						
ISOPHORONE	33000	UJ	H	4000	UJ	H						
N-NITROSO-DI-N-PROPYLAMINE	33000	UJ	H	4000	UJ	H						
N-NITROSODIPHENYLAMINE	33000	UJ	H	4000	UJ	H						
NAPHTHALENE	33000	UJ	H	4000	UJ	H						
NITROBENZENE	33000	UJ	H	4000	UJ	H						
PENTACHLOROPHENOL	160000	UJ	H	19000	UJ	H						
PHENANTHRENE	33000	UJ	H	4300	J	H						
PHENOL	33000	UJ	H	4000	UJ	H						
PYRENE	33000	UJ	H	4000	UJ	H						

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR438

SAMPLE NUMBER:	WA-2B-01	WA-2B-02		
SAMPLE DATE:	11/19/98	11/19/98	//	//
LABORATORY ID:	C8K200154002	C8K200154003		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	81.0 %	83.0 %	100.0 %	100.0 %
UNITS:	UG/KG	UG/KG		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
4,4'-DDD	19	J	CH	8.5	J	CH						
4,4'-DDE	21	UJ	H	2.2	J	H						
4,4'-DDT	21	UJ	CH	2.1	UJ	CH						
ALDRIN	21	UJ	H	2.1	UJ	H						
ALPHA-BHC	21	UJ	H	2.1	UJ	H						
ALPHA-CHLORDANE	21	UJ	H	2.1	UJ	H						
AROCLOR-1016	41	U		40	U							
AROCLOR-1221	41	UJ	C	40	UJ	C						
AROCLOR-1232	41	U		40	U							
AROCLOR-1242	41	U		40	U							
AROCLOR-1248	41	U		40	U							
AROCLOR-1254	41	U		40	U							
AROCLOR-1260	41	U		40	U							
BETA-BHC	21	U	H	2.1	UJ	H						
DELTA-BHC	21	UJ	H	2.1	UJ	H						
DIELDRIN	21	UJ	H	2.1	UJ	H						
ENDOSULFAN I	21	UJ	H	2.1	UJ	H						
ENDOSULFAN II	21	UJ	H	2.1	UJ	H						
ENDOSULFAN SULFATE	21	UJ	H	2.1	UJ	H						
ENDRIN	21	UJ	H	2.1	UJ	H						
ENDRIN ALDEHYDE	21	UJ	H	2.1	UJ	H						
ENDRIN KETONE	21	UJ	H	2.1	UJ	H						
GAMMA-BHC (LINDANE)	21	UJ	H	2.1	UJ	H						
GAMMA-CHLORDANE	21	UJ	H	2.1	UJ	H						
HEPTACHLOR	21	UJ	H	2.1	UJ	H						
HEPTACHLOR EPOXIDE	21	UJ	H	2.1	UJ	H						
METHOXYCHLOR	210	UJ	CH	21	UJ	CH						
TOXAPHENE	830	UJ	H	81	UJ	H						



Tetra Tech NUS

INTERNAL CORRESPONDENCE

PH 1-91-9-164

TO: MR. G. GLENN **DATE:** FEBRUARY 11, 1999

FROM: JUSTIN ORBICH **COPIES:** DV FILE

SUBJECT: ORGANIC DATA VALIDATION - PAH
CTO252, NAWC WARMINSTER
SDG BR428

SAMPLES: 1/Aqueous
W-RB-102398
5/Solid
VS-3A-01S VS-3A-02S
VS-3A-03S VS-3A-06S
VS-3A-20S

OVERVIEW

The sample set for CTO 252, SDG BR428, Naval Air Warfare Center (NAWC) Warminster consists of one (1) rinsate blank (designated RB) and five (5) solid environmental samples. The samples were analyzed for Polynuclear Aromatic Hydrocarbons (PAH) organic compounds. No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech NUS, Inc. on October 23rd, 1998 and analyzed by Quanterra. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria, and SW 846 Method 8270C analytical and reporting protocols.

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until extraction/analysis, GC/MS tuning and system performance, initial and continuing calibration data, laboratory and field quality control blank results, surrogate spike recoveries, Matrix Spike/Matrix Spike Duplicate (MS/MSD) results, Laboratory Control Sample (LCS) results, internal standard performance, and compound identification and quantitation.

Areas of concern are listed below.

Major Problems

- None noted.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 – PAGE 2

Minor Problems

- Several samples contained positive results for compounds below the contract required quantitation limits (CRQL). These results were qualified as estimated (J). The direction of bias is unknown.

Notes

The Laboratory Control Sample (LCS) Percent Recovery (%R) exceeded the upper quality control limit for hexachlorocyclopentadiene and di-n-octylphthalate. No action is warranted on LCS data alone, as per the functional guidelines.

The Matrix Spike/Matrix Spike Duplicate (MS/MSD) %R exceeded the upper quality control limit for di-n-octylphthalate and pyrene. No action is warranted on MS/MSD data alone, as per the functional guidelines.

In samples VS-3A-02S and VS-3A-03S, elevated detection limits were reported due to a 2X dilution.

In sample VS-3A-20S, elevated detection limits were reported due to a 4X dilution.

It should be noted sample VS-3A-03S reported full TCL semivolatile organic compounds on the Form I.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

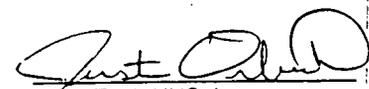
Other Factors Affecting Data Quality: Several LCS %Rs noncompliances were noted for hexachlorocyclopentadiene and di-n-octylphthalate. MS/MSD %Rs exceeded the quality control limits for pyrene and di-n-octylphthalate. Several samples were analyzed at a dilution. The laboratory reported full TCL semivolatile organic compounds on the Form I in sample VS-3A-03S.

MEMO TO: MR. G. GLENN
 DATE: FEBRUARY 11, 1999 – PAGE 3

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Evaluation" (February, 1994), as intended for use within EPA Region III, and the NFESC Interim Guidance Document entitled "Naval Installation Restoration Laboratory Quality Assurance Guide" (February, 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS, Inc.

Justin Orbich
 Chemist/Data Validator



Tetra Tech NUS, Inc.

Joseph A. Samchuck
 Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
Qualified Analytical Results

DATA QUALIFIER DEFINITIONS:

- U - Value is a nondetected result as reported by the laboratory and should not be considered present.
- J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR428

SAMPLE NUMBER:	VS-3A-01S	VS-3A-02S	VS-3A-03S	VS-3A-06S
SAMPLE DATE:	10/23/98	10/23/98	10/23/98	10/23/98
LABORATORY ID:	C8J240154001	C8J240154002	C8J240154003	C8J240154006
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	87.0 %	87.0 %	87.0 %	87.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
ACENAPHTHENE	380	U		760	U		760	U		380	U	
ACENAPHTHYLENE	120	J	P	89	J	P	66	J	P	33	J	P
ANTHRACENE	140	J	P	220	J	P	65	J	P	100	J	P
BENZO(A)ANTHRACENE	610			1200			340	J	P	480		
BENZO(A)PYRENE	650			1200			400	J	P	490		
BENZO(B)FLUORANTHENE	800			1300			470	J	P	580		
BENZO(G,H,I)PERYLENE	150	J	P	320	J	P	110	J	P	110	J	P
BENZO(K)FLUORANTHENE	590			1000			410	J	P	590		
CHRYSENE	730			1100			430	J	P	510		
DIBENZO(A,H)ANTHRACENE	63	J	P	99	J	P	760	U		35	J	P
FLUORANTHENE	1500			2600			790			1200		
FLUORENE	41	J	P	760	U		760	U		28	J	P
INDENO(1,2,3-CD)PYRENE	200	J	P	380	J	P	130	J	P	140	J	P
NAPHTHALENE	380	U		760	U		760	U		380	U	
PHENANTHRENE	700			520	J	P	330	J	P	460		
PYRENE	940			1700			590	J	P	920		



Tetra Tech NUS

FEB 11 1999
INTERNAL CORRESPONDENCE

PITT-01-9-154

TO: MR. G. GLENN **DATE:** FEBRUARY 11, 1999
FROM: JUSTIN ORBICH **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION - PAH
CTO252, NAWC WARMINSTER
SDG BR422
SAMPLES: 4/Solid
SB-03-101398 SB-03-17
SB-03-1707 SB-03-18

OVERVIEW

The sample set for CTO 252, SDG BR422, Naval Air Warfare Center (NAWC) Warminster consists of four (4) solid environmental samples. The samples were analyzed for Polynuclear Aromatic Hydrocarbon (PAH) organic compounds. No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech NUS, Inc. on October 13th, 1998 and analyzed by Quanterra. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria, and SW 846 Method 8270C analytical and reporting protocols.

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until extraction/analysis, GC/MS tuning and system performance, initial and continuing calibration data, laboratory and field quality control blank results, surrogate spike recoveries, Matrix Spike/Matrix Spike Duplicate (MS/MSD) results, Laboratory Control Sample (LCS) results, internal standard performance, and compound identification and quantitation.

Areas of concern are listed below.

Major Problems

- None noted.

Minor Problems

- Several polynuclear aromatic hydrocarbons samples contained positive results for compounds below the contract required quantitation limits (CRQL). These results were qualified as estimated (J). The direction of bias is unknown.

MEMO TO: MR. N. TEAMERSON
DATE: FEBRUARY 11, 1999 – PAGE 2

Notes

Sample SB-03-17 was diluted 4X due to the presence of following compounds above the instrument's linear calibration range. Results from the dilution were transposed over the undiluted sample results and used for validation purposes.

