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NAS WILLOW GROVE
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# Remedial Investigation Report
# Addendum Six
# for
# Site 5 - Fire Training Area Soil (OU-4)

## NAS JRB Willow Grove
Horsham, Pennsylvania

## Naval Facilities Engineering Command
## Mid-Atlantic

Contract No. N62472-03-D-0057
Contract Task Order 003

June 2007

PHIL-20936

# REMEDIAL INVESTIGATION REPORT
# ADDENDUM SIX
for

## SITE 5 - FIRE TRAINING AREA SOIL (OU-4)

NAVAL AIR STATION JOINT RESERVE BASE
WILLOW GROVE, PENNSYLVANIA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command
Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511-3095

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Contract No. N62472-03-D-0057
Contract Task Order 003

June 2007


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# TABLE OF CONTENTS

**SECTION** **PAGE**

**INTRODUCTION** ..... **1**

**SITE DESCRIPTION** ..... **1**

**BACKGROUND** ..... **2**

**SUMMARY OF DIOXIN FIELD INVESTIGATION** ..... **3**

**RESULTS OF DIOXIN INVESTIGATION** ..... **4**
Summary of Soil Sample Analysis ..... 4
Human health Risk Assessment Summary ..... 4

**CONCLUSION** ..... **5**

**REFERENCES** ..... **R-1**

**APPENDICES**

**A Site 5 Remedial Investigation Addendum No. 1**
**B Site 5 Remedial Investigation Addendum No. 2**
**C Residual Risk Calculation**
**D Sample Log Sheets**
**E RMC Closeout Report**

**TABLES**

**NUMBER**

1 Preliminary Remediation Goals
2 Data Summary of Analytical Results: Dioxins/Furans in Soil

**FIGURES**

**NUMBER**

1 Facility Location Map
2 Site Location Map
3 Dioxin Sample Locations

## INTRODUCTION

Tetra Tech NUS (TtNUS) performed additional investigation of the soil at Site 5 (the former Fire Training Area) at the Naval Air Station Joint Reserve Base (NAS JRAB) Willow Grove, Pennsylvania. The work was performed under Contract Task Order No. 003 under Contract N62472-03-D-0057, Comprehensive Long-Term Environmental Action – Navy (CLEAN), in accordance with the approved Work Plan for Soil Investigation, Fall 2006, Dioxin Sampling, Site 5 - Fire Training Area, Operable Unit 4 (OU 4) (Tetra Tech NUS, September 2006). This work complements the previous remedial investigation work that is documented in the Remedial Investigation (RI) Report for Site 5 - Fire Training Area (Tetra Tech NUS, February 2002), and the Remedial Investigation Report for Sites 1, 2, 3, and 5 (Halliburton NUS, February 1993). The purpose of this soil investigation was to address regulatory agency concerns regarding the possible presence of dioxin at unacceptable concentrations within and in the vicinity of the Site 5 soil removal excavation.

## SITE DESCRIPTION

NAS JRB Willow Grove is located in Horsham Township, Montgomery County, Pennsylvania, approximately 20 miles north of the city of Philadelphia. NAS JRB Willow Grove occupies approximately 1,000 acres of the 1,200 acres maintained by the Department of Defense at the Air Station, and the Willow Grove Air Reserve Station occupies the remaining 200 acres (see Figure 1). The Air Station is generally bounded by State Route 611 (Easton Road) to the east, State Route 463 (Horsham Road) to the southwest, and Keith Valley Road to the north.

Site 5 is located in the south-central portion of NAS JRB, approximately midway between Runway 10/28 and Horsham Road (Figure 2). The site is located immediately south of Taxiway Juliet, and covers an irregularly shaped area of approximately 1.25 acres. The training area was used from 1942 to 1975 for firefighting exercises, which included the disposal and burning of flammable liquid wastes generated by the Naval Air Station. Wastes including solvents, paint chemicals, xylenes, toluene, and various petroleum compounds were reportedly consumed at the rate of at least 4,000 gallons per year. Drums were reportedly stored in the vicinity of the burn ring during the periods between firefighting exercises.

Site 5 is comprised of flat to slightly rolling terrain, and is primarily covered by grasses, buildings, and a parking lot, with some woody and brushy vegetation present within the southern portion of the area.

## BACKGROUND

The final RI report for Site 5, completed in February 2002, documented halogenated VOC contaminants in groundwater and a range of organic compounds mainly polynuclear aromatic hydrocarbons (PAHs) in limited site surface soils (Tetra Tech NUS, February 2002). After submission of the RI report, the Navy contracted for installation of an additional airport runway perimeter security fence. Part of the new security fencing was installed in or near the area of known PAH soil contamination. In order to determine whether the fence installation had significantly altered the distribution of PAH soil contamination documented in the RI report, fifteen additional surface and shallow subsurface soil samples were collected and analyzed for PAHs, TOC, and pH in June 2004. The results of the new sampling, submitted in Site 5 RI Addendum No. 1 in October 2004, indicated that there were no significant changes in the contaminant distribution within the site soils. Four samples exceeded PADEP residential medium-specific concentrations (MSCs) for PAHs, which was in accord with the previous findings. The complete Site 5 RI Addendum One report is included as Appendix A.

Based on the Site 5 RI Report (February 2002), the human health risk assessment indicated acceptable risk (reasonable maximum exposure [RME] $2.6 \times 10^{-5}$) levels for the most probable anticipated future land use scenario (continuation of occupational worker exposure), but unacceptable risk (RME $1.4 \times 10^{-3}$) above the maximum acceptable guideline risk ($1 \times 10^{-4}$) for the potential future resident exposure scenario. Since NAS JRB Willow Grove did not want restrictions on future land use based on soil at the site, a soil removal action was planned for soils along the transport corridor and the former burn ring, described in the Action Memorandum Site 5 - Fire Training Area, Soil Removal, submitted in August 2005. Preliminary Remediation Goals (PRGs) for protection of human health were developed by EPA Region 3 and the Navy using EPA Region III RBCs for lifetime resident exposure scenarios (Table 1). The potential PAH-related ecological risks were limited primarily to soil invertebrates and burrowing animals within a relatively small area. Since the potential for off-site migration of PAHs is considered low, no PRGs were developed or needed for protection of the environment.

In October 2005, selected RI soil sample locations were resampled for volatile organic compounds (VOCs) using the Encore sampling method, which was not available at the time of the previous investigations. The samples were collected in order to address EPA concerns regarding the quality of the historical analytical data for VOCs. The results of the investigation, presented in the Site 5 RI Addendum No. 2 (TtNUS, March 2006), confirmed the existing interpretation of Site 5 soil conditions as presented in the February 2002 RI report. The complete Site 5 RI Addendum No. 2 report is included as Appendix B.

In January 2006, in accordance with the Action Memorandum, Site 5 - Fire Training Area Soil Removal, soil was excavated and removed to a depth of approximately 2 feet in the burn ring area. The work was

performed by Resource Management Concepts, Inc. (RMC) and is described in the Final Report of Soil Removal Action, Site 5 Fire Fighting Training Area (see Appendix E). A total of 286 tons of soil was excavated in the first phase of removal and transported to Clean Earth of Philadelphia, Pennsylvania for disposal. The results of the confirmatory soil sampling revealed that several PAH compounds exceeded the $10^{-5}$ cancer risk level PRG for a lifelong resident, and the total residual risk ($7.39 \times 10^{-4}$) exceeded EPA's target carcinogenic risk range ($1 \times 10^{-6}$ to $1 \times 10^{-4}$) for the maximum exposure scenario. The first phase removal residual risk evaluation is included in Appendix C.

In order to address the unacceptable residual risk, the Navy performed additional excavation at the site in August 2006. A total of 227 tons of soil were excavated and transported to Clean Earth for disposal (see Appendix E). The results of the confirmatory soil sampling after the second phase of removal indicated that considerable risk reduction had been achieved; however, the total residual risk ($1.23 \times 10^{-4}$) still slightly exceeded the target carcinogenic risk range for the maximum exposure scenario.

It was determined that dioxins were a significant contributor to the residual risk. Only two sample results for dioxin (from 1997) were available. Although both sample results were below the EPA recommended PRG of 1 ppb for dioxin in surface soils involving a residential exposure scenario, EPA requested that additional data be collected to establish that dioxin was not a contaminant of concern.

**SUMMARY OF DIOXIN FIELD INVESTIGATION**

In September 2006, soil samples were collected from five locations within and in the vicinity of the soil removal excavation for dioxin analysis (Figure 3). Sample locations 05SS60 through 05SS63 were within the excavation and corresponded with the locations of the verification samples for PAHs previously collected by RMC. The remaining sample location, 05SS64, was approximately 20 feet north of the northern limit of the excavation, near RI soil boring location 05SB14. This was the location of the highest total 2,3,7,8-TCDD Toxicity Equivalent concentration (0.177 ppb) from the RI. At the time of the soil sampling, the excavation was filled with groundwater seepage to a maximum depth of approximately 2.5 feet.

Due to safety protocol that precluded entry into those portions of the excavation that were greater than two feet in depth, three of the sample locations within the excavation (05SS61, 05SS62, and 05SS63) could not be directly accessed. It was necessary to employ a remote sampling device to collect these samples. This device consisted of a long metal rod to the end of which was attached the sample bottle. The sample was collected directly into the sample jar by scooping soil from the bottom of the excavation. Once filled, the jar was capped, removed from the assembly, and packaged for shipment. The remaining two sample locations (05SS60 and 05SS64) were directly accessible and were collected by filling the

sample jar with a dedicated disposable trowel. All of the samples were collected from a depth of 0 to 6 inches as measured from the existing ground surface. The floor of the excavation was approximately 1 foot to 4 feet below grade. The lithology of each sample was described by the TtNUS geologist and noted on the sample log. The lithologies observed in the samples were consistent with those noted during previous site investigations, and consisted predominantly of fine-grained soils ranging from silty clay to sandy silt. The sample log sheets are included in Appendix D.

The laboratory analysis was performed by Eno River Labs of Durham, North Carolina (a Navy-certified laboratory) using SW-846 Method 8290. The data were validated to EPA validation level M3 by TtNUS in accordance with EPA's national and regional protocol and with Navy guidelines.

All work was performed in accordance with the site specific Health and Safety Plan prepared for this investigation following procedures outlined in the Work Plan for Phase II Remedial Investigation, NAS JRB Willow Grove, Pennsylvania submitted to the Northern Division, Naval Facilities Engineering Command (May 1997).

For quality control, one field duplicate sample (one per 10 samples) was collected. There were no equipment rinsate blanks collected since only dedicated, disposable sampling equipment was used.

## RESULTS OF DIOXIN INVESTIGATION

### Summary of Soil Sample Analysis

The complete set of validated analytical data is presented in Table 2. The total 2,3,7,8-TCDD Toxicity Equivalent concentrations ranged from 0.00121 ug/kg (an average of the concentrations of the two duplicate samples, 05SS60 and 05SS65) to 0.01708 ug/kg for sample 05SS64. The concentration for 05SS64 exceeded the PADEP Medium Specific Concentration (MSC) for residential soil, 0.012 ug/kg, and the Region 3 Residential Soil risk-based concentration (RBC), 0.0043 ug/kg. Sample 05SS64 was collected outside of the excavation, approximately 20 feet north of its northern limit, near RI soil boring location 05SB14.

### Human Health Risk Assessment Summary

A residual risk evaluation was performed that included the additional dioxin sampling data. The maximum total 2,3,7,8-TCDD Toxicity Equivalent from the present sampling results was used in place of the 1997 maximum value, since the present concentration was derived from a resampling of the 1997 sample location. The total residual risk was determined to be $8.31 \times 10^{-5}$, which is within the EPA's target

carcinogenic risk range of $1 \times 10^{-6}$ to $1 \times 10^{-4}$. See Appendix C for the complete residual risk evaluation results.

**CONCLUSION**

In October 2006, following the determination that the residual risk of the excavated area was within acceptable limits for both PAHs and dioxin, the excavation was backfilled using high quality fill dirt and topsoil from a borrow pile located on the Base (see Appendix E). The borrow pile was sampled by RMC prior to the backfilling operation and the analytical results did not reveal any contaminant levels that would affect the total residual risk calculated for Site 5 soils (see Appendix C).

## REFERENCES


Brown & Root Environmental, October 1993. Phase I Remedial Investigation/Feasibility Study Work Plan for NASJRB Willow Grove, Pennsylvania.

Brown & Root Environmental, October 1996. Phase II Remedial Investigation/Feasibility Study Work Plan for NASJRB Willow Grove, Pennsylvania.

Tetra Tech NUS, Incorporated, February 2002. Feasibility Study (FS) Report for Operable Unit 2 (OU-2), (Site 5 - Fire Training Area Groundwater), NASJRB Willow Grove.

Tetra Tech NUS, Incorporated, October 2004. Site 5 RI Addendum 1, PAH Confirmation Sampling and Analysis Addendum Remedial Investigation Report for Site 5 - Fire Training Area Soil, Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania.

Tetra Tech NUS, Incorporated, August 2005. Action Memorandum for Site 5 - Fire Training Area Soil Removal Action, Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania.

Tetra Tech NUS, Incorporated, March 2006. Site 5 RI Addendum 2, Soil Investigation for Volatile Organic Compound Soil to Groundwater Impact for Site 5 - Fire Training Area, Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania.

Tetra Tech NUS, Incorporated, July 2006. Site 5 RI Addendum 4, Technical Memorandum of Risk Assessment Evaluation for Site 5 - Fire Training Area Soil (OU 4), Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania.

# TABLES

**TABLE 1**
**PRELIMINARY REMEDIATION GOALS**
**SITE 5 - FIRE TRAINING AREA**
**NASJRB WILLOW GROVE, PENNSYLVANIA**

| Chemical | USEPA Region 3 Soil RBC[1] | | Cancer Risk Levels | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | $10^{-6}$ | $10^{-5}$ | $10^{-4}$ | $10^{-6}$ | $10^{-5}$ | $10^{-4}$ |
| | Industrial | Residential | Occupational Workers | | | Lifelong Residents | | |
| 2,3,7,8-TCDD Equivalents | 1.9E-05 | 4.3E+06 | 2.0E-05 | 2.0E-04 | 2.0E-03 | 4.0E-06 | 4.0E-05 | 4.0E-04 |
| Benzo(a)anthracene | 3.9 | 0.87 | 2.1 | 21 | 210 | 0.62 | 6.2 | 62 |
| Benzo(a)pyrene | 0.39 | 0.087 | 0.21 | 2.1 | 21 | 0.062 | 0.62 | 6.2 |
| Benzo(b)fluoranthene | 3.9 | 0.87 | 2.1 | 21 | 210 | 0.62 | 6.2 | 62 |
| Benzo(k)fluoranthene | 39 | 8.7 | 21 | 210 | 2100 | 6.2 | 62 | 620 |
| Dibenzo(a,h)anthracene | 0.39 | 0.087 | 0.21 | 2.1 | 21 | 0.062 | 0.62 | 6.2 |
| Indeno(1,2,3-cd)pyrene | 3.9 | 0.87 | 2.1 | 21 | 210 | 0.62 | 6.2 | 62 |

Notes:
All concentrations are in mg/kg.
1 - USEPA Region 3 Risk-Based Concentration Table, April 7, 2005.

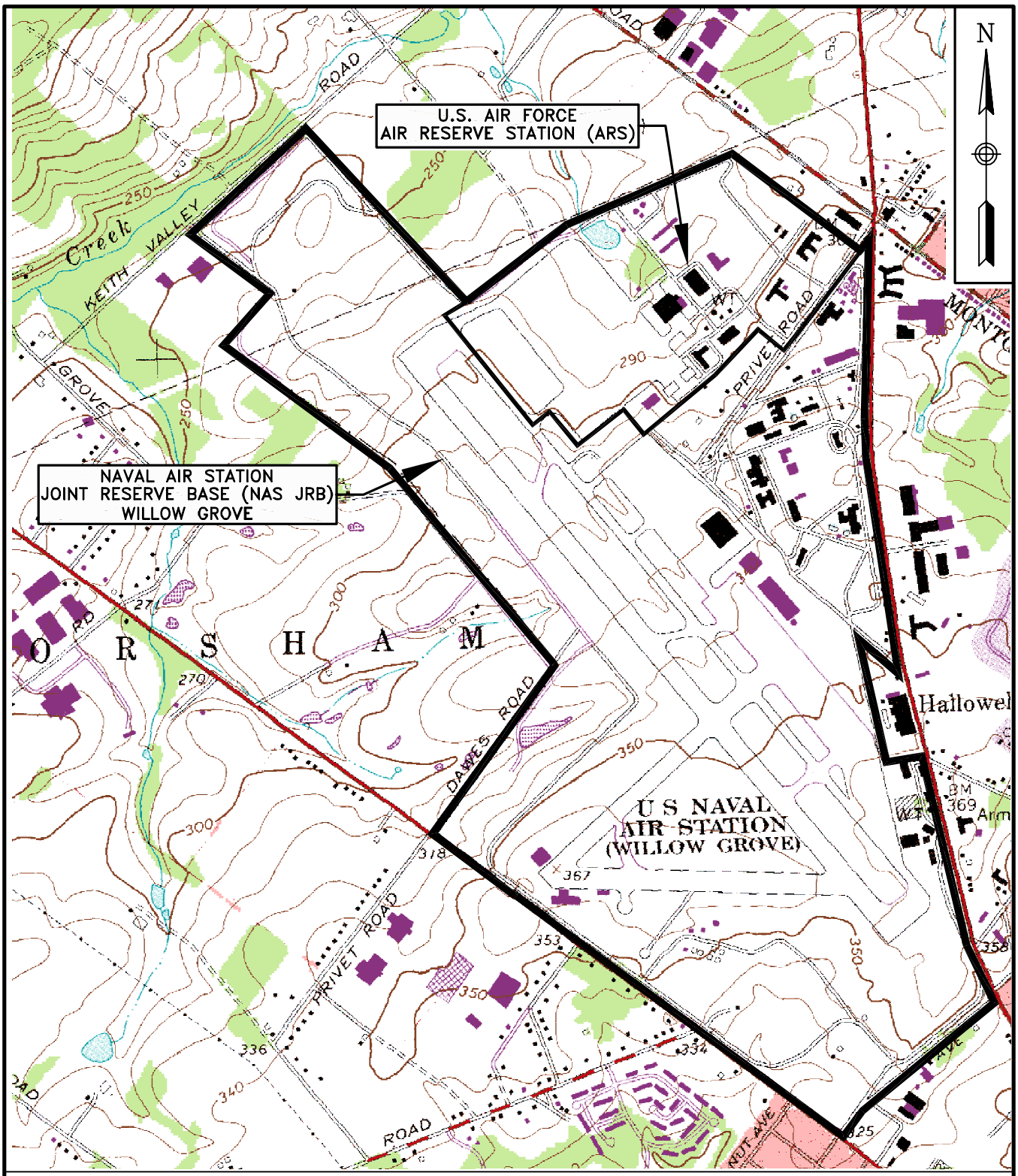
# TABLE 2
# DATA SUMMARY OF ANALYTICAL RESULTS
# DIOXINS/FURANS IN SOIL
# NAS JRB WILLOW GROVE SITE 5

| Sample ID:<br>Collection Date:<br>Duplicate Sample: | Units | 05SS60<br>09/28/2006<br>05SS65 | 05SS61<br>09/28/2006 | 05SS62<br>09/28/2006 | 05SS63<br>09/28/2006 | 05SS64<br>09/28/2006 | 05SS65<br>09/28/2006<br>05SS60 | Region 3 Residential Soil RBC |
|---|---|---|---|---|---|---|---|---|
| 1,2,3,4,6,7,8,9-OCDD | ng/kg | 2060 | 5820 | 3880 | 3600 | 8670 | 2880 | 0.0043 |
| 1,2,3,4,6,7,8,9-OCDF | ng/kg | 0.88 J | 0.52 J | 0.27 J | 0.4 J | 45.3 | 1.5 J | 0.0043 |
| 1,2,3,4,6,7,8-HpCDD | ng/kg | 23.3 | 24.4 | 12.6 | 13.9 | 338 | 37.4 | 0.043 |
| 1,2,3,4,6,7,8-HpCDF | ng/kg | 0.72 J | 0.45 J | 0.15 EMPC | 0.2 J | 32.1 | 1.4 J | --- |
| 1,2,3,4,7,8,9-HpCDF | ng/kg | 0.2 U | 0.07 U | 0.1 U | 0.09 U | 2.6 J | 0.2 U | 0.043 |
| 1,2,3,4,7,8-HxCDD | ng/kg | 0.2 U | 0.24 EMPC | 0.1 U | 0.08 U | 4.3 J | 0.2 U | 0.43 |
| 1,2,3,4,7,8-HxCDF | ng/kg | 0.2 U | 0.12 J | 0.07 U | 0.12 J | 9.4 J | 0.29 J | 0.43 |
| 1,2,3,6,7,8-HxCDD | ng/kg | 0.52 J | 0.4 J | 0.1 U | 0.18 J | 10.9 | 0.79 J | 0.43 |
| 1,2,3,6,7,8-HxCDF | ng/kg | 0.1 U | 0.05 U | 0.07 U | 0.05 U | 3.9 J | 0.1 U | 0.43 |
| 1,2,3,7,8,9-HxCDD | ng/kg | 0.5 J | 0.42 J | 0.1 U | 0.08 U | 6.4 | 0.63 J | 0.43 |
| 1,2,3,7,8,9-HxCDF | ng/kg | 0.2 U | 0.05 U | 0.08 U | 0.06 U | 0.2 U | 0.2 U | 0.43 |
| 1,2,3,7,8-PeCDD | ng/kg | 0.3 U | 0.11 EMPC | 0.1 U | 0.08 U | 3 J | 0.2 U | 2.15 |
| 1,2,3,7,8-PeCDF | ng/kg | 0.2 U | 0.05 U | 0.08 U | 0.06 U | 17.1 EMPC | 0.2 U | 0.215 |
| 2,3,4,6,7,8-HxCDF | ng/kg | 0.1 U | 0.04 U | 0.06 U | 0.05 U | 4.7 J | 0.1 U | 0.43 |
| 2,3,4,7,8-PeCDF | ng/kg | 0.2 U | 0.05 U | 0.08 U | 0.06 U | 2.8 J | 0.2 U | 2.15 |
| 2,3,7,8-TCDD | ng/kg | 0.3 U | 0.07 U | 0.1 U | 0.08 U | 2.7 | 0.2 U | 4.3 |
| 2,3,7,8-TCDF | ng/kg | 0.2 U | 0.06 U | 0.09 U | 0.07 U | 2.4 | 0.41 J | 0.43 |
| Total 2,3,7,8-TCDD Toxicity Equivalents | **UG/KG** | 0.00096 | 0.00209 | 0.00129 | 0.00125 | 0.01708 ** | 0.00146 | 0.0043 |

Data Qualifiers:
EMPC -- Value is considered an estimated maximum possible concentration because criteria for compound identification based on ion ratios were not met.
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.
** -- Indicates Total Toxicity Equivalents for this sample exceeds the Region 3 Residential Soil RBC, which is based on a 1E-06 cancer risk level (EPA, 2006).

# FIGURES

2192 WillowGrove\0932\2192CM01.DWG 06/29/07 MKB




BASE MAP IS A PORTION OF THE AMBLER, PA U.S.G.S. 7.5 MINUTE QUADRANGLE MAP, DATED 1963, PHOTOREVISED IN 1983.

QUADRANGLE LOCATION

0 1500 3000

SCALE IN FEET

TETRA TECHNUS, INC.

# FACILITY LOCATION MAP
# NAS JRB WILLOW GROVE
# WILLOW GROVE, PENNSYLVANIA

| | |
|---|---|
| SCALE | AS NOTED |
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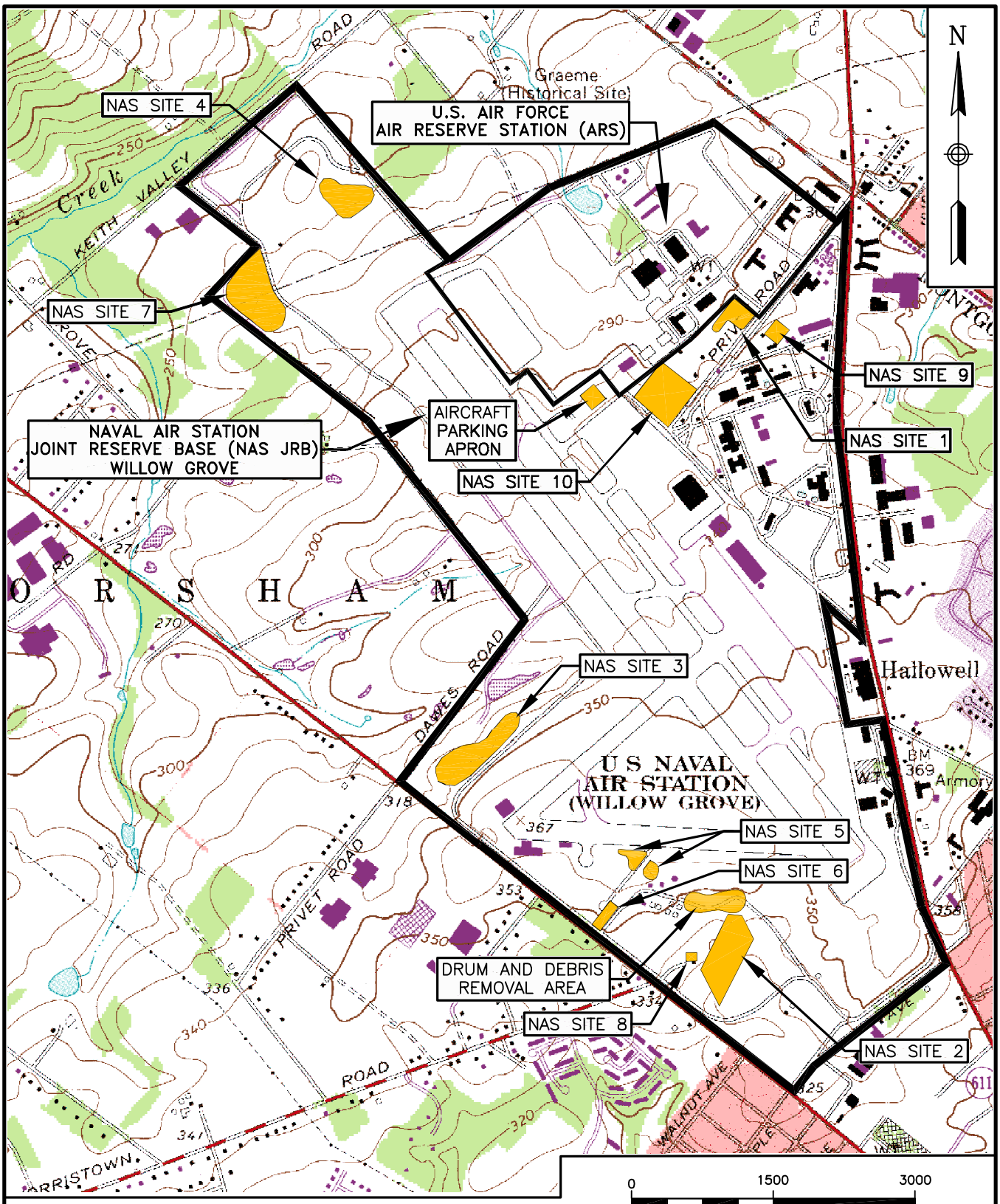
| FIGURE NUMBER | FIGURE 1 |

2192 WillowGrove\0932\2192CM02.DWG 06/29/07 MKB




BASE MAP IS A PORTION OF THE AMBLER, PA U.S.G.S. 7.5 MINUTE QUADRANGLE MAP, DATED 1963, PHOTOREVISED IN 1983.

TETRA TECH NUS, INC.

SITE LOCATION MAP
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

| | |
|---|---|
| SCALE | AS NOTED |
| FILE | 2192CM02.DWG |
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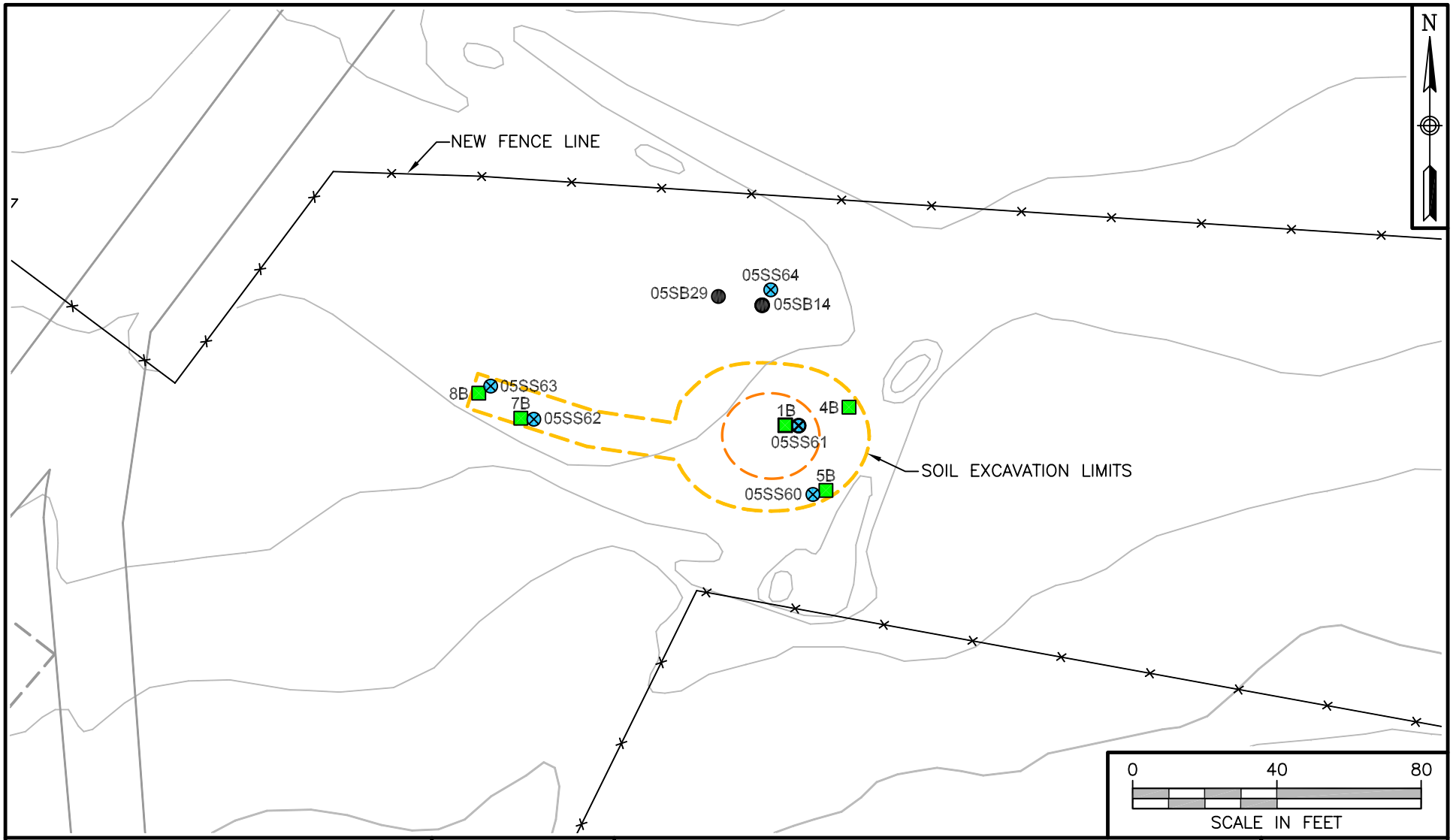
| DATE | 06/29/07 |
| FIGURE NUMBER | FIGURE 2 |

2192/0931/2192CM14.DWG 03/27/07 MKB




LEGEND

- DIOXIN SAMPLE LOCATION
- RMC BOTTOM CONFIRMATION SAMPLE
- PREVIOUS RI SOIL SAMPLE LOCATION

TETRA TECHNUS, INC.

DIOXIN SAMPLE LOCATIONS
SITE 5 – FIRE TRAINING AREA
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

| | |
|---|---|
| SCALE | AS NOTED |
| FILE | 2192CM14.DWG |
| REV | 0 |
| DATE | 03/27/07 |
| FIGURE NUMBER | FIGURE 3 |

# APPENDIX A

# SITE 5 REMEDIAL INVESTIGATION ADDENDUM NO. 1

# Addendum Remedial Investigation Report
# For
# Site 5 - Fire Training Area Soil
# NAS JRB Willow Grove, Pennsylvania

## INTRODUCTION

Tetra Tech NUS, Inc. (TtNUS) submits this letter report for environmental site investigation on Naval Air Station Joint Reserve Base (NAS JRB) Willow Grove property in response to a request for change from the Navy for Contract Task Order No. 003 under Contract N62472-03-D-0057, Comprehensive Long - Term Environmental Action-Navy (CLEAN).

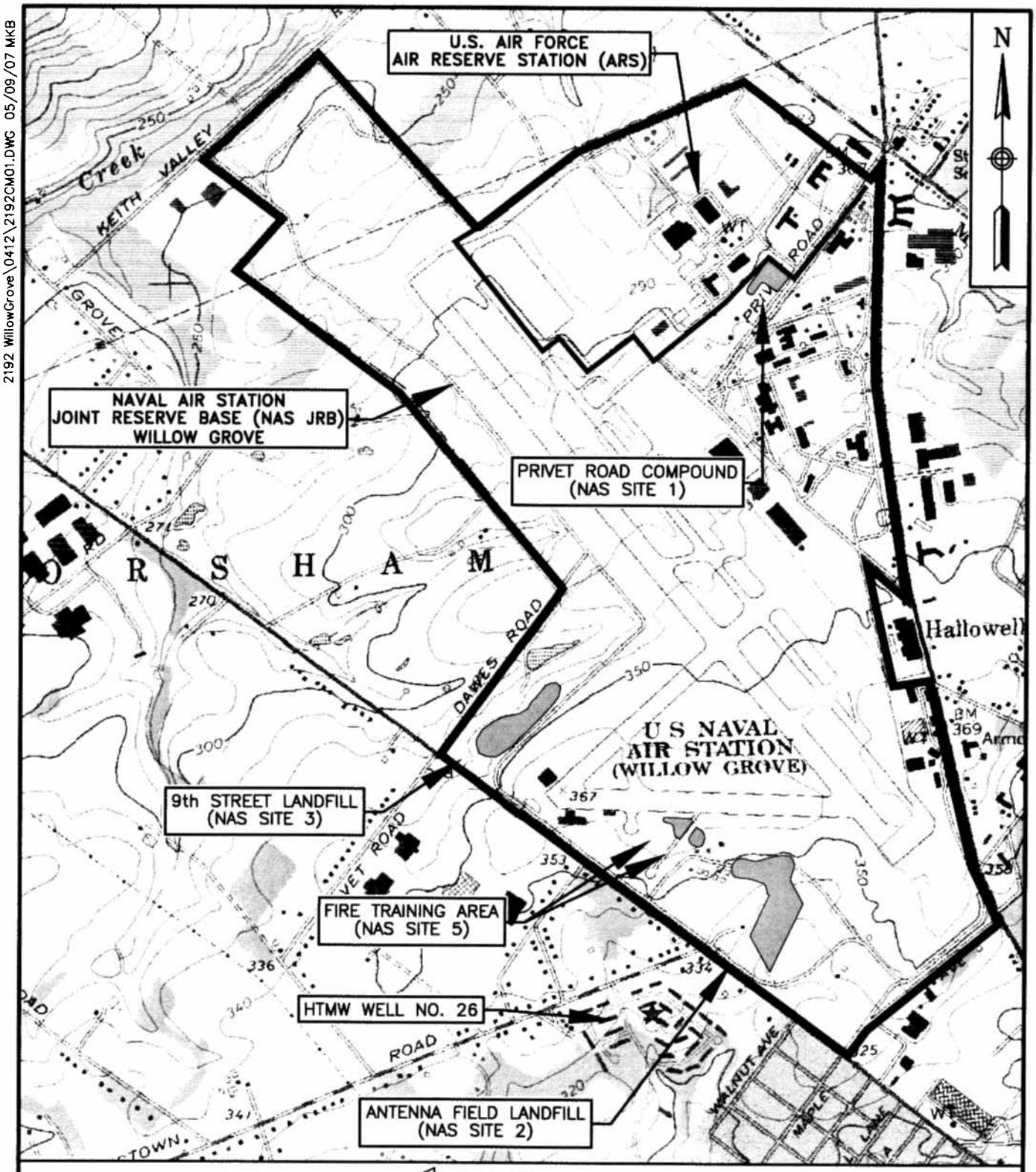
### Site Description and Setting

NAS JRB Willow Grove is located in Horsham Township, Montgomery County in southeastern Pennsylvania, approximately 20 miles north of the city of Philadelphia (Figure 1). NAS JRB Willow Grove occupies approximately 1,000 acres of 1,200 acres the Department of Defense (DoD) maintains at the Air Station. The Willow Grove Air Reserve Station (ARS) occupies approximately 200 acres of land in the northeastern section of the Air Station and shares common facilities with the NAS JRB. Figure 1 shows the location of NAS JRB Willow Grove and ARS. The Air Station is comprised of flat to slightly rolling terrain and is generally bounded by State Route 611 to the east, State Route 463 to the southwest, and Keith Valley Road to the north.

The primary mission of NAS JRB Willow Grove is to provide support for operations involving aviation training activities and to train Navy reservists. NAS JRB Willow Grove supports DoD tenants such as the Marine Reserve, Pennsylvania National Guard and the Army Reserve, and shares facilities/services with the Air Force Reserve. The base provides facilities, services, materials, and training in direct support of all assigned units. These units include anti-submarine warfare squadrons, a helicopter squadron, fleet logistic support squadrons, and other DoD units.

The Fire Training Area is located in the south-central portion of NAS JRB, approximately midway between Runway 10/28 and State Route 463 (Figures 1 and 2). The site is located immediately to the south of Taxiway Juliet and covers an irregularly shaped area of approximately 1.25 acres. The training area was used from 1942 to 1975 for large-scale firefighting exercises, which included the disposal and burning of flammable liquid wastes generated by the Naval Air Station. Wastes

2192 WillowGrove\0412\2192CM01.DWG 05/09/07 MKB




BASE MAP IS A PORTION OF THE AMBLER, PA U.S.G.S. 7.5 MINUTE QUADRANGLE MAP, DATED 1963, PHOTOREVISED IN 1983.

QUADRANGLE LOCATION

0 1500 3000

SCALE IN FEET

TETRA TECHNUS, INC.

LOCATION OF RI SITES
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

| | |
|---|---|
| SCALE | AS NOTED |
| FILE | 2192CM01.DWG |
| REV | 0 |
| DATE | 05/09/07 |
| FIGURE NUMBER | FIGURE 1 |

2192 WillowGrove\0931\2192CM02-1.DWG 09/14/04 MKB

N

05SS26

05SS28

NEW FENCE LINE

05SS34

05SS17

05SS21

05SS29

05SS14

05SS33

05SS35

05SS19

05SS22

05SS45

05SS31

05SS18

05SS36

05SS37

05SS43

05SS38

05SS30

APPROXIMATE LOCATION OF FORMER BURNING RING

05SS20

05SS24

05SS23

05SS44

05SS39

05SS32

05SS25

05SS41

05SS40

05SS42

LEGEND

SURFACE SOIL SAMPLE LOCATION, 2004

PREVIOUS SURFACE SOIL SAMPLE LOCATION, 1997

0 60 120

SCALE IN FEET

| | | | |
|---|---|---|---|
| DRAWN BY MKB DATE 9/9/04 | Tetra Tech NUS, Inc. | EXISTING SAMPLE LOCATIONS SITE 5 – FIRE TRAINING AREA NAS JRB WILLOW GROVE WILLOW GROVE, PENNSYLVANIA | CONTRACT NO. 2192 |
| CHECKED BY DATE | | | OWNER NO. 0931 (SITE 5) |
| REVISED BY DATE | | | APPROVED BY DATE |
| SCALE AS NOTED | | | DRAWING NO. FIGURE 2 REV. |

including solvents, paint chemicals, xylenes, toluene, and various petroleum compounds were consumed at the rate of up to 4,000 gallons or more per year in these firefighting exercises. The area was also reportedly used for the drum storage of these flammable materials during the periods between burning exercises.

The Fire Training Area is primarily covered by grasses, with some woody and brushy vegetation present within the southern portion of the area. The burn area is located in the south-central portion of the site. Two small (normally dry) "ponds" are immediately south of the former burning area. Additional site information can be found in the Remedial Investigation Report for Site 5 – Fire Training Area (Tetra Tech NUS, February 2002).

**Background**

The final RI report for Site 5, completed in February 2002, documented halogenated VOC contaminants in groundwater and a range of organic compounds (mainly polynuclear aromatic hydrocarbons (PAHs) in limited site surface soils. After submission of the RI report, the Navy contracted for installation of an additional airport runway perimeter security fence. Part of the new security fencing was installed in or near the area of known PAH soil contamination. Security fence construction activities may have changed the extent of the surface soil contamination in parts of the area.

The draft feasibility study (FS) completed for groundwater was also submitted for comment in February 2002. EPA and Restoration Advisory Board (RAB) comments requested that the Navy look further into another type of chemical or in situ treatment for groundwater. This issue is being dealt with separately in a revised draft FS for Site 5 groundwater, which was submitted on September 21, 2004.

**SUMMARY OF FIELD INVESTIGATION**

The objective of this study was to collect surface and shallow subsurface soil samples from 15 locations at Site 5. Figure 2 shows the sample locations and the new fence line. These sample locations generally mirror the locations sampled in 1997 for a direct side by side comparison, however two locations were moved from inside the new fence to be included in the sampling area. The air strip, located inside the new fence, is a restricted area and sampling in this area was not recommended. The 1997 analytical data had low concentrations of PAHs in the two soil sample locations within the new air strip security fence. The two locations that were moved and an additional sample are not intended to fill data gaps, they were included as additional sampling points to help determine if PAH concentrations have decreased.

A field technician collected samples by digging from ground surface to a maximum of 24 inches below the ground surface with a stainless-steel trowel or stainless-steel hand-auger and placing soil into a clean stainless steel bucket. All samples were homogenized and transferred into laboratory supplied sample jars. The samples were sent to a subcontracted analytical laboratory to be analyzed for PAHs through laboratory method SW846/8270C (including analysis by the SIM method for potential ecological risk levels), total organic carbon (TOC) through laboratory method EPA 415.1 modified, and pH through laboratory method SW846/9045C.

All work was performed in accordance with the site specific Health and Safety Plan prepared for this investigation following procedures outlined in the Work Plan for Phase II Remedial Investigation, NAS JRB Willow Grove, Pennsylvania submitted to the Northern Division, Naval Facilities Engineering Command (May 1997).

For quality control, two field duplicate samples (one per 10 samples), two equipment rinsate blanks (one per sampling day), and one field blank were analyzed for PAHs, TOC, and pH.

Actual site sample locations were agreed upon between the TtNUS lead field technician and a representative of the Navy. Each sample location was marked for a subsequent land survey to obtain coordinates of the sample location. This report presents an updated assessment of PAHs in surface soil at Site 5.

**Soil Investigation**

On June 1 and June 2, 2004, TtNUS personnel collected fifteen surface and shallow subsurface soil samples from 0 to a maximum of 24 inches below ground surface. Figure 2 shows the locations of the soil samples.

Soil samples were collected using a stainless-steel trowel and stainless-steel hand-auger. Soil samples were placed into a stainless steel bucket, homogenized, and transferred into laboratory supplied sample jars. The hand auger samples were logged by a TtNUS geologist and screened with a photoionization detector (PID). No PID readings above background were encountered in the soil samples, except 05SS43, which had a PID reading of 20 parts per million (ppm). The sample log sheets are presented in Appendix A. Soil boring locations were surveyed to obtain horizontal coordinates.

Samples were submitted to Mitkem Corporation in Warwick, Rhode Island for laboratory analysis. All soil samples were analyzed for PAHs, TOC, and pH.

### Survey

On July 22, 2004 the horizontal locations for the 15 surface and shallow subsurface soil samples were measured and recorded by James M. Stewart Inc. Land Surveyors of Philadelphia, Pennsylvania. The survey was to the nearest 0.01 foot tied to three existing wells: MW-07I, MW-09I, and MW-10I. The surveyors report is presented in Appendix B.

### Field Decontamination

The sampling equipment used for collecting samples were decontaminated before field sampling, between samples and after sampling activities. The following decontamination steps were followed:

- Alconox or liquinox detergent solution wash.
- Potable water rinse.
- Deionized water rinse.
- Air dry.
- Wrap in aluminum foil (if not immediately used).

### Investigation Derived Waste

Investigative derived wastes, including extra soil generated from sampling and decontamination fluids, were handled and disposed as discussed below.

Surplus soil generated during sampling was placed back at the point of generation. Decontamination fluids were containerized and disposed in the sanitary sewer for ultimate treatment at the onsite waste water treatment plant (WWTP).

## RESULTS OF INVESTIGATION

This section describes the results of the field investigation and laboratory analysis from the field investigation sampling.

### Geology and Site Hydrogeology

This field investigation did not collect geology or hydrogeology information that would change existing site information already included in the RI Report for Site 5 (TtNUS, 2002).

## Summary of Soil Sample Analysis

Laboratory analysis results are summarized in Table 1 (surface and shallow subsurface soils) with comparison columns for reference criteria. Sample locations 05DUP-01 and 05DUP-02, presented in Table 1, are field duplicates of surface soil samples 05SS34 and 05SS32, respectively.

Four surface soil and shallow subsurface soil sample locations had concentrations above PADEP medium-specific concentrations (MSCs) for residential soil: 05SS31, 05SS36, 05SS43, and 05SS45. Three of the four samples were located in the vicinity of the former burn ring. Sample 05SS36 was located next to a roadway (see Figure 2). Soil sample concentrations are compared to residential risk-based concentrations (RBCs) in the human health risk assessment summary below.

## Human Health Risk Assessment Summary

All samples had at least one compound above residential RBCs, except 05SS41 and 05SS42. Five samples had low level exceedances for one compound, benzo(a)pyrene (05SS33, 05SS34, 05SS37, 05SS38, and 05SS44) with the concentrations ranging from 0.14 J mg/kg to 0.4 J mg/kg. The four samples listed above that exceeded residential MSCs are the same samples that have the greatest exceedances with the residential RBCs (05SS31, 05SS36, 05SS43, and 05SS45). These four samples exceed the residential RBCs for some or all of the following compounds: benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene (see Figure 2). Three other samples had low level exceedances above residential RBCs (05SS32 and its duplicate 05DUP-02, 05SS39, and 05SS40).

The 2004 sample concentrations were similar to the 1997 sample concentrations. As discussed in the ecological risk assessment, the 2004 concentrations were compared to the 1997 concentrations to determine if there is more or less risk related to the soil at Site 5 since the new perimeter fence was installed.

## Ecological Risk Assessment Summary

A screening level ecological risk assessment for the Site 5 Fire Training Area was submitted to the Navy and USEPA Region 3 Biological Technical Assistance Group (BTAG) in 2001. As described in the ecological risk assessment, polycyclic aromatic hydrocarbon (PAH) concentrations were elevated in several surface soil samples collected in 1997 from the general vicinity of the former burn area.

Surface soil samples collected during June 2004 were analyzed for PAH compounds. Concentrations of PAHs in nine of 15 samples were much lower than in co-located samples collected in 1997. PAH

TABLE 1
SEMIVOLATILE ANALYSIS RESULTS
SITE 5 SOIL
CTO 003, NASJRB WILLOW GROVE

| Sample ID: | | | | | 05SS31 | | 05SS32 | | 05DUP-02 | | 05SS33 | | 05SS34 | | 05DUP-01 | | 05SS35 | | 05SS36 | | 05SS37 | | 05SS38 | | 05SS39 | | 05SS40 | | 05SS41 | | 05SS42 | | 05SS43 | | 05SS44 | | 05SS45 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory ID: | | | | | C0508-16A | | C0508-15A | | C0508-17A | | C0508-10A | | C0508-05A | | C0508-04A | | C0508-03A | | C0508-02A | | C0508-13A | | C0508-01A | | C0508-06A | | C0508-09A | | C0508-07A | | C0508-08A | | C0508-18A | | C0508-19A | | C0508-14A | |
| Sample Date: | | | | | 06/02/04 | | 06/02/04 | | 06/02/04 | | 06/01/04 | | 06/01/04 | | 06/01/04 | | 06/01/04 | | 06/01/04 | | 06/01/04 | | 06/01/04 | | 06/01/04 | | 06/01/04 | | 06/01/04 | | 06/01/04 | | 06/02/04 | | 06/02/04 | | 06/01/04 | |
| Duplicate: | | | | | | | 05DUP-02 | | 05SS32 | | | | 05DUP-01 | | 05SS34 | | | | | | | | | | | | | | | | | | | | | | | |
| Percent Moisture | | | | | 9.0 | | 13.0 | | 13.0 | | 13.0 | | 20.0 | | 20.0 | | 16.0 | | 12.0 | | 13.0 | | 11.0 | | 14.0 | | 12.0 | | 13.0 | | 13.0 | | 9.0 | | 13.0 | | 13.0 | |
| Sample ID: | EPA 3 RBCs | | PADEP MSCs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Residential | | Residential 0-15 feet | Non-Residential 0 2 feet | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL | RESULT | QUAL |
| SEMIVOLATILES | 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 | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | |
| 2-Methylnaphthalene | 310 | N | 4400 | G 10000 | C | 0.9 | | 0.029 | J | 0.058 | J | 0.1 | | 0.011 | | 0.008 | | 0.015 | J | 0.048 | | 0.0038 | U | 0.014 | | 0.0062 | | 0.0061 | | 0.0038 | U | 0.0038 | U | 4.4 | J | 0.007 | | 0.052 | J |
| Acenaphthene | 4700 | N | 13000 | G 170000 | G | 5.6 | | 0.12 | | 0.23 | J | 0.024 | | 0.0041 | U | 0.0041 | U | 0.035 | J | 0.31 | | 0.0043 | | 0.012 | | 0.066 | | 0.045 | | 0.017 | U | 0.0038 | U | 28 | | 0.046 | | 0.27 | J |
| Acenaphthylene | -- | | 13000 | G 170000 | G | 1.6 | | 0.13 | J | 0.18 | J | 0.05 | | 0.0052 | | 0.0044 | | 0.075 | J | 0.18 | | 0.011 | | 0.02 | | 0.056 | | 0.023 | | 0.0075 | | 0.004 | | 1.9 | | 0.056 | | 0.51 | J |
| Anthracene | 23000 | N | 66000 | G 190000 | C | 24 | | 0.34 | | 0.84 | | 0.073 | | 0.017 | | 0.0086 | | 0.19 | J | 1.50 | | 0.015 | | 0.069 | J | 0.36 | | 0.19 | | 0.11 | | 0.006 | | 61 | | 0.26 | | 1.2 | |
| Benz(a)anthracene | 0.87 | C | 25 | G 110 | G | 59 | | 0.88 | | 2.1 | | 0.22 | | 0.15 | | 0.051 | | 0.76 | | 13 | | 0.067 | | 0.28 | J | 1.2 | | 0.73 | | 0.32 | | 0.022 | | 82 | | 0.45 | | 4.8 | |
| Benzo(a)pyrene | 0.087 | C | 3 | G 11 | G | 47 | J | 0.37 | J | 1.9 | J | 0.18 | J | 0.14 | J | 0.053 | J | 0.72 | J | 12 | J | 0.15 | J | 0.4 | J | 0.94 | J | 0.53 | J | 0.24 | J | 0.037 | J | 68 | J | 0.35 | J | 4.9 | J |
| Benzo(b)fluoranthene | 0.87 | C | 25 | G 110 | G | 61 | J | 1.4 | J | 2.3 | J | 0.37 | J | 0.19 | | 0.06 | | 1.3 | J | 22 | J | 0.31 | J | 0.6 | J | 1.4 | J | 1.1 | J | 0.27 | | 0.064 | | 77 | J | 0.88 | J | 7.4 | J |
| Benzo(g,h,i)perylene | -- | | 13000 | G 170000 | G | 27 | | 0.60 | | 1.2 | J | 0.17 | J | 0.11 | | 0.05 | | 0.4 | | 6.2 | | 0.084 | J | 0.17 | J | 0.62 | | 0.27 | J | 0.13 | | 0.021 | | 43 | | 0.37 | J | 6.2 | J |
| Benzo(k)fluoranthene | 0.87 | C | 250 | G 1100 | G | 20 | J | 0.37 | J | 1.3 | J | 0.31 | J | 0.052 | | 0.038 | | 0.34 | | 7.7 | | 0.12 | J | 0.22 | | 0.72 | | 0.28 | | 0.12 | | 0.02 | | 38 | | 0.18 | | 2.2 | J |
| Chrysene | 87 | C | 2500 | G 11000 | G | 46 | J | 0.92 | | 2.7 | | 0.25 | | 0.16 | | 0.079 | | 0.98 | | 12 | | 0.20 | J | 0.34 | | 1.3 | | 0.53 | | 0.27 | | 0.075 | | 75 | | 0.34 | | 3.9 | J |
| Dibenz(a,h)anthracene | 0.087 | C | 3 | G 11 | G | 8.4 | J | 0.19 | J | 0.3 | J | 0.041 | J | 0.029 | J | 0.013 | J | 0.2 | J | 1.9 | J | 0.013 | J | 0.068 | J | 0.17 | J | 0.08 | J | 0.032 | J | 0.0054 | J | 15 | J | 0.13 | J | 1.4 | J |
| Fluoranthene | 3100 | N | 8800 | G 110000 | G | 150 | | 2.8 | | 5.1 | | 0.58 | | 0.35 | | 0.18 | | 2 | | 26 | | 0.21 | | 0.74 | | 4.0 | | 2.10 | | 0.7 | | 0.093 | | 220 | | 1.2 | | 7.4 | |
| Fluorene | 3100 | N | 8800 | G 110000 | G | 6.5 | | 0.17 | J | 0.33 | J | 0.044 | | 0.0041 | U | 0.0041 | U | 0.073 | J | 0.26 | | 0.0044 | | 0.015 | | 0.085 | | 0.073 | | 0.023 | U | 0.0038 | U | 44 | | 0.082 | | 0.38 | |
| Indeno(1,2,3-cd)pyrene | 0.87 | C | 25 | G 110 | G | 26 | | 0.58 | | 1.1 | J | 0.18 | J | 0.094 | | 0.043 | | 0.44 | | 6.1 | | 0.068 | J | 0.21 | J | 0.67 | | 0.28 | J | 0.12 | | 0.022 | | 48 | | 0.35 | J | 4.2 | J |
| Naphthalene | 1600 | N | 4400 | G 56000 | G | 2.1 | | 0.02 | J | 0.052 | J | 0.054 | | 0.0083 | | 0.0072 | | 0.01 | J | 0.019 | U | 0.0055 | | 0.0088 | | 0.0078 | | 0.0076 | | 0.0038 | U | 0.0038 | U | 11 | | 0.012 | | 0.043 | J |
| Phenanthrene | -- | | 66000 | G 190000 | C | 76 | | 1.6 | | 3.1 | | 0.45 | | 0.092 | | 0.099 | | 0.76 | | 7.2 | | 0.12 | | 0.29 | J | 1.2 | | 0.81 | | 0.34 | | 0.054 | | 230 | | 0.49 | | 2.5 | |
| Pyrene | 2300 | N | 6600 | G 84000 | G | 100 | J | 2.6 | J | 7.4 | J | 0.55 | J | 0.25 | | 0.15 | | 2.4 | J | 25 | J | 0.33 | | 0.71 | J | 3 | J | 1.9 | J | 0.81 | | 0.090 | | 200 | J | 1.2 | J | 21 | J |

Notes:
Results in bold/shaded in blue indicate exceedance in EPA 3 RBCs for Residential.
Results in bold/shaded in yellow indicate exceedance in EPA 3 RBCs for Residential and PADEP MSCs for Residential 0-15 feet.
Results that are bold/shaded in orange indicate exceedance in EPA 3 RBCs for Residential, PADEP MSCs for Residential 0-15 feet, and Non-residential 0-2 feet

concentrations in two of 15 samples collected in 2004 were higher than in co-located samples collected in 1997. Co-located PAH data are not available for four of 15 samples collected in 2004. Three locations were added as additional sampling points to determine if PAH concentrations had decreased. One co-located sample from 1997 was not analyzed for PAHs.

PAH concentrations were especially elevated in four of the recent samples, with total PAH concentrations (*i.e.*, the sum of individual detected PAHs) as follows:

05SS43: 1,244,300 µg/kg
05SS31: 661,120 µg/kg
05SS36: 141,398 µg/kg
05SS45: 68,355 µg/kg

PAH concentrations in these four samples were considerably greater than ecological screening levels for individual and total PAHs. For comparison, the screening level for total PAHs used in Site 5 ecological risk assessment was 4,000 µg/kg, and the maximum total PAH concentration in background samples was 14,100 µg/kg. PAHs were moderately elevated in sample 05SS32 (average of sample and its duplicate = 21,652 µg/kg). Total PAH concentrations in the remaining 10 samples were not elevated relative to the screening level or to the maximum background value.

As discussed in the Site 5 ecological risk assessment, contaminants generally fall into one of two categories: 1) chemicals for which the exposure route of concern is direct contact, and 2) chemicals for which the exposure route of concern is the food web (TtNUS, 2002). PAH compounds show little tendency to biomagnify in the food web, and thus, PAHs fall in the first category: toxicity through direct contact and toxicity via the food chain is not expected for upper level receptors that forage over large areas. Elevated PAHs could pose potential risks for soil invertebrates, especially those that ingest soil, (i.e., earthworms). Burrowing animals such as woodchucks could also be directly exposed to elevated PAHs in soil. Plants can absorb PAHs from soil through their roots, but PAH-induced toxicity to plants is rare. The flat character of the site and abundant vegetation in the area result in minimal surface water runoff into the nearby ditch; subsequently, offsite migration of PAHs is probably negligible.

In summary, potential PAH-related risks are limited primarily to soil invertebrates and burrowing animals in the vicinity of four or five samples. Sample 05SS43 is located in the former burn pit. Samples 05SS31, 05SS32, and 05SS45 are immediately west of the burn pit, and sample 05SS36 is in the western portion of the site (see Figure 2). These samples comprise a relatively small area, and the potential for offsite migration of PAHs is considered low.

## SUMMARY OF PROPOSED HOTSPOT REMOVAL ACTION

### Preliminary Engineering Evaluation

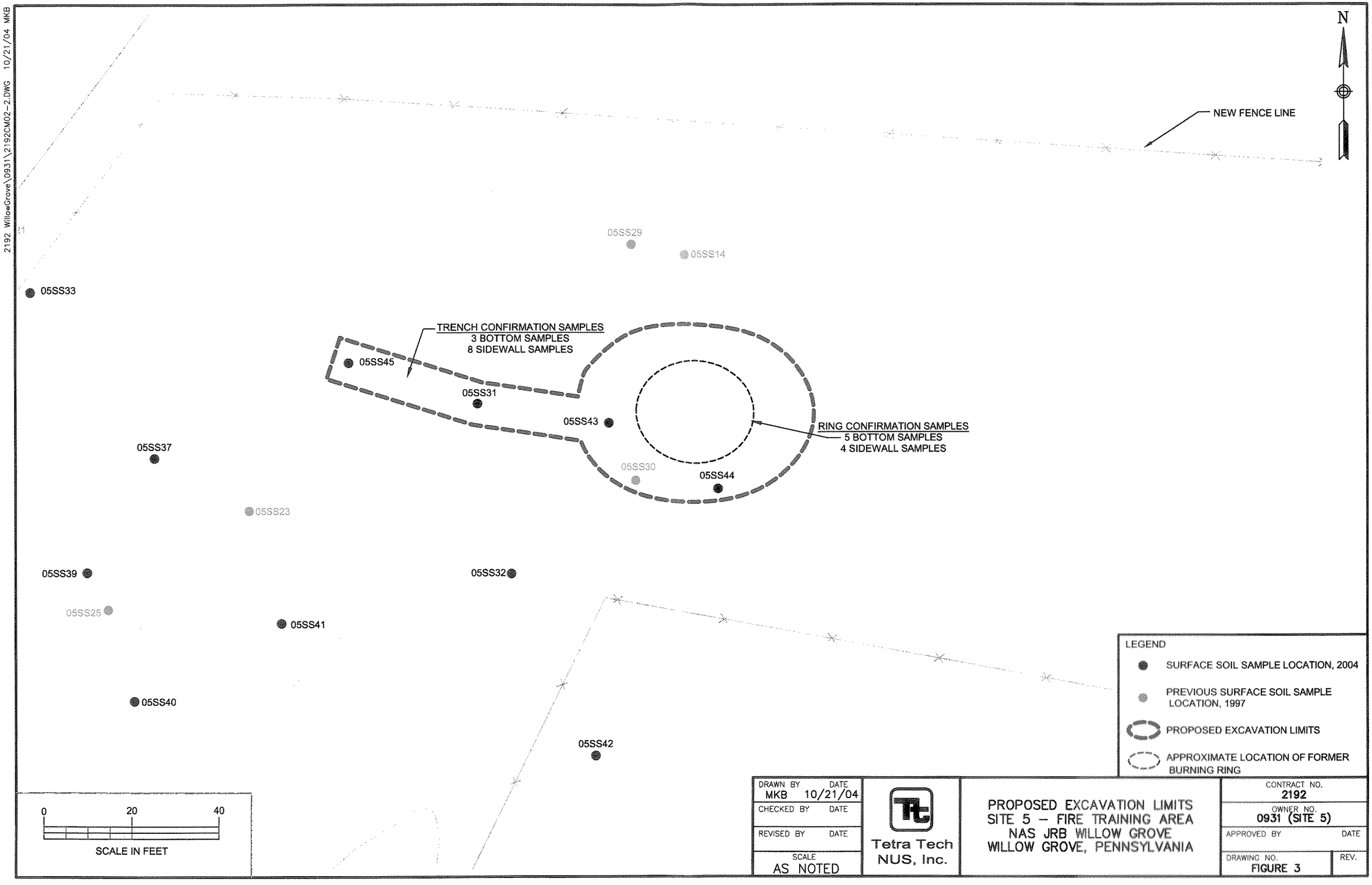
The Navy is considering a "hotspot" removal to address the PAH concentrations in soil that would preclude unrestricted land use at Site 5 NAS JRB Willow Grove based on human health risk considerations. The Navy may wish to pursue a non-time-critical "hot spot" soil removal action for soil in the vicinity of samples 05SS45, 05SS31 and 05SS43. All three of these samples (as well as sample 05SS36) exceed PADEP MSCs for residential soil. Sample location 05SS36 would be left as is because it is next to the asphalt roadway. The PAHs encountered at sample location 05SS36 could just as likely be related to the asphalt roadway itself or vehicle traffic.

At this time, the Navy has considered only one remedial alternative; soils excavation for hotspot soil removal. The soil removal would be limited to the three hotspot soil sample locations (mentioned above) in the vicinity of the former burn ring as well as soil within the former burn ring and the metal burning ring itself. The goal would be to reduce soil concentrations to allow unrestricted use at Site 5. This alternative is not intended to remove all soil with concentrations above regulatory levels. For example, soil sample 05SS36 had multiple exceedances above residential RBCs; however this location is in close proximity of a roadway and the PAH contamination may be associated with vehicular traffic and bituminous paving. Preliminary clean up goals proposed would be residential RBCs (i.e., residual risk correlating to approximately no more than 1 E-06).

### Preliminary Cost Estimate

Figure 3 shows the approximate proposed excavation limits. The estimated volume of soil for disposal is 230 cubic yards. Soil to be disposed would be excavated from a trench; 65 feet long, 10 feet wide, and 2 feet deep, which includes hotspots 05SS45 and 05SS31. The excavation in the former burning ring area would include sample location 05SS43 and a 25 foot radius around the former burn ring, as well as the steel burn ring itself. Confirmation samples would be collected according to procedures outlined in Chapter 2 on Table 1 and Table 2 of the Pennsylvania Land Recycling Program (PA Act 2, 1995). Based on Table 1 and Table 2 of PA Act 2, 8 bottom samples and 12 sidewall samples will be collected from the excavation (Figure 3). Confirmation samples would be collected after soil removal and used in a risk ratio and toxicological evaluation to determine if soil is within acceptable risk for residential risk based concentrations (RBCs).

2192 WillowGrove\0931\2192CM02-2.DWG 10/21/04 MKB




| | | | |
|---|---|---|---|
| DRAWN BY MKB DATE 10/21/04 | Tetra Tech NUS, Inc. | PROPOSED EXCAVATION LIMITS<br>SITE 5 – FIRE TRAINING AREA<br>NAS JRB WILLOW GROVE<br>WILLOW GROVE, PENNSYLVANIA | CONTRACT NO. 2192 |
| CHECKED BY DATE | | | OWNER NO. 0931 (SITE 5) |
| REVISED BY DATE | | | APPROVED BY DATE |
| SCALE AS NOTED | | | DRAWING NO. FIGURE 3 REV. |

A cost estimate for the hotspot soil removal is included in Appendix C. The cost estimated, $177,000, includes soil removal, disposal, confirmation sampling, clean soil backfill, site restoration and oversight fees.

Soil disposal would be determined based on disposal facility acceptance criteria. Disposal of excavated soil is anticipated to be non hazardous, non residual waste in a Subtitle D landfill.

**CONCLUSIONS**

The 2004 sample concentrations were similar to the 1997 RI sample concentrations. Four samples (05SS31, 05SS36, 05SS43, and 05SS45) from the 2004 sampling and analysis program exceeded residential MSCs. These results are in accord with previous findings. The human health risk assessment indicated acceptable risk (reasonable maximum exposure (RME) 2.6E-05) levels for the most probable anticipated future land use exposure scenario (continuation of occupational worker exposure) but excess risk (RME 1.4E-03) above maximum acceptable guideline risk (1E-04) for potential future residential exposure.

In agreement with the 2002 Site 5 RI report, potential PAH-related ecological risks are limited primarily to soil invertebrates and burrowing animals in the vicinity of four or five samples. These samples comprise a relatively small area, and the potential for off site migration of PAHs is considered low. Any decision to perform a soil removal for ecological concerns would be at the discretion of the Navy and regulatory agency decision makers, but does not appear necessary according to current ecological risk evaluation guidelines.

# APPENDIX A

# SAMPLE LOG SHEETS

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAS JRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS31
Sample Location: 05SS31
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-2-04 | | 0" to 3" | Dark Brown | Clayey Silt - Some Sand / Rock Frags |
| Method: | 0929 | 3" to 19" | Brown | Sandy Silt with numerous Rock frags |
| Hand Auger | | | | some concrete chunks and pieces |
| Monitor Readings | | | | of Asphalt. |
| (Range in ppm): | | | | (Refusal at 19" BGS) |
| | | | | |
| 0 | | | | |

**SAMPLE COLLECTION INFORMATION:**

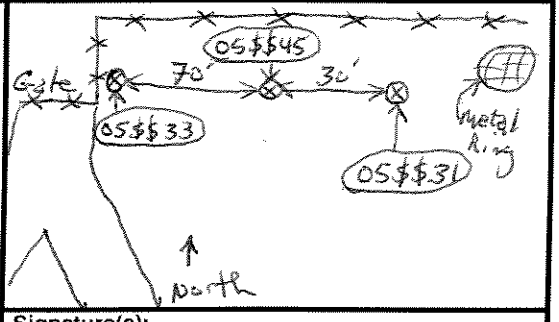
| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |

**OBSERVATIONS / NOTES:**

No odors, stains, or elevated PID readings observed.

- Made 3 attempts at separate locations to get below 19" BGS. Unable to get deeper.
- Sample Homogenized in stainless steel Bucket Prior to sampling

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS32
Sample Location: 05SS32
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-2-04 | | 0" to 5" | Dark Brown | Clayey Silt - some Sand / Rock Frags |
| Method: | 0854 | 5" to 24" | Brown-Red | Sandy Silt - some clay / Rock Frags |
| Hand Auger | | | | |
| Monitor Readings | | | | (All intervals damp to moist) |
| (Range in ppm): | | | | |
| 0 | | | | |

**SAMPLE COLLECTION INFORMATION:**

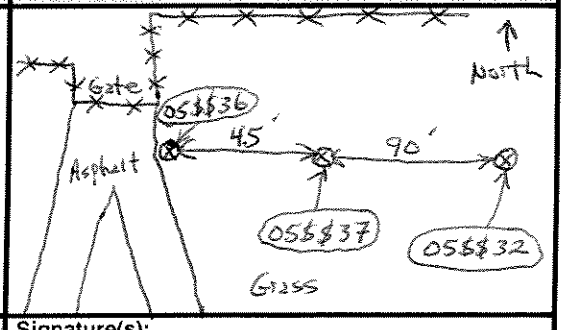
| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8oz Amber bottle | 2 | — |

**OBSERVATIONS / NOTES:**

No odors, stains, or elevated PID readings observed.

- Sample Homogenized in stainless steel Bucket prior to collection

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | 05DUP-02 |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS33
Sample Location: 05SS33
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: | | | |
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 8" | Brown | Clayey Silt - Some Sand / Rock Frags |
| Method: | 1423 | 8" to 24" | Red-Brown | Sandy Silt - Some Clay / Rock Frags |
| Hand Auger | | | | |
| Monitor Readings | | | | (All intervals damp to moist) |
| (Range in ppm): | | | | |
| 0 | | | | |
| | | | | |
| | | | | |
| | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |
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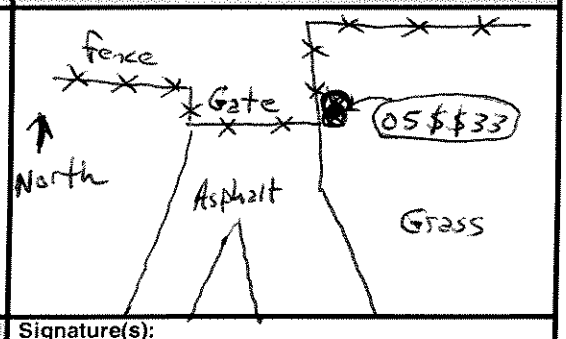
**OBSERVATIONS / NOTES:**

No odors, stains, or elevated PID readings observed.

- Sample Homogenized in stainless steel Bucket prior to collection.

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS34
Sample Location: 05SS34
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 8" | Dark Brown | Clayey Silt - Trace Sand / Rock Frags |
| Method: | | 8" to 16" | Red-Brown | Clayey Silt - Trace Sand |
| Hand Auger | 1133 | 16" to 24" | Orange-Gray-Brown | Clayey Silt - Trace Sand / Rock Frags |
| Monitor Readings | | | | |
| (Range in ppm): | | | | (All intervals moist) |
| 0 | | | | |
| | | | | |
| | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 2 | — |
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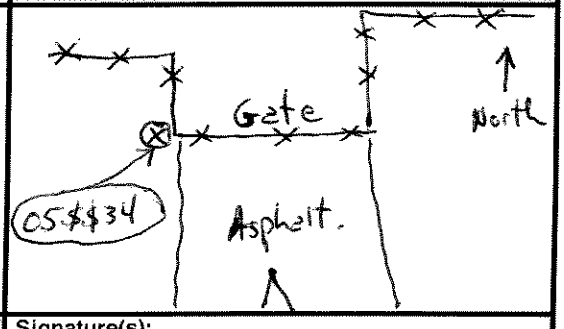
**OBSERVATIONS / NOTES:**

No odors, stains, elevated PID readings observed.

- Sample Homogenized in stainless steel Bucket prior to collection

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | 05DUP-01 |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAS JRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS35
Sample Location: 05SS35
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 7" | Gray-Black-Brn | Clayey/Silty Sand + Rock Frags |
| Method: | | 7" to 16" | Red-Brown | Silty Sand and Rock Frags |
| Hand Auger | 1058 | 16" to 22" | Orange-Red-Brown | Silty Sand and Rock Frags |
| Monitor Readings | | | | |
| (Range in ppm): | | | | (All intervals damp to moist) |
| 0 | | | | |

**SAMPLE COLLECTION INFORMATION:**

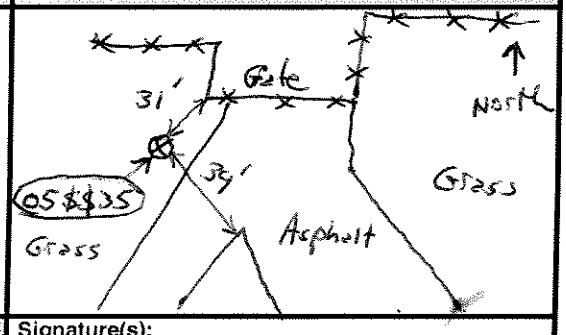
| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |

**OBSERVATIONS / NOTES:**

No odors, stains, or elevated PID readings observed.

- Sample was Homogenized in stainless steel bucket prior to collection

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

Signature(s):

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS36
Sample Location: 05SS36
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: | | | |
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 11" | Red-Brown | Silty-Sand and Rock Frags |
| Method: | | 11" to 18" | Orange-Red-Brown | Sandy Silt and Rock Frags |
| Hand Auger | 1015 | 18" to 24" | Red-Brown | Sandy Silt and Rock Frags |
| Monitor Readings | | | | |
| (Range in ppm): | | | | (All intervals damp to moist) |
| 0 | | | | |

**SAMPLE COLLECTION INFORMATION:**

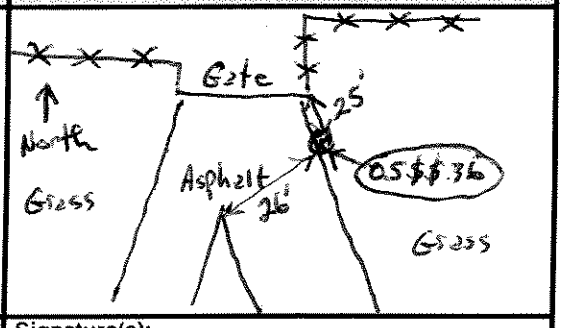
| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | – |

**OBSERVATIONS / NOTES:**

No odors, stains or elevated PID readings observed

- Sample Homogenized in stainless steel bucket prior to collection
- location is 5' due south of 05MW01I well

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| – | – |

Signature(s):

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAS JRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS37
Sample Location: 05SS37
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: | | | |
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 9" | Brown | clayey Silt - Some Sand/Rock Frags |
| Method: | 1527 | 9" to 21" | Red-Brown | Sandy Silt - Some clay/Rock Frags |
| Hand Augur | | | | (Refusal at 21" BGS) |
| Monitor Readings | | | | |
| (Range in ppm): | | | | (all intervals damp to moist) |
| | | | | |
| 0 | | | | |
| | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |
| | | | |
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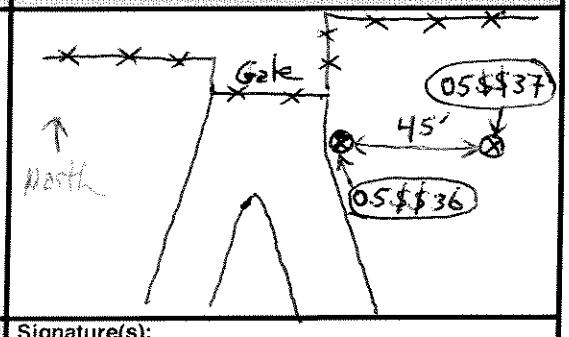
**OBSERVATIONS / NOTES:**

No odors, stains, or elevated PID readings observed.

- Sample Homogenized in stainless steel Bucket prior to collection

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N.2192

Sample ID No.: 05SS38
Sample Location: 05SS38
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 6" | Dark Brown | clayey-silt - some sand/Rock Frags |
| Method: Hand Auger | | 6" to 13" | Brown | Silty Sand - some Rock Frags |
| | 0928 | 13" to 24" | Red-Brown | Sandy Silt - some Rock Frags |
| Monitor Readings (Range in ppm): | | | | |
| | | | | All intervals dry to damp |
| 0 | | | | |
| | | | | |
| | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |
| | | | |
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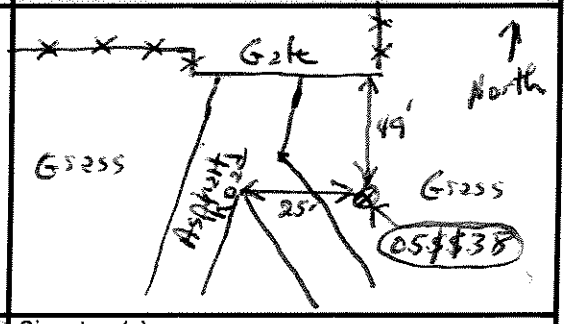
**OBSERVATIONS / NOTES:**

No odors, stains or elevated PID readings observed.

- Sample Homogenized in Stainless steel Bucket prior to collection.

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):** VAS

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS39
Sample Location: 05SS39
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 5" | Dark Brown | Clayey Silt - some Sand / Rock Frags |
| Method: | 1209 | 5" to 24" | Red-Brown | Sandy Silt - some clay / Rock Frags |
| Hand Auger | | | | |
| Monitor Readings | | | | (All intervals damp to moist) |
| (Range in ppm): | | | | |
| 0 | | | | |

**SAMPLE COLLECTION INFORMATION:**

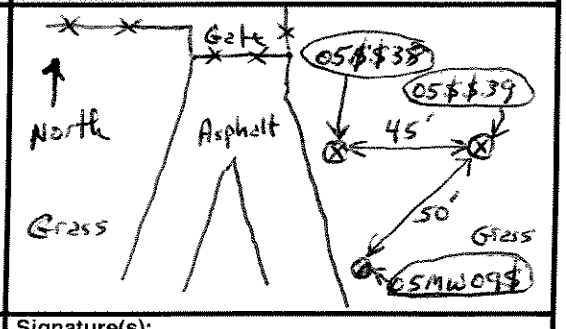
| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 2 | — |

**OBSERVATIONS / NOTES:**

No odors, stains, or elevated PID readings observed.

- Sample Homogenized in stainless steel bucket prior to collection

**MAP:**




**Circle if Applicable:**

MS/MSD: Yes

Duplicate ID No.: —

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 05SS40
Sample Location: 05SS40
Sampled By: VAS
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: | | | |
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: 6-1-04 | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| | | 0" to 8" | Brown | Clayey Silt - some Sand/Rock frags |
| Method: Hand Augur | 1351 | 8" to 24" | Red-Brown | Sandy Silt - some clay/Rock frags |
| | | | | |
| Monitor Readings | | | | (All intervals damp to moist) |
| (Range in ppm): | | | | |
| | | | | |
| 0 | | | | |
| | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |
| | | | |
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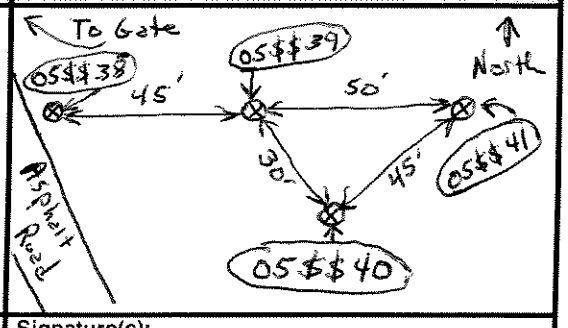
**OBSERVATIONS / NOTES:**

No odors, stains, or elevated PID readings observed.

- Sample Homogenized in stainless steel Bucket prior to collection

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

Signature(s):

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS41
Sample Location: 05SS41
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 6" | Dark Brown | Clayey Silt - some Sand/Rock frag |
| Method: | 1242 | 6" to 24" | Red-Brown | Sandy Silt - some clay/Rock frags |
| Hand Auger | | | | |
| Monitor Readings | | | | (All intervals damp to moist) |
| (Range in ppm): | | | | |
| 0 | | | | |

**SAMPLE COLLECTION INFORMATION:**

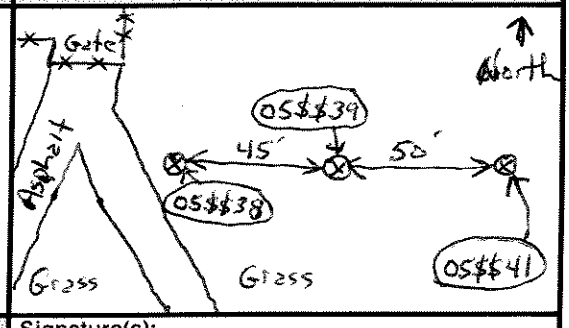
| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |

**OBSERVATIONS / NOTES:**

No odors, stains, or elevated PID readings observed

- Sample Homogenized in stainless steel Bucket prior to collection

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):** VAS

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS42
Sample Location: 05SS42
Sampled By:
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 6" | Dark Brown | Clayey Silt - Some Sand/Rock Frags |
| Method: | | 6" to 14" | Gray-Brown-Red | Sandy Silt - some clay/Rock Frags |
| Hand Augur | 1318 | 14" to 24" | Red-Brown | Sandy Silt - some clay/Rock Frags |
| Monitor Readings | | | | |
| (Range in ppm): | | | | (all intervals damp to moist) |
| 0 | | | | |

**SAMPLE COLLECTION INFORMATION:**

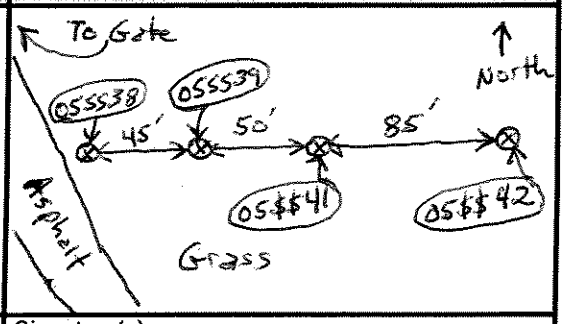
| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |

**OBSERVATIONS / NOTES:**

No odors, stains, or elevated PID readings observed

- Sample Homogenized in stainless steel Bucket prior to collection

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS43
Sample Location: 05SS43
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-2-04 | 1018 | 0" to 19" | Gray-Brown-Black | Clayey Silt with numerous pieces of gravel concrete and asphalt (damp to moist) |
| Method: Hand Auger | | | | |
| Monitor Readings (Range in ppm): 20ppm | | | | (Refusal at 19" BGS) |

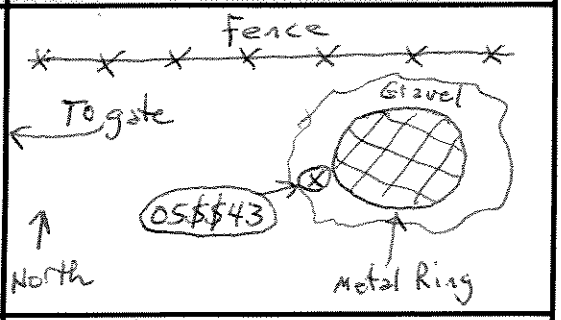
**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8ounce Amber Jar | 1 | — |

**OBSERVATIONS / NOTES:**

- Slight fuel-oil-like odor and Black staining of soils observed. PID readings from 0ppm to 20ppm in hole.
- Made 3 attempts at separate locations to get below 19" BGS. Unable to go any deeper.
- Sample Homogenized in stainless steel Bucket prior to sampling

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 05SS44
Sample Location: 05SS44
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| Date: | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-2-04 | | 0" to 5" | Dark Brown | Clayey silt - Some Sand / Rock frags |
| Method: | 1106 | 5" to 24" | Red-Brown | Sandy Silt - Some Rock frags |
| Hand Auger | | | | |
| Monitor Readings | | | | (All intervals damp to moist) |
| (Range in ppm): | | | | |
| 0 | | | | |

**SAMPLE COLLECTION INFORMATION:**

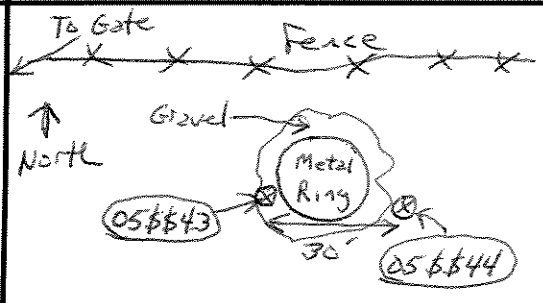
| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |

**OBSERVATIONS / NOTES:**

- No odors, stains, or elevated PID readings observed.

- Sample Homogenized in stainless steel Bucket prior to collection.

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project No.: N2192

Sample ID No.: 055545
Sample Location: 055545
Sampled By: VAS
C.O.C. No.:

[X] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: | | | |
| Time: | | | |
| Method: | | | |
| Monitor Reading (ppm): | | | |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth Interval | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| 6-1-04 | | 0" to 10" | Brown | Sandy Silt with numerous Rock Frags |
| Method: | 1603 | 10" to 19" | Red-Brown | Sandy Silt with clay and Rock Frags |
| Hand Auger | | | | (Refusal at 19" BGS) |
| Monitor Readings | | | | |
| (Range in ppm): | | | | (All intervals damp to moist) |
| | | | | |
| 0 | | | | |
| | | | | |

**SAMPLE COLLECTION INFORMATION:**

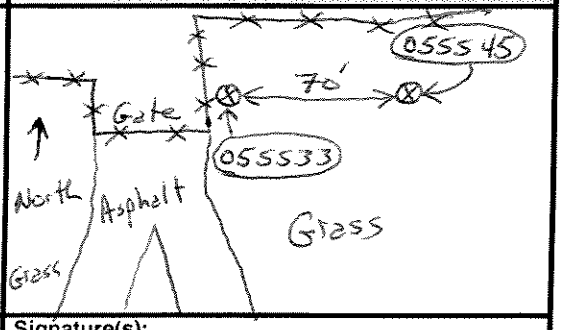
| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| PAH, TOC, pH | 8 ounce Amber Jar | 1 | — |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**OBSERVATIONS / NOTES:**

No odors, stains or elevated PID readings observed.

- Sample Homogenized in stainless steel Bucket prior to sampling.

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# QA SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project Number: N2192
Sample Location: Site 5
QA Sample Type:

Sample ID Number: 05FB060104
Sampled By: VAS
C.O.C. Number:

[] Trip Blank
[] Source Water Blank
[] Rinsate Blank
[X] Other Blank Field Blank

**SAMPLING DATA:**

Date: 6-1-04
Time: 1505
Method: Direct Pour

**WATER SOURCE:**

[] Laboratory Prepared
[X] Purchased
[] Other
[] Tap
[] Fire Hydrant

**PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):**

Product Name: HPLC Water
Supplier: Alfa Aesar
Manufacturer: Alfa Aesar
Order Number:
Lot Number: D03N22
Expiration Date:

**RINSATE INFORMATION (If Applicable):**

Media Type: ~~SCVAS~~
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Preservative | Container Requirements | Collected |
|---|---|---|---|
| Volatiles | Cool 4°C & HCl | | YES / NO |
| Semivolatiles | Cool 4°C | | YES / NO |
| Pesticide / PCB | Cool 4°C | | YES / NO |
| Metals | Cool 4°C & $HNO_3$ | | YES / NO |
| Cyanide | Cool 4°C & NaOH | | YES / NO |
| | | | |
| PAH, TOC, pH | cool 4°C | 1 Liter Amber bottle | (Yes) |
| | | | |
| | | | |
| | | | |

**OBSERVATIONS / NOTES:**

Sample poured at site 5.

**Signature(s):** VAS

Tetra Tech NUS, Inc.

# QA SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project Number: N 2192
Sample Location: Site 5
QA Sample Type:

Sample ID Number: 05RB060104
Sampled By: VAS
C.O.C. Number:

[] Trip Blank
[] Source Water Blank
[X] Rinsate Blank
[] Other Blank

**SAMPLING DATA:**

Date: 6-1-04
Time: 1445
Method: Direct pour

**WATER SOURCE:**

[] Laboratory Prepared
[X] Purchased
[] Other
[] Tap
[] Fire Hydrant

**PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):**

Product Name: HPLC water
Supplier: Alfa Aesar
Manufacturer: Alfa Aesar
Order Number:
Lot Number: D03N22
Expiration Date:

**RINSATE INFORMATION (If Applicable):**

Media Type: Soils
Equipment Used: Hand Auger
Equipment Type:
[] Dedicated
[X] Reusable

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Preservative | Container Requirements | Collected |
|---|---|---|---|
| Volatiles | Cool 4°C & HCl | | YES / NO |
| Semivolatiles | Cool 4°C | | YES / NO |
| Pesticide / PCB | Cool 4°C | | YES / NO |
| Metals | Cool 4°C & $HNO_3$ | | YES / NO |
| Cyanide | Cool 4°C & NaOH | | YES / NO |
| | | | |
| PAH, TOC, pH | cool 4°C | VAS 1 Liter Amber bottle | Yes |
| | | | |
| | | | |
| | | | |

**OBSERVATIONS / NOTES:**

HPLC water poured over "clean" Hand Auger directly into Sample bottleware

**Signature(s):**

Tetra Tech NUS, Inc.