Benzo(a)anthracene	Benzo(a)pyrene
Benzo(b)fluoranthene	Benzo(k)fluoranthene
Chrysene	Fluoranthene
Phenanthrene	Pyrene

Sample SB-03-101398 yielded surrogate Percent Recovery (%R) above the quality control limit for nitrobenzene-d5. No action is warranted for samples having only one surrogate recovery that is noncompliant.

The Matrix Spike/Matrix Spike Duplicate (MS/MSD) %R exceeded the quality control limits for pyrene. No action is taken on MS/MSD data alone, and the MS/MSD sample was not included in this SDG.

Sample SB-03-101398 was diluted 5X.

Sample SB-03-1707 was diluted 50X.

Sample SB-03-18 was diluted 2X.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Sample SB-03-17 was analyzed at a dilution since several compounds were above the instruments linear calibration range.

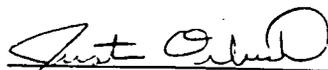
Other Factors Affecting Data Quality: Several samples were analyzed at a dilution.

MEMO TO: MR. N. TEAMERSON
DATE: FEBRUARY 11, 1999 – PAGE 3

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Evaluation" (February, 1994), as amended for use within EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February, 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."


Tetra Tech NUS, Inc.

Justin Orbich
Chemist/Data Validator


Tetra Tech NUS, Inc.

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

Qualified Analytical Results

DATA QUALIFIER DEFINITIONS:

- U - Value is a nondetected result as reported by the laboratory and should not be considered present.
- J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.
- UJ - Nondetected result is considered to be estimated as a result of technical noncompliances.

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR422

SAMPLE NUMBER	SB-03-17	SB-03-1707	SB-03-18	SB-03-101398
SAMPLE DATE:	10/13/98	10/13/98	10/13/98	10/13/98
LABORATORY ID:	C8J140115001	C8J140115002	C8J140115003	C8J140115004
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	85.0 %	90.0 %	63.0 %	82.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				SB-03-18

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
ACENAPHTHENE	400			4400	J	P	1500			2600		
ACENAPHTHYLENE	1200			18000	U		120	J	P	150	J	P
ANTHRACENE	1700			21000			640	J	P	1500	J	P
BENZO(A)ANTHRACENE	4700			53000			960	J	P	1700	J	P
BENZO(A)PYRENE	5100			44000			870	J	P	1500	J	P
BENZO(B)FLUORANTHENE	4900			45000			780	J	P	1400	J	P
BENZO(G,H,I)PERYLENE	930			26000			430	J	P	610	J	P
BENZO(K)FLUORANTHENE	3600			34000			800	J	P	1300	J	P
CHRYSENE	4800			51000			1000			1700	J	P
DIBENZO(A,H)ANTHRACENE	440			9400	J	P	140	J	P	200	J	P
FLUORANTHENE	8400			120000			2500			5900		
FLUORENE	700			4500	J	P	790	J	P	1500	J	P
INDENO(1,2,3-CD)PYRENE	1300			29000			480	J	P	700	J	P
NAPHTHALENE	120	J	P	18000	U		360	J	P	450	J	P
PHENANTHRENE	4700			71000			2400			5300		
PYRENE	8100			97000			2100			4200		



Tetra Tech NUS

INTERNAL CORRESPONDENCE

FITT-01-9-145

TO: MR. G. GLENN **DATE:** FEBRUARY 11, 1999
FROM: JUSTIN ORBICH **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION - VOA
CTO252, NAWC WARMINSTER
SDG BR416
SAMPLES: 2/Aqueous
1TB-090298 RB-090298
1/Solid
VS-A-1B-06

OVERVIEW

The sample set for CTO 252, SDG BR416, Naval Air Warfare Center (NAWC) Warminster consists of two (2) aqueous environmental samples, which includes one (1) trip blank (designated TB) and one (1) rinsate blank (designated RB), and one (1) solid environmental sample. The samples were analyzed for volatile organic compound trichloroethene. No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech NUS, Inc. on September 2nd, 1998 and analyzed by Quanterra. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria, and SW 846 Method 8260B analytical and reporting protocols.

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until extraction/analysis, GC/MS tuning and system performance, initial and continuing calibration data, laboratory and field quality control blank results, surrogate spike recoveries, Matrix Spike/Matrix Spike Duplicate (MS/MSD) results, Laboratory Control Sample (LCS) results, internal standard performance, compound identification and quantitation, and detection limits.

Areas of concern are listed below.

Major Problems

- None noted.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 – PAGE 2

Minor Problems

- Sample VS-A-1B-06 yielded internal standard areas below the quality control limit for fluorobenzene, chlorobenzene, and 1,4-dichlorobenzene. The sample was reanalyzed with similar results. Additionally, due to surrogate noncompliance for toluene in the original analysis, the reanalysis was used for validation purposes. The nondetected result was qualified as estimated (UJ) in the associated internal standard. The direction of bias is unknown.

Notes

In sample VS-A-1B-06, the surrogate Percent Recovery (%R) was below the quality control limit for toluene. The sample was reanalyzed within holding time with the surrogate %R within the quality control limit for toluene. The reanalysis was used for validation purposes.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: The surrogate %R for toluene was below the quality control limit. Internal standard areas were below the quality control limit in sample VS-A-1B-06.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 – PAGE 3

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Evaluation" (February, 1994), as amended for use within EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February, 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."


Tetra Tech NUS, Inc.

Justin Orbich
Chemist/Data Validator


Tetra Tech NUS, Inc.

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
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APPENDIX A
Qualified Analytical Results

DATA QUALIFIER DEFINITIONS:

- U - Value is a nondetected result as reported by the laboratory and should not be considered present.
- J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.
- UJ - Nondetected result is considered to be estimated as a result of technical noncompliances.

CTO252 - NAWC WARMINSTER
 WATER DATA
 QUANTERRA
 SDG: BR416

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

1TB-090298
 09/02/98
 C81030123015
 NORMAL
 0.0 %
 UG/L

RB-090298
 09/02/98
 C81030123014
 NORMAL
 0.0 %
 UG/L

//

 100.0 %

//

 100.0 %

	RESULT	QUAL	CODE									
VOLATILES												
TRICHLOROETHENE	5	U		5	U							



Tetra Tech NUS

INTERNAL CORRESPONDENCE

PITT-01-9-147

TO: MR. G. GLENN **DATE:** FEBRUARY 11, 1999

FROM: JUSTIN ORBICH **COPIES:** DV FILE

SUBJECT: ORGANIC DATA VALIDATION - VOA
CTO252, NAWC WARMINSTER
SDG BR415

SAMPLES: 3/Aqueous

1TB-090398	FB-090398
RB-090398	

2/Solid

VS-A-1A-04	VS-A-1B-10
------------	------------

OVERVIEW

The sample set for CTO 252, SDG BR415, Naval Air Warfare Center (NAWC) Warminster consists of three (3) aqueous environmental samples, which includes one (1) trip blank (designated TB), one (1) field blank (designated FB), and one (1) rinsate blank (designated RB), and two (2) solid environmental sample. The aqueous samples were analyzed for Target Compound List (TCL) volatile organic compounds. The solid samples were analyzed for trichloroethene. No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech NUS, Inc. on September 3rd, 1998 and analyzed by Quanterra. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria, and SW 846 Method 8260B analytical and reporting protocols.

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until extraction/analysis, GC/MS tuning and system performance, initial and continuing calibration data, laboratory and field quality control blank results, surrogate spike recoveries, Matrix Spike/Matrix Spike Duplicate (MS/MSD) results, Laboratory Control Sample (LCS) results, internal standard performance, and compound identification and quantitation.

Areas of concern are listed below.

Major Problems

- None noted.

MEMO TO: MR. G. GLENN
 DATE: FEBRUARY 11, 1999 – PAGE 2

Minor Problems

- The initial calibration Percent Relative Standard Deviations (%RSDs) exceeded the 10% quality control limits for acetone and 2-butanone. The positive results were qualified as estimated (J) in samples 1TB-090398, FB-090398, and RB-090398. The direction of bias is unknown.

Notes

The following compounds were detected in the field quality control blanks at the maximum concentrations indicated below:

<u>Compound</u>	<u>Concentration</u>	<u>Soil Action Level</u>
Acetone*	5.7µg/L	57.0µg/kg
2-Butanone*	2.6µg/L	26.0µg/kg

*Trip Blank

No action was warranted since the solid environmental samples were analyzed for trichloroethene and field quality control blanks are not qualified based on field quality control blank contamination.

Several initial and continuing calibration %RSDs and Percent Differences (%Ds) exceeded the quality control limits. No action was warranted since only nondetected results were reported.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Initial calibration %RSDs exceeded the quality control limits for acetone and 2-butanone. Several initial and continuing calibration %Ds exceeded the quality control limits.

Other Factors Affecting Data Quality: Acetone and 2-butanone were detected in the field quality control blanks.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 – PAGE 3

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Evaluation" (February, 1994), as amended for use within EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February, 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."


Tetra Tech NUS, Inc.

Justin Orbich
Chemist/Data Validator


Tetra Tech NUS, Inc.

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

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2. Appendix B - Results as Reported by the Laboratory
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APPENDIX A
Qualified Analytical Results

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- UJ - Nondetected result is considered to be estimated as a result of technical noncompliances.