# QA SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project Number: N2192
Sample Location: Site 5
QA Sample Type:

Sample ID Number: 05RB060204
Sampled By: VAS
C.O.C. Number:

[] Trip Blank
[] Source Water Blank
[X] Rinsate Blank
[] Other Blank

**SAMPLING DATA:**

Date: 6-2-04
Time: 1130
Method: Direct pour

**WATER SOURCE:**

[] Laboratory Prepared
[X] Purchased
[] Other
[] Tap
[] Fire Hydrant

**PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):**

Product Name: HPLC water
Supplier: Alfa Aesar
Manufacturer: Alfa Aesar
Order Number:
Lot Number: D03N22
Expiration Date:

**RINSATE INFORMATION (If Applicable):**

Media Type: Soils
Equipment Used: Stainless steel Trowel
Equipment Type:
[] Dedicated
[X] Reusable

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Preservative | Container Requirements | Collected |
|---|---|---|---|
| Volatiles | Cool 4°C & HCl | | YES / NO |
| Semivolatiles | Cool 4°C | | YES / NO |
| Pesticide / PCB | Cool 4°C | | YES / NO |
| Metals | Cool 4°C & $HNO_3$ | | YES / NO |
| Cyanide | Cool 4°C & NaOH | | YES / NO |
| | | | |
| PAH, TOC, pH | cool 4°C | 1 Liter Amber bottle | (Yes) |
| | | | |
| | | | |
| | | | |

**OBSERVATIONS / NOTES:**

HPLC water poured over "clean" stainless steel Trowel directly into bottleware

**Signature(s):**

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

# CHAIN-OF-CUSTODY RECORD



| REPORT TO | | INVOICE TO | | |
|---|---|---|---|---|
| COMPANY Tetra Tech NUS | PHONE (610) 491-9688 | COMPANY Tetra Tech NUS | PHONE | LAB PROJECT #: |
| NAME Russ Turner | FAX (610) 491-9645 | NAME | FAX | |
| ADDRESS 600 Clarke Ave. | | ADDRESS | | TURNAROUND TIME: |
| CITY/ST/ZIP King of Prussia PA 19406 | | CITY/ST/ZIP | | |

CLIENT PROJECT NAME: NASJRB Willow Grove
CLIENT PROJECT #: N2192
CLIENT P.O.#:

REQUESTED ANALYSES: 8 ounce Amber PAH, TOC, pH; 1 Liter Amber PAH, TOC, pH

| SAMPLE IDENTIFICATION | DATE/TIME SAMPLED | COMPOSITE | GRAB | WATER | SOIL | OTHER | LAB ID | # OF CONTAINERS | 8 ounce Amber PAH, TOC, pH | 1 Liter Amber PAH, TOC, pH | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05SS38 | 6-1-04/0928 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS36 | 6-1-04/1015 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS35 | 6-1-04/1058 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05DUP-01 | 6-1-04/0000 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS34 | 6-1-04/1133 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS39 | 6-1-04/1209 | X | | | X | | | 2 | 2 | | | | | | | | | | | | Do MS/MSD |
| 05SS41 | 6-1-04/1242 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS42 | 6-1-04/1318 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS40 | 6-1-04/1351 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS33 | 6-1-04/1423 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05RB060104 | 6-1-04/1445 | | X | X | | | | 1 | | 1 | | | | | | | | | | | |
| 05FB060104 | 6-1-04/1505 | | X | X | | | | 1 | | 1 | | | | | | | | | | | |

| TSF# | RELINQUISHED BY | DATE/TIME | ACCEPTED BY | DATE/TIME |
|---|---|---|---|---|
| | [signature] | 6-2-04/1700 | | / |
| | | / | | / |
| | | / | | / |

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Airbill # 8389 5045 3374

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(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

# CHAIN-OF-CUSTODY RECORD



| REPORT TO | | INVOICE TO | | |
|---|---|---|---|---|
| COMPANY Tetra Tech NUS | PHONE (610) 491-9688 | COMPANY Tetra Tech NUS | PHONE | LAB PROJECT #: |
| NAME Russ Turner | FAX (610) 491-9645 | NAME | FAX | |
| ADDRESS 600 Clarke Ave | | ADDRESS | | TURNAROUND TIME: |
| CITY/ST/ZIP King of Prussia PA 19406 | | CITY/ST/ZIP | | |

| CLIENT PROJECT NAME: | CLIENT PROJECT #: | CLIENT P.O.#: |
|---|---|---|
| NASJRB Willow Grove | N2192 | |

REQUESTED ANALYSES

| SAMPLE IDENTIFICATION | DATE/TIME SAMPLED | COMPOSITE | GRAB | WATER | SOIL | OTHER | LAB ID | # OF CONTAINERS | 8 ounce Amber PAH, TOC, pH | 1 Liter Amber PAH, TOC, pH | | | | | | | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05SS37 | 6-1-04/1527 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS45 | 6-1-04/1603 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS32 | 6-2-04/0854 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS31 | 6-2-04/0929 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05DUP-02 | 6-2-04/0000 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05SS43 | 6-2-04/1018 | X | | | X | | | 1 | 1 | | | | | | | | | | | | PID reading ~ 20ppm |
| 05SS44 | 6-2-04/1106 | X | | | X | | | 1 | 1 | | | | | | | | | | | | |
| 05RB060204 | 6-2-04/1130 | | X | X | | | | 1 | | 1 | | | | | | | | | | | |
| | / | | | | | | | | | | | | | | | | | | | | |
| | / | | | | | | | | | | | | | | | | | | | | |
| | / | | | | | | | | | | | | | | | | | | | | |
| | / | | | | | | | | | | | | | | | | | | | | |

| TSF# | RELINQUISHED BY | DATE/TIME | ACCEPTED BY | DATE/TIME |
|---|---|---|---|---|
| | [signature] | 6-2-04/1700 | | / |
| | | / | | / |
| | | / | | / |

ADDITIONAL REMARKS: Shipped by FED EX
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COOLER TEMP:

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# APPENDIX B

# SURVEYORS REPORT

# James M. Stewart, Inc. Land Surveyors

**9622 Evans Street Philadelphia, PA 19115**

**Office 215 969 1577 Fax 215 969 0338 email jmssurveys@comcast.net**

**Willow Grove Naval Air Station**
**Site 5**
**Willow Grove, PA**

File # 3516List
Horizontal Datum: Pennsylvania State Plane Coordinates NAD 83 South Zone
Vertical Datum: NAVD 88

July 22, 2004

| | Elevation in Feet | Coordinates in Feet | | |
|---|---|---|---|---|
| Sampling | | Y | X | |
| Point # | Ground | North | East | Date Of Survey |
| 05SS31 | 361.83 | 323592.99 | 2695618.46 | July 22, 2004 |
| 05SS32 | 360.39 | 323553.71 | 2695626.21 | July 22, 2004 |
| 05SS33 | 362.03 | 323618.74 | 2695516.29 | July 22, 2004 |
| 05SS34 | 361.94 | 323644.92 | 2695450.73 | July 22, 2004 |
| 05SS35 | 361.91 | 323614.25 | 2695443.85 | July 22, 2004 |
| 05SS36 | 361.98 | 323591.61 | 2695483.35 | July 22, 2004 |
| 05SS37 | 360.53 | 323580.41 | 2695544.52 | July 22, 2004 |
| 05SS38 | 361.49 | 323567.57 | 2695485.79 | July 22, 2004 |
| 05SS39 | 360.65 | 323553.99 | 2695529.13 | July 22, 2004 |
| 05SS40 | 359.73 | 323524.41 | 2695539.84 | July 22, 2004 |
| 05SS41 | 360.01 | 323542.27 | 2695573.68 | July 22, 2004 |
| 05SS42 | 359.54 | 323511.89 | 2695645.56 | July 22, 2004 |
| 05SS43 | 361.36 | 323588.51 | 2695648.65 | July 22, 2004 |
| 05SS44 | 360.87 | 323573.29 | 2695673.71 | July 22, 2004 |
| 05SS45 | 361.88 | 323602.42 | 2695589.04 | July 22, 2004 |

Reference Points Used

| | | | | |
|---|---|---|---|---|
| MW-09I | 362.07 | 323509.35 | 2695497.87 | July 22, 2004 |
| MW-10I | 362.44 | 323475.90 | 2695399.07 | July 22, 2004 |
| MW-7I | 360.61 | 323324.70 | 2695447.79 | July 22, 2004 |

# APPENDIX B

# SITE 5 REMEDIAL INVESTIGATION ADDENDUM NO. 2

# Soil Investigation for Volatile Organic Compound Soil To Groundwater Impact Site 5 - Fire Training Area

## NAS JRB Willow Grove

Horsham, Pennsylvania

## Engineering Field Activity Northeast

## Naval Facilities Engineering Command

Contract No. N62472-03-D-0057
Contract Task Order 003

March 2006

TETRA TECH NUS, INC.

# SOIL INVESTIGATION FOR VOLATILE ORGANIC COMPOUND SOIL TO GROUNDWATER IMPACT SITE 5 - FIRE TRAINING AREA NAS JRB WILLOW GROVE HORSHAM TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA

## 1.0 INTRODUCTION

Tetra Tech NUS (TtNUS) performed additional investigation of the soil at Site 5 (the former Fire Training Area) at the Naval Air Station Joint Reserve Base (NAS JRAB) Willow Grove, Pennsylvania. The work was performed under Contract Task Order No. 003 under Contract N62472-03-D-0057, Comprehensive Long-Term Environmental Action – Navy (CLEAN), in accordance with the approved Work Plan for Soil Investigation, Summer 2005, Volatile Organic Compound Soil to Groundwater Impact, Site 5 - Fire Training Area Soil, Operable Unit 4 (OU 4) (Tetra Tech NUS, December 2005). This work complements the previous remedial investigation work that is documented in the Remedial Investigation Report for Site 5 – Fire Training Area (Tetra Tech NUS, February 2002), and the Remedial Investigation Report for Sites 1, 2, 3, and 5 (Halliburton NUS, February 1993).

The purpose of this soil investigation was to address regulatory agency concerns regarding the quality of the historical analytical data for volatile organic compounds (VOCs) in Site 5 soil. Specifically, the Environmental Protection Agency (EPA) had concerns regarding the sampling methods used during the previous investigations, and requested that these locations be resampled with the EnCore™ sampling technique (a sampling method that was not available during the previous investigations) to confirm the historical results. EPA concerns included:

- Whether the analytical non-detections of VOCs from soil samples in the vicinity of the former burn ring could be false negatives. These samples were chosen in the field because of elevated photoionization detector (PID) responses observed during screening procedures.

- Whether the VOC concentrations reported for the soils containing positive detections could have been under-reported.

- Whether the VOC concentrations exceed the applicable benchmark screening concentrations for the soil-to-groundwater migration pathway.

## 2.0 SITE DESCRIPTION AND SETTING

NAS JRB Willow Grove is located in Horsham Township, Montgomery County, Pennsylvania, approximately 20 miles north of the city of Philadelphia. NAS JRB Willow Grove occupies 1,000 acres of the 1,200 acres maintained by the Department of Defense at the Air Station, and the Willow Grove Air Reserve Station occupies the remaining 200 acres (see Figure 1). The Air Station is generally bounded by State Route 611 (Easton Road) to the east, State Route 463 (Horsham Road) to the southwest, and Keith Valley Road to the north.

Site 5 is located in the south-central portion of NAS JRB, approximately midway between Runway 10/28 and Horsham Road. The site is located immediately south of Taxiway Juliet, and covers an irregularly shaped area of approximately 1.25 acres. The training area was used from 1942 to 1975 for firefighting exercises, which included the disposal and burning of flammable liquid wastes generated by the Naval Air Station. Wastes including solvents, paint chemicals, xylenes, toluene, and various petroleum compounds were reportedly consumed at the rate of at least 4,000 gallons per year. Drums were reportedly stored in the vicinity of the burn ring during the periods between firefighting exercises.

Site 5 is comprised of flat to slightly rolling terrain, and is primarily covered by grasses, buildings, and a parking lot, with some woody and brushy vegetation present within the southern portion of the area.

## 3.0 SCOPE OF THE INVESTIGATION

The field investigation was designed to gather additional analytical data from subsurface soils at selected locations that were sampled during previous investigations. These locations included:

- Soil boring locations where elevated PID readings were observed in the field, but no VOCs were subsequently detected during the laboratory analyses. These soils were resampled to confirm that VOCs are not present at these locations.

- Soil boring locations where elevated PID readings were observed in the field, and VOCs were subsequently detected during the laboratory analyses. These soils were resampled to confirm the accuracy of the previously reported concentrations.

The following field investigation tasks were completed to address the identified data gaps:

- Soil Borings (see Section 4.1). Six soil borings were drilled near the locations of selected historical borings (see Figure 2). Continuous soil cores were obtained from the ground surface to the top of bedrock at each boring location.

- Soil Sampling and Analysis (see Section 4.2). The soil cores were screened in the field with a PID. Based on these results, two soil samples were selected from each boring using the EnCore™ sampling technique, and submitted to a fixed-base analytical laboratory for VOC analyses.

## 4.0 SUMMARY OF FIELD INVESTIGATION

The locations of the six soil borings are illustrated on Figure 2. Three of the borings (05SB-54, -55, and -56) are located in the vicinity of the former burn ring, where no VOCs have historically been detected, and three of the borings (05SB-51, -52, and -53) are located in the vicinity of the former drum storage area, where elevated concentrations of VOCs have historically been detected.

Each drilling location was cleared for subsurface utilities by NAS JRB personnel, and by contacting the Pennsylvania One-Call utility clearing system.

## 4.1 BOREHOLE DRILLING

The drilling subcontractor was Vironex, Inc., of Bowie, Maryland. The soil borings were drilled by the direct push technology (DPT, or "Geoprobe") drilling method. With the DPT method, a sampling barrel fitted with an acetate core sleeve is hydraulically advanced (or pushed) into the subsurface to obtain a soil core. The barrel is withdrawn from the borehole, the acetate core sleeve is removed, a new core sleeve is inserted into the barrel, and the sampling assembly is reinserted into the borehole to obtain the next core. The borehole stayed open when the sampling assembly was withdrawn due to the clayey and silty nature of the soil. At each location, continuous soil samples or cores were collected from the ground surface to the top of bedrock (which was defined as hydraulic refusal, or the inability to further advance the barrel). The depths of the borings ranged from 18 to 23 feet in the vicinity of the former burn ring, and from 11 to 19 feet in the vicinity of the former drum storage area. At the conclusion of each boring, the borehole was backfilled with a mixture of soil cuttings and bentonite.

The soil borings were surveyed for horizontal location and vertical elevation by James M. Stewart, Inc. The survey data are presented in Appendix A.

## 4.2 SOIL SAMPLING AND ANALYSIS

### 4.2.1 Lithologic Analysis

The lithology of each core was described by the TtNUS geologist and noted on the boring log. The lithologies observed in the cores were consistent with those noted during previous site investigations, and consisted predominantly of fine-grained soils ranging from a silty clay to a sandy silt. The boring logs are included in Appendix B.

### 4.2.2 Field Screening

Concurrent with the lithologic analysis, each core was field-screened for VOCs using a PID. These PID readings are recorded on the boring logs. In addition, headspace analyses were conducted for each core at two-foot intervals. To determine the headspace concentrations, a soil sample was placed in a clean glass jar and tightly covered with aluminum foil. The jar was then shaken to thoroughly mix the soil sample with the air in the headspace. After the sample was allowed to equilibrate for a period of 10 minutes, the foil was perforated by the PID and a headspace reading was recorded. The results of the headspace analyses are included in Table 1.

### 4.2.3 Soil Sampling and Laboratory Analysis

Soil samples were collected (and preserved) every two feet from the entire borehole of each boring. Two soil samples from each boring were selected for VOC analysis by a fixed-base laboratory. One soil sample for laboratory analysis was taken from the interval displaying the highest headspace PID reading, and one soil sample was taken from the basal soils occurring immediately above the top of bedrock. No PID readings were noted at location 05SB56, so one sample was taken from the basal soils, and one sample was taken from the midpoint of the boring. All soil samples were obtained using the closed

sampling vessel (EnCore™) sampling technique and in accordance with the sampling procedures described in Appendix B of the work plan.

The samples ultimately selected for VOC analysis are shown in Table 1. The requisite QA/QC samples (including field duplicate, field blank, rinsate blank, and trip blank) were also taken and submitted as prescribed in the work plan. The sample log sheets are included in Appendix C.

The laboratory analyses were performed by Northeast Laboratory Services of Waterville, Maine (a Navy-certified laboratory) using SW-846 Method 8260B. The data were validated to EPA validation level M3 by TtNUS in accordance with EPA's national and regional protocol. The complete set of validated analytical data is presented in Appendix D.

## 5.0 RESULTS AND DISCUSSION

The analytical data obtained through the EnCore™ sampling method for this current investigation are summarized in Table 2 (for the soil borings located in the vicinity of the former drum storage area) and Table 3 (for the soil borings located in the vicinity of the former burn ring). For comparison, these tables also include the historical analytical data from the corresponding previous borings (see Figure 2 for locations) that were obtained using the now-obsolete sampling methods.

### 5.1 COMPARISON OF CURRENT AND HISTORICAL ANALYTICAL DATA

Overall, the current analytical data compare favorably with the historical data. Although no statistical comparisons of the data sets were conducted, the level of similarity in both the qualitative (presence versus absence) and quantitative (concentration) results indicate that all existing analytical data may be confidently used for the interpretation of site conditions.

Qualitatively, the list of compounds positively detected at each location in 2005 is similar to the compounds that were detected in 1997 or 1991. One exception to this trend occurred at boring location 05SB52 (2005), where 14 VOCs were detected, versus 05SB21 (1997), where 2 VOCs were detected. This difference, however, is due to the significantly higher detection limits that were reported for the 1997 sample.

Quantitatively, the VOC concentrations detected in 2005 are similar to the concentrations detected in 1997 or 1991. No sampling event displays consistently higher or lower concentrations than the other

sampling events, and the reported differences in concentrations are generally small. The exceedances (or non-exceedances) of benchmark criteria are consistent across the data sets. That is, the compounds that exceeded a benchmark concentration for the current sampling round typically exceeded the benchmark for the historical sampling round. Again, one exception to this trend was noted at location 05SB21, where the lower detection limits achieved for the current round resulted in the positive detection of 12 additional VOCs, and consequently a higher number of benchmark exceedances.

## 5.2 UPDATED SITE 5 CONCEPTUAL MODEL FOR SOILS

The analytical results of the current sampling event support the existing interpretation of Site 5 soil conditions as presented in the RI report (Tetra Tech NUS, February 2002). No significant changes to this interpretation are required.

The most significant VOC concentrations in the soil (based on the number of detected compounds, the VOC concentrations, and the number of benchmark screening criteria that are exceeded) are detected in the vicinity of the former drum storage area. Here, selected benchmark criteria were exceeded from subsurface depths as shallow as 1 foot (at 05SB52) to as deep as the overburden/bedrock interface (15 feet at 05SB53). In contrast, little VOC impact to the soils is detected in the vicinity of the former burn ring. In addition, the nature and extent of VOCs in the soil are very consistent with the nature and extent of VOCs in the resultant groundwater plume, where the former drum storage area (which consistently records the highest VOC concentrations for groundwater) is interpreted to be the source area of the plume.

During the scoping of this project, regulators questioned the lack of historical contamination detected in the vicinity of the burn ring, and noted that the highest VOC concentrations at most fire training sites are typically detected at the burn area. However, this investigation revealed that at NAS JRB, the burn ring has a competent steel bottom, and is actually a half-buried, soil-filled tank, rather than simply a steel partition encircling unlined native soil. The tank is interpreted to have prevented the infiltration of VOCs into the underlying native soil. Soil boring 05SB55 was placed near the tank's spill point (overflow pipe) to investigate whether VOCs may have spilled out of the tank, but the analytical results indicated no VOCs in the surface soils, and very low detections of 2 VOCs at the overburden/bedrock interface (2-butanone at 2.8J ug/L and methyl acetate at 5.2J ug/L).

## 5.3 SUMMARY AND CONCLUSIONS

The purpose of this investigation was to gather additional analytical data from subsurface soils at selected locations that were sampled during previous investigations. The objective of the resampling was to address regulatory concerns regarding the quality of the historical analytical data for VOCs because of the now-outdated sampling techniques that were used. The current samples were obtained using the EnCore™ sampling method.

One subset of soil samples were obtained from boring locations where elevated PID readings were previously observed in the field, but not VOCs were subsequently detected during the laboratory analyses. The results of the current investigation confirm that VOCs are not present in these areas.

One subset of soil samples were obtained from boring locations where elevated PID readings were previously observed in the field, and VOCs were subsequently detected during the laboratory analyses. The results of the current investigation confirm that VOCs are present in these areas at the approximate concentrations that had been previously reported.

In summary, the results of this investigation validate the historical data and indicate that all of these results may be used with confidence.

# TABLES

**TABLE 1**
**RESULTS OF PHOTOIONIZATION DETECTOR (PID) HEADSPACE SCREENINGS**
**NAS JRB WILLOW GROVE SITE 5 - FIRE TRAINING AREA**

| Boring | Depth | Headspace (PID, ppm) | Boring | Depth | Headspace (PID, ppm) |
|---|---|---|---|---|---|
| 05SB51 | 0 - 1 | 187 | 05SB54 | 0 - 1** | 310 |
| | 2 - 3 | 450 | | 2 - 3 | 121 |
| | 4 - 5** | 1013 | | 4 - 5 | 7.8 |
| | 6 - 7 | 180 | | 6 - 7 | 16.5 |
| | 8 - 9 | 61.9 | | 8 - 9 | 0.4 |
| | 11 - 12 | 38.9 | | 10 - 11 | 28.5 |
| | 12 - 13 | 18.7 | | 12 - 13 | 17.4 |
| | 14 - 15 | 35.3 | | 14 - 15 | 29.7 |
| | 16 - 17 | 0.0 | | 16 - 17 | 0.0 |
| | 18 - 19** | 0.0 | | 17 - 18** | 8.8 |
| 05SB52 | 0 - 1** | 1523 | 05SB55 | 0 - 1** | 43.2 |
| | 2 - 3 | 215 | | 2 - 3 | 0.0 |
| | 4 - 5 | 21.2 | | 4 - 5 | 2.2 |
| | 6 - 7 | 23.5 | | 6 - 7 | 6.1 |
| | 8 - 9 | 24.1 | | 8 - 9 | 0.0 |
| | 10 - 11** | 82.6 | | 10 - 11 | 15.4 |
| 05SB53 | 0 - 1 | 2.6 | | 12 - 13 | 18.2 |
| | 2 - 3 | 22.7 | | 14 - 15 | 8.5 |
| | 4 - 5 | 14.4 | | 16 - 17 | 22.3 |
| | 6 - 7 | 18.0 | | 18 - 19 | 17.7 |
| | 8 - 9 | 12.6 | | 20 - 21 | 15.0 |
| | 10 - 11** | 22.9 | | 22 - 23** | 42.4 |
| | 12 - 13 | 16.4 | 05SB56 | 0 - 1 | 0.0 |
| | 14 - 15** | 34.2 | | 2 - 3 | 0.0 |
| | | | | 4 - 5 | 0.0 |
| | | | | 6 - 7 | 0.0 |
| | | | | 8 - 9 | 0.0 |
| | | | | 10 - 11** | 0.0 |
| | | | | 12 - 13 | 0.0 |
| | | | | 14 - 15 | 0.0 |
| | | | | 16 - 17 | 0.0 |
| | | | | 19 - 20** | 0.0 |

** Interval selected for laboratory analysis.

TABLE 2

## DATA SUMMARY OF ANALYTICAL RESULTS
## VOLATILE ORGANIC COMPOUNDS (VOCs) IN SOIL
## NAS JRB WILLOW GROVE SITE 5 - FORMER FIRE TRAINING AREA

### SOIL BORINGS LOCATED IN THE VICINITY OF THE FORMER DRUM STORAGE AREA

| Boring: | 05SB51 | | 05SB17 | | 05SB52 | | 05SB21 | 05SB53 | | 05SB22 | SCREENING LEVELS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date: | 2005 | | 1997 | | 2005 | | 1997 | 2005 | | 1997 | | |
| Depth (feet): | 4 - 5 | 18 - 19 | 4 - 6 | 10 - 12 | 1 - 2 | 10 - 11 | 2 - 4 | 10 - 11 | 14 - 15 | 4 - 6 | EPA SSL | PADEP |
| 1,1,1-Trichloroethane | 10U | 10U | 12U | 12U | **7300** | 11U | 1500U | **29** | **6.7J** | **140** | 60000 | 7200 |
| 1,1,2-Trichloroethane | 1U | **0.55J** | 12U | 12U | 1U | **1.2** | 1500U | 10U | **0.9J** | **15** | 0.78 | 150 |
| 1,1-Dichloroethane | **0.56J** | **4.2J** | 12U | **11J** | **290J** | **1.1** | 1500U | **120** | **48** | **160** | 51000 | 650 |
| 1,1-Dichloroethene | 10U | 10U | 12U | 12U | **170J** | 11U | 1500U | **9.6J** | **2.4J** | **5J** | 2900 | 190 |
| 1,2-Dichlorobenzene | 10U | 10U | NA | NA | 10UJ | 11U | NA | 10U | 11U | NA | 4600 | 59000 |
| 1,2-Dichloroethane | 1U | 1U | 12U | 12U | 1U | 1.1U | 1500U | 1U | 1.1U | 12U | 1 | 100 |
| 1,3-Dichlorobenzene | 10U | 10U | NA | NA | 10UJ | 11U | NA | 10U | 11U | NA | 290 | 61000 |
| 2-Butanone | 10U | 10U | 12U | 12U | 10U | 11U | 1500U | 10U | **1.7J** | **55** | 29000 | 54000 |
| 4-methyl-2-pentanone | 10U | **0.56J** | 12U | 12U | 10U | **3.8J** | 1500U | 10U | 11U | 12U | 59000 | 2900 |
| Acetone | 2.9B | 2.1B | **70** | 12U | **47J** | 4.7B | 1500UJ | 10U | 6.3B | **140J** | 2200 | 41000 |
| Benzene | **28** | 2U | **15** | **20J** | **20** | 2.2U | 1500U | **6.5** | **1.9J** | **19** | 1.9 | 130 |
| Bromomethane | 2U | 2U | 12U | 12U | 2U | 2.2U | 1500U | 2U | 2.2U | 12U | 41 | 540 |
| cis-1,2-Dichloroethene | 10U | **1.3J** | 12U (total) | 12U (total) | **0.61J** | 11U | 1500U (total) | **45** | **16** | **120 (total)** | 350 | 1600 |
| Carbon Disulfide | 10U | 10U | 12U | 12U | **1.3J** | 11U | 1500U | 10U | 11U | 12U | 19000 | 160000 |
| Cyclohexane | **29** | 10U | NA | NA | **130** | 11U | NA | **12** | **1.1J** | NA | - - | - - |
| Ethylbenzene | **130** | 10U | **180** | **150J** | **1600** | 11U | **3400** | 10U | 11U | **50** | 15000 | 46000 |
| Isopropylbenzene | 10U | 10U | NA | NA | 10UJ | 11U | NA | **5.9J** | **0.6J** | NA | 64000 | 780000 |
| Methyl Acetate | 10U | 10U | NA | NA | 10U | 11U | NA | 10U | 11U | NA | 25000 | 690000 |
| Methylcyclohexane | **160J** | 10U | NA | NA | **4500** | 11U | NA | **45** | **1.7J** | NA | - - | - - |
| MTBE | 1U | 1U | NA | NA | 1U | 1.1U | NA | 1U | 1.1U | NA | 12 | 280 |
| Styrene | 10U | 10U | 12U | 12U | 10UJ | 11U | 1500U | 10U | 11U | 12U | 57000 | 24000 |
| Tetrachloroethene | 2U | 2U | 12U | 12U | **11** | 2.2U | 1500U | **2.5** | 2.2U | **10J** | 4.7 | 430 |
| Toluene | **1.2J** | 10U | 12U | 12U | **17** | 11U | 1500U | 10U | 11U | **14** | 8800 | 44000 |
| Trichloroethene | 1U | 1U | 12U | **8J** | **6** | 1.1U | 1500U | **4.4** | **1.1** | **2J** | 0.26 | 170 |
| Xylenes (total) | **320** | 10U | **410** | **1100** | **16000** | 11U | **16000** | 10U | 11U | **220** | 3000 | 990000 |

Notes:
All concentrations are reported in values of ug/KG.
Listed compounds have at least one positive detection in at least one sample. Target compounds with no positive detections are not listed.
EPA benchmarks are the Region 3 Soil Screening Levels (SSLs) for soil-to-groundwater migration at a dilution-attenuation factor (DAF) = 20.
PADEP benchmarks are the soil-to-groundwater generic values for a used, residential aquifer with TDS < 2500.
Concentrations reported for borings 05SB22, 05SB51 (4-5), and 05SB52 (10-11) are the highest reported concentrations from the field & field duplicate sample pair.
U = Compound was Undetected at the posted detection limit.
J = The reported concentration is estimated.
B = The reported detection was qualified as blanked through the data validation process.
NA = Not Analyzed

**Bolded concentrations represent positive detections.**
**Highlighted concentrations represent exceedances of at least one benchmark screening value.**

## TABLE 3

## DATA SUMMARY OF ANALYTICAL RESULTS
## VOLATILE ORGANIC COMPOUNDS (VOCs) IN SOIL
## NAS JRB WILLOW GROVE SITE 5 - FORMER FIRE TRAINING AREA

### SOIL BORINGS LOCATED IN THE VICINITY OF THE FORMER BURN RING

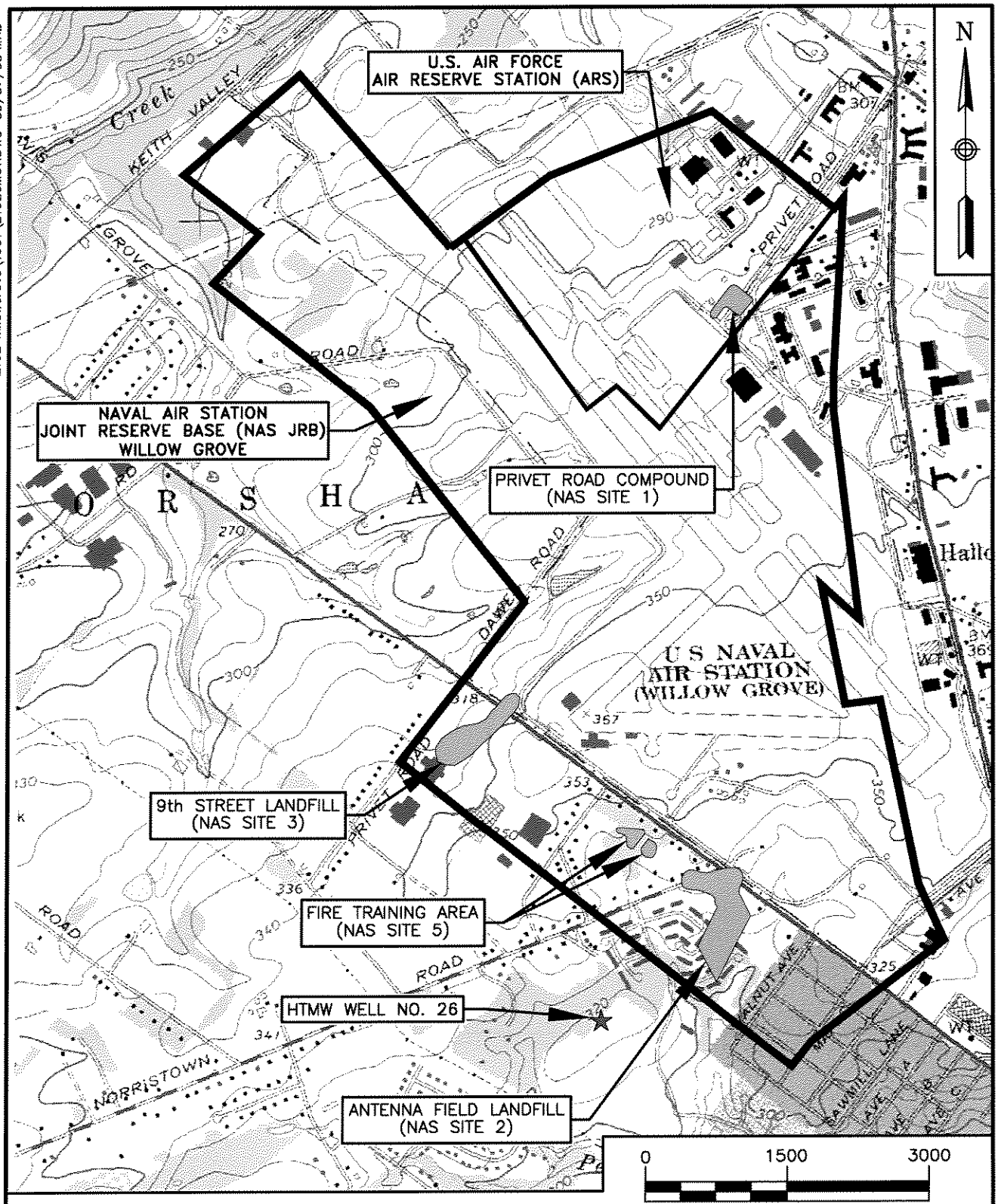
| Boring: | 05SB54 | | 05SB15 | | 05SB55 | | 05SB30 | 05SB56 | | No nearby historical borings | SCREENING LEVELS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date: | 2005 | | 1991 | | 2005 | | 1997 | 2005 | | | | |
| Depth (feet): | 0 - 1 | 17 - 18 | 0 - 2 | 4 - 6 | 0 - 1 | 22 - 23 | 4 - 6 | 10 - 11 | 19 - 20 | | EPA SSL | PADEP |
| 1,1,1-Trichloroethane | 10UJ | 10U | 5U | 6U | 10U | 10UJ | 12U | 10U | 10U | - - | 60000 | 7200 |
| 1,1,2-Trichloroethane | 1UJ | 1U | 5U | 6U | 1U | 1U | 12U | 1U | 1U | - - | 0.78 | 150 |
| 1,1-Dichloroethane | 10UJ | 10U | 5U | 6U | 10U | 10UJ | 12U | **0.58J** | 10U | - - | 51000 | 650 |
| 1,1-Dichloroethene | 10UJ | 10U | 1B | 6U | 10U | 10UJ | 12U | 10U | 10U | - - | 2900 | 190 |
| 1,2-Dichlorobenzene | **1J** | 10U | NA | NA | 10U | 10U | NA | 10U | 10U | - - | 4600 | 59000 |
| 1,2-Dichloroethane | 1UJ | 1U | 5U | 6U | 1U | 1UJ | 12U | **7.8** | **3.7** | - - | 1 | 100 |
| 1,3-Dichlorobenzene | **0.98J** | 10U | NA | NA | 10U | 10U | NA | 10U | 10U | - - | 290 | 61000 |
| 2-Butanone | **6.9J** | 10U | 10U | 12U | 10U | **2.8J** | 12U | 10U | 10U | - - | 29000 | 54000 |
| 4-methyl-2-pentanone | 10UJ | 10U | 10U | 12U | 10U | 10U | 12U | 10U | 10U | - - | 59000 | 2900 |
| Acetone | **29J** | 10U | 10U | 52B | 10U | 1B | **41J** | 1.5B | 10U | - - | 2200 | 41000 |
| Benzene | 2UJ | 2U | 5U | **1J** | 2U | 2UJ | 12U | 2U | 2U | - - | 1.9 | 130 |
| Bromomethane | 2UJ | 2U | 10U | 12U | 2U | 2UJ | 12U | 2U | 2U | - - | 41 | 540 |
| cis-1,2-Dichloroethene | 10UJ | 10U | 5U (total) | 6U (total) | 10U | 10UJ | 12U (total) | 10U | 10U | - - | 350 | 1600 |
| Carbon Disulfide | **1.6J** | 10U | 5U | **2J** | 10U | 10UJ | 12U | 10U | 10U | - - | 19000 | 160000 |
| Cyclohexane | 10UJ | 10U | NA | NA | 10U | 10UJ | NA | 10U | 10U | - - | - - | - - |
| Ethylbenzene | 10UJ | 10U | 5U | 6U | 10U | 10U | **5J** | 10U | 10U | - - | 15000 | 46000 |
| Isopropylbenzene | 10UJ | 10U | NA | NA | 10U | 10U | NA | 10U | 10U | - - | 64000 | 780000 |
| Methyl Acetate | **11J** | 10U | NA | NA | 10U | **5.2J** | NA | 10U | 10U | - - | 25000 | 690000 |
| Methylcyclohexane | 10UJ | 10U | NA | NA | 10U | 10UJ | NA | 10U | 10U | - - | - - | - - |
| MTBE | **1.1J** | 1U | NA | NA | 1U | 1UJ | NA | 1U | 1U | - - | 12 | 280 |
| Styrene | 10UJ | 10U | 5U | 6U | 10U | 10U | 12U | 10U | 10U | - - | 57000 | 24000 |
| Tetrachloroethene | 2UJ | 2U | 5U | 6U | 2U | 2U | 12U | 2U | 2U | - - | 4.7 | 430 |
| Toluene | 10UJ | 10U | **1J** | 6U | 10U | 10U | **2J** | 10U | 10U | - - | 8800 | 44000 |
| Trichloroethene | 1UJ | 1U | 5U | 6U | 1U | 1U | 12U | 1U | 1U | - - | 0.26 | 170 |
| Xylenes (total) | **1J** | 10U | 5U | 6U | 10U | 10U | **22** | 10U | 10U | - - | 3000 | 990000 |

Notes:
All concentrations are reported in values of ug/KG.
Listed compounds have at least one positive detection in at least one sample. Target compounds with no positive detections are not listed.
EPA benchmarks are the Region 3 Soil Screening Levels (SSLs) for soil-to-groundwater migration at a dilution-attenuation factor (DAF) = 20.
PADEP benchmarks are the soil-to-groundwater generic values for a used, residential aquifer with TDS < 2500.
Concentrations reported for borings 05SB22, 05SB51 (4-5), and 05SB52 (10-11) are the highest reported concentrations from the field & field duplicate sample pair.
U = Compound was Undetected at the posted detection limit.
J = The reported concentration is estimated.
B = The reported detection was qualified as blanked through the data validation process.
NA = Not Analyzed

**Bolded concentrations represent positive detections.**
**Highlighted concentrations represent exceedances of at least one benchmark screening value.**

# FIGURES

2192 WillowGrove\1601\2192CM01.DWG 09/07/05 MKB



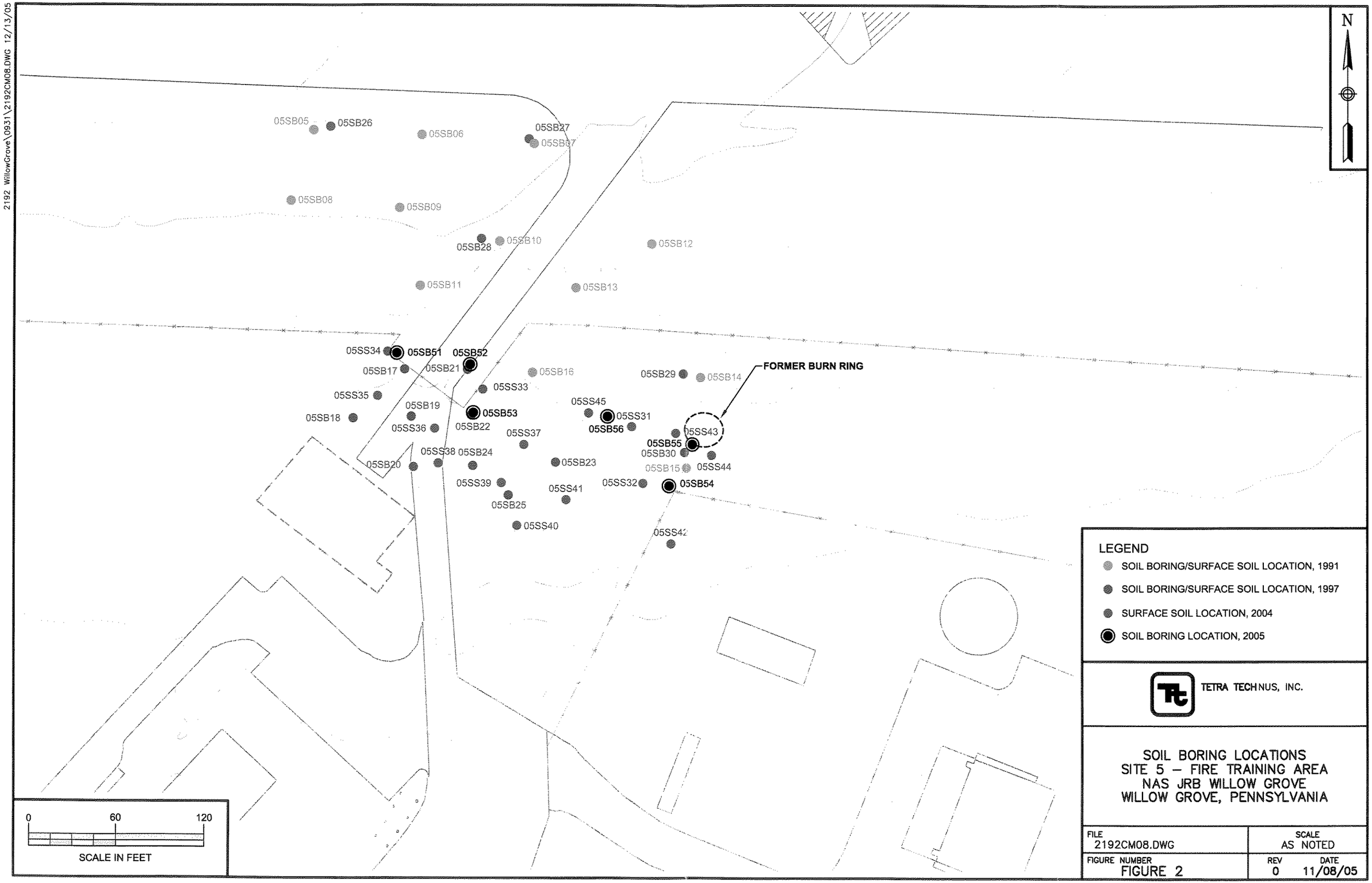

BASE MAP IS A PORTION OF THE AMBLER, PA U.S.G.S. 7.5 MINUTE QUADRANGLE MAP, DATED 1963, PHOTOREVISED IN 1983.

TETRA TECHNUS, INC.

LOCATION OF RI SITES
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

| | |
|---|---|
| SCALE | AS NOTED |
| FILE | 2192CM01.DWG |
| REV | 0 |
| DATE | 09/07/05 |
| FIGURE NUMBER | FIGURE 1 |

2192 WillowGrove\0931\2192CM08.DWG 12/13/05




LEGEND

- SOIL BORING/SURFACE SOIL LOCATION, 1991
- SOIL BORING/SURFACE SOIL LOCATION, 1997
- SURFACE SOIL LOCATION, 2004
- SOIL BORING LOCATION, 2005

TETRA TECH NUS, INC.

SOIL BORING LOCATIONS
SITE 5 – FIRE TRAINING AREA
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

| FILE | SCALE |
|---|---|
| 2192CM08.DWG | AS NOTED |
| FIGURE NUMBER | REV / DATE |
| FIGURE 2 | 0 / 11/08/05 |

# APPENDIX A

# SURVEY DATA

# James M. Stewart, Inc. Land Surveyors

**9622 Evans Street Philadelphia, PA 19115**

**Office 215 969 1577 Fax 215 969 0338 email jmssurveys@comcast.net**


**Willow Gove Naval Air Station**
**Site 05 - Fire Training Area**
**Willow Grove - Pennsylvania**

Project #: 3516 October 27, 2005
Horizontal Datum: Pennsylvania State Plane Coordinates NAD 83 - South Zone
Vertical Datum: NAVD 88

| | Elevation in Feet | Coordinates in Feet | | |
|---|---|---|---|---|
| Sampling | | Y | X | |
| Point # | Ground | North | East | Date Of Survey |
| | | | | |
| 05SS34 | 361.9 | 323644.92 | 2695450.73 | July 22, 2004 |
| 05SS35 | 361.9 | 323614.25 | 2695443.85 | July 22, 2004 |
| 05SS36 | 362.0 | 323591.61 | 2695483.35 | July 22, 2004 |
| 05SS38 | 361.5 | 323567.57 | 2695485.79 | July 22, 2004 |
| 05SS33 | 362.0 | 323618.74 | 2695516.29 | July 22, 2004 |
| 05SS39 | 360.7 | 323553.99 | 2695529.13 | July 22, 2004 |
| 05SS40 | 359.7 | 323524.41 | 2695539.84 | July 22, 2004 |
| 05SS37 | 360.5 | 323580.41 | 2695544.52 | July 22, 2004 |
| 05SS41 | 360.0 | 323542.27 | 2695573.68 | July 22, 2004 |
| 05SS32 | 360.4 | 323553.71 | 2695626.21 | July 22, 2004 |
| 05SS42 | 359.5 | 323511.89 | 2695645.56 | July 22, 2004 |
| 05SS43 | 361.4 | 323588.51 | 2695648.65 | July 22, 2004 |
| 05SS44 | 360.9 | 323573.29 | 2695673.71 | July 22, 2004 |
| 05SS31 | 361.8 | 323592.99 | 2695618.46 | July 22, 2004 |
| 05SS45 | 361.9 | 323602.42 | 2695589.04 | July 22, 2004 |
| 05SB51 | 363.9 | 323643.89 | 2695457.12 | October 27, 2005 |
| 05SB52 | 363.5 | 323635.93 | 2695507.70 | October 27, 2005 |
| 05SB53 | 362.3 | 323602.56 | 2695509.80 | October 27, 2005 |
| 05SB54 | 361.0 | 323552.01 | 2695644.15 | October 27, 2005 |
| 05SB55 | 361.2 | 323580.86 | 2695660.44 | October 27, 2005 |
| 05SB56 | 362.2 | 323600.07 | 2695602.04 | October 27, 2005 |

# APPENDIX B

# BORING LOGS

Tetra Tech NUS, Inc.



# BORING LOG

PROJECT NAME: NASJRB Willow Grove (OU-5)
PROJECT NUMBER: 2192
DRILLING COMPANY: Vironex
DRILLING RIG: Geoprobe

BORING No.: 055B51
DATE: 10-18-05
GEOLOGIST: Vince Shickora
DRILLER: Jorge Sacta

| Time | Sample No. and Type or RQD | Depth (Ft.) or Run No. | Blows / 6" or RQD (%) | Sample Recovery / Sample Length | Lithology Change (Depth/Ft.) or Screened Interval | Soil Density/ Consistency or Rock Hardness | Color | Material Classification | USCS * | Remarks | PID/FID Reading (ppm) Sample | Sampler BZ | Borehole** | Driller BZ** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0810 | S-1 | 1 | | | | | Dark Brn | Silty Clay with grass roots and rock frags | | moist | 0 | 0 | 0 | 0 |
| | | 2 | | | | | | | | | 63 | 0 | 0 | 0 |
| | | 3 | | | | | Brn | Clayey Silt with some FGR Sand + Rock Frags | | very moist | 74 | 0 | 0 | 0 |
| | | 4 | | 46"/48" | | | Brn Gry | Same as above | | moist | 75 | 0 | 0 | 0 |
| 0812 | S-2 | 5 | | | | | | | | | 133 | 0 | 0 | 0 |
| | | 6 | | | | | Brn Gry | Silty Clay with weathered Rock Frags | | very moist | 148 | 0 | 0 | 0 |
| | | 7 | | | | | | | | | 151 | 0 | 0 | 0 |
| | | 8 | | 47"/48" | | | Red Brn | Clayey Silt with some FGR Sand + Rock Frags | | moist | 140 | 0 | 0 | 0 |
| 851 | S-3 | 9 | | | | | | | | | 94 | 0 | 0 | 0 |
| | | 10 | | | | | Red Brn | Same as above | | moist | 88 | 0 | 0 | 0 |
| | | 11 | | | | | | | | | 101 | 0 | 0 | 0 |
| | | 12 | | 47"/48" | | | Red Brn | Sandy Silt with highly weathered Rock Frags Trace Clay | | moist to damp | 122 | 0 | 0 | 0 |
| 910 | S-4 | 13 | | | | | | | | | 82 | 0 | 0 | 0 |
| | | 14 | | | | | Red Brn | Same as above (saprolite) | | moist | 56 | 0 | 0 | 0 |
| | | 15 | | | | | | | | | 54 | 0 | 0 | 0 |
| | | 16 | | 46"/48" | | | Red Brn | Same as above (saprolite) | | moist to damp | 59 | 0 | 0 | 0 |
| 122 | S-5 | 17 | | | | | | | | | 11 | 0 | 0 | 0 |
| | | 18 | | | | | | | | | 4.0 | 0 | 0 | 0 |
| | | 19 | | 30"/36" | | | Red Brn | Same as above (saprolite) | | moist to damp | 1.0 | 0 | 0 | 0 |
| | | 20 | | | EOB (refusal) | | | | | | | | | |
| | | 21 | | | | | | | | | | | | |
| | | 22 | | | | | | | | | | | | |
| | | 23 | | | | | | | | | | | | |
| | | 24 | | | | | | | | | | | | |
| | | 25 | | | | | | | | | | | | |

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Direct Push sampling using 2" x 4' Acetate Sleeves

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

# BORING LOG



PROJECT NAME: NASJRB Willow Grove
PROJECT NUMBER: 2192
DRILLING COMPANY: Vironex
DRILLING RIG: Geoprobe

BORING No.: 055B52
DATE: 10-17-05
GEOLOGIST: Vince Shickora
DRILLER: Jorge Sosto

| Sample No. and Type or RQD | Depth (Ft.) or Run No. | Blows / 6" or RQD (%) | Sample Recovery / Sample Length | Lithology Change (Depth/Ft.) or Screened Interval | Soil Density/ Consistency or Rock Hardness | Color | Material Classification | USCS * | Remarks | PID/FID Reading (ppm) Sample | Sampler BZ | Borehole** | Driller BZ** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 412 S-1 | 1 | | | | | Red Brn | Silty Clay and gravel | | very moist | 0 | 0 | 0 | 0 |
| | 2 | | | | | | | | | 44 | 0 | 0 | 0 |
| | 3 | | | | | Red Brn | Clayey silt with Trace FGR Sand + Rock Frags | | very moist | 21 | 0 | 0 | 0 |
| | 4 | | 46"/48" | | | | | | | 20 | 0 | 0 | 0 |
| 124 S-2 | 5 | | | | | Gry Brn | Clay with Some silt | | very moist | 11 | 0 | 0 | 0 |
| | 6 | | | | | | | | | 3.5 | 0 | 0 | 0 |
| | 7 | | | | | Red Brn | Clayey Silt with Trace weathered Rock Frags | | moist | 2.9 | 0 | 0 | 0 |
| | 8 | | 47"/48" | | | | | | | 3.0 | 0 | 0 | 0 |
| 142 S-3 | 9 | | | | | Red Brn | Same as above | | very moist | 15 | 0 | 0 | 0 |
| | 10 | | | | | | | | | 22 | 0 | 0 | 0 |
| 51 | 11 | | | | | Red Brn | Same as above with highly weathered Rock Frags. | | moist | 27 | 0 | 0 | 0 |
| | 12 | | | EOB (refusal) | | | | | | | | | |
| | 13 | | | | | | | | | | | | |
| | 14 | | | | | | | | | | | | |
| | 15 | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | |
| | 17 | | | | | | | | | | | | |
| | 18 | | | | | | | | | | | | |
| | 19 | | | | | | | | | | | | |
| | 20 | | | | | | | | | | | | |
| | 21 | | | | | | | | | | | | |
| | 22 | | | | | | | | | | | | |
| | 23 | | | | | | | | | | | | |
| | 24 | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | |

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Direct push sampling using 2"x4' Acetate Sleeves

Drilling Area Background (ppm): 0

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.



# BORING LOG

PROJECT NAME: NASJRB Willow Grove (OU-5)
PROJECT NUMBER: 2192
DRILLING COMPANY: Vironex
DRILLING RIG: Geoprobe

BORING No.: 05SB53
DATE: 12-17-05
GEOLOGIST: Vince Shickora
DRILLER: Jorge Sarta

| | Sample No. and Type or RQD | Depth (Ft.) or Run No. | Blows / 6" or RQD (%) | Sample Recovery / Sample Length | Lithology Change (Depth/Ft.) or Screened Interval | Soil Density/ Consistency or Rock Hardness | Color | Material Classification | USCS * | Remarks | PID/FID Reading (ppm) Sample | Sampler BZ | Borehole** | Driller BZ** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 310 | S-1 | 1 | | | | | Dark Brn | Silty Clay with grass roots | | Very moist | 0 | 0 | 0 | 0 |
| | | 2 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 3 | | | | | Org Brn | Clayey Silt with Trace rock frags and FGR Sand | | moist | 0 | 0 | 0 | 0 |
| | | 4 | | 47"/48" | | | | | | | 0 | 0 | 0 | 0 |
| 321 | S-2 | 5 | | | | | Org Brn | Silty clay with Trace weathered rock frags | | very moist | 0 | 0 | 0 | 0 |
| | | 6 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 7 | | | | | Red Brn | Clayey Silt with Trace weathered rock frags | | moist | 0 | 0 | 0 | 0 |
| | | 8 | | 47"/48" | | | | | | | 0 | 0 | 0 | 0 |
| 336 | S-3 | 9 | | | | | Red Brn | Same as above | | very moist | 9.9 | 0 | 0 | 0 |
| | | 10 | | | | | | | | | 8.7 | 0 | 0 | 0 |
| | | 11 | | | | | | | | | 6.4 | 0 | 0 | 0 |
| | | 12 | | 45"/48" | | | Red Brn | Same as above | | very moist | 5.9 | 0 | 0 | 0 |
| 47 | S-4 | 13 | | | | | | | | | 7.7 | 0 | 0 | 0 |
| | | 14 | | | | | Red Brn | Silt with highly weathered rock | | moist to damp | 20.2 | 0 | 0 | 0 |
| | | 15 | | | | | | | | | 11.4 | 0 | 0 | 0 |
| 52 | | 16 | | | FOB (refusal) | | | | | | | | | |
| | | 17 | | | | | | | | | | | | |
| | | 18 | | | | | | | | | | | | |
| | | 19 | | | | | | | | | | | | |
| | | 20 | | | | | | | | | | | | |
| | | 21 | | | | | | | | | | | | |
| | | 22 | | | | | | | | | | | | |
| | | 23 | | | | | | | | | | | | |
| | | 24 | | | | | | | | | | | | |
| | | 25 | | | | | | | | | | | | |

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Direct push sampling using 2"x4' Acetate sleeves

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

# BORING LOG



PROJECT NAME: NASJRB Willow Grove
PROJECT NUMBER: 2192
DRILLING COMPANY: Vironex
DRILLING RIG: Geoprobe

BORING No.: 055B54
DATE: 10-18-05
GEOLOGIST: Vince Shuckort
DRILLER: Jorge Sorto

| Line | Sample No. and Type or RQD | Depth (Ft.) or Run No. | Blows / 6" or RQD (%) | Sample Recovery / Sample Length | Lithology Change (Depth/Ft.) or Screened Interval | Soil Density/ Consistency or Rock Hardness | Color | Material Classification | USCS * | Remarks | PID/FID Reading (ppm) Sample | Sampler BZ | Borehole** | Driller BZ** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 128 | S-1 | 1 | | | | | Brn Blk | Silty clay with gravel and organic material | | stained very moist | 10.1 | 0 | 0 | 0 |
| | | 2 | | | | | Red Brn | Sandy Silt with Trace clay and Rock frags | | moist | 10 | 0 | 0 | 0 |
| | | 3 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 4 | | 39"/48" | | | Org Brn | Silty Sand with Trace clay and Rock frags | | very moist | 0 | 0 | 0 | 0 |
| 139 | S-2 | 5 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 6 | | | | | Brn Gry | Clayey Silt with Trace rock frags | | very moist | 0 | 0 | 0 | 0 |
| | | 7 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 8 | | 46"/48" | | | Brn Gry | Same as above | | very moist | 0 | 0 | 0 | 0 |
| 249 | S-3 | 9 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 10 | | | | | Org Brn | Same as above | | moist | 0 | 0 | 0 | 0 |
| | | 11 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 12 | | 48"/48" | | | Red Brn | Silty Clay with some highly weathered rock frags | | very moist | 0 | 0 | 0 | 0 |
| 0 | S-4 | 13 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 14 | | | | | Red Brn | Clayey Silt with highly weathered Rock frags | | moist | 0 | 0 | 0 | 0 |
| | | 15 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 16 | | 47"/48" | | | Red Brn | Same as above (saprolite) | | moist | 0 | 0 | 0 | 0 |
| 20 | S-5 | 17 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 18 | | | | | Red Brn | Same as above | | damp | 0 | 0 | 0 | 0 |
| | | 19 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 20 | | | EOB (refusal) | | | | | | | | | |
| | | 21 | | | | | | | | | | | | |
| | | 22 | | | | | | | | | | | | |
| | | 23 | | | | | | | | | | | | |
| | | 24 | | | | | | | | | | | | |
| | | 25 | | | | | | | | | | | | |

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Direct push sampling using 2" x 4' Acetate Sleeves.

Drilling Area Background (ppm): 0

Converted to Well: Yes _____ No ✓ Well I.D. #: _____

Tetra Tech NUS, Inc.



# BORING LOG

PROJECT NAME: NASJRB Willow Grove (OU-5)
PROJECT NUMBER: 2192
DRILLING COMPANY: Vironex
DRILLING RIG: Geoprobe

BORING No.: 055B55
DATE: 10-18-05
GEOLOGIST: Vince Shickora
DRILLER: Jorge Sorte

| Time | Sample No. and Type or RQD | Depth (Ft.) or Run No. | Blows / 6" or RQD (%) | Sample Recovery / Sample Length | Lithology Change (Depth/Ft.) or Screened Interval | Soil Density/ Consistency or Rock Hardness | Color | Material Classification | USCS * | Remarks | PID/FID Reading (ppm) Sample | Sampler BZ | Borehole** | Driller BZ** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07 | S-1 | 1 | | | | | Blk Gry | Sandy Clay and gravel | | stained - fuel odor | 9.5 | 0 | 0 | 0 |
| | | 2 | | | | | Red Brn | Silty clay with weathered Rock Frags | | moist | 0 | 0 | 0 | 0 |
| | | 3 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 4 | | 30"/48" | | | Brn | Clayey Silt with some sand and Rock frags | | moist | 0 | 0 | 0 | 0 |
| 119 | S-2 | 5 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 6 | | | | | Org Brn | Same as above | | moist | 0 | 0 | 0 | 0 |
| | | 7 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 8 | | 43"/48" | | | Gry Brn | Clayey Silt | | very moist | 0 | 0 | 0 | 0 |
| 129 | S-3 | 9 | | | | | Org Brn | Silt with trace clay and weathered Rock Frags | | moist | 0 | 0 | 0 | 0 |
| | | 10 | | | | | Org Brn | Clayey Silt | | very moist | 0 | 0 | 0 | 0 |
| | | 11 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 12 | | 47"/48" | | | Red Brn | Silt with trace clay and weathered Rock Frags | | moist | 0 | 0 | 0 | 0 |
| 139 | S-4 | 13 | | | | | Red Brn | Clayey Silt trace weathered Rock Frags | | moist | 0 | 0 | 0 | 0 |
| | | 14 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 15 | | | | | Red Brn | Silt some Sand and highly weathered Rock Frags | | damp to moist | 0 | 0 | 0 | 0 |
| | | 16 | | 47"/48" | | | | | | | 0 | 0 | 0 | 0 |
| 153 | S-5 | 17 | | | | | Red Brn | Same as above (saprolite) | | damp | 0 | 0 | 0 | 0 |
| | | 18 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 19 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 20 | | 45"/48" | | | Red Brn | Same as above (saprolite) | | damp | 0 | 0 | 0 | 0 |
| 207 | S-6 | 21 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 22 | | | | | Red Brn | Same as above | | damp | 0 | 0 | 0 | 0 |
| | | 23 | | 34"/42" | | | | | | | 0 | 0 | 0 | 0 |
| | | 24 | | | | | Red Brn | Same as above (Saprolite) | | | 0 | 0 | 0 | 0 |
| | | 25 | | | EOB (refusal) | | | | | | | | | |

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Direct Push sampling using 2" x 4' Acetate Sleeves

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

# BORING LOG



PROJECT NAME: NASJRB Willow Grove (OU-5)
PROJECT NUMBER: 2192
DRILLING COMPANY: Vironex
DRILLING RIG: Geoprobe

BORING No.: 055B56
DATE: 10-18-05
GEOLOGIST: Vince Shickora
DRILLER: Jorge Sorto

| Depth (Ft.) | Sample No. and Type or RQD | Depth (Ft.) or Run No. | Blows / 6" or RQD (%) | Sample Recovery / Sample Length | Lithology Change (Depth/Ft.) or Screened Interval | Soil Density/ Consistency or Rock Hardness | Color | Material Classification | USCS * | Remarks | PID/FID Reading (ppm) Sample | Sampler BZ | Borehole** | Driller BZ** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time 1552 | S-1 | 1 | | | | | Brn Gry | Sandy Silt and Clay with gravel / grass roots | | very moist | 0 | 0 | 0 | 0 |
| | | 2 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 3 | | | | | Red Brn | Clayey Silt with some FGR Sand + Rock Frags | | moist | 0 | 0 | 0 | 0 |
| | | 4 | | 42"/48" | | | | | | | 0 | 0 | 0 | 0 |
| 05 | S-2 | 5 | | | | | Gry | Clayey silt with Trace Rock Frags | | moist | 0 | 0 | 0 | 0 |
| | | 6 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 7 | | | | | Org Brn | Same as above | | very moist | 0 | 0 | 0 | 0 |
| | | 8 | | 47"/48" | | | | | | | 0 | 0 | 0 | 0 |
| 10 | S-3 | 9 | | | | | Red Brn | Silt with trace clay and weathered Rock Frags | | moist | 0 | 0 | 0 | 0 |
| | | 10 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 11 | | | | | Red Brn | Sandy Silt with some FGR Sand + Rock Frags | | moist | 0 | 0 | 0 | 0 |
| | | 12 | | 46"/48" | | | | | | | 0 | 0 | 0 | 0 |
| 20 | S-4 | 13 | | | | | Red Brn | Silt with trace Sand Highly weathered Rock Frags | | moist | 0 | 0 | 0 | 0 |
| | | 14 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 15 | | | | | Red Brn | Same as above (saprolite) | | moist to damp | 0 | 0 | 0 | 0 |
| | | 16 | | 47"/48" | | | | | | | 0 | 0 | 0 | 0 |
| 15 | S-5 | 17 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 18 | | | | | Red Brn | Same as above (saprolite) | | moist to damp | 0 | 0 | 0 | 0 |
| | | 19 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 20 | | | | | | | | | 0 | 0 | 0 | 0 |
| | | 21 | | | EOB (refusal) | | | | | | | | | |
| | | 22 | | | | | | | | | | | | |
| | | 23 | | | | | | | | | | | | |
| | | 24 | | | | | | | | | | | | |
| | | 25 | | | | | | | | | | | | |

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Direct push sampling using 2" x 4' Acetate sleeves.

Drilling Area Background (ppm): 0

Converted to Well: Yes _____ No _____ Well I.D. #: _____

# APPENDIX C

# SOIL SAMPLE LOG SHEETS

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055B53-1011
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-17-05<br>Time: 1333<br>Method: Direct Push<br>Monitor Reading (ppm): 22.9 | 10.5' BGS | Red-Brown | Clayey Silt with Trace weathered Rock Frags (very moist) |

**COMPOSITE SAMPLE DATA:**

| Date: NA | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 22.9 ppm

**MAP:**

(See work Plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055B53-1415
Sample Location: site 5
Sampled By: V.Shickora/D.Arnate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-17-05<br>Time: 1355<br>Method: Direct Push<br>Monitor Reading (ppm): 34.2 | 15' BGS | Red-Brown | Silt with highly weathered Rock Frags (moist to damp) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 34.2 ppm

**MAP:**

(see Work Plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055B52-0102
Sample Location: site 5
Sampled By: V.Shickora/D.Arnate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-17-05<br>Time: 1420<br>Method: Direct Push<br>Monitor Reading (ppm): 1523 | 2' BGS | Red-Brown | Clayey Silt with Trace FGR Sand and Rock Frags. (very moist) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 1,523 ppm
Fuel oil/Solvent odor From Sample material.

**MAP:**

(see work Plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055B52-1011
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-17-05<br>Time: 1454<br>Method: Direct Push<br>Monitor Reading (ppm): 82.6 | 11' BGS | Red-Brown | Clayey Silt with highly weathered Rock Frags (moist) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 82.6 ppm

**MAP:**

(see work Plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# QA SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project Number: 2192
Sample Location: Site 5
QA Sample Type:

[X] Trip Blank
[] Source Water Blank
[] Rinsate Blank
[] Other Blank _____

Sample ID Number: TB 10180501
Sampled By: V.Shickora/D.Amate
C.O.C. Number: _____

## SAMPLING DATA:

Date: 10-18-05
Time: 0738
Method: Lab prepared

## WATER SOURCE:

[X] Laboratory Prepared
[] Purchased
[] Other _____
[] Tap
[] Fire Hydrant

## PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: _____
Supplier: _____
Manufacturer: _____
Order Number: _____
Lot Number: _____
Expiration Date: _____

## RINSATE INFORMATION (If Applicable):

Media Type: _____
Equipment Used: _____
Equipment Type:
[] Dedicated
[] Reusable

## SAMPLE COLLECTION INFORMATION:

| Analysis | Preservative | Container Requirements | Collected |
|---|---|---|---|
| Volatiles | Cool 4°C & HCl | 3 x 40 ml vials | (YES) NO |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## OBSERVATIONS / NOTES:

Laboratory prepared Trip Blank

Signature(s): [signature]

Tetra Tech NUS, Inc.

# QA SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project Number: 2192
Sample Location: Site 5
QA Sample Type:

Sample ID Number: FB10180501
Sampled By: V.Shickora/D.Amate
C.O.C. Number:

[] Trip Blank
[] Source Water Blank
[] Rinsate Blank
[X] Other Blank Field Blank

## SAMPLING DATA:

Date: 10-18-05
Time: 0745
Method: Direct Pour

## WATER SOURCE:

[X] Laboratory Prepared
[] Purchased
[] Other
[] Tap
[] Fire Hydrant

## PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name:
Supplier:
Manufacturer:
Order Number:
Lot Number:
Expiration Date:

## RINSATE INFORMATION (If Applicable):

Media Type:
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

## SAMPLE COLLECTION INFORMATION:

| Analysis | Preservative | Container Requirements | Collected |
|---|---|---|---|
| Volatiles | Cool 4°C & HCl | 3 x 40 ml vials | (YES) NO |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## OBSERVATIONS / NOTES:

Poured using Laboratory Supplied Blank Water.

Signature(s):

Tetra Tech NUS, Inc.

# QA SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove
Project Number: 2192
Sample Location: Site 5
QA Sample Type:

Sample ID Number: RB10180501
Sampled By: V.Shickora/D.Amate
C.O.C. Number:

[] Trip Blank
[] Source Water Blank
[X] Rinsate Blank
[] Other Blank

## SAMPLING DATA:

Date: 10-18-05
Time: 1228
Method: (see below)

## WATER SOURCE:

[X] Laboratory Prepared
[] Purchased
[] Other
[] Tap
[] Fire Hydrant

## PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name:
Supplier:
Manufacturer:
Order Number:
Lot Number:
Expiration Date:

## RINSATE INFORMATION (If Applicable):

Media Type:
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

## SAMPLE COLLECTION INFORMATION:

| Analysis | Preservative | Container Requirements | Collected |
|---|---|---|---|
| Volatiles | Cool 4°C & HCl | 3 X 40 ml vials | (YES) NO |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## OBSERVATIONS / NOTES:

Sample collected by pouring Laboratory supplied Blank Water through clean Acetate sleeve and geoprobe sample head directly into sample bottleware.

Signature(s):

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055B51-0405
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-18-05<br>Time: 0837<br>Method: Direct Push<br>Monitor Reading (ppm): 1013 | 5' BGS | Brown-Gray | Silty clay with weathered Rock frags. (very moist) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 6 | 4°C |
| Dry Weight | 4 oz Glass Jar | 2 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 1,013 ppm

fuel/Solvent odor from sample material

**MAP:**

(see work Plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | Dup-02 |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055B51-1819
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-18-05<br>Time: 0930<br>Method: Direct Push<br>Monitor Reading (ppm): 0.0 | 19' BGS | Red-Brown | Sandy Silt with highly weathered Rock Frags (moist to damp) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 0.0 ppm

**MAP:**

(see work plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055856-1011
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-18-05<br>Time: 1025<br>Method: Direct Push<br>Monitor Reading (ppm): 0.0 | 10' BGS | Red-Brown | Sandy Silt with some Rock Frags. (moist) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 0.0 ppm

**MAP:**

(See Work Plan)

**Circle if Applicable:**

MS/MSD —

Duplicate ID No.: —

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055B56-1920
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-18-05<br>Time: 1054<br>Method: Direct Push<br>Monitor Reading (ppm): 0.0 | 20' BGS | Red-Brown | Silt with Trace Sand and highly weathered Rock Frags. (moist to damp) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 0.0 ppm

**MAP:**

(see work Plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055B55-0001
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-18-05<br>Time: 1109<br>Method: Direct Push<br>Monitor Reading (ppm): 43.2 | 1' BGS | Gray-Black | Sandy Clay and Gravel (very moist) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 43.2 ppm

Black Staining observed
slight fuel/solvent odor.

**MAP:**

(see work Plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055855-2223
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-18-05<br>Time: 1216<br>Method: Direct Push<br>Monitor Reading (ppm): 42.5 | 23' BGS | Red-Brown | Silt with some sand and highly weathered Rock Frags. (damp) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 9 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 42.5 ppm

**MAP:**

(See Work Plan)

**Circle if Applicable:**

MS/MSD: Yes

Duplicate ID No.:

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055B54-0001
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-18-05<br>Time: 1232<br>Method: Direct Push<br>Monitor Reading (ppm): 310 | 1' BGS | Black-Brown | Silty Clay with Gravel and organic material. (very moist) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 310 ppm

Black staining observed
slight fuel / solvent odor

**MAP:**

(see work Plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NASJRB Willow Grove Site 5
Project No.: 2192

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 05SB54-1718
Sample Location: site 5
Sampled By: V.Shickora/D.Amate
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 10-18-05<br>Time: 1328<br>Method: Direct Push<br>Monitor Reading (ppm): 8.8 | 18' BGS | Red-Brown | Clayey Silt with highly weathered Rock Frags (damp) |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: NA | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Preservative |
|---|---|---|---|
| VOAs | 5-Gram Encore | 3 | 4°C |
| Dry Weight | 4 oz Glass Jar | 1 | 4°C |

**OBSERVATIONS / NOTES:**

Head Space Readings Off Sample - 8.8 ppm

**MAP:**

(see work plan)

**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| — | — |

**Signature(s):**

# APPENDIX D

# ANALYTICAL RESULTS

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 5 SOIL SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

| Sample ID: | 05SB51-0405 | | 05SB51-0405-D | | 05SB51-1819 | | 05SB52-0102 | | 05SB52-1011 | | 05SB53-1011 | | 05SB53-1415 | | 05SB54-0001 | | 05SB54-1718 | | 05SB55-0001 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date: | 10/18/05 | | 10/18/05 | | 10/18/05 | | 10/17/05 | | 10/17/05 | | 10/17/05 | | 10/17/05 | | 10/18/05 | | 10/18/05 | | 10/18/05 | |
| Duplicate Of: | 05SB51-0405-D | | 05SB51-0405 | | | | | | | | | | | | | | | | | |
| Top Depth (feet): | 4.0 | | 4.0 | | 18.0 | | 1.0 | | 10.0 | | 10.0 | | 14.0 | | 0.0 | | 17.0 | | 0.0 | |
| Bottom Depth (feet): | 5.0 | | 5.0 | | 19.0 | | 2.0 | | 11.0 | | 11.0 | | 15.0 | | 1.0 | | 18.0 | | 1.0 | |
| VOLATILES | ug/kg | | ug/kg | | ug/kg | | ug/kg | | ug/kg | | ug/kg | | ug/kg | | ug/kg | | ug/kg | | ug/kg | |
| 1,1,1-Trichloroethane | 10 | U | 10 | U | 10 | U | 7300 | | 11 | U | 29 | | 6.7 | J | 10 | UJ | 10 | U | 10 | U |
| 1,1,2,2-Tetrachloroethane | 1 | U | 1 | U | 1 | U | 1 | UJ | 1.1 | U | 1 | U | 1.1 | U | 1 | UJ | 1 | U | 1 | U |
| 1,1,2-Trichloroethane | 1 | U | 10 | U | 0.55 | J | 1 | U | 1.2 | | 10 | U | 0.9 | J | 1 | UJ | 1 | U | 1 | U |
| 1,1,2-Trichlorotrifluoroethane | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| 1,1-Dichloroethane | 10 | U | 0.56 | J | 4.2 | J | 290 | J | 1.1 | J | 120 | | 48 | | 10 | UJ | 10 | U | 10 | U |
| 1,1-Dichloroethene | 10 | U | 10 | U | 10 | U | 170 | J | 11 | U | 9.6 | J | 2.4 | J | 10 | UJ | 10 | U | 10 | U |
| 1,2,4-Trichlorobenzene | 10 | U | 10 | U | 10 | U | 10 | UJ | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| 1,2-Dibromo-3-chloropropane | 1 | U | 1 | U | 1 | U | 1 | UJ | 1.1 | U | 1 | U | 1.1 | U | 1 | UJ | 1 | U | 1 | U |
| 1,2-Dibromoethane | 1 | U | 1 | U | 1 | U | 1 | U | 1.1 | U | 1 | U | 1.1 | U | 1 | UJ | 1 | U | 1 | U |
| 1,2-Dichlorobenzene | 10 | U | 10 | U | 10 | U | 10 | UJ | 11 | U | 10 | U | 11 | U | 1 | J | 10 | U | 10 | U |
| 1,2-Dichloroethane | 1 | U | 1 | U | 1 | U | 1 | U | 1.1 | U | 1 | U | 1.1 | U | 1 | UJ | 1 | U | 1 | U |
| 1,2-Dichloroethene (cis) | 10 | U | 10 | U | 1.3 | J | 0.61 | J | 11 | U | 45 | | 16 | | 10 | UJ | 10 | U | 10 | U |
| 1,2-Dichloroethene (trans) | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| 1,2-Dichloropropane | 2 | U | 2 | U | 2 | U | 2 | U | 2.2 | U | 2 | U | 2.2 | U | 2 | UJ | 2 | U | 2 | U |
| 1,3-Dichlorobenzene | 10 | U | 10 | U | 10 | U | 10 | UJ | 11 | U | 10 | U | 11 | U | 0.98 | J | 10 | U | 10 | U |
| 1,4-Dichlorobenzene | 1 | U | 1 | U | 1 | U | 1 | UJ | 1.1 | U | 1 | U | 1.1 | U | 1 | UJ | 1 | U | 1 | U |
| 2-Butanone | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 1.7 | J | 6.9 | J | 10 | U | 10 | U |
| 2-Hexanone | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| 4-Methyl-2-pentanone | 10 | U | 10 | U | 0.56 | J | 10 | U | 3.8 | J | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| Acetone | 2.9 | B | 10 | U | 2.1 | B | 47 | J | 4.7 | B | 10 | U | 6.3 | B | 29 | J | 10 | U | 10 | U |
| Benzene | 25 | | 28 | | 2 | U | 20 | | 2.2 | U | 6.5 | | 1.9 | J | 2 | UJ | 2 | U | 2 | U |
| Bromodichloromethane | 1 | U | 1 | U | 1 | U | 1 | U | 1.1 | U | 1 | U | 1.1 | U | 1 | UJ | 1 | U | 1 | U |
| Bromoform | 5 | U | 5 | U | 5 | U | 5 | UJ | 5.5 | U | 5 | U | 5.5 | U | 5 | UJ | 5 | U | 5 | U |
| Bromomethane | 2 | U | 2 | U | 2 | U | 2 | U | 2.2 | U | 2 | U | 2.2 | U | 2 | UJ | 2 | U | 2 | U |
| Carbon Disulfide | 10 | U | 10 | U | 10 | U | 1.3 | J | 11 | U | 10 | U | 11 | U | 1.6 | J | 10 | U | 10 | U |
| Carbon Tetrachloride | 1 | U | 1 | U | 1 | U | 1 | U | 1.1 | U | 1 | U | 1.1 | U | 1 | UJ | 1 | U | 1 | U |
| Chlorobenzene | 10 | U | 10 | U | 10 | U | 10 | UJ | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| Chloroethane | 2 | U | 2 | U | 2 | U | 2 | U | 2.2 | U | 2 | U | 2.2 | U | 2 | UJ | 2 | U | 2 | U |
| Chloroform | 1 | U | 1 | U | 1 | U | 1 | U | 1.1 | U | 1 | U | 1.1 | U | 1 | UJ | 1 | U | 1 | U |
| Chloromethane | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| cis-1,3-Dichloropropene | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| Cyclohexane | 21 | | 29 | | 10 | U | 130 | | 11 | U | 12 | | 1.1 | J | 10 | UJ | 10 | U | 10 | U |
| Dibromochloromethane | 2 | U | 2 | U | 2 | U | 2 | U | 2.2 | U | 2 | U | 2.1 | U | 2 | UJ | 2 | U | 2 | U |
| Dichlorodifluoromethane | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| Ethylbenzene | 130 | | 120 | | 10 | U | 1600 | | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| Isopropylbenzene | 10 | U | 10 | U | 10 | U | 10 | UJ | 11 | U | 5.9 | J | 0.6 | J | 10 | UJ | 10 | U | 10 | U |
| Methyl Acetate | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 11 | U | 11 | J | 10 | U | 10 | U |
| Methyl Cyclohexane | 94 | J | 160 | J | 10 | U | 4500 | | 11 | U | 45 | | 1.7 | J | 10 | UJ | 10 | U | 10 | U |
| Methyl Tert-butyl Ether | 1 | U | 1 | U | 1 | U | 1 | U | 1.1 | U | 1 | U | 1.1 | U | 1.1 | J | 1 | U | 1 | U |
| Methylene Chloride | 7.1 | B | 6.9 | B | 8.2 | B | 7.4 | B | 6.7 | B | 6.3 | B | 6.4 | B | 23 | B | 6.4 | B | 7 | B |
| Styrene | 10 | U | 10 | U | 10 | U | 10 | UJ | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| Tetrachloroethene | 2 | U | 2 | U | 2 | U | 11 | | 2.2 | U | 2.5 | | 2.2 | U | 2 | UJ | 2 | U | 2 | U |
| Toluene | 1.2 | J | 1.1 | J | 10 | U | 17 | | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| trans-1,3-Dichloropropene | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 11 | U | 10 | UJ | 10 | U | 10 | U |
| Trichloroethene | 1 | U | 1 | U | 1 | U | 6 | | 1.1 | U | 4.4 | | 1.1 | | 1 | UJ | 1 | U | 1 | U |
| Trichlorofluoromethane | 10 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U | 11 | U | 1.5 | B | 10 | U | 10 | U |
| Vinyl Chloride | 10 | U | 1 | U | 1 | U | 1 | U | 11 | U | 10 | U | 1.1 | U | 1 | UJ | 1 | U | 10 | U |
| Xylene (Total) | 320 | | 230 | | 10 | U | 16000 | | 11 | U | 10 | U | 11 | U | 1 | J | 10 | U | 10 | U |

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 5 SOIL SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

| Sample ID: | 05SB55-2223 | | 05SB56-1011 | | 05SB56-1920 | |
|---|---|---|---|---|---|---|
| Sample Date: | 10/18/05 | | 10/18/05 | | 10/18/05 | |
| Duplicate Of: | | | | | | |
| Top Depth (feet): | 22.0 | | 10.0 | | 19.0 | |
| Bottom Depth (feet): | 23.0 | | 11.0 | | 20.0 | |
| | | | | | | |
| VOLATILES | ug/kg | | ug/kg | | ug/kg | |
| 1,1,1-Trichloroethane | 10 | UJ | 10 | U | 10 | U |
| 1,1,2,2-Tetrachloroethane | 1 | U | 1 | U | 1 | U |
| 1,1,2-Trichloroethane | 1 | U | 1 | U | 1 | U |
| 1,1,2-Trichlorotrifluoroethane | 10 | U | 10 | U | 10 | U |
| 1,1-Dichloroethane | 10 | UJ | 0.58 | J | 10 | U |
| 1,1-Dichloroethene | 10 | UJ | 10 | U | 10 | U |
| 1,2,4-Trichlorobenzene | 10 | U | 10 | U | 10 | U |
| 1,2-Dibromo-3-chloropropane | 1 | U | 1 | U | 1 | U |
| 1,2-Dibromoethane | 1 | U | 1 | U | 1 | U |
| 1,2-Dichlorobenzene | 10 | U | 10 | U | 10 | U |
| 1,2-Dichloroethane | 1 | UJ | 7.8 | | 3.7 | |
| 1,2-Dichloroethene (cis) | 10 | UJ | 10 | U | 10 | U |
| 1,2-Dichloroethene (trans) | 10 | UJ | 10 | U | 10 | U |
| 1,2-Dichloropropane | 2 | U | 2 | U | 2 | U |
| 1,3-Dichlorobenzene | 10 | U | 10 | U | 10 | U |
| 1,4-Dichlorobenzene | 1 | U | 1 | U | 1 | U |
| 2-Butanone | 2.8 | J | 10 | U | 10 | U |
| 2-Hexanone | 10 | U | 10 | U | 10 | U |
| 4-Methyl-2-pentanone | 10 | U | 10 | U | 10 | U |
| Acetone | 1 | B | 1.5 | B | 10 | U |
| Benzene | 2 | UJ | 2 | U | 2 | U |
| Bromodichloromethane | 1 | U | 1 | U | 1 | U |
| Bromoform | 5 | U | 5 | U | 5 | U |
| Bromomethane | 2 | UJ | 2 | U | 2 | U |
| Carbon Disulfide | 10 | UJ | 10 | U | 10 | U |
| Carbon Tetrachloride | 1 | UJ | 1 | U | 1 | U |
| Chlorobenzene | 10 | U | 10 | U | 10 | U |
| Chloroethane | 2 | UJ | 2 | U | 2 | U |
| Chloroform | 1 | UJ | 1 | U | 1 | U |
| Chloromethane | 10 | UJ | 10 | U | 10 | U |
| cis-1,3-Dichloropropene | 10 | U | 10 | U | 10 | U |
| Cyclohexane | 10 | UJ | 10 | U | 10 | U |
| Dibromochloromethane | 2 | U | 2 | U | 2 | U |
| Dichlorodifluoromethane | 10 | UJ | 10 | U | 10 | U |
| Ethylbenzene | 10 | U | 10 | U | 10 | U |
| Isopropylbenzene | 10 | U | 10 | U | 10 | U |
| Methyl Acetate | 5.2 | J | 10 | U | 10 | U |
| Methyl Cyclohexane | 10 | UJ | 10 | U | 10 | U |
| Methyl Tert-butyl Ether | 1 | UJ | 1 | U | 1 | U |
| Methylene Chloride | 8.7 | B | 6.4 | B | 6.7 | B |
| Styrene | 10 | U | 10 | U | 10 | U |
| Tetrachloroethene | 2 | U | 2 | U | 2 | U |
| Toluene | 10 | U | 10 | U | 10 | U |
| trans-1,3-Dichloropropene | 10 | U | 10 | U | 10 | U |
| Trichloroethene | 1 | U | 1 | U | 1 | U |
| Trichlorofluoromethane | 10 | UJ | 10 | U | 10 | U |
| Vinyl Chloride | 1 | UJ | 1 | U | 1 | U |
| Xylene (Total) | 10 | U | 10 | U | 10 | U |

# APPENDIX C

# RESIDUAL RISK CALCULATION

**DEPARTMENT OF THE NAVY**
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE, NORTHEAST
4911 SOUTH BROAD STREET
PHILADELPHIA, PA 19112-1303

5090
Code BPMO/RL
Ser: 07-041
February 9, 2007

Ms. Lisa Cunningham
Remedial Project Manager
U.S. EPA Region III (3HS11)
1650 Arch Street
Philadelphia, PA 19103-2029

Ms. April Flipse
PA Department of Environmental Protection
Environmental Cleanup Program
2 East Main Street
Norristown, PA 19401

Dear Ms. Cunningham and Ms. Flipse:

SUBJECT: DRAFT REPORT OF SOIL REMOVAL ACTION, SITE 05 SOILS - FIRE TRAINING AREA (OU 4), NOVEMBER 2007, NAVAL AIR STATION JOINT RESERVE BASE, WILLOW GROVE, PA

The Draft Report of Soil Removal Action, Site 05 Soils - Fire Training Area, is provided as enclosure (1) for your review and comment. Additionally, a Post Removal Action Residual Risk Evaluation is provided as enclosure (2). The risk evaluation, which was prepared since post excavation confirmatory samples revealed slight exceedances of the Preliminary Remediation Goals (PRGs), demonstrates that the risks are acceptable.

Accordingly, the Navy's position is that no further action for soils is warranted. After your review and comment on the Draft Soil Removal Action Report, we will finalize the report and submit a No Further Action Proposed Remedial Action Plan (NFA PRAP) for review.

If you have any questions, please do not hesitate to contact the Remedial Project Manager, Mr. Curt Frye, at (215) 897-4914.

Sincerely,

Robert F. Lewandowski, P.E.
BRAC Environmental Coordinator
By direction of BRAC PMO

Enclosure:
1. Draft Report of Soil Removal Action, Site 05 Soils - Fire Training Area (OU 4), NASJRB Willow Grove, PA, November 2006
2. Post Removal Action Residual Risk Evaluation of Site 05 Soils, NASJRB Willow Grove, PA, February 2007

Copy to:
J. Edmond, NASJRB Willow Grove
C. Frye, NAVFAC Midlant
R. Turner, TtNUS
B. Hall, RMC (w/o encl (1))

# Post Removal Action Residual Risk Evaluation of Site 5 Soils, NASJRB Willow Grove, PA
07 FEB 2007

Prepared by:
Lisa Yeutter
BRAC PMO Northeast
4911 South Broad Street
Bldg 679, PNBC
Philadelphia, PA 19112

1. Below is a summary of the excavations performed by UMC at the Site 05 Fire Fighting Training Area and the associated residual risk calculations which I have prepared to demonstrate that risk is acceptable.

2. **First Excavation Soil Sampling Analysis** – Confirmatory soil sample analysis revealed that maximum results of benzo(a)anthracene, benzo(a)pyrene, benoz(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded the 10-5 cancer risk level Preliminary Remediation Goal (PRG) for a lifelong resident. Benzo(a)pyrene was the only chemical which also exceeded the 10-4 cancer risk level PRG for a lifelong resident. Please see the *Final Report of Soil Removal Action* for details on the confirmation soil sampling and Appendix C of this document for the laboratory data results.

3. **First Excavation Residual Risk Analysis** – A risk ratio analysis was employed using the 10-5 cancer risk level, the PRG for a resident and the maximum confirmatory result to determine the residual risk for each chemical. The total residual risk was 7.39E-04, which exceeds EPA's target carcinogenic risk range of 1E-06 to 1E-04 for the maximum exposure scenario (see Table 1). The Navy decided to complete a second excavation of soil at Site 5 since the remediation goals were not met and the residential residual risk exceeded the EPA's acceptable carcinogenic risk range.