**CTO252 - NAWC WARMINSTER
WATER DATA
QUANTERRA
SDG: BR415**

SAMPLE NUMBER	1TB-090398	FB-090398	RB-090398	
SAMPLE DATE	09/03/98	09/03/98	09/03/98	//
LABORATORY ID	C81040138010	C81040138011	C81040138012	
QC_TYPE	NORMAL	NORMAL	NORMAL	
% SOLIDS:	100.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	5	U		5	U		5	U				
1,1,2,2-TETRACHLOROETHANE	5	U		5	U		5	U				
1,1,2-TRICHLOROETHANE	5	U		5	U		5	U				
1,1-DICHLOROETHANE	5	U		5	U		5	U				
1,1-DICHLOROETHENE	5	U		5	U		5	U				
1,2-DICHLOROETHANE	5	U		5	U		5	U				
1,2-DICHLOROETHENE (TOTAL)	5	U		5	U		5	U				
1,2-DICHLOROPROPANE	5	U		5	U		5	U				
2-BUTANONE	2.6	J	C	20	U		20	U				
2-HEXANONE	20	U		20	U		20	U				
4-METHYL-2-PENTANONE	20	U		20	U		20	U				
ACETONE	5.7	J	CP	4.9	J	CP	5.5	J	CP			
BENZENE	5	U		5	U		5	U				
BROMODICHLOROMETHANE	5	U		5	U		5	U				
BROMOFORM	5	U		5	U		5	U				
BROMOMETHANE	10	U		10	U		10	U				
CARBON DISULFIDE	5	U		5	U		5	U				
CARBON TETRACHLORIDE	5	U		5	U		5	U				
CHLOROBENZENE	5	U		5	U		5	U				
CHLOROETHANE	10	U		10	U		10	U				
CHLOROFORM	5	U		5	U		5	U				
CHLOROMETHANE	10	U		10	U		10	U				
CIS-1,3-DICHLOROPROPENE	5	U		5	U		5	U				
DIBROMOCHLOROMETHANE	5	U		5	U		5	U				
ETHYLBENZENE	5	U		5	U		5	U				
METHYLENE CHLORIDE	5	U		5	U		5	U				
STYRENE	5	U		5	U		5	U				
TETRACHLOROETHENE	5	U		5	U		5	U				
TOLUENE	5	U		5	U		5	U				
TRANS-1,3-DICHLOROPROPENE	5	U		5	U		5	U				
TRICHLOROETHENE	5	U		5	U		5	U				
VINYL CHLORIDE	10	U		10	U		10	U				
XYLENES, TOTAL	5	U		5	U		5	U				

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR415

SAMPLE NUMBER:	VS-A-1A-04	VS-A-1B-10		
SAMPLE DATE:	09/03/98	09/03/98	//	//
LABORATORY ID:	C81040138004	C81040138001		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	96.6 %	70.0 %	100.0 %	100.0 %
UNITS:	UG/KG	UG/KG		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
TRICHLOROETHENE	7	U		9	U							



Tetra Tech NUS

INTERNAL CORRESPONDENCE

PITT-01-9-168

TO: MR. G. GLENN

DATE: FEBRUARY 11, 1999

FROM: JUSTIN ORBICH

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - SVOA
CTO252, NAWC WARMINSTER
SDG BR431

SAMPLES: 5/Solid

VS-2A-11S
VS-2A-75S
VS-2A-14S

VS-2A-12S
VS-2A-13S

OVERVIEW

The sample set for CTO 252, SDG BR431, Naval Air Warfare Center (NAWC) Warminster consists of five (5) solid environmental samples. The samples were analyzed for benzo(g,h,i)perylene and indo(1,2,3-cd)pyrene organic compounds. No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech NUS, Inc. on October 14th, 1998 and analyzed by Quanterra. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria, and SW 846 Method 8270C analytical and reporting protocols.

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until extraction/analysis, GC/MS tuning and system performance, initial and continuing calibration data, laboratory and field quality control blank results, surrogate spike recoveries, Matrix Spike/Matrix Spike Duplicate (MS/MSD) results, Laboratory Control Sample (LCS) results, internal standard performance, and compound identification and quantitation.

Areas of concern are listed below.

Major Problems

- None noted.

Minor Problems

- In the semivolatile fraction, all samples were extracted outside the EPA Region III holding time criteria by fourteen (14) days. The positive and nondetected results were qualified as estimated, (J) and (UJ), respectively. The direction of bias is unknown.
- Several samples contained positive results for compounds below the contract required quantitation limits (CRQL). These results were qualified as estimated (J). The direction of bias is unknown.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 – PAGE 2

Notes

The Laboratory Control Sample (LCS) Percent Recovery (%R) exceeded the upper quality control limit for hexachlorocyclopentadiene. No action is warranted on LCS data alone, as per the functional guidelines.

It should be noted several Matrix Spike/Matrix Spike Duplicate (MS/MSD) Percent Recoveries (%Rs) were calculated by the laboratory incorrectly. The corrected %Rs exceeded the quality control limit for several compounds. No action is warranted on MS/MSD data alone, as per the Functional Guidelines.

The laboratory incorrectly called the client sample identification as VS-2A-15S on the Form I. By using the laboratory sample identification as a reference, the correct identification was determined to be VS-2A-75S. The data was not impacted by the change of the identification on the associated Forms.

Sample VS-2A-11S reported elevated detection limits due to a 5X dilution.

Sample VS-2A-14S reported elevated detection limits due to a 10X dilution.

It should be noted sample VS-2A-11S reported full TCL semivolatile organic compounds on the Form I. However, the Chain of Custody stated only benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene were analyzed.

EXECUTIVE SUMMARY

Laboratory Performance Issues: The samples were extracted outside of the seven (7) day holding time criteria. The laboratory incorrectly labeled a sample VS-2A-75S as VS-2A-15S. Several MS/MSD %Rs were calculated incorrectly.

Other Factors Affecting Data Quality: Several MS/MSD %Rs exceeded the quality control limit. LCS %R noncompliance was noted for hexachlorocyclopentadiene. Several samples were analyzed at a dilution.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 – PAGE 3

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Evaluation" (February, 1994), as amended for use within EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February, 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."


Tetra Tech NUS, Inc.

Justin Orbich
Chemist/Data Validator


Tetra Tech NUS, Inc.

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
Qualified Analytical Results

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR431

SAMPLE NUMBER:	VS-2A-11S	VS-2A-12S	VS-2A-75S	VS-2A-13S
SAMPLE DATE:	10/14/98	10/14/98	10/14/98	10/14/98
LABORATORY ID:	C8J270104001	C8J270104002	C8J270104005	C8J270104003
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	89.0 %	88.0 %	95.5 %	91.3 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:			VS-2A-12S	

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BENZO(G,H,I)PERYLENE	2800	J	H	310	J	HP	410	J	H	360	UJ	H
INDENO(1,2,3-CD)PYRENE	3200	J	H	310	J	HP	410	J	H	360	UJ	H

DATA QUALIFIER DEFINITIONS:

- U - Value is a nondetected result as reported by the laboratory and should not be considered present.
- J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.
- UJ - Nondetected result is considered to be estimated as a result of technical noncompliances.



Tetra Tech NUS

INTERNAL CORRESPONDENCE

PITT-02-9-094

TO: MR. G. GLENN **DATE:** FEBRUARY 11, 1999

FROM: JUSTIN ORBICH **COPIES:** DV FILE

SUBJECT: ORGANIC DATA VALIDATION – PAH
CTO252, NAWC WARMINSTER
SDG BR455

SAMPLES: 1/Aqueous
W-RB-121798
3/Solid
VS-2B-01 VS-2B-02
VS-2B-03

OVERVIEW

The sample set for CTO 252, SDG BR455, Naval Air Warfare Center (NAWC) Warminster consists of one (1) rinsate blank (designated RB) and three (3) solid environmental samples. The samples were analyzed for selected Polynuclear Aromatic Hydrocarbon (PAH) organic compounds. No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech NUS, Inc. on December 17th, 1998 and analyzed by Quanterra. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria, and SW 846 Method 8270C analytical and reporting protocols.

All compounds were successfully analyzed with the exception of those compounds qualified as rejected. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until extraction/analysis, GC/MS tuning and system performance, initial and continuing calibration data, laboratory and field quality control blank results, surrogate spike recoveries, Matrix Spike/Matrix Spike Duplicate (MS/MSD) results, Laboratory Control Sample (LCS) results, internal standard performance, and compound identification and quantitation.

Areas of concern are listed below.

Major Problems

- None noted.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 – PAGE 2

Minor Problems

- Several samples contained positive results for compounds below the contract required quantitation limits (CRQL). These results were qualified as estimated (J). The direction of bias is unknown.

Notes

In the semivolatile sample W-RB-121798, the continuing calibration Percent Difference (%D) exceeded the 25% quality control limit for benzo(g,h,i)perylene. No action was warranted since the %D did not exceed 50% and only nondetected results were reported.

Sample W-RB-121798 yielded zero percent recoveries for the acid fraction surrogates. No action was warranted since the compounds of interest in the samples were of the base/neutral fraction.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Continuing calibration %D exceeded the quality control limit for benzo(g,h,i)perylene.

Other Factors Affecting Data Quality: Several acid fraction surrogates yielded 0% recoveries.

MEMO TO: MR. G. GLENN
DATE: FEBRUARY 11, 1999 – PAGE 3

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Evaluation" (February, 1994), as amended for use within EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February, 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS, Inc.

Justin Orbich
Chemist/Data Validator



Tetra Tech NUS, Inc.

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
Qualified Analytical Results

DATA QUALIFIER DEFINITIONS:

- U - Value is a nondetected result as reported by the laboratory and should not be considered present.
- J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.
- UJ - Nondetected result is considered to be estimated as a result of technical noncompliances.
- R - Value is rejected as a result of a high %D between columns.