4. **Second Excavation Soil Sampling Analysis** - Confirmatory soil sample analysis revealed that maximum results of benzo(a)pyrene and dibenzo(a,h)anthracene exceeded the 10-5 cancer risk level PRG for a lifelong resident. No chemicals exceeded the 10-4 cancer risk level PRG for a lifelong resident. Please see the *Final Report of Soil Removal Action* for details on the confirmation soil sampling and Appendix E of this document for the laboratory data results.

5. **Second Excavation Residual Risk Analysis** – A risk ratio analysis was employed using the 10-5 cancer risk level, the PRG for a resident and the maximum confirmatory result to determine the residual risk for each chemical. The total residual risk was 1.23E-04, which exceeds EPA's target carcinogenic risk range of 1E-06 to 1E-04 for the maximum exposure scenario (see Table 2). The excavation of PAH contaminated soils had achieved considerable risk reduction. However, dioxins were contributing 4.43E-05 to residual risk. Since the removal action focused on PAHs and no confirmatory sampling data for dioxins was collectes, then the available dioxin data was reviewed.

6. **Dioxins** - In 1997 two soil samples were analyzed for dioxins and the maximum total 2,3,7,8-TCDD equivalents being 1.77E-04 ppm or 0.177 ppb occurred at sample 05SS14, which was north of the excavation. For details

on the historic dioxin sampling please refer to the *Phase II Remedial Investigation Report*, NAS JRB Willow Grove, April 1998. In the OSWER Directive 9200.4-26 EPA recommends a PRG of 1 ppb (total toxicity equivalents) for remedial sites for dioxin in surface soils involving a residential exposure scenario. At a team meeting on September 27, 2006, the EPA indicated that although the historic dioxin maximum of 0.177 ppb (total toxicity equivalents) was below the recommended EPA cleanup level of 1 pbb additional data would be needed in order to concur that dioxins are not a contaminant of concern at Site 5 in soil. Since a limited data set was available for dioxin, i.e. only 2 historic samples, the Navy agreed to collect and analyze six additional soil samples. Five samples were located in the excavation and generally at the locations with the highest residual PAH levels. One sample (05SS65) was located outside of the excavation and was targeted to confirm the previous maximum dioxin result at 05SS14.

7. **Dioxin Soil Sampling Analysis** – Total 2,3,7,8-TCDD Toxicity Equivalents ranged from 0.00096 to 0.01708 ppb among the six additional dioxin soil samples collected in September 2006. Only one location exceeded the EPA Region III residential soil RBC for total toxicity equivalents. All sample results were well below the recommended EPA cleanup level of 1 ppb. The total 2,3,7,8-TCDD Toxicity Equivalents for sample 05SS65 was 0.00146 ppb, which is much less than the previous result of 0.177 ppb reported at 05SS14 in 1997 for the same general sampling location. Furthermore, none of the additional dioxin sample results exceeded the 10-5 cancer risk level PRG for a lifelong resident. Please see the Appendix I of the *Final Report of Soil Removal Action* for the additional dioxin sampling results.

8. **Residual Risk Analysis Including Additional Dioxin Data** - A risk ratio analysis was employed using the 10-5 cancer risk level, the PRG for a resident and the maximum confirmatory result to determine the residual risk for each chemical. Since the location of the previous maximum dioxin concentration was resampled and confirmed to be much less than previously detected concentrations, the maximum total 2,3,7,8-TCDD Toxicity Equivalent from the September 2006 sampling was used in this iteration of the residual risk analysis. The total residual risk was 8.31E-05 and does not exceed the EPA's target carcinogenic risk range of 1E-06 to 1E-04 (see Table 3).

9. **Borrow Pile Analytical Results** - The excavation was backfilled in October 2006 with high quality fill dirt and topsoil from a borrow pile located on NAS JRB Willow Grove. The borrow pile was sampled and the results of the analysis (metals and semivolatiles) can be found in Appendix H of the *Final Report of Soil Removal Action*. Arsenic (5.51 mg/kg) and benzo(a)pyrene (0.480 mg/kg) were the only chemicals that exceeded the EPA Region III RBCs. According to the *Remedial Investigation Report* for Site 5 issued in February 2002 (Table 2-14), arsenic was encountered in 12 of 12 background soil samples, with a range of detection concentrations from 3.7 to 10.6 mg/kg.

The mean arsenic background concentration was 6.65 mg/kg and the 95% upper tolerable limit for arsenic in background was 10.9 mg/kg. Therefore, 5.51 mg/kg of arsenic in the borrow pile is consistent with background levels at Site 5. The benzo(a)pyrene concentration of 0.480 mg/kg in the borrow pile does not exceed the 10-5 cancer risk level PRG for a lifelong resident and does not affect the total residual risk calculated for Site 5 soils.

**Referenced Documents:**

1. *Final Report of Soil Removal Action*, Site 5 Fire Fighting Training Area, NAS JRB, Willow Grove, November 2006.

2. *Remedial Investigation Report*, Site 5 – Fire Training Area, NAS JRB Willow Grove, February 2002.

3. *Phase II Remedial Investigation Report*, NAS JRB Willow Grove, April 1998.

**Table 1**
**First Excavation Residual Risk Analysis**
**NAS JRB Willow Grove - Site 5 - Soil Removal**

| | 10-5 Cancer Risk Level | PRG for resident mg/kg | Maximum Confirmatory mg/kg | Residual Carcinogenic Risk |
|---|---|---|---|---|
| 2,3,7,8-TCDD Equivalents | 1.E-05 | 4.00E-05 | 1.77E-04 | 4.43E-05 |
| Benzo(a)anthracene | 1.E-05 | 6.2 | 61 | 9.84E-05 |
| Benzo(a)pyrene | 1.E-05 | 0.62 | 26 | 4.19E-04 |
| Benzo(b)fluoranthene | 1.E-05 | 6.2 | 52 | 8.39E-05 |
| Benzo(k)fluoranthene | 1.E-05 | 62 | 9 | 1.45E-06 |
| Dibenzo(a,h)anthracene | 1.E-05 | 0.62 | 5.7 | 9.19E-05 |
| Indeno(1,2,3-cd)pyrene | 1.E-05 | 6.2 | 23 | 3.71E-05 |
| | | | **Total** | **7.39E-04** |

**Table 2**
**Second Excavation Residual Risk Analysis**
**NAS JRB Willow Grove - Site 5 - Soil Removal**

| | 10-5 Cancer Risk Level | PRG for resident mg/kg | Maximum Confirmatory mg/kg | Residual Carcinogenic Risk |
|---|---|---|---|---|
| 2,3,7,8-TCDD Equivalents | 1.E-05 | 4.00E-05 | 1.77E-04 | 4.43E-05 |
| Benzo(a)anthracene | 1.E-05 | 6.2 | 3.4 | 5.48E-06 |
| Benzo(a)pyrene | 1.E-05 | 0.62 | 3.4 | 5.48E-05 |
| Benzo(b)fluoranthene | 1.E-05 | 6.2 | 4.5 | 7.26E-06 |
| Benzo(k)fluoranthene | 1.E-05 | 62 | 1.6 | 2.58E-07 |
| Dibenzo(a,h)anthracene | 1.E-05 | 0.62 | 0.68 | 1.10E-05 |
| Indeno(1,2,3-cd)pyrene | 1.E-05 | 6.2 | 2.1 | 3.39E-06 |
| | | | **Total** | **1.23E-04** |

**Table 3**
**Residual Risk Analysis Including Additional Dioxin Data**
**NAS JRB Willow Grove - Site 5 - Soil Removal**

| | 10-5 Cancer Risk Level | PRG for resident mg/kg | Maximum Confirmatory mg/kg | Residual Carcinogenic Risk |
|---|---|---|---|---|
| 2,3,7,8-TCDD Equivalents | 1.E-05 | 4.00E-05 | 1.71E-05 | 4.27E-06 |
| Benzo(a)anthracene | 1.E-05 | 6.2 | 3.4 | 5.48E-06 |
| Benzo(a)pyrene | 1.E-05 | 0.62 | 3.4 | 5.48E-05 |
| Benzo(b)fluoranthene | 1.E-05 | 6.2 | 4.5 | 7.26E-06 |
| Benzo(k)fluoranthene | 1.E-05 | 62 | 1.6 | 2.58E-07 |
| Dibenzo(a,h)anthracene | 1.E-05 | 0.62 | 0.68 | 1.10E-05 |
| Indeno(1,2,3-cd)pyrene | 1.E-05 | 6.2 | 2.1 | 3.39E-06 |
| | | | **Total** | **8.31E-05** |

# APPENDIX D

# SAMPLE LOG SHEETS

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove
Project No.: 2192

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055560
Sample Location:
Sampled By: DW/RT
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 9-28-06<br>Time: 1430<br>Method: disposable trowel<br>Monitor Reading (ppm): | 0"-6" | Brown | Clayey silt, wet<br>some fine Gravel |

**COMPOSITE SAMPLE DATA:**

| Date: | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| | | | | |
| Method: | | | | |
| | | | | |
| Monitor Readings (Range in ppm): | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

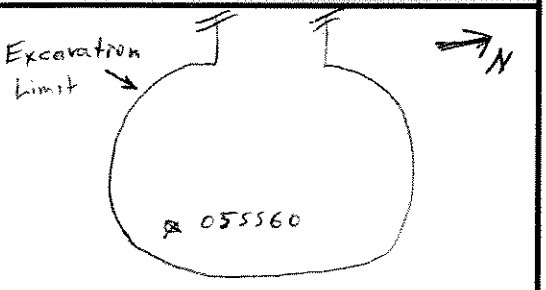
**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| Dioxin (SW846 8290) | 4 oz. jar | 2 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**OBSERVATIONS / NOTES:**

- sample collected by directly filling sample jar
- sample location was under 6" of water
- No odors or stains observed
- Excavation was ~ 2' deep at sample location

**MAP:**




**Circle if Applicable:**

MS/MSD

Duplicate ID No.: 055565

**Signature(s):**

Donald W Lahin

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove
Project No.: 2192

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055561
Sample Location:
Sampled By: DW/RT
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

Date: 9-28-06
Time: 1555
Method: Direct Fill
Monitor Reading (ppm):

| Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|
| 0" - 6" | Brown | clayey silt, wet |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

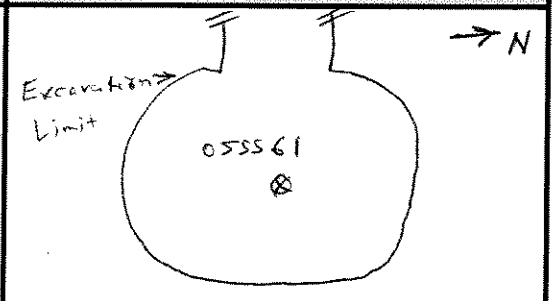
**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| Dioxin (SW846 8290) | 4 oz. jar | | |

**OBSERVATIONS / NOTES:**

- Sample collected using remote sampling device by directly filling sample jar.
- Sample collected on bottom of excavation
- that was filled with rain water (2' to 3' deep)
- No odors or stains observed

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| | |

**Signature(s):** Darell Walker

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove
Project No.: 2192

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055562
Sample Location:
Sampled By: DW/RT
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 9/28/06<br>Time: 1555<br>Method: Direct Fill<br>Monitor Reading (ppm): | 0" to 6" | BROWN | Clayey silt, wet |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

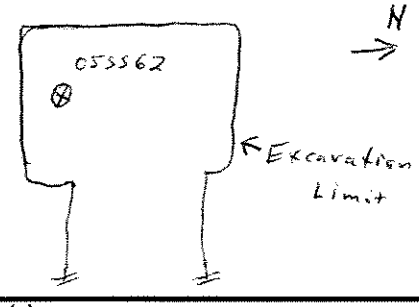
**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| Dioxin (SW846 8290) | 4 oz. jar | 1 | |

**OBSERVATIONS / NOTES:**

- No odors or stains observed.
- Sample collected using remote sampling device by directly filling sampling jar.
- Sample collected from the floor of the excavation (~2.5' deep), at SW corner.
- Excavation was filled with rain water.

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| | |

**Signature(s):** Donald Whalen

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove
Project No.: 2192

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055563
Sample Location:
Sampled By: DW/RT
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 9/28/06<br>Time: 1607<br>Method: Direct Fill<br>Monitor Reading (ppm): | 0"-6" | Brown | clayey silt, some sand; WET |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

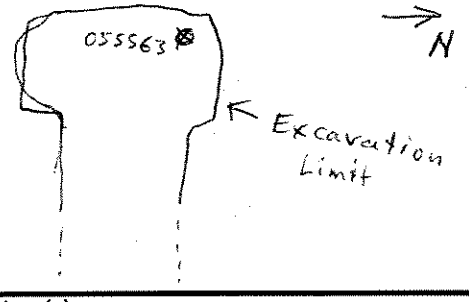
**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| Dioxin (SW846 8290) | 4 oz. jar | | |

**OBSERVATIONS / NOTES:**

- No stains or odors observed
- Sample collected using remote sampling device by directly filling sample jar
- Sample collected from the floor of the excavation near the NW corner
- Excavation was filled with rain water

**MAP:**




**Circle if Applicable:**

| MS/MSD | Duplicate ID No.: |
|---|---|
| | |

**Signature(s):**

Tetra Tech NUS, Inc.

# SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove
Project No.: 2192

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 055564
Sample Location:
Sampled By: DW/RT
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

**GRAB SAMPLE DATA:**

| | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|
| Date: 9/28/06<br>Time: 1622<br>Method: Disposable trowel<br>Monitor Reading (ppm): | 0" to 6" | Brown | Sandy silt, tr. clay |

**COMPOSITE SAMPLE DATA:**

| | Time | Depth | Color | Description (Sand, Silt, Clay, Moisture, etc.) |
|---|---|---|---|---|
| Date: | | | | |
| Method: | | | | |
| Monitor Readings (Range in ppm): | | | | |

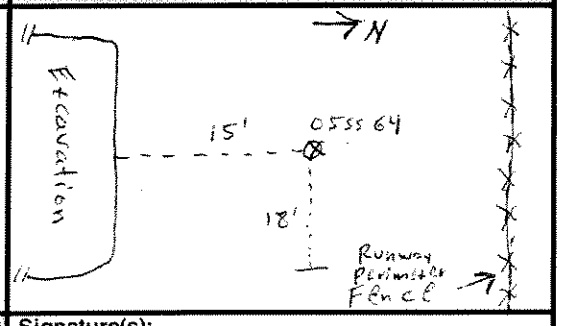
**SAMPLE COLLECTION INFORMATION:**

| Analysis | Container Requirements | Collected | Other |
|---|---|---|---|
| Dioxin (SW846 8290) | 4 oz. jar | 2 | |

**OBSERVATIONS / NOTES:**

No odors or stains observed.

**MAP:**




**Circle if Applicable:**

MS/MSD

Duplicate ID No.:

Signature(s):

**CLIENT CHAIN OF CUSTODY** **SAMPLER'S SIGNATURE** Donald Whalen **Quote 0600000302**

From (1): Tetra Tech/NUS
600 Clark Avenue
Suite 3
King of Prussia, PA 19406-1433

Project (1): CTO-003, NAS JRB Willow Grove

Contact: Meg Price/~~Daniel Braccia~~
Phone: 610/491-9688
Fax: 610/491-9645
P.O.# (1): _____

**(BRE07 /UN)**

Please provide any special reporting instructions.

**Analysis Wanted (2):** 8290:T-O

**Total Number of Containers:** 7

**Turn Around Time (In Calendar Days):**

| Sample ID (3) | Date / Time | Preservation (4) | Matrix | Sample Amt. | 8290:T-O | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 055560 | 9-28-06/1430 | ICE | Soil | 4 oz | ✓ | | | | | |
| 055561 | 9-28-06/1615 | ICE | Soil | 4 oz | ✓ | | | | | |
| 055562 | 9-28-06/1555 | ICE | Soil | 4 oz | ✓ | | | | | |
| 055563 | 9-28-06/1607 | ICE | Soil | 4oz | ✓ | | | | | |
| 055564 | 9-28-06/1622 | ICE | Soil | 2 x 4oz | ✓ | | | | | Do MS/MSD |
| 055565 | 9-28-06/1628 | ICE | Soil | 4oz | ✓ | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| Relinquished By/Sign. | Date/Time | Received By/Sign. | Relinquished By/Sign. | Date/Time | Received By/Sign. |
|---|---|---|---|---|---|
| Donald Whalen | 1700 9-29-06 | | | | |

| Received for Laboratory By/Signature | Date/Time | Send Samples to: |
|---|---|---|
| | | **Eno River Labs, LLC**<br>**Attn: Sample Management Group**<br>**2445 S. Alston Ave.**<br>**Durham, NC 27713 USA**<br>**Phone: (919) 281-4040 • Fax: (919) 281-4070** |

Directions:
(1) Provide and/or correct client and project information.
(2) Verify analysis, check approriate boxes for each sample.
(3) Please be sure that this matches the ID on the sample container.
(4) Please indicate the preservation used for each sample.

# APPENDIX E

# RMC CLOSEOUT REPORT

# FINAL REPORT OF SOIL REMOVAL ACTION, SITE 5 FIRE FIGHTING TRAINING AREA

## NAVAL AIR STATION JOINT RESERVE BASE
## WILLOW GROVE, PENNSYLVANIA

PROJECT EM-54 Including Modification One

CONTRACT NO. N62472-99-D-0826

*PREPARED FOR:*

**Department of the Navy**
BRAC PMO Northeast
4911 South Broad Street
Building 679, PNBC
Philadelphia, PA 19112

*PREPARED BY:*

rmc
Creative solutions. Proven results.

**Resource Management Concepts, Inc.**
**46970 Bradley Boulevard, Suite B**
**Lexington Park, MD 20653**

**November 2006**

# EXECUTIVE SUMMARY

This report gives the details of the soil removal action at the Site 5 Fire Fighting Training Area, Willow Grove Naval Air Station Joint Reserve Base. The purpose of this project was to remove contaminated soil in the area of the former Fire Fighting Training Area. This project was completed in three phases. In Phase I approximately 230 cubic yards of contaminated soil was removed. Confirmatory analytical results of the soil remaining in the excavation area exceeded the remediation goals for polyaromatic hydrocarbons; consequently, the Navy issued a contract modification to remove an additional 200 cubic yards of soil, which became Phase II of this project.

A modified work plan to meet the requirements of the contract modification was submitted to the Navy and approved. The soil was removed according to the work plan and taken to Clean Earth of Philadelphia for thermal treatment. An analysis of the residual soil revealed marginally higher-than-targeted concentrations of targeted polyaromatic hydrocarbon compounds, but the total organic carbon and the pH of the residual soil was within the targeted range. The Navy calculated the residual risk from soil using confirmatory sampling data and determined that carcinogenic risks were within the EPA's acceptable risk range.

Phase III included backfill and seeding. High quality fill dirt and topsoil was used from a borrow pile located on WG NAS JRB. The backfilled area was compacted and leveled to the top of the soil in the surrounding area. The filled area was covered with fresh grass seed. At the request of WG NAS JRB, a straw blanket over the fresh seeding was omitted.

# ACRONYM LIST

| | |
|---|---|
| COC | Contaminants of Concern |
| FTA | Fire Training Area |
| JRB | Joint Reserve Base |
| MSCS | Medium Specific Concentrations |
| NAS | Naval Air Station |
| PADEP | Pennsylvania Department of Environmental Protection |
| PAH | Polyaromatic Hydrocarbons |
| PRG | Preliminary Remediation Goal |
| RBCs | Risk Based Concentrations |
| ROICC | Resident Officer in Charge of Construction |
| TOC | Total Organic Carbon |
| WG | Willow Grove |
| RFQ | Request for Quotation |

# TABLE OF CONTENTS

1 PROJECT SUMMARY ..... 1-1
1.1 General Project Description ..... 1-1
1.2 Quantity of Soil for Remediation ..... 1-1
1.3 Contaminants of Concern ..... 1-1
1.4 Project Deliverables ..... 1-2
1.5 Work Location ..... 1-2
2 FIRST EXCAVATION AND SOIL DISPOSAL ..... 2-1
2.1 Soil Characterization ..... 2-1
2.2 First Excavation Dates of Mobilization, Excavation, and Disposal ..... 2-1
2.3 First Excavation Soil Sampling and Results of Soil Analysis ..... 2-2
2.4 The Burn Ring ..... 2-3
3 SECOND EXCAVATION AND SOIL DISPOSAL ..... 3-1
3.1 Second Excavation Scope of Work ..... 3-1
3.2 Second Excavation Field Work ..... 3-1
3.2.1 Condition of Site ..... 3-1
3.2.2 Mobilization, Excavation, and Disposal ..... 3-5
3.3 Second Excavation Results of Soil Analysis ..... 3-5
3.4 Appearance and Odor ..... 3-5
3.5 Burn Ring Disposal ..... 3-8
4 BACKFILL AND SEEDING ..... 4-1
4.1 Backfill ..... 4-1
4.2 Seeding ..... 4-3
5 DIOXIN DATA ..... 5-1
6 CONCLUSION ..... 6-1
7 APPENDICES ..... 7-1
APPENDIX A: Soil Disposal Characterization Requirements by Clean Earth and the results of the First Characterization Samples ..... 7-3
A-1: Requirements for Characterization for Disposal ..... 7-3
A-2: First Soil Characterization Results ..... 7-5
APPENDIX B: Sampling Protocol ..... 7-7
B-1: Sample Collection and Sampling Tool Decontamination ..... 7-7
B-2: Reusable Sampling Tools ..... 7-7
B-3: Sample Quality Assurance/Quality Control ..... 7-8
B-4: Chain of Custody ..... 7-8
APPENDIX C: First Soil Confirmation Results Laboratory Data ..... 7-9

APPENDIX D: Manifests and Weigh tickets, First Excavation.....7-11
APPENDIX E: Second Soil Characterization Results Laboratory Data.....7-13
APPENDIX F: Manifests and Weigh tickets, Second Excavation.....7-15
APPENDIX G: Second Soil Confirmation Results Laboratory Data.....7-17
APPENDIX H: Laboratory Analyses for Borrow Pile (Fill Dirt and Topsoil)....7-19
APPENDIX I: Dioxin Data Supplied by the Navy .....7-21
APPENDIX J: Contact List.....7-23

# TABLE OF TABLES

Table 1-1: Contaminants of Concern and Analytical Method .....1-1
Table 1-2: Preliminary Remediation Goals Site 5 - Fire Training Area NASJRB, Willow Grove, PA.....1-2
Table 2-1 : Results of Residual Soil Analysis for First Excavation .....2-3
Table 3-1: Summary of Results for Second Excavation.....3-6
Table 3-2: Tabular Results for Confirmation Sampling for Target Compounds..3-6
Table B-7-1: Waste Characterization Samples and Analysis for Waste Petroleum Soil .....7-3

# TABLE OF FIGURES

Figure 1-1: Location of Work Site.....1-3
Figure 2-1 Bottom and Sidewall Soil Analysis Confirmation Points for the First Excavation .....2-2
Figure 2-2: Equipment Used To Perform First Excavation.....2-4
Figure 2-3: The First Excavation Looking NW Showing Two Feet Below the Existing Grade and the Immediate Formation of Ice in the Seepage Water.....2-4
Figure 2-4: The Excavated Area After Winter Thaw.....2-5
Figure 3-1: Second Excavation Area Showing Confirmation Point Locations ....3-2
Figure 3-2: Portable Submersible Pump in Operation.....3-3
Figure 3-3: Fabric Silt Filter in Operation .....3-3
Figure 3-4: Specification Cut Sheet for Dirtbag Fabric Filter.....3-4
Figure 3-5: East Wall of Second Excavation.....3-7
Figure 3-6: Looking NW Down the Trench.....3-7
Figure 3-7: The Burn Ring has been Crushed, Perforated, and Removed from the Site .....3-9
Figure 3-8: Sale Ticket for Burn Ring Disposal .....3-9
Figure 4-1: The Caterpillar D4G Used to Distribute and Compact the Backfill and Topsoil .....4-1
Figure 4-2: The Backfilled Area Looking NW toward the Trench at Top Left .....4-2
Figure 4-3: The Backfilled Area Showing the Eastern Edge of the Site (Debris off the Project Scope) .....4-2
Figure 4-4: Grass Seed Label .....4-4

# 1 PROJECT SUMMARY

## 1.1 GENERAL PROJECT DESCRIPTION

The general goal of this project was to remediate an area of contaminated soil known as the Site 5 Fire Training Area (FTA) at the Willow Grove (WG) Naval Air Station (NAS) Joint Reserve Base (JRB). The goals of this project were established by the request for quotation (RFQ) N62472-05-Q-EM54 issued by the Engineering Field Activity Northeast (EFANE) on 11 April 2005, and by the Final Action Memorandum of August 2005.

## 1.2 QUANTITY OF SOIL FOR REMEDIATION

According to the EFANE scope of work, the estimated volume of soil for disposal was 230 cubic yards. Soil for disposal would be excavated from a 25-foot radius around the former burn ring as well as the steel burn ring itself and from a trench 65 feet long and 10 feet wide. The excavation was to be 2 feet below the existing grade. It was anticipated that the excavated soil would be non-hazardous waste that would be suitable for disposal in a Subtitle D landfill or other facility permitted to dispose of similar soils.

## 1.3 CONTAMINANTS OF CONCERN

The original RFQ established the contaminants of concern (COC) as polyaromatic hydrocarbons (PAH), total organic carbon (TOC), and pH. The contaminants of concern and the analytical methods to be used are listed in Table 1-1.

**Table 1-1: Contaminants of Concern and Analytical Method**

| COC | Analytical Method |
|---|---|
| PAH | EPA Method 8270 |
| TOC | EPA Method 9060 |
| pH | Standardized meter, saturated soil |

The remediation goals are based on the EPA Region 3 risk based concentrations (RBCs) for carcinogenic PAH compounds. The Navy selected target compounds and established the remediation goals in the final Action Memorandum and in the initial project RFQ. The table of remediation goals which is duplicated from the Action Memorandum follows as Table 1-2.

**Table 1-2: Preliminary Remediation Goals Site 5 - Fire Training Area NASJRB, Willow Grove, PA**

| Chemical | US EPA Region 3 RBCs[1] | | Cancer Risk Levels | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | $10^{-6}$ | $10^{-5}$ | $10^{-4}$ | $10^{-6}$ | $10^{-5}$ | $10^{-4}$ |
| | Industrial | Residential | Occupational Workers | | | Lifelong Residents | | |
| 2,3,7,8-TCDD Equivalents[2] | 1.9E-05 | 4.3E+06 | 2.0E-05 | 2.0E-04 | 2.0E-03 | 4.0E-06 | 4.0E-05 | 4.0E-04 |
| Benzo(a)anthracene | 3.9 | 0.87 | 2.1 | 21 | 210 | 0.62 | 6.2 | 62 |
| Benzo(a)pyrene | 0.39 | 0.087 | 0.21 | 2.1 | 21 | 0.062 | 0.62 | 6.2 |
| Benzo(b)fluoranthene | 3.9 | 0.87 | 2.1 | 21 | 210 | 0.62 | 6.2 | 62 |
| Benzo(k)fluoranthene | 39 | 8.7 | 21 | 210 | 2100 | 6.2 | 62 | 620 |
| Dibenzo(a,h)anthracene | 0.39 | 0.087 | 0.21 | 2.1 | 21 | 0.062 | 0.62 | 6.2 |
| Indeno(1,2,3-cd)pyrene | 3.9 | 0.87 | 2.1 | 21 | 210 | 0.62 | 6.2 | 62 |

Notes:
All concentrations are in mg/kg.
(1) - USEPA Region 3 Risk-Based Concentration Table, April 7, 2005.
(2) – Monitored under a separate project but data included in this report

## 1.4 PROJECT DELIVERABLES

Project deliverables include a work plan including the details of soil characterization for disposal, excavation, soil disposal, and remediation confirmation. A site-specific health and safety plan was required. A final report giving the laboratory results of confirmation was required. The excavated site was to be backfilled, covered with a layer of topsoil, broadcast seeded with fresh grass seed, and finally topped with a blanket of straw.

At the request of the WG NAS JRB resident officer in charge of construction (ROICC), the backfill and topsoil was taken from an on-site borrow pile. At the request of the ROICC, the final blanket of straw was omitted.

## 1.5 WORK LOCATION

The site was located in the south-central portion of WG NAS JRB, approximately midway between Runway 10/28 and State Route 463. The site is located immediately to the south of Taxiway Juliet and covers an irregularly shaped area of approximately 1.25 acres. The burn area is located in the south-central portion of the site and is an untended area of grasses and woody and brushy vegetation.

Figure 1-1 illustrates the location of the work site. The work was limited to the burn ring area and the rectangular area extending westward from the burn ring as described in the work plan.

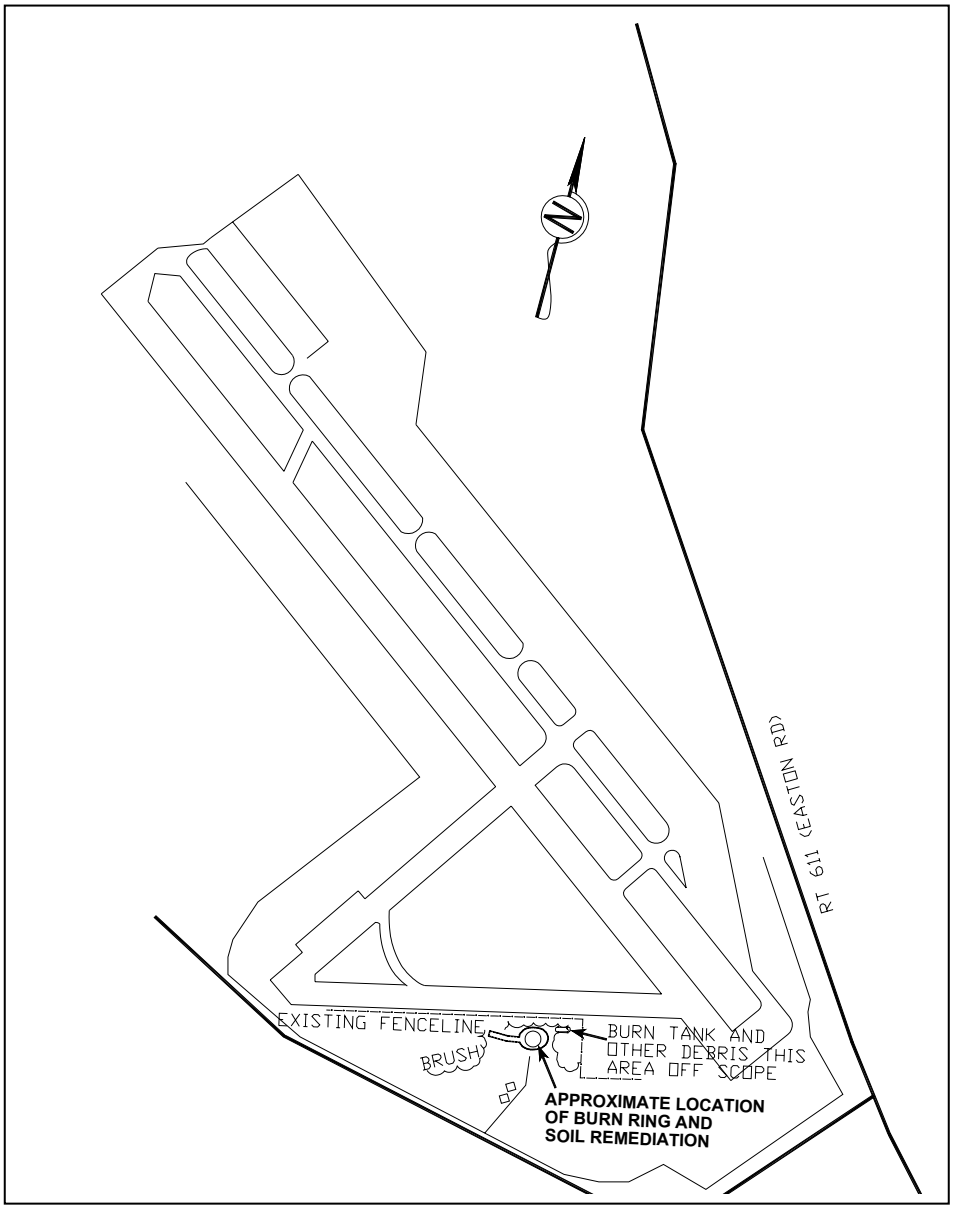



**Figure 1-1: Location of Work Site**

# 2 FIRST EXCAVATION AND SOIL DISPOSAL

The first excavation was completed on 20 December 2005. The confirmation soil samples were collected on 17 January 2006. The results of the analysis of PAH residuals in the soil were above target levels; therefore, the backfill was postponed until a contract modification for a second excavation was approved. This section re-reports on the first excavation and the results of the first excavation in order for the Navy to have a complete report in one document.

## 2.1 SOIL CHARACTERIZATION

A soil characterization sampling protocol was developed as part of the work plan in accordance with the requirements of Clean Earth of Philadelphia. The samples were sent to American Analytical Laboratories of New York, a laboratory licensed and certified to do soil analyses for Pennsylvania. The results of the characterization samples were satisfactory to Clean Earth and reported to EFANE and the WG NAS JRB ROICC.

The laboratory results for the characterization samples are attached to this report as Appendix A.

## 2.2 FIRST EXCAVATION DATES OF MOBILIZATION, EXCAVATION, AND DISPOSAL

The approval for the work plan for the first excavation was received in November 2005, and written approval for soil disposal as non-hazardous waste was received from Clean Earth of Philadelphia. Clean Earth issued approval number 6950 for the soil disposal.

The excavation area was marked in the field according to the figure supplied in the original scope of work, and a representative of the WG NAS JRB approved the marked area. Work was scheduled at the site for 20 December 2005. Equipment was mobilized to the site on 19 December 2005, and the site was excavated on 20 December 2005. All soil was transported to Clean Earth of Philadelphia for thermal destruction. A representative of the WG NAS JRB Environmental Office signed the manifest for each load transported off site. The manifests and weigh tickets for the soil transportation and acceptance at Clean Earth are on file with the WG NAS JRB ROICC. A total of 286.49 tons of waste soil was transported to Clean Earth. A representative of the WG NAS JRB ROICC office witnessed and approved the excavation.

Although the temperatures were near or below freezing, the excavation was completed in one day in accordance with the work plan. Groundwater seeped into the excavation and froze quickly. Soil sampling took place on 17 January 2006 after a period of above-freezing temperatures and after the water seepage had decreased.

## 2.3 FIRST EXCAVATION SOIL SAMPLING AND RESULTS OF SOIL ANALYSIS

Samples were collected according to the diagram approved in the work plan. The diagram is reproduced in this report as Figure 2-1. Sampling was accomplished in accordance with the protocol in Appendix B. The results of the first excavation are summarized in Table 2-1. The original laboratory documentation in PDF electronic format is on file with the WG NAS JRB ROICC and EFANE. Printouts of the data accompany this report in Appendix C and the electronic laboratory documentation accompanies this report on a compact disk.

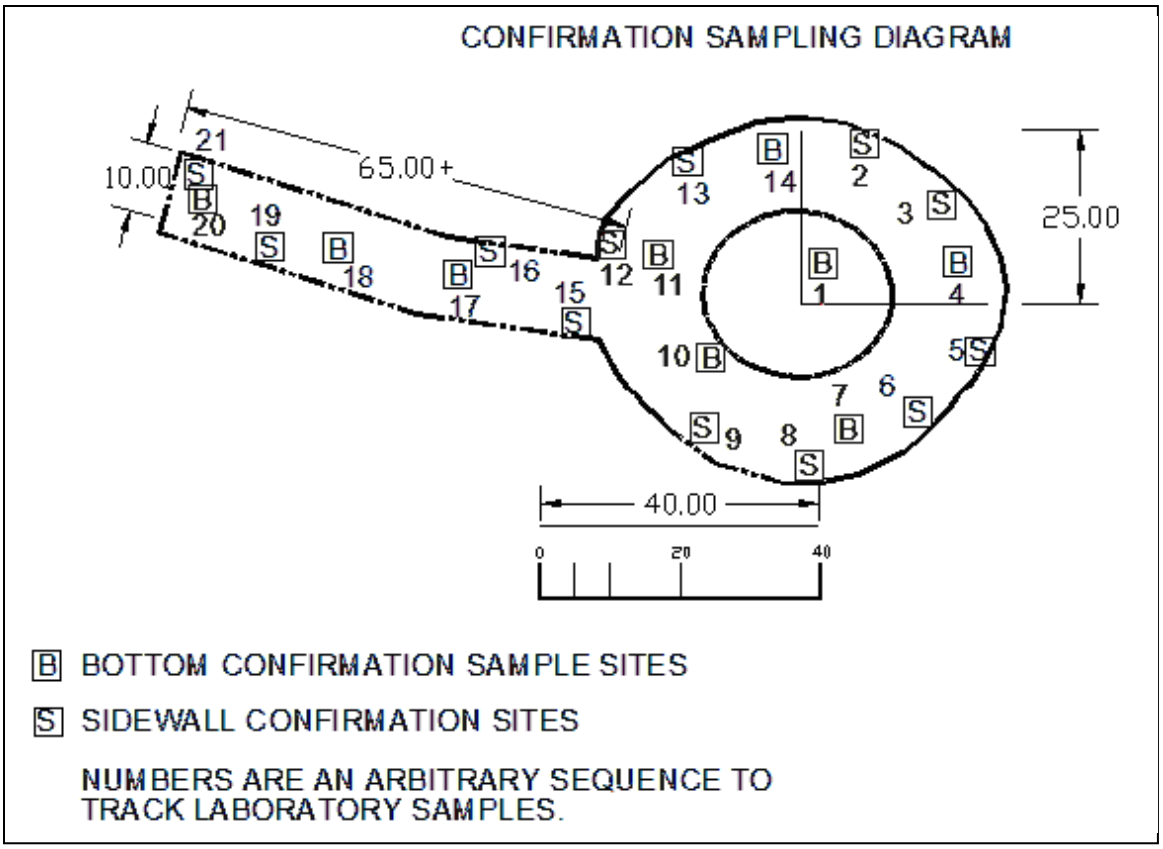



**Figure 2-1 Bottom and Sidewall Soil Analysis Confirmation Points for the First Excavation**

**Table 2-1 : Results of Residual Soil Analysis for First Excavation**

| ANALYTE | EPA REGION 3 RBC RESIDENTIAL PPM | SAMPLING POINTS LIST OF EXCEEDANCES | RANGE OF EXCEEDANCES, PPM |
|---|---|---|---|
| Benzo(a)pyrene | 0.087 | 1-B, 2-S, 3-S, 4-B, 6-S, 7-B, 8-S, 9-S, 10-B, 11-B, 12-S, 13-S, 14-B, 15-S, 16-S, 17-B, 18-B, 19-S, 20-B, 21-S | 26.0 – 2.8 |
| Dibenzo(a,h)-anthracene | 0.087 | 1-B, 2-S, 3-S, 4-B, 6-S, 7-B, 8-S, 9-S, 10-B, 11-B, 12-S, 13-S, 17-B, 19-S, 20-B, 21-S | 5.70 – 0.27 |
| Benzo(a)-anthracene | 0.87 | 1-B, 2-S, 3-S, 4-B, 6-S, 7-B, 8-S, 9-S, 10-B, 11-B, 12-S, 13-S, 14-B, 16-S, 17-B, 19-S, 20-B | 61.0 – 1.7 |
| Benzo(k)-fluoranthene | 0.87 | 1-B, 2-S, 3-S, 4-B, 6-S, 7-B, 8-S, 9-S, 10-B, 11-B, 12-S, 13-S, 14-B, 17-B, 19-S, 20-B, 21-S | 9.0 --.94 |
| **Total PAH Range** | 851,000 ppm, #10 Bottom – Trace, #5 Side | | |
| **TOC Range** | 358,000 ppm, # 10 Bottom – 35,900 ppm, #16 Side | | |
| **pH** | 6.8 – 7.5 | | |

Upon examination of the confirmation data, the Navy determined certain areas of the excavation did not meet the goals of the removal action so a contract modification was issued for additional excavation.

Figures 2-2, 2-3, and 2-4 illustrate the excavation as it was completed in December 2005.

## 2.4 THE BURN RING

The scope of work described a “burn ring.” The burn ring was actually one end of a cylindrical tank. The bottom of the burn ring was approximately 2 ½ feet below the crown of the crushed stone that surrounded the burn ring and approximately two feet below the overall surrounding grade. About two-thirds up the side of the burn ring was an overflow. As rainwater and other liquid accumulated in the tank, the liquid reached a maximum depth in the tank. Upon the removal of the burn ring, there was a distinct odor of petroleum products and an area of dark staining. Additional material was removed from the area below the burn ring to remove the visible staining. The end of the cylindrical tank that formed the burn ring is visible in Figure 2-2.

**Figure 2-2: Equipment Used To Perform First Excavation**

(19 December 2005)

---

**Figure 2-3: The First Excavation Looking NW Showing Two Feet Below the Existing Grade and the Immediate Formation of Ice in the Seepage Water**

Note: The excavation equipment was still on site when this photograph was taken.
(19 December 2005)

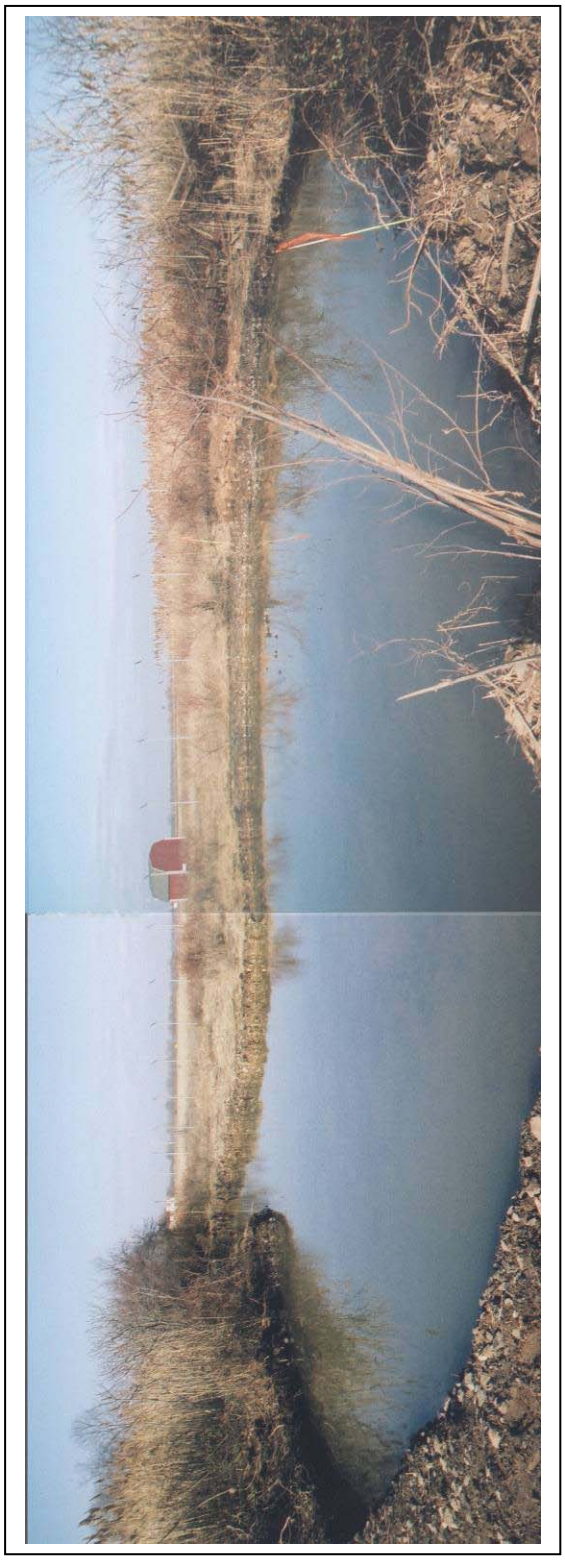


**Figure 2-4: The Excavated Area After Winter Thaw**

(April, 2006)

# 3 SECOND EXCAVATION AND SOIL DISPOSAL

## 3.1 SECOND EXCAVATION SCOPE OF WORK

The tasks associated with the second excavation to accomplish remediation of the site were:

(1) Excavate an additional 200 cubic yards of contaminated soil [as shown on Figure 3-1]. For each of the two areas outlined in Figure 3-1, the existing excavation shall be expanded by excavating approximately 2 feet deeper and 2 feet wider.
(2) Perform waste characterization and disposal for the removed soil.
(3) Perform confirmation sampling for the new excavations in accordance with the original work plan, i.e., 8 base samples and 12 sidewall samples.
(4) Backfill newly excavated areas.