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR455

SAMPLE NUMBER:	VS-2B-01	VS-2B-02	VS-2B-03	
SAMPLE DATE:	12/17/98	12/17/98	12/17/98	//
LABORATORY ID:	C8L180120001	C8L180120002	C8L180120003	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	88.0 %	91.9 %	85.0 %	100.0 %
UNITS:	UG/KG	UG/KG	UG/KG	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BENZO(A)ANTHRACENE	340	J	P	380			390	U				
INDENO(1,2,3-CD)PYRENE	220	J	P	280	J	P	37	J	P			

The samples were collected by Tetra Tech NUS on September 2-3, and October 14 and 15th, 1998 and analyzed by Quanterra Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and SW-846 Method 8260B and 8270C analytical and reporting protocols.

All samples were successfully analyzed with the exception of those compounds qualified as rejected. The findings offered in this report are based upon a general review of all available data including: data completeness, holding times, GC/MS tuning and system performance, initial/continuing calibrations, laboratory method and field quality control blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standard performance, tentatively identified compounds, compound identification, compound quantitation, and detection limits. Areas of concern are listed below.

Major Problems

- None noted.

Minor Problems

- Positive results reported below the Contract Required Quantitation Limit (CRQL) are qualified as estimated, (J). The direction of bias cannot be determined.

Notes

The electronic deliverable did not include volatile results for VS-A-1A-07 and VS-A-1A-08. These results were added manually.

Several samples in BR423 and BR424 required dilution due to compounds exceeding the instrument's linear calibration range. Dilution factors ranged for 2X to 4X.

Matrix spike and matrix spike duplicate recoveries less than 10% were reported for benzo(g,h,i)perylene and indeno(1,2,3-c,d)pyrene in VS-2A-15S. No qualifiers were assigned on this basis as the noncompliance was due to the required dilution of the sample extract.

Because VS-2A-15S was used for the MS/MSD analysis, the Form 1 for this sample contained the entire semivolatile target compound list. However, only the results for the compounds of interest were reported on the electronic deliverable.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: None.

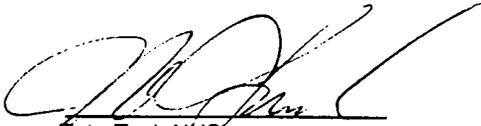
The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (9/94) as modified by Region III and the NFESC guidelines "Navy Installation Restoration Program Laboratory Quality Assurance Guide" (February, 1996). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."



TetraTech NUS

Linda Karsonovich
Chemist/Data Validator



TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Definitions:

- U- Compound is nondetected as reported by the laboratory.
- J- Reported result is an estimate due to various technical noncompliances.

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

CTO252 - NAWC WARMINSTER

SOIL DATA

QUANTERRA

SDG: BR119

SAMPLE NUMBER	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-05
SAMPLE DATE:	09/02/98	09/02/98	09/02/98	09/03/98
LABORATORY ID:	A81040132004	A81040132005	A81040132006	A81040127001
QC_TYPE	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	83.0 %	54.0 %	70.0 %	80.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
TRICHLOROETHENE	5.4	U		10	U		6.8	U		6	U	

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR119

SAMPLE NUMBER:	VS-A-1A-06	VS-A-1A-25	VS-A-1B-07	VS-A-1B-08
SAMPLE DATE:	09/03/98	09/03/98	09/02/98	09/02/98
LABORATORY ID:	A81040127003	A81040127002	A81040132001	A81040132002
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	85.0 %	80.0 %	85.0 %	87.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
TRICHLOROETHENE	6.2	U		6.4	U		5	U		5.4	U	

CTO252 - NAWC WARMINSTER
 WATER DATA
 QUANTERRA
 SDG: BR119

SAMPLE NUMBER:	2TB-090298	2TB-090398		
SAMPLE DATE:	09/02/98	09/03/98	//	//
LABORATORY ID:	A81040132007	A81040127006		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	100.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
TRICHLOROETHENE	5	U		5	U							

CTO252 - NAWC WARMINSTER
 WATER DATA
 QUANTERRA
 SDG: BR119

SAMPLE NUMBER	2TB-090298	2TB-090398		
SAMPLE DATE	09/02/98	09/03/98	//	//
LABORATORY ID	A81040132007	A81040127006		
QC_TYPE	NORMAL	NORMAL		
% SOLIDS	0.0 %	0.0 %	100.0 %	100.0 %
UNITS	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
TRICHLOROETHENE	5	U		5	U							

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR119

SAMPLE NUMBER:	VS-A-1A-01	VS-A-1A-02	VS-A-1A-03	VS-A-1A-05
SAMPLE DATE:	09/02/98	09/02/98	09/02/98	09/03/98
LABORATORY ID:	A81040132004	A81040132005	A81040132006	A81040127001
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	83.0 %	54.0 %	70.0 %	80.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
TRICHLOROETHENE	5.4	U		10	U		6.8	U		6	U	

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR119

SAMPLE NUMBER:	VS-A-1A-06	VS-A-1A-25	VS-A-1B-07	VS-A-1B-08
SAMPLE DATE:	09/03/98	09/03/98	09/02/98	09/02/98
LABORATORY ID:	A81040127003	A81040127002	A81040132001	A81040132002
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	85.0 %	80.0 %	85.0 %	87.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
TRICHLOROETHENE	6.2	U		6.4	U		5	U		5.4	U	

CTO252 - NAWC WARMINSTER
SOIL DATA
QUANTERRA
SDG: BR423

SAMPLE NUMBER:	VS-2A-01S	VS-2A-02S	VS-2A-03S	VS-2A-04S
SAMPLE DATE:	10/14/98	10/14/98	10/14/98	10/14/98
LABORATORY ID:	C8J150136016	C8J150136017	C8J150136018	C8J150136019
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	87.0 %	83.0 %	88.0 %	85.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BENZO(G,H,I)PERYLENE	3100			400	U		970			390	U	
INDENO(1,2,3-CD)PYRENE	4300			49	J	P	1300			390	U	

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR423

SAMPLE NUMBER:	VS-2A-05S	VS-2A-06S	VS-2A-07S	VS-2A-08S
SAMPLE DATE:	10/14/98	10/14/98	10/14/98	10/14/98
LABORATORY ID:	C8J150136020	C8J150136021	C8J150136022	C8J150136023
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	82.0 %	81.0 %	83.0 %	85.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMI-VOLATILES												
BENZO(G,H,I)PERYLENE	400			410	U		55	J	P	2000		
INDENO(1,2,3-CD)PYRENE	540			410	U		72	J	P	2500		

CTO252 - NAWC WARMINSTER
 SOIL DATA
 QUANTERRA
 SDG: BR424

SAMPLE NUMBER:	VS-2A-15S	VS-2A-76S	VS-2A-16S	VS-2A-17S
SAMPLE DATE	10/15/98	10/15/98	10/15/98	10/15/98
LABORATORY ID.	C8J160146009	C8J160146013	C8J160146010	C8J160146011
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	94.0 %	89.0 %	88.0 %	89.0 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:		VS-2A-15S		

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BENZO(G,H,I)PERYLENE	1900			2200			380	U		250	J	P
INDENO(1,2,3-CD)PYRENE	2200			2600			380	U		330	J	P

APPENDIX C



TETRA TECH NUS, INC.

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(610) 491-9688 ■ FAX (610) 491-9645 ■ www.tetrattech.com

C-51-12-8-3

December 2, 1998

Project 7603

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern Division
Environmental Contracts Branch, Mailstop #82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N642472-90-D-1298
Contract Task Order (CTO) No. 290

Subject: Additional Geophysical Survey for Sites 1 and 2 (Revision No. 1)
Area A Remedial Investigation/Feasibility Study (RI/FS)
Former Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

As requested, Tetra Tech NUS, Inc. (TiNUS) has reviewed the results of previous geophysical surveys conducted in the vicinity of Sites 1, 2, and 3 (collectively refer to as Area A) at the subject base. Two separate surveys have been performed in this area. The first electromagnetic (EM) survey was performed by SMC Martin in 1990 as part of Phase I RI work (refer to Figure 5-1, Stages I and II Rough Draft RI Report, April 1991). Brown & Root (B&R) Environmental (now TiNUS) did the second EM survey in 1995 (Figures 4-16 and 4-17, Draft Phase III RI Report, November 1996). The second survey was conducted due to perceived deficiencies with the first survey in terms of the extent of coverage, spacing of profile lines and stations, and data evaluation process. Both surveys were performing using EM-31 electromagnetic equipment.

While there are some similarities between the results of the two surveys, in general, the B&R Environmental survey results did not substantiate the findings of the Phase I RI. No detailed notes regarding the SMC Martin survey are available regarding surface conditions within Area A and the possible interference of engineered features (e.g., fences, utility lines, vehicles, parking lots, roadways, concrete works, and equipment) on the survey results. The significant observations concerning the Phase I RI and Phase III RI EM survey results are as follows:

Vicinity of Site 1

- The Phase I RI EM in-phase (metal mode) results showed a relatively straight pattern of possible buried metal readings that appear to correspond with the electric utility line for lighting near Site 1.
- Both EM surveys identified possible buried metallic debris near Excavation 1a. No such debris was encountered during work at Excavation 1a. Neither survey (based on conductivity readings) indicated the presence of buried material recently removed and disposed from Excavation 1b.

C-51-12-8-3

Mr. Lonnie Monaco

Naval Facilities Engineering Command (NAVFACENGCOM)

December 2, 1998 - Page 2

- Neither EM survey identified the drums encountered within Excavation 1b. The highest Phase I RI EM in-phase readings were noted west of the general location where buried drums were found.
- The Phase III RI EM in-phase readings identified a buried metallic anomaly near Excavation 1b, to the west of well HN-111, but metallic surface debris was noted at this location as well.

Vicinity of Site 2

- The Phase I RI EM conductivity results revealed a conductivity low (indicative of possible buried material) near the boundary for Excavation 2a. While the Phase I EM in-phase readings identified possible buried metal within this same anomaly, buried metal was not found in this general area.
- The Phase III RI EM survey readings were hampered by the presence of OHM Corporation construction trailers. The Phase III conductivity results indicated the possible presence of buried material in the western half of Excavation 2a.
- The EM anomaly identified during the Phase I RI EM survey does not correspond well to the Phase III RI soil boring results and visual observations made during work at Excavation 2a.
- Again, the Phase I RI EM in-phase (metal mode) results show a relatively straight pattern of possible buried metal readings that may be related to the electric utility line for lighting near Site 2.

Proposed Scope of Work

To confirm and verify current conditions at Sites 1 and 2, a limited magnetometer and electromagnetic (EM) survey is proposed in the vicinity of Sites 1 and 2. This survey will help identify any areas of anomalous magnetic field strength. The purpose of the survey is to locate any remaining buried drums and other ferrous metal objects and to clear drilling locations for the Area A extraction well network.

The magnetometer and EM survey will be conducted along the northern property boundary in the vicinity of Area A. This area was previously not available for geophysical surveying due to presence of multiple fences. The survey will not include the locations of Excavations 1a and 1b, since these excavations have already proceeded to bedrock. Figure 1 shows the approximate area to be surveyed. The survey area will be confined to the estimated boundary of potential disposal sites (as identified by EPIC) in the vicinity of Sites 1 and 2.

Before conducting the magnetometer survey, an on-base reconnaissance will be done to evaluate possible interferences and to lay out the survey grid. A base station will be established and magnetometer readings will be collected at each grid station. Total field magnetic field intensity and vertical gradient measurements will be recorded with the magnetometer. The EM survey will cover the same survey grid and measurements of metal detections will be recorded. Station spacing will be approximately 10 feet.

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Mr. Lonnie Monaco
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A Geometrics G-858 cesium vapor magnetometer will be used to record readings. A Geometrics G-856 proton precession magnetometer will be set up at a pre-selected base station, if practicable. If not practicable, magnetometer readings will be recorded at a common point before, during, and after the survey on each day. The base station magnetometer will be calibrated to a reference magnet or to a fixed-length (6 inches) of steel pipe as needed during the survey. The EM survey will be conducted using a Geonics EM-61, which will allow for closer EM readings near well casings and other potential interferences. Both instruments will be tested at the start of the survey to better refine the survey grid.

The traverses of the survey grid will be oriented parallel to the long axis of Sites 1 and 2 (i.e., along the northeastern fence). TtNUS believes that the area to be surveyed better lends itself to this type of orientation. Traverses running north and south will be extremely short and may impede the data collection phase of the survey. If necessary, the grid will be divided in two pieces, one for Site 1 and one for Site 2.

The data collection phase of the magnetometer survey is expected to take between 3 and 5 days. The data evaluation phase will last about another week. The results of the magnetometer survey will be compared to the Phase I and Phase III RI EM surveys. The results will also be reviewed with regard to any cultural or engineered interferences, if they could not be eliminated during the data collection phase of the survey.

Based on the results of the magnetometer and EM survey, TtNUS will make recommendations regarding additional work that may be necessary to investigate any significant magnetic anomalies.

Please contact me if you have any questions or comments.

Sincerely,



Neil Teamerson
Project Coordinator

ANT/ejc

Enclosure

c: Thomas Ames (NAVFACENGCOM)
Timothy McEntee (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
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C-51-12-8-54

December 31, 1998

Project 7603

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern Division
Environmental Contracts Branch, Mailstop #82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N642472-90-D-1298
Contract Task Order (CTO) No. 290

Subject: Results from Additional Geophysical Surveys for Sites 1 and 2
Area A Remedial Investigation/Feasibility Study (RI/FS)
Former Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

As requested, Tetra Tech NUS, Inc. (TtNUS) has reviewed the results of the additional geophysical surveys conducted in the vicinity of Sites 1 and 2 at the subject base. This letter summarizes the scope of work and related preliminary findings.

Background

During the period December 8 through December 11, 1998, TtNUS conducted additional geophysical surveys at the former Naval Air Warfare Center (NAWC), Warminster, Pennsylvania. The surveys were conducted in the vicinity of Sites 1 and 2 (see Figure 1). The purpose of the geophysical surveys was to locate any remaining buried drums and other ferrous metal objects and to clear drilling locations for the Area A extraction well network.

Geophysical Equipment and Data Acquisition

TtNUS deployed two Geometrics G858 Cesium Vapor magnetometers and one Geonics EM-61 electromagnetic (EM) metal detector for the survey. The magnetometer was selected for this project to detect ferrous, metallic objects. One magnetometer was used to record the diurnal variations of the earth's magnetic field. The second magnetometer was used as a roving magnetic gradiometer. An experienced geophysicist operated the equipment.

During the magnetometer survey, the base station magnetometer was set up in the best possible location away from traffic, power lines, and strong magnetic gradient. Data were stored at one-half-second intervals, along with time of measurement synchronized to the roving magnetometer clock. The base station magnetometer was downloaded to a computer at the end of the day to correct the roving magnetometer data for diurnal variations of the earth's magnetic field.

The roving magnetic gradiometer sensors were positioned vertically on a pole, one-half meter apart. Data from the two-sensor gradiometer were stored in the console's internal memory as top and bottom sensor total magnetic field data with assigned line coordinates. The data were time-

stamped for the diurnal corrections and recorded at ten reading per second. Measurements were collected along lines spaced 10 feet apart. A mark was placed within the data as the operator passed each 50-foot interval flag. The magnetic gradiometer data was downloaded to a computer at the end of the day for processing. The data were later interpolated between marks and assigned "X" and "Y" grid coordinate positioning. The top sensor data were used for the total field data in nanoTesla's (nT), and the vertical magnetic gradient data were calculated by determining the difference between the top and bottom sensors. The gradient data are expressed as nanoTesla's per meter (nT/m).

The Geonics EM-61 time domain electromagnetic metal detector system was selected for this project to sense all types of buried metallic objects. The EM-61 has been proven effective in obtaining data in the proximity of wellheads, fences, power lines and other man-made interference. The EM-61 was operated in standard wheel mode, with data collection at 0.63-foot intervals along lines spaced 5 feet apart. The data collected by the EM-61 are expressed as millivolts (mV). Data were stored in an Omnidata Polycorder with associated line and position coordinates. The data were downloaded periodically to a computer for later processing.

Field Activities

On December 8, 1998, the project team established a local coordinate grid system with compass and tape measures. The starting point (designated x = 0 feet and y = 100 feet) was positioned north of the water treatment building and truck apron (see Figure 1). The grid was oriented from northwest to southeast to maximize data collection efficiency. Stakes and pin flags were placed at 50-foot intervals along the lines spaced 10 feet apart.

On December 9, 1998, the survey grid was completed. Metal barricade posts were removed from the site, because they were expected to interfere with geophysical measurements. The magnetometer survey was initiated in the afternoon of December 9. On December 10, magnetometer measurements over the Area 1 (i.e., Site 1) and Area 2 (i.e., Site 2) grid were completed. Following the magnetometer survey, the EM survey was started over Area 1.

In the afternoon of December 10, a conversation with the TtNUS site representative outlined additions to the survey area. The grid area was expanded to cover additional area toward the southeast adjacent to Area 2. A majority of the grid over Area 2 was completed with the EM instrumentation. On December 11, 1998, EM and magnetometer data collection was completed over all of the Area 1 and 2 grid. Preliminary data analysis was performed to verify completeness of the data sets. On December 12, a limited rough-sketch map was drawn to aid in the interpretation of the data, and barricades were placed to limit access to the area.

Data Processing and Interpretation

The data from each instrument were entered into software packages to check for accuracy and completeness and to correct operator entry errors from field data collection. Upon demobilization, the magnetometer data were fully corrected for diurnal drift and formatted for processing software. The EM-61 data were also formatted for the processing software package. Each data set was entered into the Geosoft Oasis Montaj® data processing software for visual display of the data. Anomalous areas were checked using computer aided design (CAD) drawings and limited sketch maps to determine if the anomaly was associated with man-made features or anomalies caused by metallic debris or possible drums. The EM-61 data (see Figure 2), magnetometer total field data (see Figure 3) and magnetic gradient data (see Figure 4) were compared to one another to determine if coincident anomalies occurred. The magnetometer data were found to be influenced more from the fences, well heads, power lines and other interference than the EM-61 data. In most cases, anomalies were found to coincide from each data set.

Findings

The anomaly interpretation map is shown as Figure 5. Four areas have been highlighted as significant anomalous zones, and about 20 other small, isolated anomalies are indicated as "X's" on the map.

Anomalous Zone 1 begins near the Site 1 and Site 2 boundary. A former walkway is present on the eastern edge of this zone. The cause of this zone may be associated with possible lighting foundations, the sidewalk itself, and associated metallic objects. This area should be fully ground-checked to determine if surface features influence the anomalous zone.

Anomalous Zone 2 is located on the northwestern edge of Excavation 2a. A portion of the anomalous zone is outside of the excavation, and the other half is within the excavation. Wires and rusty cables were observed protruding from the wall of the excavation during the geophysical surveys. This anomalous zone is likely caused by the wires and cables visually observed by the survey team.

Anomalous Zone 3 is located primarily within Excavation 2a and was detected by both the EM and magnetic instruments. Visual observations indicate that the excavation area contains considerable metallic debris, primarily pieces of rusty metal. The EM data suggest that the debris is contained inside of the fenced area north of Excavation 2a. The extreme eastern portion of Zone 3 extends into a wooded area. It was not possible to obtain accurate data in this thickly wooded area adjacent to the fencing.