In addition to the four specific tasks, an amended (as necessary) work plan and a site-specific health and safety plan were required. The sketch referenced in the contract modification scope of work and shown in Figure 3-1 is overlaid in the figure with the confirmation sample locations as submitted in the amended work plan. For clarity the locations of the confirmation bottom samples are shown in red on the figure. The results of the characterization sample and the work plan were accepted by the Navy in July 2006. Work was scheduled for August 2006.

Clean Earth required an additional site characterization sample and requested the results of the confirmation samples for the first excavation. The additional characterization sample was acquired and transferred to American Analytical Laboratories. Clean Earth accepted the characterization data in August 2006. Because the soil was from the same location as the previous excavation, Clean Earth maintained the same approval number 6950 for the soil from the second excavation. The results of the second characterization sample may be found in Appendix E.

## 3.2 SECOND EXCAVATION FIELD WORK

### 3.2.1 Condition of Site

The second excavation was scheduled for August 2006 after a relatively dry summer. However, the site was very wet in the bottom of the excavation with standing pools in the deeper areas. To ensure that there would not be any dripping from the trucks as the waste soil was transported to the disposal site, it was determined that the site should be pumped as dry as possible. A portable submersible pump was used to lower the water level, and the pumped water was discharged through a fabric silt filter known as a “Dirtbag.” The filtrate was discharged into the reedy and wet area immediately west of the excavation. The dirt bag was included with the soil for disposal.

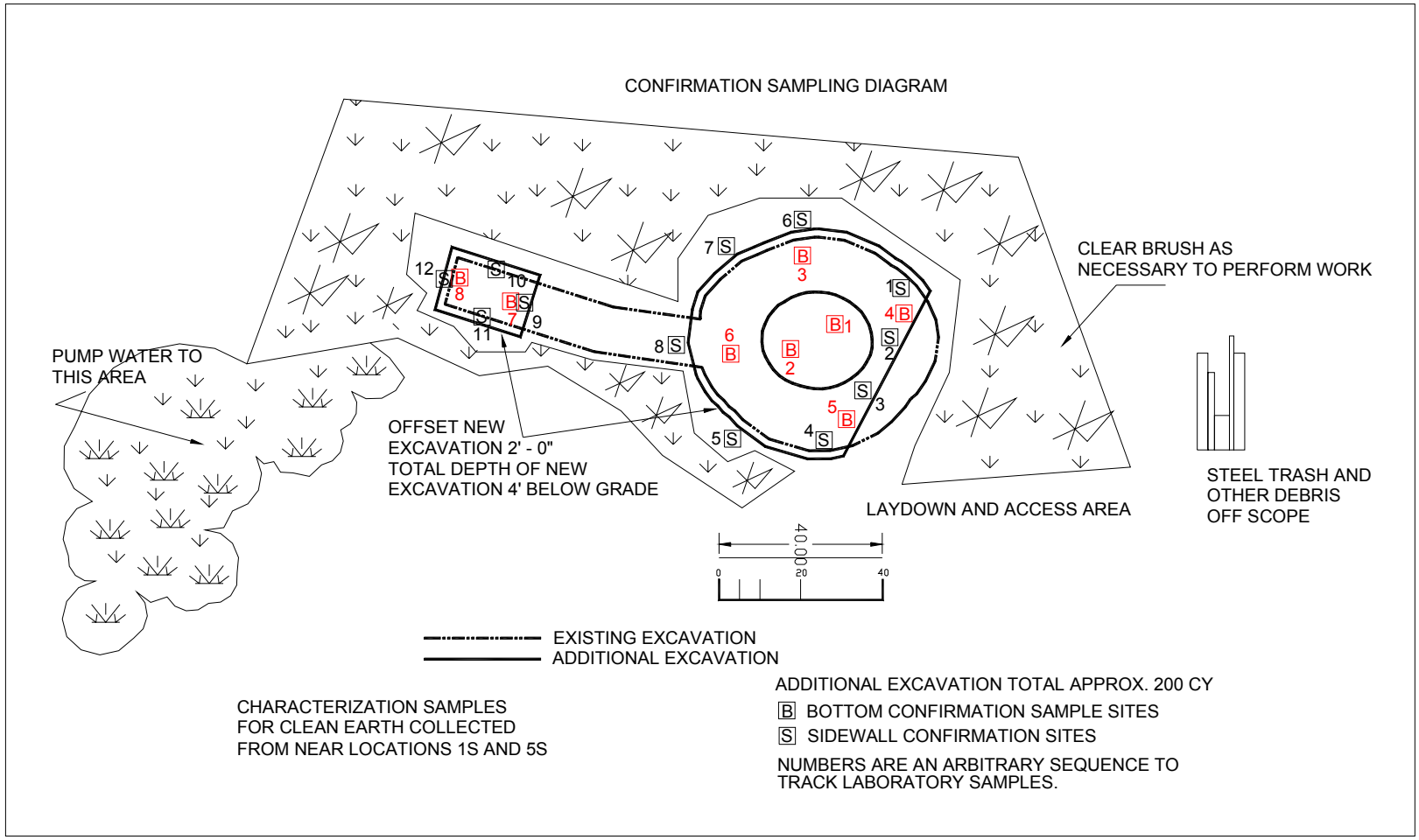



**Figure 3-1: Second Excavation Area Showing Confirmation Point Locations**

The water sources were direct catchment, runoff, and percolation through the stone fill at the south end of the base. There was no sheen on the water and care was taken to limit the disturbance of bottom sediment. A telephone call to the vendor revealed that the Dirtbag pore size is 150 microns (μ). The pump and Dirtbag are illustrated below in Figure 3-2 and Figure 3-3. The vendor's cut sheet specifications for the Dirtbag are shown in Figure 3-4.

**Figure 3-2: Portable Submersible Pump in Operation**

(August 2006)

**Figure 3-3: Fabric Silt Filter in Operation**

(August 2006)

## Dirtbag® Specifications
## Control of Sediment In Pumped Water

**1.0 Description**

**1.1** This work shall consist of furnishing, placing and removing the DIRTBAG® pumped sediment control device as directed by the design engineer or as shown on the contract drawings. The dirtbag® pumped-silt control system is marketed by:

ACF Environmental, Inc.
2831 Cardwell Drive
Richmond, Virginia 23234
Phone: 800-448-3636
Fax: 804-743-7779

**2.0 Materials**

**2.1 Dirtbag®**

**2.1.1** The DIRTBAG® shall be a nonwoven bag which is sewn with a double needle matching using a high strength thread.

**2.1.2** The DIRTBAG® seams shall have an average wide width strength per ASTM D-4884 as follows.

| Dirtbag Style | Test Method | Test Result |
|---|---|---|
| Dirtbag® 53 | ASTM D-4884 | 60 LB/IN |
| Dirtbag® 55 | ASTM D-4884 | 100 LB/IN |

**2.1.3** Each standard DIRTBAG® has a fill spout large enough to accommodate a 4" discharge hose. Attached are straps to secure the hose and prevent pumped water from escaping without being filtered.

**2.1.4** The geotextile fabric shall be nonwoven fabric with the following properties:

| Properties | Test Method | Units | Nonwoven | |
|---|---|---|---|---|
| | | | 53 | 55 |
| Weight | ASTM D-3776 | Oz/yd | 8 | 10 |
| Grab Tensile | ASTM D-4632 | Lbs. | 203 | 250 |
| Puncture | ASTM D-4833 | Lbs. | 130 | 165 |
| Flow Rate | ASTM D-4491 | Gal/Min/Ft2 | 80 | 70 |
| Permittivity | ASTM D-4491 | $Sec.^{-1}$ | 1.5 | 1.3 |
| Mullen Burst | ASTM D-3786 | $Lbs.^{in2}$ | 400 | 550 |
| UV Resistant | ASTM D-4355 | % | 70 | 70 |
| AOS % Retained | ASTM D-4751 | % | 100 | 100 |

*All properties are minimum average roll value except the weight of the fabric which is given for information only.*

**3.0 Construction Sequence**

**3.1.1** Install DIRTBAG® on a slope so incoming water flows downhill through the DIRTBAG® without creating more erosion. Strap the neck of the DIRTBAG® tightly to the discharge hose. To increase the efficiency of filtration, place the bag on an aggregate or haybale bed to maximize water flow through the surface area of the bag.

**3.1.2** The DIRTBAG® is full when it no longer can efficiently filter sediment or pass water at a reasonable rate. Flow rates will vary depending on the size of the DIRTBAG, the type and amount of sediment discharged into the DIRTBAG®, the type of ground, rock or other substance under the bag and the degree of the slope on which the bag lies. Under most circumstances DIRTBAG'S® will accommodate flow rates of 1500 gallons per minute. Use of excessive flow rates or overfilling DIRTBAG® with sediment will cause ruptures of the bags or failure of the hose attachment straps.

**3.1.3** Dispose DIRTBAG® as directed by the site engineer. If allowed, the DIRTBAG® may be cut open and the contents seeded after removing visible fabric. DIRTBAG is strong enough to be lifted with added straps if it must be hauled away (extra option). Off-site disposal may be facilitated by placing the DIRTBAG® in the back of a dump truck or flatbed prior to use and allowing the water to drain from the bag in place, thereby dismissing the need to lift the DIRTBAG®.

**4.0 Basis of Payment**

**4.1** The payment for any DIRTBAG® used during construction is to be included in the bid of overall erosion and sediment control plan unless a unit price is requested.

**Figure 3-4: Specification Cut Sheet for Dirtbag Fabric Filter**

### 3.2.2 Mobilization, Excavation, and Disposal

Mobilization to the site occurred on 14 August 2006, and excavation and disposal occurred on 15 August 2006. The marked area was excavated to 4 feet below the existing grade. The excavation was witnessed and approved by a representative of the WG NAS JRB ROICC office, and a representative of the WG NAS JRB Environmental Department signed each manifest for each load leaving the base. A total of 226.90 tons of waste soil was sent to the Clean Earth disposal site. Photographs of the excavated area are shown in Figure 3-5 and Figure 3-6. Copies of the manifests and weigh tickets for the second excavation are located in Appendix F.

## 3.3 SECOND EXCAVATION RESULTS OF SOIL ANALYSIS

Soil samples were collected from the areas shown in Figure 3-1 in accordance with the sampling protocol detailed in Appendix B. The soil samples were transported to American Environmental Laboratories of Plainview, New York, for analysis. The total PAH levels and the TOC levels are much improved compared to the first excavation. The TOC results range from a low of 650 ppm at sampling point 3S to a high of 6,800 ppm at sampling point 8B. These results may be compared to the results obtained after the first excavation where the TOC ranged from a low of 35,900 ppm to a high of 328,000 ppm. The pH values range from a low of 5.1 at sampling point 4B to a high of 7.1 at sampling point 5S.

Based on the remediation goals of the Final Action Memorandum, the samples that exceeded the EPA Region 3 PAH RBCs for residential are summarized in Table 3-1. The results for PAH that exceeded the EPA Region 3 RBCs came from an area that runs from near the center of the location of the former burn ring eastward and southeastward to the edge of the excavation and around to point 5S and also at the end of the excavated trench.

The results for the selected PAH compounds by sampling point are shown in Table 3-2, and samples that exceed the 10-5 cancer risk level of the project remediation goal (PRG) are highlighted in yellow. The laboratory analysis results are in Appendix G of this report, and the data in electronic format accompany this report on a compact disk.

## 3.4 APPEARANCE AND ODOR

Following the excavation, no areas of staining or residual oil were evident by vision or smell. There are areas that are darker than other areas and soil layers that differ slightly from other soils in appearance, but no specific areas appear oily or suspicious. During the early stages of this excavation, some odor was detectable by the excavation crew near the area of the former burn ring, but there was no discernible odor by the end of the task.

**Table 3-1: Summary of Results for Second Excavation**

| ANALYTE | EPA REGION 3 RBC RESIDENTAIL PPM | SAMPLING POINTS LIST OF EXCEEDANCES | RANGE OF EXCEEDANCES, PPM |
|---|---|---|---|
| Benzo(a)anthracene | 0.87 | 1B,5B, 4S,10S,12S, | 3.4 – 1.1 |
| Benzo(a)pyrene | 0.087 | 1B,4B,5B,7B,8B,2S, 4S,5S,9S,10S,11S,12S,22S | 3.4 – 0.11 |
| Benzo(b)fluoranthene | 0.87 | 1B,5B,7B,4S,5S,210S,12S | 4.5 – 1.1 |
| Benzo(k)fluoranthene | 0.87 | 5B,12S | 1.6 – 1.3 |
| Dibenzo(a,h)anthracene | 0.087 | 1B,4B,5B, 7B,4S,5S | 0.68 – 0.099 |
| Indeno(1,2,3-cd)pyrene | 0.87 | 5B,12S | 2.1 – 1.5 |
| Total PAH | Low Undetectable at points 2B, 6B and 8S to high 40.730 PPM at point 5B | | |
| TOC | Low 650 PPM at point 3S to high 6,800 PPM at point 8B | | |
| pH | range low 5.1 at point 4B to high 7.2 at point 9S | | |

**Table 3-2: Tabular Results for Confirmation Sampling for Target Compounds**

| Sample No. | pH | Benzo(a)-pyrene | Dibenzo(a,h)-anthracene | Benzo(a)-anthracene | Benzo(k)-fluoranthene | Benzo(b)-fluoranthene | Indeno(1,2,3-cd) pyrene | Total PAH (ppm) | TOC (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| 1B | 6.3 | 1.200 | .220 | 1.600 | .680 | 1.4 | 0.64 | 20.770 | 4,700 |
| 2B | 5.6 | U | U | U | U | U | U | U | 1,800 |
| 3B | 5.3 | U | U | T | U | U | U | 0.140 | 1,100 |
| 4B | 5.1 | 0.620 | 0.099 | 0.540 | 0.280 | 0.70 | 0.34 | 5.770 | 1,100 |
| 5B | 6.8 | 3.400 | 0.680 | 3.400 | 1.600 | 4.50 | 2.1 | 40.730 | 3,600 |
| 6B | 5.3 | U | U | U | U | U | U | U | 1,200 |
| 7B | 6.0 | 0.820 | 0.210 | 0.700 | 0.310 | 1.10 | 0.53 | 7.190 | 3,100 |
| 8B | 5.5 | 0.550 | U | 0.400 | 0.290 | 0.74 | 0.33 | 4.660 | 6,800 |
| 21B* | 5.6 | U | U | U | U | U | U | 0.500 | 3,800 |
| 1S | 6.3 | U | U | U | U | U | U | Trace | 1,100 |
| 2S | 6.2 | 0.290 | U | 0.250 | U | U | 0.16 | 2.395 | 1,100 |
| 3S | 5.3 | U | U | U | U | U | U | Trace | 650 |
| 4S | 7.1 | 1.100 | 0.190 | 1.100 | 0.570 | 1.50 | 0.68 | 14.310 | 3,000 |
| 5S | 7.0 | 0.760 | 0.160 | 0.620 | 0.350 | 1.10 | 0.43 | 7.490 | 1,300 |
| 6S | 5.4 | U | U | U | U | U | U | 0.190 | 800 |
| 7S | 5.6 | U | U | U | U | U | U | Trace | 1,000 |
| 8S | 5.2 | U | U | U | U | U | U | U | 1,100 |
| 9S | 7.2 | 0.360 | U | 0.360 | T | 0.58 | 0.24 | 3.710 | 1,100 |
| 10S | 5.9 | 1.400 | U | 0.360 | U | 1.80 | 0.78 | 11.620 | 4,000 |
| 11S | 6.1 | 0.590 | U | 0.530 | 0.190 | 0.77 | U | 5.630 | 2,900 |
| 12S | 6.2 | 2.500 | U | 2.700 | 1.300 | 3.30 | 1.5 | 29.970 | 4,100 |
| 22S** | 5.4 | 0.110 | U | 0.110 | U | 0.15 | U | 0.550 | 1,100 |

*21B Duplicate sample for 8B

**22S Duplicate sample for 6S
The highlighted values exceed the respective 10-5 cancer risk level PRG.

**Figure 3-5: East Wall of Second Excavation**

**Figure 3-6: Looking NW Down the Trench**

## 3.5 BURN RING DISPOSAL

The burn ring was crushed and perforated and has been completely removed from the site. The crushed tank section that formed the burn ring is shown in Figure 3-7. The burn ring was taken to the Coatesville Scrap Iron and Metal yard in Coatesville, Pennsylvania. The acceptance slip from the recycler is shown in Figure 3-8.

**Figure 3-7: The Burn Ring has been Crushed, Perforated, and Removed from the Site**

---

SCALE TICKET

Coatesville Scrap Iron & Metal
1000 S. 1st Avenue
Coatesville, PA 19320
610-384-9230

275847
TICKET NUMBER

URCHASED FROM: 9999999
A VALUED CUSTOMER

| | DATE | TIME |
|---|---|---|
| WEIGH IN: | 08/16/2006 | 08:41 |
| WEIGH OUT: | 08/16/2006 | 08:59 |

BERNER CONSTRUCTION

All weights in pounds (M=Manual Weight)

| COMMODITY / PRICE | GROSS | TARE | WT ADJ | NET WT | $ ADJ | AMT DUE |
|---|---|---|---|---|---|---|
| STEEL #1 UNP | 16220 | 14180 | | 2040 | | $91.80 |
| @ $4.500-CW | | | | | | |
| | | | | | | $0.00 |
| | | | | | | $0.00 |

ADJUSTMENT REASON: _____

NET DUE: $91.80

Customer Copy

**Figure 3-8: Sale Ticket for Burn Ring Disposal**

# 4 BACKFILL AND SEEDING

## 4.1 BACKFILL

At the request of the WG NAS JRB ROICC, the site was backfilled in October 2006 with high quality fill dirt and topsoil from a borrow pile located on the WG NAS JRB. According to representatives from the WG NAS JRB ROICC and Environmental Department, the soil had been tested in the past and was considered suitable for unrestricted use. However, as data could not be supplied, the borrow pile was sampled for analysis in January 2006, and the results of the analysis are in Appendix H. The laboratory results were either below or equivalent to the residential RBCs or below background. The data were made available to EFANE and WG NAS JRB in February 2006 and were verbally accepted by a representative of the ROICC and the Environmental Department.

The backfilled area was compacted by the Caterpillar D4G excavator that was used to distribute the fill and topsoil, and the area was leveled to the top of the soil in the surrounding area. The excavator is shown below in Figure 4-1, and photographs of the backfilled and compacted site are shown in Figure 4-2 and Figure 4-3.

**Figure 4-1: The Caterpillar D4G Used to Distribute and Compact the Backfill and Topsoil**

**Figure 4-2: The Backfilled Area Looking NW toward the Trench at Top Left**

**Figure 4-3: The Backfilled Area Showing the Eastern Edge of the Site (Debris off the Project Scope)**

## 4.2 SEEDING

The filled area was covered with 50 pounds of fresh grass seed. Although the work plan called for a straw blanket over the fresh seeding, the WG NAS JRB requested that the straw blanket be omitted. The ROICC office explained that it was feared that the straw would get blown around and become messy. Furthermore, this area is not on the grounds maintenance schedule of the WG NAS JRB, and it will grow up in weeds and reeds.

The label for the fresh grass seed is shown in Figure 4-4.

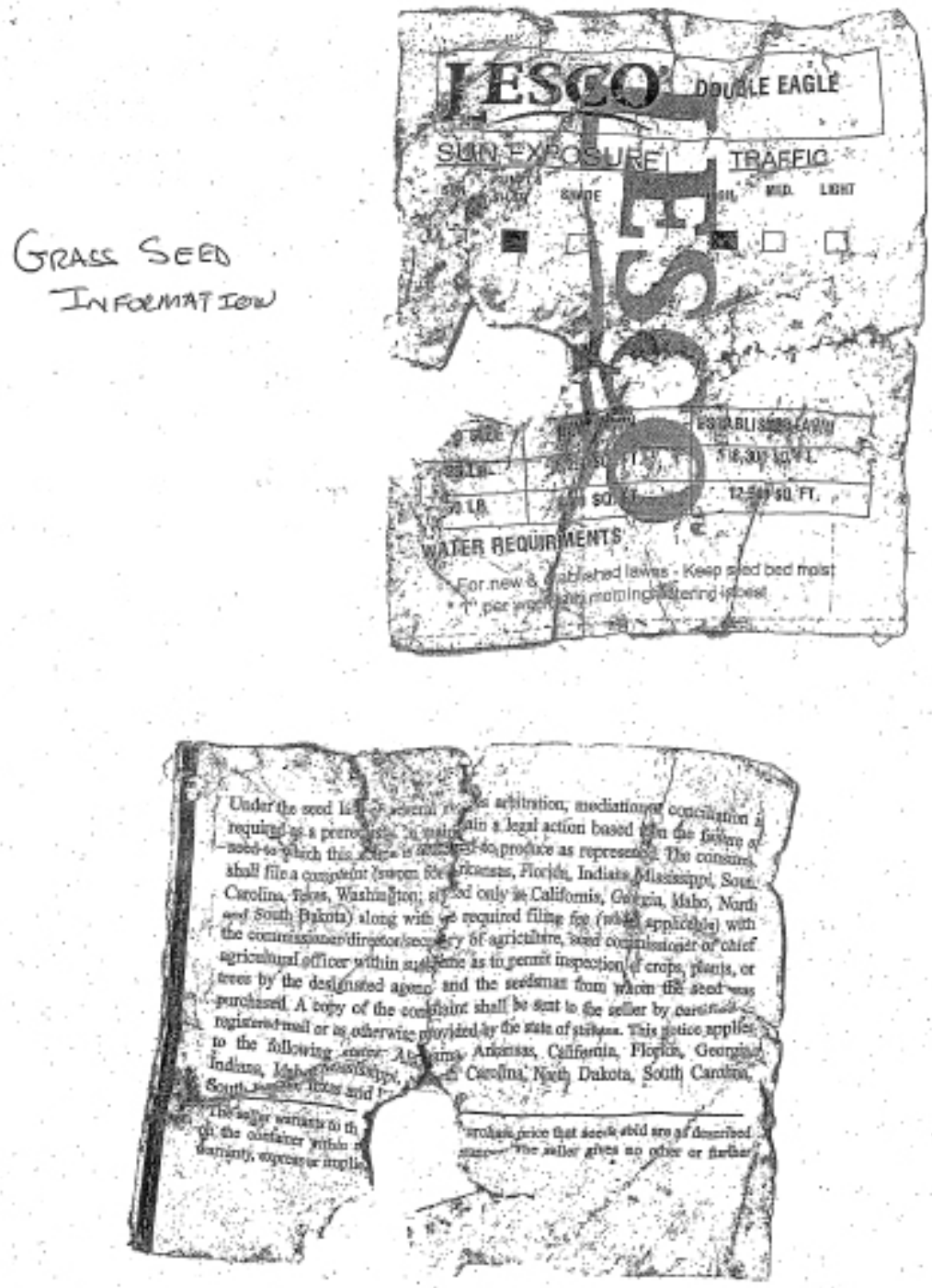



**Figure 4-4: Grass Seed Label**

# 5 DIOXIN DATA

The Navy has tested this site for residual dioxin independently of this project. The Navy has concluded that the dioxin confirmation test results as performed by Tetra Tech – NUS are within the PRG limits. The dioxin data as furnished by the Navy are located in Appendix I.

# 6 CONCLUSION

The source of PAH and other contamination at this site has been removed in accordance with the accepted work plans. All work was done in accordance with applicable Federal and Pennsylvania regulations. All samples were collected and managed according to accepted soil sampling protocols. According to good scientific and engineering principles the U.S. Navy has established that the residual risk of the excavated area is within acceptable limits for polyaromatic hydrocarbons, and the goals of the action memorandum have been achieved. The Navy has also established that dioxin compounds within the excavated area are within acceptable limits.

The residual PAH compounds are not very motile, and they have been covered with clean soil. The excavated soil has been delivered to Clean Earth of Philadelphia for thermal treatment. The excavation has been refilled to a depth of at least two feet and up to four feet of clean high quality soil. The area has been seeded with fresh grass seed. No additional work or soil removal is anticipated for this site.

# 7 APPENDICES

APPENDIX A –SOIL DISPOSAL CHARACTERIZATION REQUIREMENTS BY CLEAN EARTH AND THE RESULTS OF THE FIRST CHARACTERIZATION SAMPLES

APPENDIX B – SAMPLING PROTOCOL

APPENDIX C – FIRST SOIL CONFIRMATION RESULTS LABORATORY DATA

APPENDIX D – MANIFEST AND WEIGH TICKETS, FIRST EXCAVATION

APPENDIX E – SECOND SOIL CHARACTERIZATION RESULTS LABORATORY DATA

APPENDIX F – MANIFESTS AND WEIGH TICKETS, SECOND EXCAVATION

APPENDIX G – SECOND SOIL CONFIRMATION RESULTS LABORATORY DATA

APPENDIX H – LABORATORY ANALYSES FOR BORROW PILE (FILL DIRT AND TOPSOIL)

APPENDIX I – DIOXIN DATA SUPPLIED BY THE NAVY

APPENDIX J – CONTACT LIST

# APPENDIX A: SOIL DISPOSAL CHARACTERIZATION REQUIREMENTS BY CLEAN EARTH AND THE RESULTS OF THE FIRST CHARACTERIZATION SAMPLES

## A-1: REQUIREMENTS FOR CHARACTERIZATION FOR DISPOSAL

It is expected that the non-hazardous waste will be transported to the Clean Earth of Philadelphia, Inc. (Clean Earth) thermal treatment facility for ultimate disposal. (It is possible that this plan will need to be amended in the future to transport the soil to a landfill for ultimate disposal.) Clean Earth will require the analyses in Table B-7-1 to demonstrate that the soil is non-hazardous. Allowing for up to 250 cubic yards of waste earth at 1.4 tons per cubic yard, approximately 350 tons of material will be transported for disposal. From Table B-7-1 it can be determined that three grab samples and one composite sample will be required.

**Table B-7-1: Waste Characterization Samples and Analysis for Waste Petroleum Soil**

| Frequency | Sample Type | Analysis | Method | Limit |
|---|---|---|---|---|
| First 90 Tons | Grab | TPH DRO to C-44<br>TOX | 8015M<br>9023 | <400,000<br><1000 |
| Second 90 Tons | Grab | TPH DRO to C-44<br>TOX | 8015M<br>9023 | <400,000<br><1000 |
| Every 180 tons thereafter | Grab | TPH DRO to C-44<br>TOX | 8015M<br>9023 | <400,000<br><1000 |
| | | | | |
| Every 900 Tons | Composite | Total Metals**<br>TCLP Metals**<br>Ignitibility<br>Corrosivity<br>Reactivity-<br>Sulfide/Cyanide<br>PCBs<br>BTEX | 3050/6010<br>1311/6010<br>1010<br>9040<br>SW-846<br>7.3 8082<br>8260/8021 | none<br>TCLP Limits<br>negative<br>>2 - <12.5<br>RCRA Limits<br><50<br><30,000* |
| | **Includes As, Ba, Cd, Cr, Cu, Hg,Ni, Pb, Se, Ag, Zn | | | |
| | *<0.5mg/L TCLP Benzene | | | |

## A-2: FIRST SOIL CHARACTERIZATION RESULTS

AMERICAN ANALYTICAL LABORATORIES

| | |
|---|---|
| NYSDOH | 11418 |
| NJDEP | NY050 |
| CTDOH | PH-0205 |
| PADEP | 68-00573 |

Thursday, October 13, 2005

William T. Hall, P.E.
RMC Inc.
46970 Bradley Boulevard
Suite B
Lexington Park, MD 20653

TEL: (301) 862-7501
FAX

RE: Willow Grove NAS/JRB

Order No.: 0510008

Dear William T. Hall, P.E.:

American Analytical Laboratories, LLC. received 5 sample(s) on 9/30/2005 for the analyses presented in the following report.

Samples were analyzed in accordance with the test procedures documented on the chain of custody and detailed throughout the text of this report.

The limits provided in the data package are analytical reporting limits and not Federal or Local mandated values to which the sample results should be compared.

There were no problems with the analyses and all data for associated QC met laboratory specifications.

If you have any questions regarding these tests results, please do not hesitate to call (631) 454-6100 or email me directly at lbeyer@american-analytical.com.

Sincerely,

Karen Kelly for

Lori Beyer
Lab Director

56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX: (631) 454-8027

# American Analytical Laboratories, LLC.

**Date:** *13-Oct-05*

**CLIENT:** RMC Inc.
**Project:** Willow Grove NAS/JRB
**Lab Order:** 0510008

## Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Tag Number | Collection Date | Date Received |
|---|---|---|---|---|
| 0510008-01A | #1 Grab | 3991 | 9/28/2005 1:05:00 PM | 9/30/2005 |
| 0510008-02A | #2 Grab | 3991 | 9/28/2005 1:50:00 PM | 9/30/2005 |
| 0510008-03A | #3 Grab | 3991 | 9/28/2005 2:45:00 PM | 9/30/2005 |
| 0510008-04A | #4 Grab | 3991 | 9/28/2005 3:30:00 PM | 9/30/2005 |
| 0510008-05A | #5 Composite | 3991 | 9/28/2005 12:43:00 PM | 9/30/2005 |
| 0510008-05B | #5 Composite | 3991 | 9/28/2005 12:43:00 PM | 9/30/2005 |

AMERICAN ANALYTICAL LABORATORIES
56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX (631) 454-8027

TAG # / COC 3991

| | |
|---|---|
| NYSDOH | 11418 |
| CTDOH | PH-0205 |
| NJDEP | NY050 |
| PADEP | 68-573 |

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS: RMC, 46970 BRADLEY BLVD. SUITE B, LEXINGTON PARK, MD 20653

CONTACT: Bill Hall, 301-862-7501

SAMPLER (SIGNATURE): William T. Hall

SAMPLER NAME (PRINT): William T. Hall

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS / JRB

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/ TIME | SAMPLE # - LOCATION | TPH DRO to C44 | TOX | TOTAL METALS | TCLP METALS | IGNITABILITY | CORROSIVITY | REACTIVITY sulfide cyanide | PCB's | BTEX | FOR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0510008-1A | S | 1 | 09/28/05 1005 | 1 GRAB | X | X | | | | | | | | |
| 2A | S | 1 | 09/28/05 1350 | 2 GRAB | X | X | | | | | | | | |
| 3A | S | 1 | 09/28/05 1445 | 3 GRAB | X | X | | | | | | | | |
| 4A | S | 1 | 09/28/05 1500 | 4 GRAB | X | X | | | | | | | | |
| 5AB | S | 1 | 09/28/05 12:40 | 5A Composite | | | X | X | X | X | X | X | X | |
| | S | 1 | 09/28/05 12:40 | 5B Composite | | | X | X | X | X | X | X | X | |

SAMPLES 5A & 5B ARE ONE COMPOSITE. WTH

COOLER TEMPERATURE:

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A-AIR; W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB; C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED: 2 week MAX
NORMAL ☐ STAT ☐ BY

COMMENTS / INSTRUCTIONS

| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
|---|---|---|---|---|---|
| William T. Hall | 9/30 14:30 | William T. Hall | [illegible] | 9/30/05 1200 | P. Artonio |
| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
| | | | | | |

WHITE-OFFICE / CANARY-LAB / PINK-SAMPLE CUSTODIAN / GOLDENROD-CLIENT

American Analytical Laboratories, LLC.
*56 Toledo Street*
*Farmingdale, NY 11735-*
TEL: *6314546100* FAX: *6314548027*

**0510024**
0510024
0510024

Rec'vd Date: 10/03/05 16:39

**ECORD**



**Subcontractor:**

Environmental Testing Laboratories
208 Route 109
Farmingdale, New York 11735

TEL: (631) 249-1456
FAX: (631) 249-8344
Acct #:

**03-Oct-05**

| Sample ID | Matrix | Collection Date | Bottle Type | Requested Tests | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW9023 | | | | | | |
| 0510008-01A | Soil | 9/28/2005 1:05:00 PM | 8OZ GU | 1 | | | | | | |
| 0510008-02A | Soil | 9/28/2005 1:50:00 PM | 8OZ GU | 1 | | | | | | |
| 0510008-03A | Soil | 9/28/2005 2:45:00 PM | 8OZ GU | 1 | | | | | | |
| 0510008-04A | Soil | 9/28/2005 3:30:00 PM | 8OZ GU | 1 | | | | | | |

**Comments:** Analyze for TOX.
Results by 10/11/05, Thanks.

| | | Date/Time | | | Date/Time |
|---|---|---|---|---|---|
| **Relinquished by:** | Christy Dunn | 10-3-05 4:55 pm | **Received by:** | | 10/3 16:39 |
| **Relinquished by:** | | | **Received by:** | | |

**AMERICAN ANALYTICAL LABORATORIES, LLC**
56 TOLEDO STREET
FARMINGDALE, NEW YORK 11735
TELEPHONE: (631) 454-6100 FAX: (631) 454-8027

## DATA REPORTING QUALIFIERS

For reporting results, the following "Results Qualifiers" are used:

| | |
|---|---|
| **Value** | If the result is greater than or equal to the detection limit, report the value |
| **U** | Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required. |
| **J** | Indicates an estimated value. The flag is used:<br>(1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.)<br>(2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3ug/L was calculated report as 3J. This flag is used when similar situations arise on any organic parameter i.e. Pesticide, PCBs and others. |
| **B** | Indicates the analyte was found in the blank as well as the sample report "10B". |
| **E** | Indicates the analytes concentration exceeds the calibrated range of the instrument for that specific analysis. |
| **D** | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| **P** | This flag is used for Pesticide / PCB target analyte when there is >25% difference for detected concentrations between the two GC Columns. The higher of the two values is reported on Form I and flagged with a "P". |
| **N** | This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used. |
| **H** | Indicates sample was received and/or analyzed outside of The method allowable holding time |

# American Analytical Laboratories, LLC.

**Date:** *13-Oct-05*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #1 Grab |
| **Lab Order:** | 0510008 | **Tag Number:** | 3991 |
| **Project:** | Willow Grove NAS/JRB | **Collection Date:** | 9/28/2005 1:05:00 PM |
| **Lab ID:** | 0510008-01A **Date Received:** 9/30/2005 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **TPH 8015 DIESEL RANGE ORGANICS** | | **SW8015** | | **(SW3550A)** | | Analyst: **NP** |
| Fuel Oil #1 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| Fuel Oil #2 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| Fuel Oil #3 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| Fuel Oil #4 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| Fuel Oil #5 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| Fuel Oil #6 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| Hydraulic Fluid | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| Motor Oil Composite | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| SAE #30 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| Unknown DRO TPH | 46 | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| Total DRO TPH | 46 | 33 | | mg/Kg-dry | 3 | 10/4/2005 7:44:00 PM |
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 8.15 | 0 | | wt% | 1 | 10/6/2005 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *13-Oct-05*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #2 Grab |
| **Lab Order:** | 0510008 | **Tag Number:** | 3991 |
| **Project:** | Willow Grove NAS/JRB | **Collection Date:** | 9/28/2005 1:50:00 PM |
| **Lab ID:** | 0510008-02A **Date Received:** 9/30/2005 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **TPH 8015 DIESEL RANGE ORGANICS** | | **SW8015** | | **(SW3550A)** | | Analyst: **NP** |
| Fuel Oil #1 | U | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| Fuel Oil #2 | U | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| Fuel Oil #3 | U | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| Fuel Oil #4 | U | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| Fuel Oil #5 | U | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| Fuel Oil #6 | U | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| Hydraulic Fluid | U | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| Motor Oil Composite | U | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| SAE #30 | U | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| Unknown DRO TPH | 200 | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| Total DRO TPH | 200 | 31 | | mg/Kg-dry | 3 | 10/4/2005 8:25:00 PM |
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 4.47 | 0 | | wt% | 1 | 10/6/2005 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *13-Oct-05*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #3 Grab |
| **Lab Order:** | 0510008 | **Tag Number:** | 3991 |
| **Project:** | Willow Grove NAS/JRB | **Collection Date:** | 9/28/2005 2:45:00 PM |
| **Lab ID:** | 0510008-03A **Date Received:** 9/30/2005 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **TPH 8015 DIESEL RANGE ORGANICS** | | **SW8015** | | **(SW3550A)** | | Analyst: **NP** |
| Fuel Oil #1 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| Fuel Oil #2 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| Fuel Oil #3 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| Fuel Oil #4 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| Fuel Oil #5 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| Fuel Oil #6 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| Hydraulic Fluid | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| Motor Oil Composite | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| SAE #30 | U | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| Unknown DRO TPH | 62 | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| Total DRO TPH | 62 | 33 | | mg/Kg-dry | 3 | 10/4/2005 9:06:00 PM |
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 8.73 | 0 | | wt% | 1 | 10/6/2005 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *13-Oct-05*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #4 Grab |
| **Lab Order:** | 0510008 | **Tag Number:** | 3991 |
| **Project:** | Willow Grove NAS/JRB | **Collection Date:** | 9/28/2005 3:30:00 PM |
| **Lab ID:** | 0510008-04A **Date Received:** 9/30/2005 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **TPH 8015 DIESEL RANGE ORGANICS** | | **SW8015** | | **(SW3550A)** | | Analyst: **NP** |
| Fuel Oil #1 | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| Fuel Oil #2 | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| Fuel Oil #3 | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| Fuel Oil #4 | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| Fuel Oil #5 | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| Fuel Oil #6 | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| Hydraulic Fluid | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| Motor Oil Composite | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| SAE #30 | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| Unknown DRO TPH | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| Total DRO TPH | U | 32 | | mg/Kg-dry | 3 | 10/4/2005 9:46:00 PM |
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 7.20 | 0 | | wt% | 1 | 10/6/2005 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *13-Oct-05*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #5 Composite |
| **Lab Order:** | 0510008 | **Tag Number:** | 3991 |
| **Project:** | Willow Grove NAS/JRB | **Collection Date:** | 9/28/2005 12:43:00 PM |
| **Lab ID:** | 0510008-05A **Date Received:** 9/30/2005 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **MERCURY SW-846 7471** | | **SW7471B** | | | | Analyst: **BK** |
| Mercury | 0.0323 | 0.0111 | | mg/Kg-dry | 1 | 10/6/2005 |
| **PCB'S AS AROCLORS SW-846 8082** | | **SW8082A** | | | | Analyst: **KB** |
| Aroclor 1016 | U | 89 | | µg/Kg-dry | 3 | 10/6/2005 9:05:00 PM |
| Aroclor 1221 | U | 89 | | µg/Kg-dry | 3 | 10/6/2005 9:05:00 PM |
| Aroclor 1232 | U | 89 | | µg/Kg-dry | 3 | 10/6/2005 9:05:00 PM |
| Aroclor 1242 | U | 89 | | µg/Kg-dry | 3 | 10/6/2005 9:05:00 PM |
| Aroclor 1248 | U | 89 | | µg/Kg-dry | 3 | 10/6/2005 9:05:00 PM |
| Aroclor 1254 | U | 89 | | µg/Kg-dry | 3 | 10/6/2005 9:05:00 PM |
| Aroclor 1260 | 33 | 89 | J | µg/Kg-dry | 3 | 10/6/2005 9:05:00 PM |
| **VOLATILES BTEX SW-846 8020** | | **SW8020A** | | | | Analyst: **LDS** |
| Benzene | U | 5.6 | | µg/Kg-dry | 1 | 10/8/2005 4:02:00 PM |
| Ethylbenzene | U | 5.6 | | µg/Kg-dry | 1 | 10/8/2005 4:02:00 PM |
| m,p-Xylene | U | 11 | | µg/Kg-dry | 1 | 10/8/2005 4:02:00 PM |
| o-Xylene | U | 5.6 | | µg/Kg-dry | 1 | 10/8/2005 4:02:00 PM |
| Toluene | U | 5.6 | | µg/Kg-dry | 1 | 10/8/2005 4:02:00 PM |
| **RCRA METALS** | | **SW6010B** | | **(SW3050A)** | | Analyst: **JP** |
| Arsenic | 53.9 | 0.553 | | mg/Kg-dry | 1 | 10/12/2005 12:59:29 PM |
| Barium | 84.1 | 0.442 | | mg/Kg-dry | 1 | 10/12/2005 12:59:29 PM |
| Cadmium | 4.00 | 0.221 | | mg/Kg-dry | 1 | 10/12/2005 12:59:29 PM |
| Chromium | 51.0 | 0.442 | | mg/Kg-dry | 1 | 10/12/2005 12:59:29 PM |
| Lead | 1200 | 0.332 | | mg/Kg-dry | 1 | 10/12/2005 12:59:29 PM |
| Selenium | U | 0.553 | | mg/Kg-dry | 1 | 10/12/2005 12:59:29 PM |
| Silver | U | 0.442 | | mg/Kg-dry | 1 | 10/12/2005 12:59:29 PM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *13-Oct-05*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #5 Composite |
| **Lab Order:** | 0510008 | **Tag Number:** | 3991 |
| **Project:** | Willow Grove NAS/JRB | **Collection Date:** | 9/28/2005 12:43:00 PM |
| **Lab ID:** | 0510008-05B **Date Received:** 9/30/2005 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **TCLP MERCURY** | | **SW1311/7471B** | | **(SW1311)** | | Analyst: **BK** |
| Mercury | U | 0.0200 | | mg/L | 1 | 10/4/2005 |
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 10.3 | 0 | | wt% | 1 | 10/6/2005 |
| **TCLP METALS** | | **SW1311/6010B** | | **(SW1311)** | | Analyst: **JP** |
| Arsenic | 0.0359 | 0.0500 | J | mg/L | 1 | 10/4/2005 2:47:08 PM |
| Barium | 1.96 | 0.0500 | | mg/L | 1 | 10/4/2005 2:47:08 PM |
| Cadmium | 0.0470 | 0.0500 | J | mg/L | 1 | 10/4/2005 2:47:08 PM |
| Chromium | U | 0.0500 | | mg/L | 1 | 10/4/2005 2:47:08 PM |
| Lead | 0.911 | 0.0500 | | mg/L | 1 | 10/4/2005 2:47:08 PM |
| Selenium | U | 0.0500 | | mg/L | 1 | 10/4/2005 2:47:08 PM |
| Silver | U | 0.0500 | | mg/L | 1 | 10/4/2005 2:47:08 PM |
| **IGNITABILITY/FLASHPOINT SW-846 1010** | | **SW1010** | | | | Analyst: **IP** |
| Ignitability | > | 140 | | °F | 1 | 10/4/2005 |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **WN** |
| pH | 7.90 | 0 | | pH Units | 1 | 10/4/2005 |
| **REACTIVE CYANIDE** | | **SW7.3.3.2** | | | | Analyst: **WN** |
| Reactive Cyanide | U | 0.100 | | mg/Kg-dry | 1 | 10/4/2005 |
| **REACTIVE SULFIDE** | | **SW7.3.4.2** | | | | Analyst: **WN** |
| Reactive Sulfide | U | 2.00 | | mg/Kg-dry | 1 | 10/4/2005 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

10/11/2005

# TOX by Modified 8082

**Sample: 0510024-1**
Client Sample ID: 0510008-01A
Matrix: Soil
Remarks:
Analyzed Date: 10/05/2005
Preparation Date(s) : 10/04/2005

Type: Grab

Collected: 09/28/2005 13:05
% Solid: 91%

## Analytical Results

| Cas No | Analyte | File ID | MDL | Concentration* | Units | Q |
|---|---|---|---|---|---|---|
| | Total Organic Halides (TOX) | L 501 -6 | 0.028 | **0.61** | mg/Kg | |

* Results are reported on a dry weight basis

## Surrogate Results

| Cas No | Analyte | File ID | % Recovery | QC Limits | Q |
|---|---|---|---|---|---|
| 2051-24-3 | DECACHLOROBIPHENYL | L501-6 | 32.2 % | ( 30 - 150) | |
| 877-09-8 | TETRACHLORO M-XYLENE | L501-6 | 50.4 % | ( 30 - 150) | |

**Sample: 0510024-2**
Client Sample ID: 0510008-02A
Matrix: Soil
Remarks:
Analyzed Date: 10/05/2005
Preparation Date(s) : 10/04/2005

Type: Grab

Collected: 09/28/2005 13:50
% Solid: 88.9%

## Analytical Results

| Cas No | Analyte | File ID | MDL | Concentration* | Units | Q |
|---|---|---|---|---|---|---|
| | Total Organic Halides (TOX) | L 501 -7 | 0.028 | **0.081** | mg/Kg | |

* Results are reported on a dry weight basis

## Surrogate Results

| Cas No | Analyte | File ID | % Recovery | QC Limits | Q |
|---|---|---|---|---|---|
| 2051-24-3 | DECACHLOROBIPHENYL | L501-7 | 43.3 % | ( 30 - 150) | |
| 877-09-8 | TETRACHLORO M-XYLENE | L501-7 | 66.6 % | ( 30 - 150) | |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

10/11/2005

# TOX by Modified 8082

**Sample: 0510024-3**
Client Sample ID: 0510008-03A
Matrix: Soil
Remarks:
Analyzed Date: 10/05/2005
Preparation Date(s) : 10/04/2005

Type: Grab

Collected: 09/28/2005 14:45
% Solid: 93.5%

## Analytical Results

| Cas No | Analyte | File ID | MDL | Concentration* | Units | Q |
|---|---|---|---|---|---|---|
| | Total Organic Halides (TOX) | L 501 -8 | 0.027 | **0.047** | mg/Kg | Y |

* Results are reported on a dry weight basis

## Surrogate Results

| Cas No | Analyte | File ID | % Recovery | QC Limits | Q |
|---|---|---|---|---|---|
| 2051-24-3 | DECACHLOROBIPHENYL | L501-8 | 49.2 % | ( 30 - 150) | |
| 877-09-8 | TETRACHLORO M-XYLENE | L501-8 | 75.1 % | ( 30 - 150) | |

**Sample: 0510024-4**
Client Sample ID: 0510008-04A
Matrix: Soil
Remarks:
Analyzed Date: 10/05/2005
Preparation Date(s) : 10/04/2005

Type: Grab

Collected: 09/28/2005 15:30
% Solid: 93.2%

## Analytical Results

| Cas No | Analyte | File ID | MDL | Concentration* | Units | Q |
|---|---|---|---|---|---|---|
| | Total Organic Halides (TOX) | L 501 -9 | 0.027 | **0.051** | mg/Kg | Y |

* Results are reported on a dry weight basis

## Surrogate Results

| Cas No | Analyte | File ID | % Recovery | QC Limits | Q |
|---|---|---|---|---|---|
| 2051-24-3 | DECACHLOROBIPHENYL | L501-9 | 51.3 % | ( 30 - 150) | |
| 877-09-8 | TETRACHLORO M-XYLENE | L501-9 | 66.9 % | ( 30 - 150) | |

# APPENDIX B: SAMPLING PROTOCOL

## B-1: SAMPLE COLLECTION AND SAMPLING TOOL DECONTAMINATION

The soil samples will be placed in new 8-ounce glass sample jars. The shipping container is a common cooler. Special preservatives are not required for semivolatile organic compound and TOC soil specimens. Because of the rocky nature of the site, soil sampling and core sampling tools cannot be used. Each sample jar will be labeled and marked before collecting the sample. The chain of custody will be prepared before entering the field, but it will be dated and signed at the site.