Anomalous Zone 4 is located south of the eastern edge of Excavation 2a and north of Excavation 2c. The anomalous area is likely located beneath the gravel roadway. Comparisons of the data and CAD drawings indicate Zone 4 to be near the northeastern corner of the former OHM trailer area. The area should be visually inspected to determine if surface features could explain the anomaly.

Isolated anomalies indicated by "X's" on the anomaly map generally were detected by both magnetic and electromagnetic instrumentation. These isolated anomalies should be ground-checked to determine if surface features may have caused the associated geophysical responses. The size and strength of these anomalies likely represent small metallic objects and not steel drums or drum remnants.

Summary

During the week of December 8 through 12, 1998, TtNUS conducted geophysical surveys at NAWC Warminster. A local grid system was established using a compass and tape measure. The long axis of the local grid was oriented northwest to southeast. An EM survey using the Geonics EM-61 metal detector and a magnetic survey using the Geometrics G858 cesium vapor magnetic gradiometer were conducted.

Four anomalous zones were identified by joint interpretation of the magnetic and electromagnetic data. In addition, about 20 isolated anomalies were identified. In most instances, both the magnetic gradiometer and the EM metal detector detected the anomalous zones and other isolated anomalies. Metallic objects or debris probably causes the anomalies, but the exact type of metal (e.g., drums) cannot be determined from the geophysical data.

Significant interference from engineered (man-made) metallic objects, utilities, and fences were encountered. An effort was made by the geophysicist to eliminate known surface interference by using field sketch maps and CAD drawings from the anomaly map shown as Figure 5. Ground-

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checking of the anomalous zones should be performed to determine if engineered structures, such as utilities, lighting, wellheads or other surface metallic objects, may have caused the anomalies.

In those cases where ground-checking fails to reveal the source of the anomalous responses, exploratory test pits should be excavated to confirm the presence of buried metallic objects or debris. Existing subsurface boring logs and test pit logs should be reviewed before planning these excavations. The excavations should generally be at least 6 feet deep, 3 feet wide, and 10 feet long, given site-specific conditions.

Please contact me if you have any questions or comments.

Sincerely,

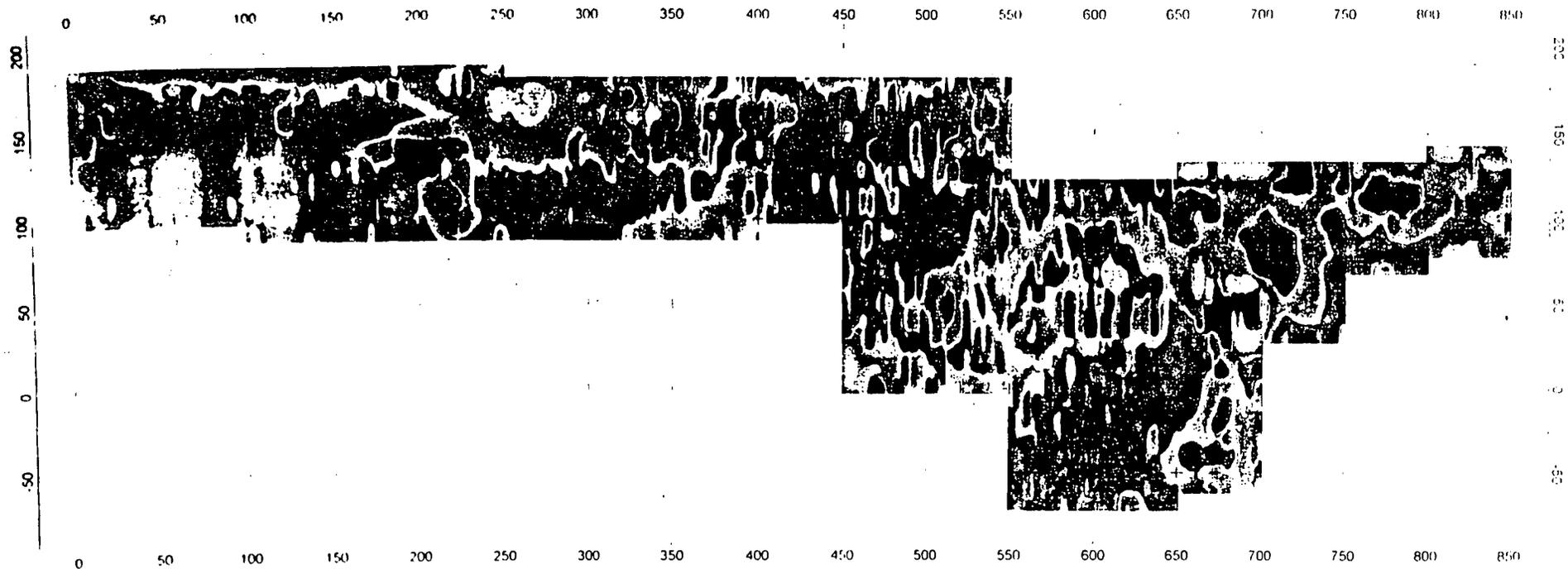


Neil Teamerson
Project Coordinator

ANT/ejc

Enclosures

c: Thomas Ames (NAVFACENGCOM)
Steven Lehman (NAVFACENGCOM)
Timothy McEntee (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
David Fennimore (Earth Data)
John Magee (Foster Wheeler)
Anthony Sauder (Pennoni)
Ronald Sloto (USGS)
Jeffrey Orient (TtNUS)
Garth Glenn (TtNUS) (without enclosures)



VERTICAL MAGNETIC GRADIENT
NANO TESLA/METER

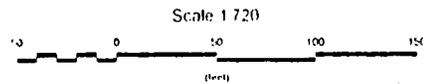
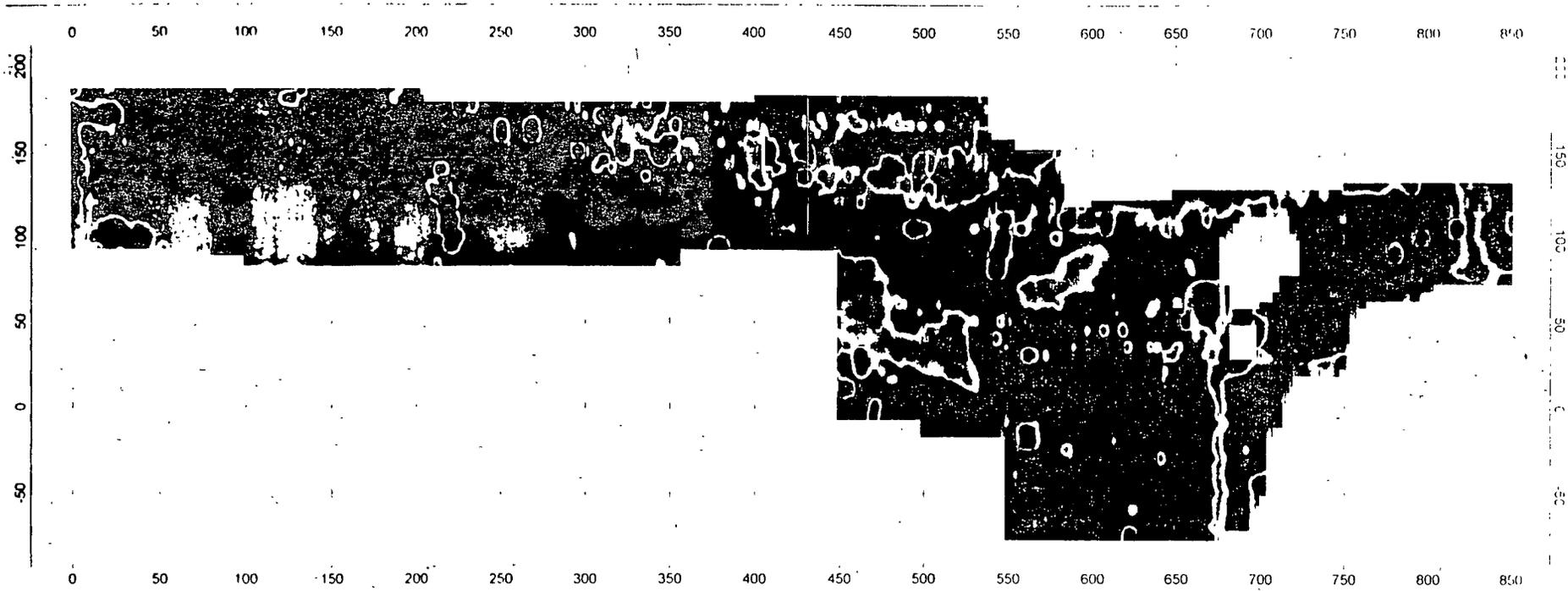


FIGURE 4
TETRA TECHNIUS
FORMER NAWC WARMINS IER CTO 290
MAGNETIC GRADIENT nT/meter
Area 1 and Area 2



100
 50
 0
 -50
 0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850

BOTTOM COIL
 MILLIVOLTS

Scale 1 720
 0 50 100 150
 (feet)

FIGURE 2
 TETRA TECH NUS
 FORMER NAWC WARMINSTER CTO 200
 EM61 METAL DETECTOR

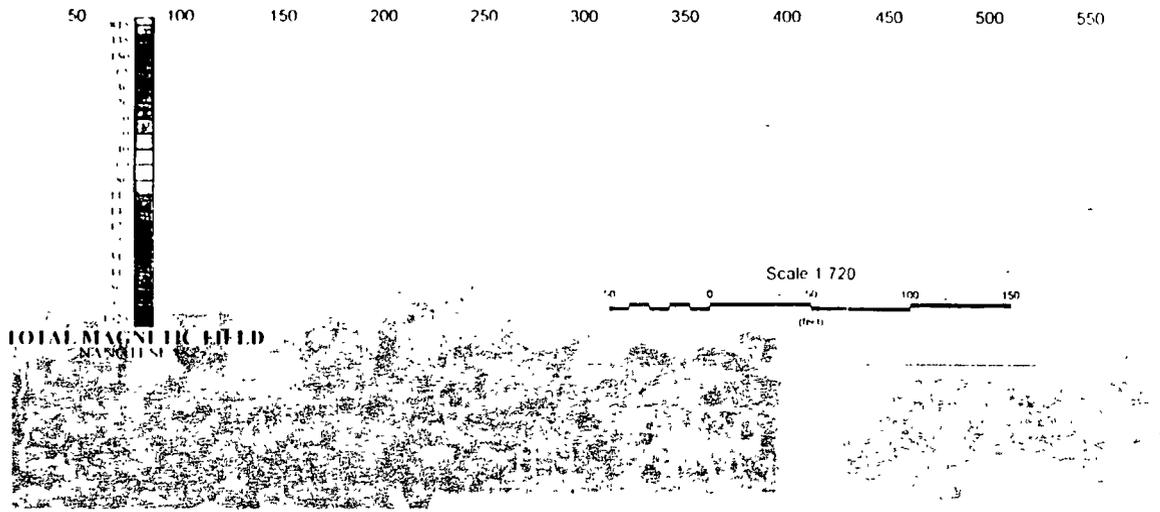
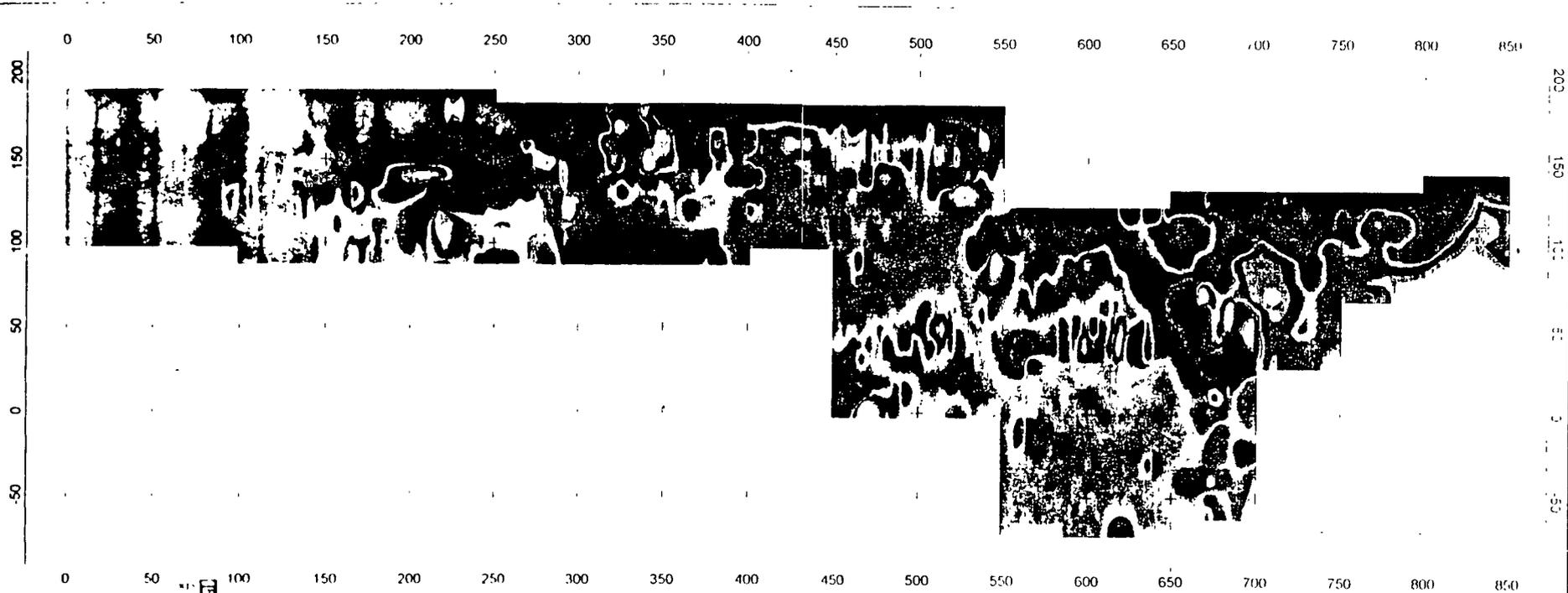
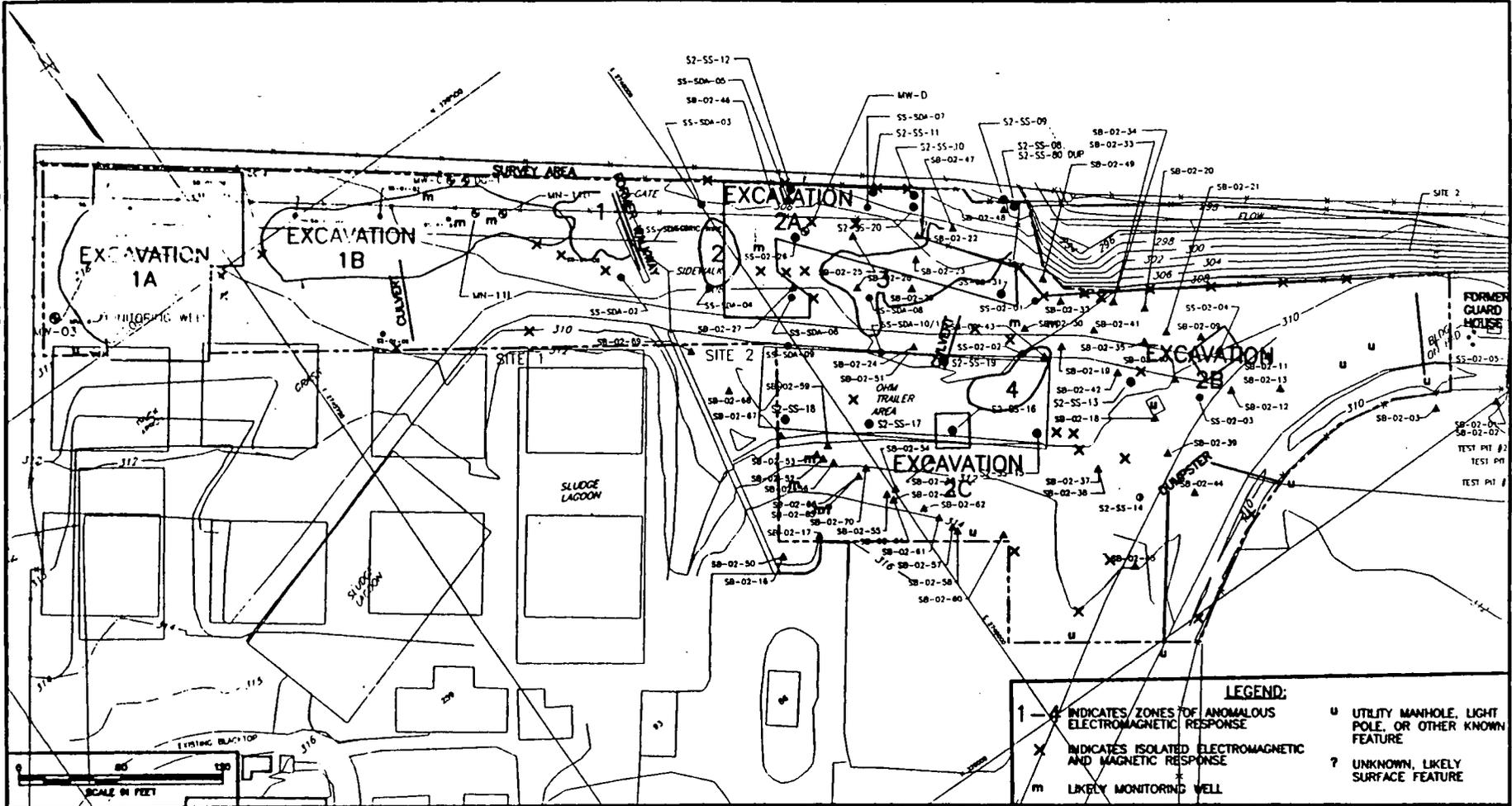


FIGURE 3
TETRA TECH NUS
FORMER NAWC WARMINSTER CTO 200
TOTAL MAGNETIC FIELD
Area 1 and Area 2

L:\UT\SCADA\CAD\PROJECTS\7603\7603CAD003



NO.	DATE	REVISIONS	BY	CHK'D	APP'D	REFERENCES

DRAWN BY FEN	DATE 12/29/1998	Tetra Tech NUS, Inc.	CONTRACT NO. NR2472-90-D-1298
CHECKED BY <i>KA</i>	DATE <i>12/31/98</i>	GEOPHYSICAL SURVEY ANOMALIES	NUMBER NO. C/D 290
COST/SCHED-AREA		FORMER NAWC WARMINSTER	APPROVED BY: _____ DATE: _____
SCALE 1 in. = 80 ft.		AREAS 1 AND 2	APPROVED BY: _____ DATE: _____
		DECEMBER 1998	Drawn by: _____
			FIGURE 5

FORM 0400 HD. L:\VAD\14\BLOCKS\BORDERS\TERRA_BLOCK02

**Summary of Field Observations
NAWC Warminster
Geophysical Test Pit Excavation**

Summary of field observations from the January 26, 1999 excavation of test pits at four geophysical areas of interest. Foster Wheeler Environmental Corp. conducted excavations at the locations identified in Attachment 1 in accordance with the plan dated January 15, 1999. Present during the excavations, as observers, were Darius Ostrauskas (EPA Region 3), Alfred Yates (Gannett Fleming, contractor to EPA), and Garth Glenn (Tetra Tech NUS).

Area 1

Surface observations: The remnants of a lamp stand with concrete foundation and electrical wires were observed about 15 feet east of the test pit location. Two steel straps were noted on the surface, toward the northern end, of the test pit area. These appeared to be cyclone fence post straps. Each was about 2 inches wide and 18 inches long with bolts at one end of the broken strap.

Subsurface observations: What appeared to be a grounding rod was encountered about 10 feet from the northern end of the test pit. The top of the rod was about 1 foot below ground surface (BGS) and about 3 feet of wire was attached to the rod. The rod extended at least 4 feet BGS. An approximately 6 foot long wire/cable (about 1/2 inches in diameter) was encountered at about 3 feet BGS about 18 feet from the northern end of the test pit.

Test pit measured 38 feet long, 5 feet 8 inches deep (to top of bedrock) and 40 inches wide. No waste materials were evident in the excavation or the material removed.

Area 2

Surface observations: Nothing remarkable was noted.

Subsurface observations: Electrical conduit pipe with wires was encountered at about 3 feet BGS about 8 feet from the northern end of the test pit. This appeared to be the wire from the original lamp stands along this portion of the property. A metal rod (about 4 feet by 2 inches) was encountered at about 4 feet BGS near the southern end of the test pit. Also encountered in this area was a small pocket (about 6 inches square) of a blue/green material similar to the material removed from excavation 2A. What appeared to be a rebar was encountered adjacent to the access road (southern end of the test pit) at about 3.5 feet BGS.

A pipe was noted protruding from the western wall of excavation 2A about 2 feet BGS adjacent to the southern end of the geophysical test pit. Upon investigation the pipe was found to be about 6 to 8 feet long and extended northwest toward the test pit.

Test pit measured 32 feet long, 5 feet 8 inches deep (to top of bedrock) and 40 inches wide. No waste materials were evident in the excavation or the material removed.

Area 3

Surface observations: Majority of test pit area extended through existing excavation 2A. The surface was littered with material including sporadic small (1 to 4 inches square) clumps and flecks of blue/green and white material similar to that removed from the excavation. The majority of the material consisted of glass and general refuse. The following items were noted along the test pit length: slag, glass, bottles, steel rings,

washers, sea shells, scrap metal, steel bands, electrical wire, metal bottle caps and lids, cinder blocks, broken stone, brick, broken china/dishes, steel straps, nails, concrete with re-bar, rusty cans, bailing wire, hinges, insulator caps, pipe couplings, and a 5 gallon metal pail filled with concrete.

Subsurface observations: It was necessary to move shallow soils from around the southern end of the test pit area to construct a temporary ramp into the area. During this activity two small pockets (about 1 to 2 inches square) of a yellow/green material were uncovered. This material was similar to that removed during excavation of 2A. Also encountered was a 3 feet by 5 feet piece of rusty sheet metal (siding?).

Northeast end of the test pit encountered materials similar to surface debris for the first 2 to 3 feet BGS over the first 6 to 8 feet of length. The soils below this depth appeared to be clay-type soils and did not contain evidence of waste or trash. This material was not present over the remaining portions of the test pit.

Three rusty steel straps, about 2 inches wide by 4 feet long, were noted at about 3 feet BGS approximately 10 feet from the northeast end of the test pit. At about 20 feet from the northeast end, at about 3 feet BGS, a 1 inch by 3 feet steel rod was encountered.

At about the 36-foot mark the bucket uncovered a bright greenish-yellow solid material at about 3 feet BGS. The material appeared to be about 1-foot square in size. The soils adjacent to the material appeared oily. The Foster Wheeler representative reported an oil or diesel odor and OVA readings of 6 to 7 PPM immediately above the soil. The bucket content was segregated for further sampling and disposal. A second bucket from the area revealed a smaller but similar "clump" of the greenish-yellow material and a portion of the soil appeared damp. A third bucket from the area did not contain the material and did not appear to contain oily or wet soils and did not exhibit OVA readings. The test pit side walls did not contain the material or appear oily. Both the second and third bucket of material were placed with the first for possible sampling and disposal.

At about 40 feet from the northeast end, an approximately 2 feet by 2 feet piece of rusty sheet metal was encountered at about 2 to 3 feet BGS. Two to 3 small (about 4 inches square) clumps of the blue-green material, similar to that removed from excavation 2A, along with several pieces of rotten wooden boards were noted at about 2 to 3 feet BGS at about the 50 foot mark of the test pit. A 3 inch by 3 feet metal pipe was also removed from this area at about 4 feet BGS. At about 60 feet from the northeast end, a 1 inch by 3 feet steel rod was encountered at about 4 feet BGS.

Test pit measured 62 feet long and 40 inches wide and was excavated to either bedrock or to 6 feet in depth. The test pit was excavated to 6 feet at the northeast end and continued at that depth to about the 10 feet from the starting point where bedrock was encountered. The remainder of the test pit was excavated to bedrock.

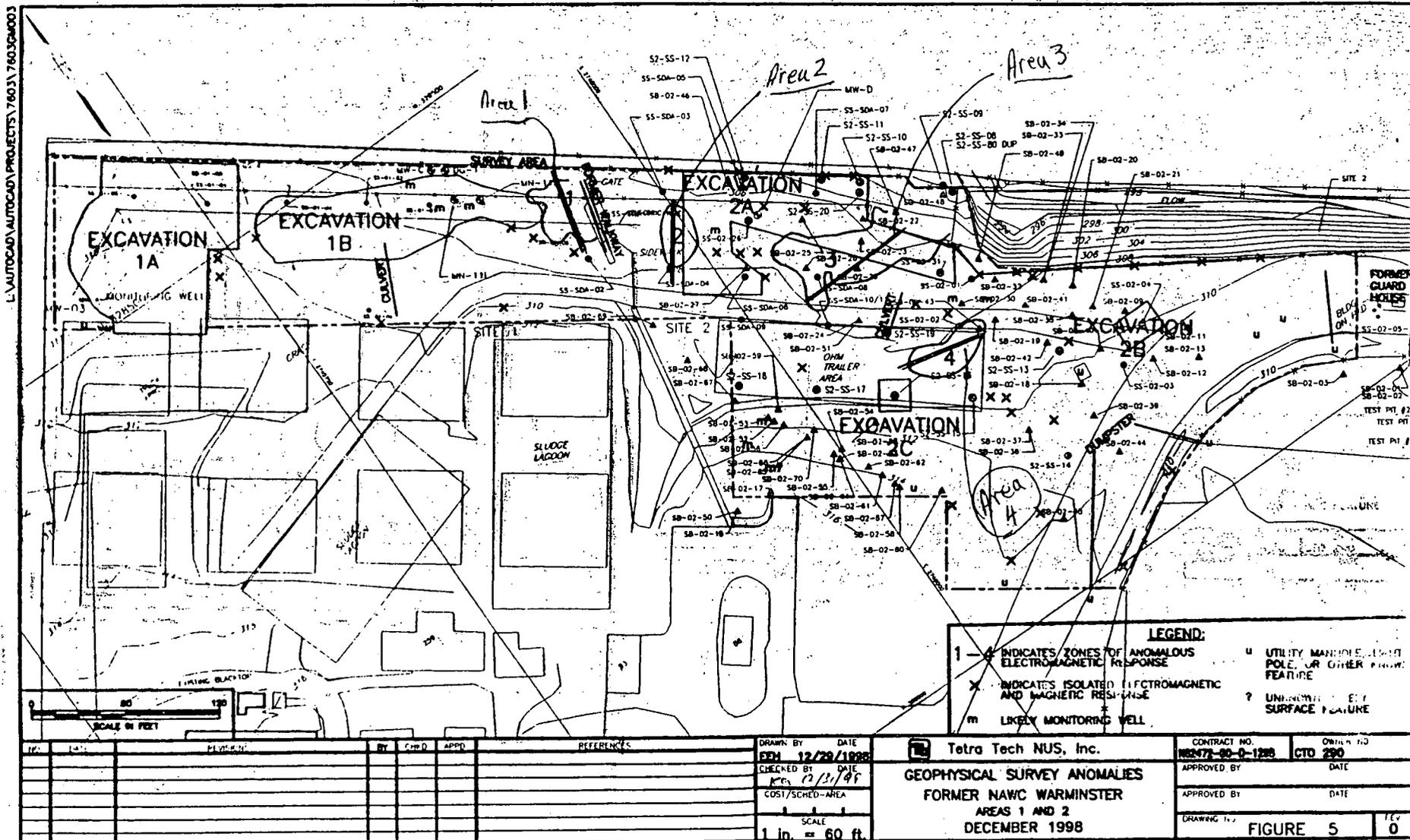
Area 4

Surface observations: Two pieces (6 inches and 2 feet) of heavy single wire electrical wire were noted on the surface of the test pit area.

Subsurface observations: A 1 inch by 3 feet steel rod and a 4 inch by 6 inch by 1/4 inch metal plate were encountered at 2 to 3 feet BGS 8 feet from the western end of the test pit. A 2 feet long piece of telephone cable/wire was removed from the top 2 feet at about 12 feet from the western end of the test pit.

Test pit measured 42 feet long, 6 feet 4 inches deep, and 40 inches wide. No waste materials were evident in the excavation or the material removed.

Approximate locations of geophysical result Test Pits
 EXAMINATED 11/24/99.



NOT TO SCALE FROM FIELD NOTES.