Soil will be collected in the following manner:

- Sampler personnel will wear a fresh pair of disposable vinyl gloves for each sample point.
- From a selected sampling site, grass, weeds, and debris will be removed to expose the soil.
- A sterile sample scoop will be used to collect soil from the interstices and from the surface of stones.
- Bottom samples will be taken straight down from the selected sample location.
- Sidewall samples will be collected from approximately six inches below the top of grade to approximately even with the bottom in six inch intervals.
- The soil sample will be placed in a commonly available food grade plastic freezer bag.
- Stones, pebbles, sticks, and debris will be moved to the top of the sample and removed by hand.
- The sample will be mixed to form a representative sample.
- A corner will be cut from the plastic bag, and a portion of the sample extruded into a labeled sample jar to completely fill the sample jar (no head space).
- The sample jar will be wrapped to prevent breakage and promptly placed in the shipping cooler.
- When all samples have been placed in the cooler, the chain of custody document will be placed in the cooler and the cooler will be taped shut with packaging tape. There is no need to place a custody seal on the cooler for these samples.
- The cooler will be taken to a package shipping location for overnight transport to American Analytical Laboratories or self-transported to the laboratory.

## B-2: REUSABLE SAMPLING TOOLS

Because of the rocky nature of the site, reusable tools are not anticipated. However, for any sampling tool that is reused in the field, the tool must be decontaminated. The sampling equipment used for collecting samples will be decontaminated before field sampling, between samples, and after sampling

activities. The following decontamination steps will be followed when sampling for PAHs:

- Alconox or liquinox detergent solution wash.
- Potable water rinse.
- Deionized water rinse.
- Air dry.
- Wrap in aluminum foil (if not immediately used).

## B-3: SAMPLE QUALITY ASSURANCE/QUALITY CONTROL

Sample quality assurance/quality control will be by redundant samples. Redundant soil samples equaling five percent of the total number of samples and at least one redundant sample for each activity will be collected. The redundant samples will be submitted blindly to American Analytical Laboratories. That is, the laboratory will not be advised that redundant samples have been submitted or which samples are redundant samples.

## B-4: CHAIN OF CUSTODY

The chain of custody will be as follows:

- RMC personnel or competent personnel under the direction of RMC will collect the samples in the field. Samples will remain in the possession of the RMC field lead or in the possession of other competent personnel at all times.
- The RMC field lead or other competent person will certify the chain of custody documentation.
- The RMC field lead or other competent person will deliver the shipping container to a common carrier; i.e., UPS, for delivery to the laboratory.
- The common carrier will seal the shipping container and place a notice of environmental samples on the container.

The laboratory will receive and certify the chain of custody document.

# APPENDIX C: FIRST SOIL CONFIRMATION RESULTS LABORATORY DATA

AMERICAN ANALYTICAL LABORATORIES

NYSDOH 11418
NJDEP NY050
CTDOH PH-0205
PADEP 68-00573

Monday, January 30, 2006

William T. Hall, P.E.
RMC Inc.
46970 Bradley Boulevard
Suite B
Lexington Park, MD 20653

TEL: (301) 862-7501
FAX

RE: Willow Grove NAS/JRB, Site 5 Fire Fightin

Order No.: 0601235

Dear William T. Hall, P.E.:

American Analytical Laboratories, LLC. received 21 sample(s) on 1/19/2006 for the analyses presented in the following report.

Samples were analyzed in accordance with the test procedures documented on the chain of custody and detailed throughout the text of this report.

The limits provided in the data package are analytical reporting limits and not Federal or Local mandated values to which the sample results should be compared.

There were no problems with the analyses and all data for associated QC met laboratory specifications.

If you have any questions regarding these tests results, please do not hesitate to call (631) 454-6100 or email me directly at lbeyer@american-analytical.com.

Sincerely,

Lori Beyer
Lab Director

56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX: (631) 454-8027

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

**CLIENT:** RMC Inc.
**Project:** Willow Grove NAS/JRB, Site 5 Fire Fighting Ar
**Lab Order:** 0601235

## Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Tag Number | Collection Date | Date Received |
|---|---|---|---|---|
| 0601235-01A | #1-Bottom | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-02A | #2-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-03A | #3-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-04A | #4-Bottom | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-05A | #5-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-06A | #6-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-07A | #7-Bottom | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-08A | #8-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-09A | #9-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-10A | #10-Bottom | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-11A | #11-Bottom | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-12A | #12-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-13A | #13-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-14A | #14-Bottom | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-15A | #15-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-16A | #16-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-17A | #17-Bottom | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-18A | #18-Bottom | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-19A | #19-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-20A | #20-Bottom | | 1/17/2006 11:00:00 AM | 1/19/2006 |
| 0601235-21A | #21-Side | | 1/17/2006 11:00:00 AM | 1/19/2006 |

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(631) 454-6100 • FAX (631) 454-8027

TAG # / COC

| | |
|---|---|
| NYSDOH | 11418 |
| CTDOH | PH-0205 |
| NJDEP | NY050 |
| PADEP | 68-573 |

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46970 Bradley Blvd., Suite B
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.
301-862-7501

SAMPLER (SIGNATURE): Andrea Kly

SAMPLER NAME (PRINT): ~~William T. Hall~~ Andrea K. Irey

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS/JRB
Site 5 Fire Fighting Area

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/ TIME | SAMPLE # - LOCATION | PAH | TOC | PH | FOR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|---|
| ~~VOC~~ 1-A | S | 3 | 1/17/06 11:00am | 1-A Bottom | X | | | |
| 1-B | S | 1 | | 1-B Bottom | | X | | 0601235-1A |
| 1-C | S | 1 | | 1-C Bottom | | | X | |
| 2-A | S | 1 | | 2-A Side | X | | | |
| 2-B | S | 1 | | 2-B Side | | X | | 2A |
| 2-C | S | 1 | | 2-C Side | | | X | |
| 3-A | S | 1 | | 3-A Side | X | | | |
| 3-B | S | 1 | | 3-B Side | | X | | 3A |
| 3-C | S | 1 | | 3-C Side | | | X | |
| 4-A | S | 1 | | 4-A Bottom | X | | | |
| 4-B | S | 1 | | 4-B Bottom | | X | | 4A |
| 4-C | S | 1 | | 4-C Bottom | | | X | |

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A=AIR; W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB, C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED: NORMAL ☒ STAT ☐ BY / /

COOLER TEMPERATURE:

COMMENTS / INSTRUCTIONS

| RELINQUISHED BY (SIGNATURE) | DATE | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE | PRINTED NAME |
|---|---|---|---|---|---|
| Andrea Kly | 1/18/06 TIME 1:00 pm | Andrea K. Irey | Lori Berger | 1/19/06 TIME 11:00 | Lori Berger |
| RELINQUISHED BY (SIGNATURE) | DATE TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE TIME | PRINTED NAME |

WHITE-OFFICE / CANARY-LAB / PINK-SAMPLE CUSTODIAN / GOLDENROD-CLIENT

AMERICAN ANALYTICAL LABORATORIES
56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX (631) 454-6027

TAG # / COC

NYSDOH 11418
CTDOH PH-0205
NJDEP NY050
PADEP 68-573

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46970 Bradley Blvd., Suite B
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.
301-862-7501

SAMPLER (SIGNATURE): Andrea K Irey

SAMPLER NAME (PRINT): ~~William T. Hall~~ Andrea K. Irey

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS/JRB
Site 5 Fire Fighting Area

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/TIME | SAMPLE # - LOCATION | PAH | TOC | pH | FOR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|---|
| 5-A | S | 3 | 1/17/06 11:00am | 5-A Side | X | | | |
| 5-B | S | 1 | | 5-B Side | | X | | 0601235-5A |
| 5-C | S | 1 | | 5-C Side | | | X | |
| 6-A | S | 1 | | 6-A Side | X | | | |
| 6-B | S | 1 | | 6-B Side | | X | | 6A |
| 6-C | S | 1 | | 6-C Side | | | X | |
| 7-A | S | 1 | | 7-A Bottom | X | | | |
| 7-B | S | 1 | | 7-B Bottom | | X | | 7A |
| 7-C | S | 1 | | 7-C Bottom | | | X | |
| 8-A | S | 1 | | 8-A Side | X | | | |
| 8-B | S | 1 | | 8-B Side | | X | | 8A |
| 8-C | S | 1 | | 8-C Side | | | X | |

COOLER TEMPERATURE:

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A-AIR; W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB; C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED:
NORMAL ☒ STAT ☐ BY / /

COMMENTS / INSTRUCTIONS

| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
|---|---|---|---|---|---|
| Andrea K Irey | 1/18/06 1:00pm | Andrea K Irey | [illegible] | 1/19/06 11:00 | Lori Beer |
| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
| | | | | | |

WHITE-OFFICE / CANARY-LAB / PINK-SAMPLE CUSTODIAN / GOLDENROD-CLIENT

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(631) 454-6100 • FAX (631) 454-8027

TAG # / COC

| | |
|---|---|
| NYSDOH | 11418 |
| CTDOH | PH-0205 |
| NJDEP | NY050 |
| PADEP | 68-573 |

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46970 Bradley Blvd., Suite B
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.
301-862-7501

SAMPLER (SIGNATURE): Andrea Irey

SAMPLER NAME (PRINT): ~~William T. Hall~~ Andrea K. Irey

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS/JRB
Site 5 Fire Fighting Area

ANALYSIS REQUIRED

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/ TIME | SAMPLE # - LOCATION | PAH | TOC | PH | FOR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|---|
| 9-A | S | ~~3~~ 1 | 1/17/06 11:00am | 9-A Side | X | | | |
| 9-B | S | 1 | ↓ | 9-B Side | | X | | 0601235-9A |
| 9-C | S | 1 | | 9-C Side | | | X | |
| 10-A | S | 1 | | 10-A Bottom | X | | | |
| 10-B | S | 1 | | 10-B Bottom | | X | | 10A |
| 10-C | S | 1 | | 10-C Bottom | | | X | |
| 11-A | S | 1 | | 11-A Bottom | X | | | |
| 11-B | S | 1 | | 11-B Bottom | | X | | 11A |
| 11-C | S | 1 | | 11-C Bottom | | | X | |
| 12-A | S | 1 | | 12-A Side | X | | | |
| 12-B | S | 1 | | 12-B Side | | X | | 12A |
| 12-C | S | 1 | | 12-C Side | | | X | |

COOLER TEMPERATURE:

COMMENTS / INSTRUCTIONS

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A-AIR; W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB; C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED: NORMAL ☒ STAT ☐ BY / /

| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
|---|---|---|---|---|---|
| Andrea Irey | 1/18/06 1:00pm | Andrea K. Irey | [signature] | 1/19/06 11:00 | Lori Beyer |
| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
| | | | | | |

WHITE-OFFICE / CANARY-LAB / PINK-SAMPLE CUSTODIAN / GOLDENROD-CLIENT

AMERICAN ANALYTICAL LABORATORIES

58 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX (631) 454-6027

TAG # / COC

NYSDOH 11418
CTDOH PH-0205
NJDEP NY050
PADEP 68-573

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46970 Bradley Blvd., Suite B
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.
301-862-7501

SAMPLER (SIGNATURE): [signature]

SAMPLER NAME (PRINT): ~~William T Hall~~ Andrea K. Irey

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS/JRB
Site 5 Fire Fighting Area

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/ TIME | SAMPLE # - LOCATION | PAH | TOC | PH | PCR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|---|
| 13-A | S | 1 | 1/17/06 11:00am | 13-A Side | X | | | 0601235-13A |
| 13-B | S | 1 | | 13-B Side | | X | | |
| 13-C | S | 1 | | 13-C Side | | | X | |
| 14-A | S | 1 | | 14-A Bottom | X | | | 14A |
| 14-B | S | 1 | | 14-B Bottom | | X | | |
| 14-C | S | 1 | | 14-C Bottom | | | X | |
| 15-A | S | 1 | | 15-A Side | X | | | 15A |
| 15-B | S | 1 | | 15-B Side | | X | | |
| 15-C | S | 1 | | 15-C Side | | | X | |
| 16-A | S | 1 | | 16-A Side | X | | | 16A |
| 16-B | S | 1 | | 16-B Side | | X | | |
| 16-C | S | 1 | | 16-C Side | | | X | |

COOLER TEMPERATURE:

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A=AIR; W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB; C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED: NORMAL ☒ STAT ☐ BY / /

COMMENTS / INSTRUCTIONS

| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
|---|---|---|---|---|---|
| [signature] | 1/18/06 1:00pm | Andrea K. Irey | [signature] | 1/19/06 11:00 | Carl Berg |
| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
| | | | | | |

AMERICAN ANALYTICAL LABORATORIES
56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX (631) 454-8027

TAG # / COC

NYSDOH 11410
CTDOH PH-0205
NJDEP NY050
PADEP 68-573

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46970 Bradley Blvd., Suite B
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.
301-862-7501

SAMPLER (SIGNATURE): [signature]

SAMPLER NAME (PRINT): ~~William T. Hall~~ Andrea K. Tray

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS/JRB
Site 5 Fire Fighting Area

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/TIME | SAMPLE # - LOCATION | ANALYSIS REQUIRED: PAH | TOC | PH | FOR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|---|
| 17-A | S | ~~3~~ 1 | 1/17/04 11:00am | 17-A Bottom | X | | | |
| 17-B | S | 1 | | 17-B Bottom | | X | | 0601235-17A |
| 17-C | S | 1 | | 17-C Bottom | | | X | |
| 18-A | S | 1 | | 18-A Bottom | X | | | |
| 18-B | S | 1 | | 18-B Bottom | | X | | 18A |
| 18-C | S | 1 | | 18-C Bottom | | | X | |
| 19-A | S | 1 | | 19-A Side | X | | | |
| 19-B | S | 1 | | 19-B Side | | X | | 19A |
| 19-C | S | 1 | | 19-C Side | | | X | |
| 20-A | S | 1 | | 20-A Bottom | X | | | |
| 20-B | S | 1 | | 20-B Bottom | | X | | 20A |
| 20-C | S | 1 | | 20-C Bottom | | | X | |

COOLER TEMPERATURE:

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A=AIR; W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB; C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED:
NORMAL ☒ STAT ☐ BY / /

COMMENTS / INSTRUCTIONS

| RELINQUISHED BY (SIGNATURE) | DATE/TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE/TIME | PRINTED NAME |
|---|---|---|---|---|---|
| [signature] | DATE 1/18/04 TIME ~~1:00pm~~ 1:00pm | Andrea K. Tray | [signature] | DATE 1/19/04 TIME 11:00 | Lori Beyer |
| RELINQUISHED BY (SIGNATURE) | DATE TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE TIME | PRINTED NAME |

AMERICAN ANALYTICAL LABORATORIES
56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX (631) 454-8027

TAG # / COC

NYSDOH 11410
CTDOH PH-0205
NJDEP NY060
PADEP 68-573

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46970 Bradley Blvd., Suite B
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.
301-862-7501

SAMPLER (SIGNATURE): Andrea K. Irey

SAMPLER NAME (PRINT): ~~William T. Hall~~ Andrea K. Irey

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS/JRB
Site 5 Fire Fighting Area

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/TIME | SAMPLE # - LOCATION | PAH | TOC | PH | FOR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|---|
| 21-A | S | ~~3~~ 1 | 1/17/06 11:00am | 21-A Side | X | | | |
| 21-B | S | 1 | ↓ ↓ | 21-B Side | | X | | 0601235-21A |
| 21-C | S | 1 | | 21-C Side | | | X | |

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A=AIR; W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB; C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED: NORMAL ☒ STAT ☐ BY / /

COOLER TEMPERATURE:

COMMENTS / INSTRUCTIONS

| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
|---|---|---|---|---|---|
| Andrea K. Irey | 1/18/06 1:00pm | Andrea K. Irey | Lori Berger | 1/19/06 1100 | Lori Berger |
| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
| | | | | | |

American Analytical Laboratories, LLC.
*56 Toledo Street*
*Farmingdale, NY 11735-*
TEL: *6314546100* FAX: *6314548027*

**0601348**
0601348
0601348

Rec'vd Date: 01/20/06 10:44



**Subcontractor:**

Environmental Testing Laboratories
208 Route 109
Farmingdale, New York 11735

TEL: (631) 249-1456
FAX: (631) 249-8344
Acct #:

**20-Jan-06**

| Sample ID | Matrix | Collection Date | Bottle Type | Requested Tests | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW9060 | | | | | | |
| 0601235-01A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-02A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-03A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-04A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-05A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-06A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-07A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-08A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-09A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-10A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-11A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-12A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-13A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-14A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-15A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-16A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-17A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-18A | Soil | /17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |

**Comments:** Analyze for TOC.
Results by 1/25/06. Thanks.

| | | Date/Time | | | Date/Time |
|---|---|---|---|---|---|
| **Relinquished by:** | Chris Owens | 1-20-06 10:40 | **Received by:** | Kyle G Backus | 1/20 10:44 |
| **Relinquished by:** | | | **Received by:** | | |

0601347

0601347

Rec'vd Date: 01/20/06 10:44

RD



American Analytical Laboratories, LLC.
*56 Toledo Street*
*Farmingdale, NY 11735-*
TEL: *6314546100* FAX: *6314548027*

**Subcontractor:**

Environmental Testing Laboratories
208 Route 109
Farmingdale, New York 11735

TEL: (631) 249-1456
FAX: (631) 249-8344
Acct #:

**20-Jan-06**

| Sample ID | Matrix | Collection Date | Bottle Type | Requested Tests | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW9060 | | | | | | |
| 0601235-19A | Soil | 1/17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-20A | Soil | 1/17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |
| 0601235-21A | Soil | 1/17/2006 11:00:00 AM | 8OZ GU | 1 | | | | | | |

**Comments:** Analyze for TOC.
Results by 1/25/06. Thanks.

| | | Date/Time | | | Date/Time |
|---|---|---|---|---|---|
| **Relinquished by:** | Christy Dunn | 1-20-06 | **Received by:** | | 1/20 |
| **Relinquished by:** | | | **Received by:** | Kyle Corbett | 10:44 |

**AMERICAN ANALYTICAL LABORATORIES, LLC**
**56 TOLEDO STREET**
**FARMINGDALE, NEW YORK 11735**
**TELEPHONE: (631) 454-6100 FAX: (631) 454-8027**

## DATA REPORTING QUALIFIERS

For reporting results, the following "Results Qualifiers" are used:

| | |
|---|---|
| **Value** | If the result is greater than or equal to the detection limit, report the value |
| **U** | Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required. |
| **J** | Indicates an estimated value. The flag is used:<br>(1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.)<br>(2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3ug/L was calculated report as 3J. This flag is used when similar situations arise on any organic parameter i.e. Pesticide, PCBs and others. |
| **B** | Indicates the analyte was found in the blank as well as the sample report "10B". |
| **E** | Indicates the analytes concentration exceeds the calibrated range of the instrument for that specific analysis. |
| **D** | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| **P** | This flag is used for Pesticide / PCB target analyte when there is >25% difference for detected concentrations between the two GC Columns. The higher of the two values is reported on Form I and flagged with a "P". |
| **N** | This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used. |
| **H** | Indicates sample was received and/or analyzed outside of The method allowable holding time |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #1-Bottom |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-01A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 19.8 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 790 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Anthracene | 3000 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Benzo(a)anthracene | 6600 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Benzo(a)pyrene | 5900 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Benzo(b)fluoranthene | 7700 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Benzo(g,h,i)perylene | 3700 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Benzo(k)fluoranthene | 2000 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Chrysene | 5700 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Dibenzo(a,h)anthracene | 1200 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Fluoranthene | 11000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 6:27:00 PM |
| Fluorene | 1400 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Indeno(1,2,3-c,d)pyrene | 3800 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Phenanthrene | 9800 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:34:00 PM |
| Pyrene | 9200 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 6:27:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 6.80 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #2-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-02A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 16.1 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 700 | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Anthracene | 3000 | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Benzo(a)anthracene | 8500 | 1400 | | µg/Kg-dry | 30 | 1/26/2006 7:03:00 PM |
| Benzo(a)pyrene | 8700 | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Benzo(b)fluoranthene | 11000 | 1400 | | µg/Kg-dry | 30 | 1/26/2006 7:03:00 PM |
| Benzo(g,h,i)perylene | 4100 | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Benzo(k)fluoranthene | 3800 | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Chrysene | 8300 | 1400 | | µg/Kg-dry | 30 | 1/26/2006 7:03:00 PM |
| Dibenzo(a,h)anthracene | 1400 | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Fluoranthene | 22000 | 1400 | | µg/Kg-dry | 30 | 1/26/2006 7:03:00 PM |
| Fluorene | 1000 | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Indeno(1,2,3-c,d)pyrene | 4300 | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 3 | 1/25/2006 4:13:00 PM |
| Phenanthrene | 10000 | 1400 | | µg/Kg-dry | 30 | 1/26/2006 7:03:00 PM |
| Pyrene | 16000 | 1400 | | µg/Kg-dry | 30 | 1/26/2006 7:03:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 6.90 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #3-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-03A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 22.1 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 620 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Anthracene | 2300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Benzo(a)anthracene | 5200 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Benzo(a)pyrene | 3700 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Benzo(b)fluoranthene | 4900 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Benzo(g,h,i)perylene | 1600 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Benzo(k)fluoranthene | 1700 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Chrysene | 4300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Dibenzo(a,h)anthracene | 560 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Fluoranthene | 9300 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 5:51:00 PM |
| Fluorene | 850 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Indeno(1,2,3-c,d)pyrene | 1800 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Phenanthrene | 8600 | 150 | | µg/Kg-dry | 3 | 1/25/2006 4:52:00 PM |
| Pyrene | 7500 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 5:51:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.10 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #4-Bottom |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-04A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 24.4 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 170 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Acenaphthylene | U | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Anthracene | 910 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(a)anthracene | 2700 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(a)pyrene | 2300 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(b)fluoranthene | 3000 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(g,h,i)perylene | 1600 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(k)fluoranthene | 1200 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Chrysene | 2400 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Dibenzo(a,h)anthracene | 460 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Fluoranthene | 5300 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Fluorene | U | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Indeno(1,2,3-c,d)pyrene | 1700 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Naphthalene | U | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Phenanthrene | 2800 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Pyrene | 4400 | 160 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.10 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #5-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-05A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 20.0 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Anthracene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Benzo(a)anthracene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Benzo(a)pyrene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Benzo(b)fluoranthene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Benzo(g,h,i)perylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Benzo(k)fluoranthene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Chrysene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Dibenzo(a,h)anthracene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Fluoranthene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Fluorene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Indeno(1,2,3-c,d)pyrene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Phenanthrene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| Pyrene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:33:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 6.80 | 0 | | pH Units | 1 | 1/23/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #6-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-06A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 25.5 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 150 | 160 | J | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Acenaphthylene | U | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Anthracene | 550 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Benzo(a)anthracene | 2400 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Benzo(a)pyrene | 2400 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Benzo(b)fluoranthene | 3100 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Benzo(g,h,i)perylene | 2200 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Benzo(k)fluoranthene | 1200 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Chrysene | 2300 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Dibenzo(a,h)anthracene | 520 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Fluoranthene | 4700 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Fluorene | 190 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Indeno(1,2,3-c,d)pyrene | 2000 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Naphthalene | U | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Phenanthrene | 1900 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| Pyrene | 4100 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:09:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 6.90 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #7-Bottom |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-07A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 17.7 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 7100 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:45:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:45:00 PM |
| Anthracene | 11000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 10:25:00 AM |
| Benzo(a)anthracene | 14000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 10:25:00 AM |
| Benzo(a)pyrene | 12000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 10:25:00 AM |
| Benzo(b)fluoranthene | 15000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 10:25:00 AM |
| Benzo(g,h,i)perylene | 7100 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:45:00 PM |
| Benzo(k)fluoranthene | 5500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:45:00 PM |
| Chrysene | 14000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 10:25:00 AM |
| Dibenzo(a,h)anthracene | 2100 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:45:00 PM |
| Fluoranthene | 44000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 10:25:00 AM |
| Fluorene | 8600 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 10:25:00 AM |
| Indeno(1,2,3-c,d)pyrene | 7100 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:45:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:45:00 PM |
| Phenanthrene | 43000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 10:25:00 AM |
| Pyrene | 35000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 10:25:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 6.90 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #8-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-08A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 16.7 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 8200 | 140 | | µg/Kg-dry | 3 | 1/25/2006 10:21:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 3 | 1/25/2006 10:21:00 PM |
| Anthracene | 23000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Benzo(a)anthracene | 35000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Benzo(a)pyrene | 26000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Benzo(b)fluoranthene | 34000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Benzo(g,h,i)perylene | 15000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Benzo(k)fluoranthene | 9000 | 140 | | µg/Kg-dry | 3 | 1/25/2006 10:21:00 PM |
| Chrysene | 31000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Dibenzo(a,h)anthracene | 4900 | 140 | | µg/Kg-dry | 3 | 1/25/2006 10:21:00 PM |
| Fluoranthene | 94000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Fluorene | 12000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Indeno(1,2,3-c,d)pyrene | 16000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 3 | 1/25/2006 10:21:00 PM |
| Phenanthrene | 78000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| Pyrene | 73000 | 2900 | | µg/Kg-dry | 60 | 1/26/2006 11:03:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 6.80 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #9-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-09A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 19.7 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 770 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Anthracene | 3300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Benzo(a)anthracene | 11000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 11:42:00 AM |
| Benzo(a)pyrene | 13000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 11:42:00 AM |
| Benzo(b)fluoranthene | 16000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 11:42:00 AM |
| Benzo(g,h,i)perylene | 9800 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Benzo(k)fluoranthene | 4900 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Chrysene | 11000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 11:42:00 AM |
| Dibenzo(a,h)anthracene | 2500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Fluoranthene | 22000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 11:42:00 AM |
| Fluorene | 1300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Indeno(1,2,3-c,d)pyrene | 9800 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Phenanthrene | 9800 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:57:00 PM |
| Pyrene | 19000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 11:42:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.10 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #10-Bottom |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-10A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 13.5 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 25000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Acenaphthylene | 2600 | 140 | | µg/Kg-dry | 3 | 1/25/2006 6:03:00 PM |
| Anthracene | 52000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Benzo(a)anthracene | 61000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Benzo(a)pyrene | 9200 | 140 | | µg/Kg-dry | 3 | 1/25/2006 6:03:00 PM |
| Benzo(b)fluoranthene | 52000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Benzo(g,h,i)perylene | 21000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Benzo(k)fluoranthene | 7400 | 140 | | µg/Kg-dry | 3 | 1/25/2006 6:03:00 PM |
| Chrysene | 54000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Dibenzo(a,h)anthracene | 5700 | 140 | | µg/Kg-dry | 3 | 1/25/2006 6:03:00 PM |
| Fluoranthene | 180000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Fluorene | 37000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Indeno(1,2,3-c,d)pyrene | 23000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Naphthalene | 1400 | 140 | | µg/Kg-dry | 3 | 1/25/2006 6:03:00 PM |
| Phenanthrene | 170000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| Pyrene | 150000 | 6900 | | µg/Kg-dry | 150 | 1/26/2006 9:46:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 6.70 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #11-Bottom |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-11A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 21.4 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 7600 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:31:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:31:00 PM |
| Anthracene | 16000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 7:39:00 PM |
| Benzo(a)anthracene | 13000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 7:39:00 PM |
| Benzo(a)pyrene | 10000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 7:39:00 PM |
| Benzo(b)fluoranthene | 14000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 7:39:00 PM |
| Benzo(g,h,i)perylene | 4400 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:31:00 PM |
| Benzo(k)fluoranthene | 4400 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:31:00 PM |
| Chrysene | 13000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 7:39:00 PM |
| Dibenzo(a,h)anthracene | 1500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:31:00 PM |
| Fluoranthene | 43000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 7:39:00 PM |
| Fluorene | 10000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 7:39:00 PM |
| Indeno(1,2,3-c,d)pyrene | 4900 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:31:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:31:00 PM |
| Phenanthrene | 55000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 7:39:00 PM |
| Pyrene | 30000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 7:39:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.10 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #12-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-12A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 19.9 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 2400 | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Anthracene | 9800 | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Benzo(a)anthracene | 9600 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 8:15:00 PM |
| Benzo(a)pyrene | 7300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Benzo(b)fluoranthene | 8800 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 8:15:00 PM |
| Benzo(b)fluoranthene | 9500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Benzo(g,h,i)perylene | 3000 | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Benzo(k)fluoranthene | 3500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Chrysene | 8800 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 8:15:00 PM |
| Dibenzo(a,h)anthracene | 1000 | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Fluoranthene | 29000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 8:15:00 PM |
| Fluorene | 3100 | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Indeno(1,2,3-c,d)pyrene | 3300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 6:08:00 PM |
| Phenanthrene | 28000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 8:15:00 PM |
| Pyrene | 21000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 8:15:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.20 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #13-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-13A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 27.4 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 320 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Acenaphthylene | U | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Anthracene | 1100 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Benzo(a)anthracene | 3100 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Benzo(a)pyrene | 2500 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Benzo(b)fluoranthene | 3200 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Benzo(g,h,i)perylene | 1300 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Benzo(k)fluoranthene | 940 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Chrysene | 3000 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Dibenzo(a,h)anthracene | 370 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Fluoranthene | 6400 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Fluorene | 570 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Indeno(1,2,3-c,d)pyrene | 1200 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Naphthalene | U | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Phenanthrene | 4400 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| Pyrene | 6500 | 170 | | µg/Kg-dry | 3 | 1/25/2006 6:44:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.30 | 0 | | pH Units | 1 | 1/23/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #14-Bottom |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-14A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 15.8 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Anthracene | 480 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Benzo(a)anthracene | 2300 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Benzo(a)pyrene | 1900 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Benzo(b)fluoranthene | 2600 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Benzo(g,h,i)perylene | 1100 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Benzo(k)fluoranthene | 810 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Chrysene | 2200 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Fluoranthene | 3900 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Indeno(1,2,3-c,d)pyrene | 1100 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Phenanthrene | 1700 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| Pyrene | 3800 | 140 | | µg/Kg-dry | 3 | 1/25/2006 7:20:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.50 | 0 | | pH Units | 1 | 1/23/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #15-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-15A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 18.6 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Anthracene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(a)anthracene | 330 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(a)pyrene | 300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(b)fluoranthene | 360 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(g,h,i)perylene | 190 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Benzo(k)fluoranthene | 150 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Chrysene | 250 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Dibenzo(a,h)anthracene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Fluoranthene | 650 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Fluorene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Indeno(1,2,3-c,d)pyrene | 190 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Phenanthrene | 220 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| Pyrene | 540 | 150 | | µg/Kg-dry | 3 | 1/25/2006 7:56:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.60 | 0 | | pH Units | 1 | 1/23/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #16-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-16A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 20.1 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Anthracene | 240 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Benzo(a)anthracene | 1700 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Benzo(a)pyrene | 1200 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Benzo(b)fluoranthene | 1500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Benzo(g,h,i)perylene | 680 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Benzo(k)fluoranthene | 780 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Chrysene | 1500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Dibenzo(a,h)anthracene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Fluoranthene | 2500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Fluorene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Indeno(1,2,3-c,d)pyrene | 690 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Phenanthrene | 840 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| Pyrene | 2700 | 150 | | µg/Kg-dry | 3 | 1/25/2006 8:32:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.30 | 0 | | pH Units | 1 | 1/23/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #17-Bottom |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-17A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 23.4 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | U | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Acenaphthylene | U | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Anthracene | 840 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Benzo(a)anthracene | 2800 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Benzo(a)pyrene | 2400 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Benzo(b)fluoranthene | 3200 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Benzo(g,h,i)perylene | 1300 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Benzo(k)fluoranthene | 1100 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Chrysene | 2600 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Dibenzo(a,h)anthracene | 330 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Fluoranthene | 4900 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Fluorene | 240 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Indeno(1,2,3-c,d)pyrene | 1300 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Naphthalene | U | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Phenanthrene | 2000 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| Pyrene | 5000 | 160 | | µg/Kg-dry | 3 | 1/25/2006 9:08:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.20 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #18-Bottom |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-18A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 21.8 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Anthracene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Benzo(a)anthracene | 500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Benzo(a)pyrene | 500 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Benzo(b)fluoranthene | 670 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Benzo(g,h,i)perylene | 280 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Benzo(k)fluoranthene | 230 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Chrysene | 490 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Dibenzo(a,h)anthracene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Fluoranthene | 1000 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Fluorene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Indeno(1,2,3-c,d)pyrene | 250 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Phenanthrene | 400 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| Pyrene | 890 | 150 | | µg/Kg-dry | 3 | 1/25/2006 9:44:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 6.80 | 0 | | pH Units | 1 | 1/23/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #19-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-19A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 21.6 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 310 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Acenaphthylene | 240 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Anthracene | 1300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Benzo(a)anthracene | 6200 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Benzo(a)pyrene | 5700 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Benzo(b)fluoranthene | 7300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Benzo(g,h,i)perylene | 3000 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Benzo(k)fluoranthene | 2600 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Chrysene | 6300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Dibenzo(a,h)anthracene | 920 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Fluoranthene | 10000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 8:51:00 PM |
| Fluorene | 360 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Indeno(1,2,3-c,d)pyrene | 3100 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Phenanthrene | 4100 | 150 | | µg/Kg-dry | 3 | 1/25/2006 10:20:00 PM |
| Pyrene | 7700 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 8:51:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.20 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #20-Bottom |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-20A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 19.3 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | 320 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Acenaphthylene | 73 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Anthracene | 1800 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Benzo(a)anthracene | 6700 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Benzo(a)pyrene | 1400 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Benzo(b)fluoranthene | 9900 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 12:19:00 PM |
| Benzo(g,h,i)perylene | 2800 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Benzo(k)fluoranthene | 3000 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Chrysene | 5900 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Dibenzo(a,h)anthracene | 370 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Fluoranthene | 22000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 12:19:00 PM |
| Fluorene | 670 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Indeno(1,2,3-c,d)pyrene | 3200 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Phenanthrene | 6400 | 150 | | µg/Kg-dry | 3 | 1/25/2006 5:26:00 PM |
| Pyrene | 17000 | 1500 | | µg/Kg-dry | 30 | 1/26/2006 12:19:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.20 | 0 | | pH Units | 1 | 1/23/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| | S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *30-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | #21-Side |
| **Lab Order:** | 0601235 | **Tag Number:** | |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighting Ar | **Collection Date:** | 1/17/2006 11:00:00 AM |
| **Lab ID:** | 0601235-21A **Date Received:** 1/19/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 22.4 | 0 | | wt% | 1 | 1/24/2006 |
| **SEMIVOLATILES SW-846 8270(PAH)** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| Acenaphthene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Acenaphthylene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Anthracene | 410 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Benzo(a)anthracene | 720 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Benzo(a)pyrene | 280 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Benzo(b)fluoranthene | 1300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Benzo(g,h,i)perylene | 710 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Benzo(k)fluoranthene | 1300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Chrysene | 790 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Dibenzo(a,h)anthracene | 270 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Fluoranthene | 1200 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Fluorene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Indeno(1,2,3-c,d)pyrene | 670 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Naphthalene | U | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Phenanthrene | 430 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| Pyrene | 1300 | 150 | | µg/Kg-dry | 3 | 1/25/2006 3:29:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **VP** |
| pH | 7.20 | 0 | | pH Units | 1 | 1/23/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2006

# Total Organic Carbon Method 415.1/SW846 9060

**Sample: 0601348-1**
Client Sample ID: 0601235-01A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 78%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **198000** | mg/Kg | |

**Sample: 0601348-2**
Client Sample ID: 0601235-02A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 79.3%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **192000** | mg/Kg | |

**Sample: 0601348-3**
Client Sample ID: 0601235-03A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 80.9%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **71300** | mg/Kg | |

Environmental Testing Laboratories, Inc.
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Phone - 631-249-1456 Fax - 631-249-8344

01/25/2006

# Total Organic Carbon Method 415.1/SW846 9060

**Sample: 0601348-4**
Client Sample ID: 0601235-04A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 77.1%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **44400** | mg/Kg | |

**Sample: 0601348-5**
Client Sample ID: 0601235-05A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 70.8%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **37100** | mg/Kg | |

**Sample: 0601348-6**
Client Sample ID: 0601235-06A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 77.9%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **50900** | mg/Kg | |

# Environmental Testing Laboratories, Inc.

208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344


**01/25/2006**

## Total Organic Carbon Method 415.1/SW846 9060

**Sample: 0601348-7**
Client Sample ID: 0601235-07A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 79.2%

### Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **213000** | mg/Kg | |

**Sample: 0601348-8**
Client Sample ID: 0601235-08A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 80.6%

### Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **190000** | mg/Kg | |

**Sample: 0601348-9**
Client Sample ID: 0601235-09A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 73.6%

### Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **185000** | mg/Kg | |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2006

# Total Organic Carbon Method 415.1/SW846 9060

**Sample: 0601348-10**
Client Sample ID: 0601235-10A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 76%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **328000** | mg/Kg | |

**Sample: 0601348-11**
Client Sample ID: 0601235-11A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 79.7%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **82600** | mg/Kg | |

**Sample: 0601348-12**
Client Sample ID: 0601235-12A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 79.4%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **169000** | mg/Kg | |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2006

# Total Organic Carbon Method 415.1/SW846 9060

**Sample: 0601348-13**
Client Sample ID: 0601235-13A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 80%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **67600** | mg/Kg | |

**Sample: 0601348-14**
Client Sample ID: 0601235-14A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 82.7%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **210000** | mg/Kg | |

**Sample: 0601348-15**
Client Sample ID: 0601235-15A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 78.7%

## Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **47600** | mg/Kg | |

# Environmental Testing Laboratories, Inc.

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01/25/2006

## Total Organic Carbon Method 415.1/SW846 9060

**Sample: 0601348-16**
Client Sample ID: 0601235-16A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 81.6%

### Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **35900** | mg/Kg | |

**Sample: 0601348-17**
Client Sample ID: 0601235-17A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 75.3%

### Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **61200** | mg/Kg | |

**Sample: 0601348-18**
Client Sample ID: 0601235-18A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 81.1%

### Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **43300** | mg/Kg | |

# Environmental Testing Laboratories, Inc.

208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344


**01/25/2006**

## Total Organic Carbon Method 415.1/SW846 9060

**Sample: 0601347-1**
Client Sample ID: 0601235-19A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 81.6%

### Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **177000** | mg/Kg | |

**Sample: 0601347-2**
Client Sample ID: 0601235-20A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 81.4%

### Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **54800** | mg/Kg | |

**Sample: 0601347-3**
Client Sample ID: 0601235-21A
Matrix: Soil
Remarks:
Analyzed Date: 01/25/2006

Type: Grab

Collected: 01/17/2006 11:00
% Solid: 77.7%

### Analytical Results

| Cas No | Analyte | MDL | Result | Units | Q |
|---|---|---|---|---|---|
| | TOC | 500 | **39400** | mg/Kg | |

# APPENDIX D: MANIFESTS AND WEIGH TICKETS, FIRST EXCAVATION

.ean Earth of Philadelphia, Inc
201 South 61st Street
iiladelphia, PA 19153

Transaction No.
295414

** Reprinted by 4 at 12/20/2005 11:42:58 **

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 12/20/2005 | 11:18 | 1 |

hicle ID: mas5 Michael A. S. Act90#Applied fo

Gross: 39.29 tn
Tare: 11.73 tn (K)
Net: 27.56 tn

istomer ID: RMC, Inc. RMC, Inc.
b# ID: 6950 Willow Grove NAS/JRB
iterial ID: 001 Soil

inefest ID:

mments:
perator: 4 Charge by Weight

iver Signature: _____

Operator Signature: _____

ean Earth of Philadelphia, Inc
01 South 61st Street
iladelphia, PA 19153

Transaction No.
295414

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 12/20/2005 | 11:18 | 1 |

hicle ID: mas5 Michael A. S. Act90#Applied fo

stomer ID: PSE&G PSE&G
b# ID: 6426 West End MGP Site
terial ID: 001 Soil

Gross: 39.29 tn
Tare: 11.73 tn (K)
Net: 27.56 tn

nefest ID:

mments:
erator: 4 Charge by Weight

iver Signature:

Operator Signature:

# 118405

**CLEAN EARTH OF PHILADELPHIA, INC.**
3201 South 61st Street
Philadelphia, Pa 19153

**Non-Hazardous Material Manifest**

**APPROVAL # 6950**

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

Fire Training Pit
NAS-JRB

**DESCRIPTION OF MATERIAL:**
Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations

Name: James Edmond
Title: Env. Coordinator
Signature: [signature]
Date: 12/20/05

Act 90 Applied For

**TRANSPORTER**

Company: TAT Trucking, Inc.
Address: Bear, DE
Truck #: MA55
Driver: Dale Shiles

Phone #:
Gross Weight:
TARE Weight:
Net Weight:

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind

Driver Signature: [signature]
Date: 12-20-05

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature: [signature]
Date: 12/20/05

.ean Earth of Philadelphia, Inc
:01 South 61st Street
ıiladelphia, PA 19153

Transaction No.
295421

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 12/20/2005 | 11:45 | 1 |

ıhicle ID: mas4 MAS Act 90 # 028606

ıstomer ID: RMC, Inc. RMC, Inc.
ıb# ID: 6950 Willow Grove NAS/JRB
ıterial ID: 001 Soil

Gross: 36.83 tn
Tare: 12.21 tn (M)
Net: 24.62 tn

ıne Test ID:

ımments:
ıerator: 4 Charge by Weight

ıiver Signature:

Operator Signature:

# 118406

**CLEAN EARTH OF PHILADELPHIA, INC.**
3201 South 61st Street
Philadelphia, Pa 19153

**Non-Hazardous Material Manifest**

**APPROVAL # 6950**

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**
Non-Hazardous/Non-Regulated Contaminated Soil Fire Training Pit NAS-JRB

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmonds
Title: Env. Coordinator
Signature:
Date: 12/20/05
Act 90# 028606

**TRANSPORTER**

Company: TAT Trucking, Inc.
Phone #:
Address: Bear, DE
Gross Weight:
Truck #: MAS 4
TARE Weight:
Driver: Al Chester
Net Weight:

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature:
Date: 12-20-05

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature:
Date: 12/20/05

ean Earth of Philadelphia, Inc
:01 South 61st Street
:iladelphia, PA 19153

Transaction No.
295424

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 12/20/2005 | 12:15 | 1 |

| | | | | |
|---|---|---|---|---|
| hicle ID: | ST11 | TAT Act 90 # 010857 | Gross: | 38.44 tn |
| istomer ID: | RMC, Inc. | RMC, Inc. | Tare: | 12.48 tn (M) |
| b# ID: | 6950 | Willow Grove NAS/JRB | Net: | 25.96 tn |
| terial ID: | 001 | Soil | | |

nefest ID:

mments:
perator: 4 Change by Weight

iver Signature:

Operator Signature:

# 118407

**CLEAN EARTH OF PHILADELPHIA, INC.**
3201 South 61st Street
Philadelphia, Pa 19153

**Non-Hazardous Material Manifest**

APPROVAL # 6950

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

Fire Training Pit
NAS-JRB

**DESCRIPTION OF MATERIAL:**
Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmond
Title: Env. Coordinator
Signature: [signature]
Date: 12/20/05

Act 90 010857

**TRANSPORTER**

Company: TAT Trucking, Inc.
Address: Bear, DE
Truck #: 57-11
Driver: Jim Cooper
Phone #:
Gross Weight:
TARE Weight:
Net Weight:

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature: [signature]
Date: 12-20-05

**DESTINATION**

I hereby certify that the above described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature: [signature]
Date: 12/20/05

ean Earth of Philadelphia, Inc
01 South 61st Street
iladelphia, PA 19153

Transaction No.
295429

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 12/20/2005 | 13:40 | 1 |

hicle ID: ST56 TAT ACT90# 31548

stomer ID: RMC, Inc. RMC, Inc.
b# ID: 6950 Willow Grove NAS/JRB
terial ID: 001 Soil

Gross: 32.46 tn
Tare: 12.50 tn (M)
Net: 19.96 tn

nefest ID:

mments:
erator: 4 Charge by Weight

iver Signature:

perator Signature:

# 118409

*LAST LOAD*

CLEAN EARTH OF PHILADELPHIA, INC.
3201 South 61st Street
Philadelphia, Pa 19153

*LAST LOAD*

## Non-Hazardous Material Manifest

APPROVAL # 6950

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**
Non-Hazardous/Non-Regulated Contaminated Soil Fire Training Pit NAS-JRB

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmond
Title: Env. Coordinator
Signature:
Date: 12/20/05
Act 90# 31548

**TRANSPORTER**

Company: TAT Trucking, Inc.
Phone #: 302-832 2667
Address: Bear, DE
Gross Weight:
Truck #: St 56
TARE Weight:
Driver: John Gebhart
Net Weight:

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature: John G
Date: 12-20-05

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature:
Date: 12/20/05

ean Earth of Philadelphia, Inc
:01 South 61st Street
iladelphia, PA 19153

Transaction No.
295430

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 12/20/2005 | 13:41 | 1 |

hicle ID: ST007 TAT Act 90 # 38086

.stomer ID: RMC, Inc. RMC, Inc.
b# ID: 6950 Willow Grove NAS/JRB
.terial ID: 001 Soil

Gross: 40.68 tn
Tare: 12.22 tn (K)
Net: 28.46 tn

.nefest ID:

mments:
erator: 4 Charge by Weight

iver Signature:

Operator Signature:

# 118408

## CLEAN EARTH OF PHILADELPHIA, INC.
3201 South 61st Street
Philadelphia, Pa 19153

### Non-Hazardous Material Manifest

APPROVAL # 6950

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**
Non-Hazardous/Non-Regulated Contaminated Soil Fire Training Pit NAS-JRB

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmond Title: Env. Coordinator

Signature: [signature] Date: 12/20/05

Act 98 38086

**TRANSPORTER**

Company: TAT Trucking, Inc. Phone #: 302-832-2667

Address: Bear, DE Gross Weight:

Truck # 5T007 TARE Weight:

Driver: Net Weight:

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature: [signature] 5T007 Date: 12/20/05

**DESTINATION**

I hereby certify that the above described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature: [signature] Date: 12/28/05

ın Earth of Philadelphia, Inc
. South 61st Street
.adelphia, PA 19153

Transaction No.
304566

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 08/15/2006 | 09:46 | 1 |

cle ID: st56 TAT Act90#31548

omer ID: CEM Clean Earth of Maryland
ID: 6950 Willow Grove NAS/JRB
rial ID: 001 Soil

Gross: 43.76 tn
Tare: 12.50 tn (M)
Net: 31.26 tn

fest ID:

ents:
ator: 4 Charge by Weight

er. Signature: John Gebhart

ator Signature: _____

#135490

# CLEAN EARTH OF PHILADELPHIA, INC.

3201 South 61st Street
Philadelphia, Pa 19153

## Non-Hazardous Material Manifest

**APPROVAL # 6950**

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**
Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmond Title: Environ. Coordinator

Signature: [signature] Date: 15 Aug 06

**TRANSPORTER**

Company: S & T Trucking Co Phone #: 302-832-2667

Address: Bear, DE Gross Weight::

Truck # ST56 TARE Weight:: 12.50

Driver: John G Net Weight: 31.26

Act 9 0# 3.15 98

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature: [signature] Date: 8-15-06

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature: [signature] Date: 8/15/06

an Earth of Philadelphia, Inc
l South 61st Street
.adelphia, PA 19153

Transaction No.
304567

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 08/15/2006 | 09:52 | 1 |

.cle ID: st65 ST / TAT Act90#34522

omer ID: CEM Clean Earth of Maryland
ID: 6950 Willow Grove NAS/JRB
rial ID: 001 Soil

Gross: 38.93 tn
Tare: 12.54 tn (M)
Net: 26.39 tn

fest ID:

ents:
ator: 4 Charge by Weight

er Signature: Clinchester

rator Signature: CMK

#135488

# CLEAN EARTH OF PHILADELPHIA, INC.

3201 South 61st Street
Philadelphia, Pa 19153

## Non-Hazardous Material Manifest

**APPROVAL # 6950**

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**

Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmond
Title: Envirno. Coordinator
Signature: [signature]
Date: 15 AUG 06

**TRANSPORTER**

Company: S & T Trucking Co.
Phone #:
Address: Bear, DE
Gross Weight::
Truck #: ST 65
TARE Weight:: 12.54
Driver: Winchester
Net Weight: 26.39

Act 90 # 34528

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature: Winchester
Date: 8/15/06

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at ClearyEarth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature: [signature]
Date: 8/15/06

TAT T90

Earth of Philadelphia, Inc
South 61st Street
delphia, PA 19153

Transaction No.
304568

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 08/15/2006 | 09:54 | 1 |

le ID: t90 TAT Act90#51885

| | | |
|---|---|---|
| mer ID: | CEM | Clean Earth of Maryland |
| ID: | 6950 | Willow Grove NAS/JRB |
| ial ID: | 001 | Soil |

| | | |
|---|---|---|
| Gross: | 42.22 tn | |
| Tare: | 12.74 tn | (M) |
| Net: | 29.48 tn | |

est ID:

ıts:
:or: 4 Charge by Weight

: Signature: T90

tor Signature:

#135491

T90
TAT

# CLEAN EARTH OF PHILADELPHIA, INC.

3201 South 61st Street
Philadelphia, Pa 19153

## Non-Hazardous Material Manifest

**APPROVAL # 6950**

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**

Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmond
Title: Environ. Coordinator
Signature:
Date: 15 Aug 06

**TRANSPORTER**

Company: TAT Trucking
Phone #: 3028322667
Address: Bear, DE
Gross Weight::
Truck #: T-90
TARE Weight:: 12.71
Driver: Michael Winnick
Net Weight: 29.48

Act 90 # 51885

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature:
Date: 8/15/06

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature:
Date: 8/15/06

an Earth of Philadelphia, Inc
1 South 61st Street
ladelphia, PA 19153

Transaction No.
304569

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 08/15/2006 | 09:56 | 1 |

Lcle ID: st25 TAT Act90#010858

:omer ID: CEM Clean Earth of Maryland
ID: 6950 Willow Grove NAS/JRB
:rial ID: 001 Soil

:fest ID:

Gross: 38.83 tn
Tare: 12.56 tn (M)
Net: 26.27 tn

ents:
ator: 4 Charge by Weight

er Signature: _____

rator Signature: _____

#135489

# CLEAN EARTH OF PHILADELPHIA, INC.

3201 South 61st Street
Philadelphia, Pa 19153

## Non-Hazardous Material Manifest

**APPROVAL # 6950**

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**

Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmond
Title: Environ. Coordinator
Signature: [signature]
Date: 15 AUG 06

**TRANSPORTER**

Company: S & T Trucking Co.
Phone #:
Address: Bear, DE
Gross Weight::
Truck #: ST25
TARE Weight:: 12.56
Driver: Jules VanSant
Net Weight: 26.27

Act 90 #
01085

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature: [signature]
Date: 8/15/06

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature: [signature]
Date: 8/15/06

# APPENDIX E: SECOND SOIL CHARACTERIZATION RESULTS LABORATORY DATA

AMERICAN ANALYTICAL LABORATORIES

| | |
|---|---|
| NYSDOH | 11418 |
| NJDEP | NY050 |
| CTDOH | PH-0205 |
| PADEP | 68-00573 |


Monday, July 24, 2006

William T. Hall, P.E.
RMC Inc.
46970 Bradley Boulevard
Suite B
Lexington Park, MD 20653

TEL: (301) 862-7501
FAX

RE: Willow Grove NAS/JRB, Site 5 Fire Fighter

Order No.: 0607156

Dear William T. Hall, P.E.:

American Analytical Laboratories, LLC. received 4 sample(s) on 7/19/2006 for the analyses presented in the following report.

Samples were analyzed in accordance with the test procedures documented on the chain of custody and detailed throughout the text of this report.

The limits provided in the data package are analytical reporting limits and not Federal or Local mandated values to which the sample results should be compared.

There were no problems with the analyses and all data for associated QC met laboratory specifications. If there are any exceptions a Case Narrative is provided in the report.

If you have any questions regarding these tests results, please do not hesitate to call (631) 454-6100 or email me directly at lbeyer@american-analytical.com.

Sincerely,

Lori Beyer
Lab Director

56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX: (631) 454-8027

# American Analytical Laboratories, LLC.

**Date:** *24-Jul-06*

**CLIENT:** RMC Inc.
**Project:** Willow Grove NAS/JRB, Site 5 Fire Fighter Are
**Lab Order:** 0607156

## Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Tag Number | Date Collected | Date Received |
|---|---|---|---|---|
| 0607156-01A | CHAR-1a-South | RMC-071306 | 7/13/2006 | 7/19/2006 |
| 0607156-02A | CHAR-2a-North | RMC-071306 | 7/13/2006 | 7/19/2006 |
| 0607156-03A | CHAR-1b-South | RMC-071306 | 7/13/2006 | 7/19/2006 |
| 0607156-04A | CHAR-2b-North | RMC-071306 | 7/13/2006 | 7/19/2006 |

AMERICAN ANALYTICAL LABORATORIES
58 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX (631) 454-8027

TAG # / COC RMC-071306

| | |
|---|---|
| NYSDOH | 11418 |
| CTDOH | PH-0205 |
| NJDEP | NY050 |
| PADEP | 68-573 |

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46970 Bradley Blvd., Suite B
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.
301-862-7501

SAMPLER (SIGNATURE): William T. Hall

SAMPLER NAME (PRINT): William T Hall

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS/JRB
Site 5 Fire Fighting Area Modification

ANALYSIS REQUESTED

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/ TIME | SAMPLE # - LOCATION | TPH DRO to C-44 Method 8015M | TOX 9023 | FOR METHANOL PRESERVED SAMPLES [ VOLATILE VIAL # ] |
|---|---|---|---|---|---|---|---|
| 0607156-1A | SG | 1 | 07/13/06 | CHAR-1a -- South | ✓ | | |
| 3A | SG | 1 | 07/13/06 | CHAR-1b -- South | | ✓ | |
| 2A | SG | 1 | 07/13/06 | CHAR-2a -- North | ✓ | | |
| 4A | SG | 1 | 07/13/06 | CHAR-2b -- North | | ✓ | |

COOLER TEMPERATURE:

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A-AIR, W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB, C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED:
NORMAL ☐ STAT ☒ BY / /

COMMENTS / INSTRUCTIONS
Prepared for shipment 07/17/06 WTH

| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
|---|---|---|---|---|---|
| | | | [signature] | 7/17/06 1345 | P. Antonio |
| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |

WHITE-OFFICE / CANARY-LAB / PINK-SAMPLE CUSTODIAN / GOLDENROD-CLIENT

0607531

0607531

Rec'vd Date: 07/20/06 11:28

# CHAIN-OF-CUSTODY RECORD



**Subcontractor:**

Environmental Testing Laboratories
208 Route 109
Farmingdale, New York 11735

TEL: (631) 249-1456
FAX: (631) 249-8344
Acct #:

**19-Jul-06**

| Sample ID | Matrix | Date Collected | Bottle Type | Requested Tests | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW9023 | | | | | | |
| 0607156-03A | Soil | 7/13/2006 | 8OZ GU | 1 | | | | | | |
| 0607156-04A | Soil | 7/13/2006 | 8OZ GU | 1 | | | | | | |

General Comments:

Analyze for TOX.

Normal TAT, Thanks.

| | | Date/Time | | | Date/Time |
|---|---|---|---|---|---|
| **Relinquished by:** | Chris Dunn | 7-20-06 11:30 | **Received by:** | | 7/20 11:20 |
| **Relinquished by:** | | | **Received by:** | | |

**AMERICAN ANALYTICAL LABORATORIES, LLC**
**56 TOLEDO STREET**
**FARMINGDALE, NEW YORK 11735**
**TELEPHONE: (631) 454-6100 FAX: (631) 454-8027**

## DATA REPORTING QUALIFIERS

For reporting results, the following "Results Qualifiers" are used:

| | |
|---|---|
| **Value** | If the result is greater than or equal to the detection limit, report the value |
| **U** | Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required. |
| **J** | Indicates an estimated value. The flag is used:<br>(1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.)<br>(2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3ug/L was calculated report as 3J. This flag is used when similar situations arise on any organic parameter i.e. Pesticide, PCBs and others. |
| **B** | Indicates the analyte was found in the blank as well as the sample report "10B". |
| **E** | Indicates the analytes concentration exceeds the calibrated range of the instrument for that specific analysis. |
| **D** | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| **P** | This flag is used for Pesticide / PCB target analyte when there is >25% difference for detected concentrations between the two GC Columns. The higher of the two values is reported on Form I and flagged with a "P". |
| **N** | This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used. |
| **H** | Indicates sample was received and/or analyzed outside of The method allowable holding time |

# American Analytical Laboratories, LLC.

**Date:** *24-Jul-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | CHAR-1a-South |
| **Lab Order:** | 0607156 | **Tag Number:** | RMC-071306 |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighter Are | **Collection Date:** | 7/13/2006 |
| **Lab ID:** | 0607156-01A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **TPH 8015 DIESEL RANGE ORGANICS** | | **SW8015** | | **SW3550A** | | Analyst: **PT** |
| Fuel Oil #1 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| Fuel Oil #2 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| Fuel Oil #3 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| Fuel Oil #4 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| Fuel Oil #5 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| Fuel Oil #6 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| Hydraulic Fluid | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| Motor Oil Composite | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| SAE #30 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| Unknown DRO TPH | 260 | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| Total DRO TPH | 260 | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:29:00 PM |
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **KK** |
| Percent Moisture | 12.2 | 0 | | wt% | 1 | 7/20/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *24-Jul-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | CHAR-2a-North |
| **Lab Order:** | 0607156 | **Tag Number:** | RMC-071306 |
| **Project:** | Willow Grove NAS/JRB, Site 5 Fire Fighter Are | **Collection Date:** | 7/13/2006 |
| **Lab ID:** | 0607156-02A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **TPH 8015 DIESEL RANGE ORGANICS** | | **SW8015** | | **SW3550A** | | Analyst: **PT** |
| Fuel Oil #1 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| Fuel Oil #2 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| Fuel Oil #3 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| Fuel Oil #4 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| Fuel Oil #5 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| Fuel Oil #6 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| Hydraulic Fluid | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| Motor Oil Composite | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| SAE #30 | U | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| Unknown DRO TPH | 170 | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| Total DRO TPH | 170 | 34 | | mg/Kg-dry | 1 | 7/21/2006 2:58:00 PM |
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **KK** |
| Percent Moisture | 12.8 | 0 | | wt% | 1 | 7/20/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

07/31/2006

# TOX by Modified 8082

**Sample: 0607531-1**
Client Sample ID: 0607156-03A
Matrix: Soil
Remarks:
Analyzed Date: 07/28/2006
Preparation Date(s) : 07/24/2006

Type: Grab

Collected: 07/13/2006
% Solid: 87.2%

## Analytical Results

| Cas No | Analyte | File ID | MDL | Concentration* | Units | Q |
|---|---|---|---|---|---|---|
| | Total Organic Halides (TOX) | L 698 -8 | 0.029 | 0.029 | mg/Kg | U |

* Results are reported on a dry weight basis

## Surrogate Results

| Cas No | Analyte | File ID | % Recovery | QC Limits | Q |
|---|---|---|---|---|---|
| 2051-24-3 | DECACHLOROBIPHENYL | L698-8 | 70.5 % | ( 30 - 150) | |
| 877-09-8 | TETRACHLORO M-XYLENE | L698-8 | 62.0 % | ( 30 - 150) | |

**Sample: 0607531-2**
Client Sample ID: 0607156-04A
Matrix: Soil
Remarks:
Analyzed Date: 07/28/2006
Preparation Date(s) : 07/24/2006

Type: Grab

Collected: 07/13/2006
% Solid: 86.4%

## Analytical Results

| Cas No | Analyte | File ID | MDL | Concentration* | Units | Q |
|---|---|---|---|---|---|---|
| | Total Organic Halides (TOX) | L 698 -9 | 0.029 | 0.029 | mg/Kg | U |

* Results are reported on a dry weight basis

## Surrogate Results

| Cas No | Analyte | File ID | % Recovery | QC Limits | Q |
|---|---|---|---|---|---|
| 2051-24-3 | DECACHLOROBIPHENYL | L698-9 | 77.0 % | ( 30 - 150) | |
| 877-09-8 | TETRACHLORO M-XYLENE | L698-9 | 41.5 % | ( 30 - 150) | |

# APPENDIX F: MANIFESTS AND WEIGH TICKETS, SECOND EXCAVATION

an Earth of Philadelphia, Inc
1 South 61st Street
ladelphia, PA 19153

Transaction No.
304571

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 08/15/2006 | 10:01 | 1 |

icle ID: st21 TAT Act90#101854

tomer ID: CEM Clean Earth of Maryland
# ID: 6950 Willow Grove NAS/JRB
erial ID: 001 Soil

Gross: 44.75 tn
Tare: 12.48 tn (K)
Net: 32.27 tn

efest ID:

ments:
rator: 4 Charge by Weight

er Signature: Bernie Hobbs

rator Signature:

#135492

# CLEAN EARTH OF PHILADELPHIA, INC.

3201 South 61st Street
Philadelphia, Pa 19153

## Non-Hazardous Material Manifest

**APPROVAL # 6950**

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**
Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmond
Title: Environ. Coordinator
Signature: [signature]
Date: 15 Aug 06

**TRANSPORTER**

Company: S&T Trucking Co.
Address: Bear, DE
Truck #: ST 21
Driver: BERNIE Hobbs

Phone #:
Gross Weight::
TARE Weight:: 12.48
Net Weight: 32.27

Act 90# 101854

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature: Bernie Hobbs
Date: 8/15/06

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature: [signature]
Date: 8/15/06

ean Earth of Philadelphia, Inc
1 South 61st Street
ladelphia, PA 19153

Transaction No.
304597

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 08/15/2006 | 12:37 | 1 |

icle ID: st65 ST / TAT Act90#34522

tomer ID: CEM Clean Earth of Maryland
# ID: 6950 Willow Grove NAS/JRB
erial ID: 001 Soil

Gross: 41.01 tn
Tare: 12.54 tn (M)
Net: 28.47 tn

efest ID:

ients:
ator: 4 Charge by Weight

er Signature: _____

rator Signature: _____

#135493

# CLEAN EARTH OF PHILADELPHIA, INC.

3201 South 61st Street
Philadelphia, Pa 19153

## Non-Hazardous Material Manifest

APPROVAL # 6950

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**

Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edward
Title: Environ. Coordinator
Signature: [signature]
Date: 15 Aug 06

**TRANSPORTER**

Company: S & T Trucking Co.
Address: Bear, DE
Truck #: ST65
Driver: Winchester
Phone #:
Gross Weight::
TARE Weight:: 12.54
Net Weight: 28.47

Act 90#
34522

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature: [signature]
Date: 8/15/06

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature: [signature]
Date: 8/15/06

an Earth of Philadelphia, Inc
1 South 61st Street
ladelphia, PA 19153

Transaction No.
304604

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 08/15/2006 | 13:38 | 1 |

.cle ID: st25 TAT Act90#010858

:omer ID: CEM Clean Earth of Maryland
ID: 6950 Willow Grove NAS/JRB
rial ID: 001 Soil

Gross: 38.34 tn
Tare: 12.56 tn (M)
Net: 25.78 tn

fest ID:

ents:
ator: 4 Charge by Weight

er Signature:

rator Signature:

#135495

# CLEAN EARTH OF PHILADELPHIA, INC.

3201 South 61st Street
Philadelphia, Pa 19153

## Non-Hazardous Material Manifest

**APPROVAL # 6950**

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**

Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Edmond
Title: Environmental Coordinator
Signature:
Date: 15 Aug. 06

**TRANSPORTER**

Company: S & T Trucking Co.
Address: Bear, DE
Truck #: ST 25
Driver: Jules Van Saint
Phone #:
Gross Weight::
TARE Weight:: 12.56
Net Weight: 25.78

Act 90th
010858

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature:
Date: 8-15-06

**DESTINATION**

I hereby certify that the above, described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature:
Date: 8/15/06

an Earth of Philadelphia, Inc
. South 61st Street
.adelphia, PA 19153

Transaction No.
304605

| | Date | Time | Scale |
|---|---|---|---|
| In: | | | 0 |
| Out: | 08/15/2006 | 13:39 | 1 |

cle ID: st56 TAT Act90#31548

omer ID: CEM Clean Earth of Maryland
ID: 6950 Willow Grove NAS/JRB
rial ID: 001 Soil

Gross: 39.48 tn
Tare: 12.50 tn (M)
Net: 26.98 tn

fest ID:

ents:
ator: 4 Charge by Weight

er Signature: _____

ator Signature: _____

# 135494

# CLEAN EARTH OF PHILADELPHIA, INC.

3201 South 61st Street
Philadelphia, Pa 19153

## Non-Hazardous Material Manifest

**APPROVAL # 6950**

**GENERATOR'S NAME & ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**SITE ADDRESS:**
Willow Grove Naval Air Station
1301 Easton Road
Willow Grove, PA 19090

**GENERATOR'S PHONE #:** 215-443-6239

**ESTIMATED QUANTITY:** 22 tons

**DESCRIPTION OF MATERIAL:**

Non-Hazardous/Non-Regulated Contaminated Soil

I hereby certify that the above described materials is not a hazardous waste as defined by 40 CFR Part 261 nor are they "PCB-Contaminated" as defined by 40 CFR Part 761. Additionally, it is the same material, which was analyzed and described in the application for treatment provided to the facility, which resulted in the approval number listed above. It is properly classified and packaged for transportation in accordance with applicable regulations.

Name: James Elmond Title: Environ. Coordinator

Signature: Date: 15/AUG 06

**TRANSPORTER**

Act 90 # 31548

Company: S & T Trucking Co. Phone #: 302-832-2667

Address: Bear, DE Gross Weight::

Truck # ST 56 TARE Weight:: 12.50

Driver: John Gebhart Net Weight: 26.98

I hereby certify the above, described materials were picked up at the above described generator address without incident and will be delivered without tampering of any kind.

Driver Signature: John Gebhart Date: 8-15-06

**DESTINATION**

I hereby certify that the above described materials was delivered and accepted at Clean Earth of Philadelphia 3201 South 61st Street Philadelphia, Pa 19153

Authorized Signature: Date: 8/15/06

# APPENDIX G: SECOND SOIL CONFIRMATION RESULTS LABORATORY DATA

AMERICAN ANALYTICAL LABORATORIES

| | |
|---|---|
| NYSDOH | 11418 |
| NJDEP | NY050 |
| CTDOH | PH-0205 |
| PADEP | 68-00573 |


Tuesday, August 29, 2006

William T. Hall, P.E.
RMC Inc.
46970 Bradley Boulevard
Suite B
Lexington Park, MD 20653

TEL: (301) 862-7501
FAX

RE: Willow Grove NAS/JRB Site 5 Fire Fightin

Order No.: 0608193

Dear William T. Hall, P.E.:

American Analytical Laboratories, LLC. received 22 sample(s) on 8/17/2006 for the analyses presented in the following report.

Samples were analyzed in accordance with the test procedures documented on the chain of custody and detailed throughout the text of this report.

The limits provided in the data package are analytical reporting limits and not Federal or Local mandated values to which the sample results should be compared.

There were no problems with the analyses and all data for associated QC met laboratory specifications. If there are any exceptions a Case Narrative is provided in the report.

If you have any questions regarding these tests results, please do not hesitate to call (631) 454-6100 or email me directly at lbeyer@american-analytical.com.

Sincerely,

Lori Beyer
Lab Director

56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX: (631) 454-8027

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

**CLIENT:** RMC Inc.
**Project:** Willow Grove NAS/JRB Site 5 Fire Fighting Ar
**Lab Order:** 0608193

## Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Tag Number | Date Collected | Date Received |
|---|---|---|---|---|
| 0608193-01A | Willow Grove Site 5 1A | 7B | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-02A | Willow Grove Site 5 2A | 8B | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-03A | Willow Grove Site 5 3A | 21B | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-04A | Willow Grove Site 5 4A | 9S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-05A | Willow Grove Site 5 5A | 10S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-06A | Willow Grove Site 5 6A | 11S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-07A | Willow Grove Site 5 7A | 12S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-08A | Willow Grove Site 5 8A | 1B | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-09A | Willow Grove Site 5 9A | 2B | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-10A | Willow Grove Site 5 10A | 3B | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-11A | Willow Grove Site 5 11A | 4B | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-12A | Willow Grove Site 5 12A | 5B | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-13A | Willow Grove Site 5 13A | 6B | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-14A | Willow Grove Site 5 14A | 1S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-15A | Willow Grove Site 5 15A | 2S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-16A | Willow Grove Site 5 16A | 3S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-17A | Willow Grove Site 5 17A | 4S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-18A | Willow Grove Site 5 18A | 5S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-19A | Willow Grove Site 5 19A | 6S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-20A | Willow Grove Site 5 20A | 22S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-21A | Willow Grove Site 5 21A | 7S | 8/15/2006 9:20:00 AM | 8/17/2006 |
| 0608193-22A | Willow Grove Site 5 22A | 8S | 8/15/2006 9:20:00 AM | 8/17/2006 |

AMERICAN ANALYTICAL LABORATORIES
58 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX (631) 454-8027

TAG # / COC: RMC 081506 A-1

| | |
|---|---|
| NYSDOH | 11418 |
| CTDOH | PH-0205 |
| NJDEP | NY050 |
| PADEP | 68-573 |

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46970 Bradley Blvd., Suite B
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.
301-862-7501

SAMPLER (SIGNATURE): William T. Hall

SAMPLER NAME (PRINT): William T Hall

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS/JRB
Site 5 Fire Fighting Area

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/ TIME | SAMPLE # - LOCATION | TOC | PAH | PH | | | | | | | | | | | FOR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0608193-1A | SG | 1 | 16Sep2006 0920 | 1A Willow Grove Site 5 | X | X | + | | | | | | | | | | | 7B |
| -2A | SG | 1 | " 0930 | 2A | X | X | + | | | | | | | | | | | 8B |
| 3A | SG | 1 | " 0930 | 3A | X | X | + | | | | | | | | | | | 21B |
| -4A | SG | 1 | " 0940 | 4A | X | X | + | | | | | | | | | | | 9S |
| -5A | SG | 1 | " 0952 | 5A | X | X | + | | | | | | | | | | | 10S |
| -6A | SG | 1 | " 1005 | 6A | X | X | + | | | | | | | | | | | 11S |
| -7A | SG | 1 | " 1018 | 7A | X | X | + | | | | | | | | | | | 12S |
| -8A | SG | 1 | " 1105 | 8A | X | X | + | | | | | | | | | | | 1B |
| -9A | SG | 1 | " 1235 | 9A | X | X | + | | | | | | | | | | | 2B |
| -10A | SG | 1 | " 1240 | 10A | X | X | + | | | | | | | | | | | 3B |
| -11A | SG | 1 | " 1300 | 11A | X | X | + | | | | | | | | | | | 4B |
| -12A | SG | 1 | " 1312 | 12A | X | X | + | | | | | | | | | | | 5B |

COOLER TEMPERATURE:

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A=AIR; W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB, C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED:
NORMAL ☐ STAT ☐ BY / /

COMMENTS / INSTRUCTIONS

| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
|---|---|---|---|---|---|
| William T. Hall | 06Aug2006 1627 | William Hall | | 08/16/06 4:25 | J. GRAY |
| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
| | | | | | |

WHITE-OFFICE / CANARY-LAB / PINK-SAMPLE CUSTODIAN / GOLDENROD-CLIENT

AMERICAN ANALYTICAL LABORATORIES

58 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX (631) 454-8027

TAG # / COC RMC 081506 A-2

NYSDOH 11418
CTDOH PH-0205
NJDEP NY050
PADEP 68-573

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46970 Bradley Blvd., Suite B
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.
301-862-7501

SAMPLER (SIGNATURE): William T. Hall

SAMPLER NAME (PRINT): William T Hall

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION: Willow Grove NAS/JRB
Site 5 Fire Fighting Area

| LABORATORY ID # | MATRIX | # CONTAINERS | SAMPLING DATE/ TIME | SAMPLE # - LOCATION | TOC | PAH | pH | | | | | | | | | | FOR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13A | SG | 1 | 15Sep2006 1255 | 13A Willow Grove Site 5 | X | X | X | | | | | | | | | | 6B |
| 14A | SG | 1 | " 1235 | 14A | X | X | X | | | | | | | | | | 1S |
| 15A | SG | 1 | " 1240 | 15A | X | X | X | | | | | | | | | | 2S |
| 16A | SG | 1 | " 1300 | 16A | X | X | X | | | | | | | | | | 3S |
| 17A | SG | 1 | " 1305 | 17A | X | X | X | | | | | | | | | | 4S |
| 18A | SG | 1 | " 1315 | 18A | X | X | X | | | | | | | | | | 5S |
| 19A | SG | 1 | " 1245 | 19A | X | X | X | | | | | | | | | | 6S |
| 20A | SG | 1 | " 1245 | 20A | X | X | X | | | | | | | | | | 22S |
| 21A | SG | 1 | " 1250 | ~~21B~~ 21A WTH | X | X | X | | | | | | | | | | 7S |
| 22A | SG | 1 | " 1320 | ~~22B~~ 22A WTH | X | X | X | | | | | | | | | | 8S |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

COOLER TEMPERATURE:

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A-AIR; W-WIPE; P-PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB, C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED: NORMAL ☐ STAT ☐ BY / /

COMMENTS / INSTRUCTIONS

| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
|---|---|---|---|---|---|
| William T. Hall | 26 Aug 2006 / 1626 | William Hall | | 08-16-06 / 4:25 | J. Gray |
| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
| | | | | | |

WHITE-OFFICE / CANARY-LAB / PINK-SAMPLE CUSTODIAN / GOLDENROD-CLIENT

American Analytical Laboratories, LLC.
*56 Toledo Street*
*Farmingdale, NY 11735-*
TEL: *6314546100* FAX: *6314548027*

# CHAIN-OF-CUSTODY RECORD



**Subcontractor:**

EcoTest Laboratories, Inc.
377 Sheffield Avenue
North Babylon, NY 11703

TEL: (631) 422-5777
FAX: (631) 422-5770
Acct #:

**17-Aug-06**

| Sample ID | Matrix | Date Collected | Bottle Type | Requested Tests | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW9060 | | | | | | |
| 0608193-01A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-02A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-03A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-04A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-05A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-06A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-07A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-08A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-09A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-10A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-11A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-12A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-13A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-14A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-15A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-16A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-17A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-18A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |

General Comments:

Analyze for TOC.

Normal TAT, thanks.

SrC 8/17

| | Date/Time | | Date/Time |
|---|---|---|---|
| **Relinquished by:** | | **Received by:** | |
| **Relinquished by:** | | **Received by:** | |

American Analytical Laboratories, LLC.
*56 Toledo Street*
*Farmingdale, NY 11735-*
TEL: *6314546100* FAX: *6314548027*

# CHAIN-OF-CUSTODY RECORD



**Subcontractor:**

EcoTest Laboratories, Inc.
377 Sheffield Avenue
North Babylon, NY 11703

TEL: (631) 422-5777
FAX: (631) 422-5770
Acct #:

**17-Aug-06**

| Sample ID | Matrix | Date Collected | Bottle Type | Requested Tests | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW9060 | | | | | | |
| 0608193-19A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-20A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-21A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |
| 0608193-22A | Soil | 8/15/2006 9:20:00 AM | 8OZ GU | 1 | | | | | | |

General Comments:

Analyze for TOC.

Normal TAT, thanks.

| | Date/Time | | Date/Time |
|---|---|---|---|
| **Relinquished by:** | | **Received by:** | |
| **Relinquished by:** | | **Received by:** | |

**AMERICAN ANALYTICAL LABORATORIES, LLC**
**56 TOLEDO STREET**
**FARMINGDALE, NEW YORK 11735**
**TELEPHONE: (631) 454-6100 FAX: (631) 454-8027**

## DATA REPORTING QUALIFIERS

For reporting results, the following "Results Qualifiers" are used:

| | |
|---|---|
| **Value** | If the result is greater than or equal to the detection limit, report the value |
| **U** | Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required. |
| **J** | Indicates an estimated value. The flag is used:<br>(1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.)<br>(2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3ug/L was calculated report as 3J. This flag is used when similar situations arise on any organic parameter i.e. Pesticide, PCBs and others. |
| **B** | Indicates the analyte was found in the blank as well as the sample report "10B". |
| **E** | Indicates the analytes concentration exceeds the calibrated range of the instrument for that specific analysis. |
| **D** | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| **P** | This flag is used for Pesticide / PCB target analyte when there is >25% difference for detected concentrations between the two GC Columns. The higher of the two values is reported on Form I and flagged with a "P". |
| **N** | This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used. |
| **H** | Indicates sample was received and/or analyzed outside of The method allowable holding time |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 1A |
| **Lab Order:** | 0608193 | **Tag Number:** | 7B |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-01A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 14.9 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Anthracene | 82 | 140 | J | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Benzo(a)anthracene | 700 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Benzo(a)pyrene | 820 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Benzo(b)fluoranthene | 1100 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Benzo(g,h,i)perylene | 560 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Benzo(k)fluoranthene | 310 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Chrysene | 580 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Dibenzo(a,h)anthracene | 210 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Fluoranthene | 910 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Indeno(1,2,3-c,d)pyrene | 530 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Phenanthrene | 170 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| Pyrene | 1300 | 140 | | µg/Kg-dry | 1 | 8/28/2006 9:08:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 6.00 | 0 | | pH Units | 1 | 8/18/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 2A |
| **Lab Order:** | 0608193 | **Tag Number:** | 8B |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-02A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 14.2 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Anthracene | 90 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Benzo(a)anthracene | 400 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Benzo(a)pyrene | 550 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Benzo(b)fluoranthene | 740 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Benzo(g,h,i)perylene | 310 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Benzo(k)fluoranthene | 290 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Chrysene | 430 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Fluoranthene | 630 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Indeno(1,2,3-c,d)pyrene | 330 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Phenanthrene | 240 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| Pyrene | 740 | 140 | | µg/Kg-dry | 1 | 8/29/2006 7:57:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.50 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 3A |
| **Lab Order:** | 0608193 | **Tag Number:** | 21B |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-03A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 14.1 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Benzo(a)anthracene | 120 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Benzo(a)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Benzo(b)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Chrysene | 130 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Fluoranthene | 240 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Phenanthrene | 100 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| Pyrene | 260 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:24:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.60 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 4A |
| **Lab Order:** | 0608193 | **Tag Number:** | 9S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-04A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 15.0 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Benzo(a)anthracene | 360 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Benzo(a)pyrene | 360 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Benzo(b)fluoranthene | 580 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Benzo(g,h,i)perylene | 300 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Benzo(k)fluoranthene | 120 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Chrysene | 320 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Fluoranthene | 580 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Indeno(1,2,3-c,d)pyrene | 240 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Phenanthrene | 150 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| Pyrene | 820 | 140 | | µg/Kg-dry | 1 | 8/29/2006 8:51:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 7.20 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 5A |
| **Lab Order:** | 0608193 | **Tag Number:** | 10S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-05A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 12.4 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Anthracene | 120 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Benzo(a)anthracene | 1100 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Benzo(a)pyrene | 1400 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Benzo(b)fluoranthene | 1800 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Benzo(g,h,i)perylene | 860 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Benzo(k)fluoranthene | 670 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Chrysene | 1200 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Fluoranthene | 1500 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Indeno(1,2,3-c,d)pyrene | 780 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Phenanthrene | 210 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| Pyrene | 2100 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:19:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.90 | 0 | | pH Units | 1 | 8/18/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 6A |
| **Lab Order:** | 0608193 | **Tag Number:** | 11S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-06A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 12.3 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Anthracene | 130 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Benzo(a)anthracene | 530 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Benzo(a)pyrene | 590 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Benzo(b)fluoranthene | 770 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Benzo(g,h,i)perylene | 340 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Benzo(k)fluoranthene | 190 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Chrysene | 590 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Fluoranthene | 1000 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Phenanthrene | 410 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| Pyrene | 1200 | 140 | | µg/Kg-dry | 1 | 8/29/2006 9:46:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 6.10 | 0 | | pH Units | 1 | 8/18/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 7A |
| **Lab Order:** | 0608193 | **Tag Number:** | 12S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-07A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 12.5 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | 190 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Anthracene | 750 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Benzo(a)anthracene | 2700 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Benzo(a)pyrene | 2500 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Benzo(b)fluoranthene | 3300 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Benzo(g,h,i)perylene | 1700 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Benzo(k)fluoranthene | 1300 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Chrysene | 2400 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Fluoranthene | 5000 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Fluorene | 330 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Indeno(1,2,3-c,d)pyrene | 1500 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Phenanthrene | 2600 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| Pyrene | 5700 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:14:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 6.20 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 8A |
| **Lab Order:** | 0608193 | **Tag Number:** | 1B |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-08A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 13.7 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | 290 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Anthracene | 850 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Benzo(a)anthracene | 1600 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Benzo(a)pyrene | 1200 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Benzo(b)fluoranthene | 1400 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Benzo(g,h,i)perylene | 580 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Benzo(k)fluoranthene | 680 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Chrysene | 1400 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Dibenzo(a,h)anthracene | 220 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Fluoranthene | 3800 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Fluorene | 410 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Indeno(1,2,3-c,d)pyrene | 640 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Phenanthrene | 3600 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| Pyrene | 4100 | 140 | | µg/Kg-dry | 1 | 8/29/2006 10:41:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 6.30 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 9A |
| **Lab Order:** | 0608193 | **Tag Number:** | 2B |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-09A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 12.0 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Benzo(a)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Benzo(a)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Benzo(b)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Chrysene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Phenanthrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| Pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:09:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.60 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 10A |
| **Lab Order:** | 0608193 | **Tag Number:** | 3B |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-10A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 12.0 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Benzo(a)anthracene | 100 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Benzo(a)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Benzo(b)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Chrysene | 82 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Fluoranthene | 110 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Phenanthrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| Pyrene | 140 | 140 | | µg/Kg-dry | 1 | 8/29/2006 11:36:00 AM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.30 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 11A |
| **Lab Order:** | 0608193 | **Tag Number:** | 4B |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-11A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 14.9 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Anthracene | 110 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Benzo(a)anthracene | 540 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Benzo(a)pyrene | 620 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Benzo(b)fluoranthene | 700 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Benzo(g,h,i)perylene | 400 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Benzo(k)fluoranthene | 280 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Chrysene | 510 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Dibenzo(a,h)anthracene | 99 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Fluoranthene | 890 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Indeno(1,2,3-c,d)pyrene | 340 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Phenanthrene | 390 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| Pyrene | 1100 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:04:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.10 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 12A |
| **Lab Order:** | 0608193 | **Tag Number:** | 5B |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-12A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 13.6 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | 300 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Acenaphthylene | 120 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Anthracene | 1300 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Benzo(a)anthracene | 3400 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Benzo(a)pyrene | 3400 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Benzo(b)fluoranthene | 4500 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Benzo(g,h,i)perylene | 2100 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Benzo(k)fluoranthene | 1600 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Chrysene | 3300 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Dibenzo(a,h)anthracene | 680 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Fluoranthene | 6400 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Fluorene | 450 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Indeno(1,2,3-c,d)pyrene | 2100 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Phenanthrene | 4000 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| Pyrene | 7200 | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:31:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 6.80 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 13A |
| **Lab Order:** | 0608193 | **Tag Number:** | 6B |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-13A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 12.1 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Benzo(a)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Benzo(a)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Benzo(b)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Chrysene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Phenanthrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| Pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 12:59:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.30 | 0 | | pH Units | 1 | 8/18/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 14A |
| **Lab Order:** | 0608193 | **Tag Number:** | 1S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-14A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 12.4 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Benzo(a)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Benzo(a)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Benzo(b)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Chrysene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Phenanthrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| Pyrene | 100 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 1:27:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 6.30 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

**CLIENT:** RMC Inc.
**Lab Order:** 0608193
**Project:** Willow Grove NAS/JRB Site 5 Fire Fighting Ar
**Lab ID:** 0608193-15A

**Client Sample ID:** Willow Grove Site 5 15A
**Tag Number:** 2S
**Collection Date:** 8/15/2006 9:20:00 AM
**Matrix:** SOIL

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 13.2 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Anthracene | 75 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Benzo(a)anthracene | 250 | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Benzo(a)pyrene | 290 | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Benzo(b)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Chrysene | 290 | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Fluoranthene | 500 | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Indeno(1,2,3-c,d)pyrene | 160 | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Phenanthrene | 190 | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| Pyrene | 640 | 140 | | µg/Kg-dry | 1 | 8/29/2006 1:54:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 6.20 | 0 | | pH Units | 1 | 8/18/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 16A |
| **Lab Order:** | 0608193 | **Tag Number:** | 3S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-16A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 12.8 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Benzo(a)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Benzo(a)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Benzo(b)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Chrysene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Fluoranthene | 89 | 140 | J | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Phenanthrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| Pyrene | U | 140 | | µg/Kg-dry | 1 | 8/29/2006 2:22:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.30 | 0 | | pH Units | 1 | 8/18/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 17A |
| **Lab Order:** | 0608193 | **Tag Number:** | 4S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-17A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 15.8 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | 97 | 140 | J | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Anthracene | 400 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Benzo(a)anthracene | 1100 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Benzo(a)pyrene | 1100 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Benzo(b)fluoranthene | 1500 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Benzo(g,h,i)perylene | 690 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Benzo(k)fluoranthene | 570 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Chrysene | 980 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Dibenzo(a,h)anthracene | 190 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Fluoranthene | 2500 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Fluorene | 200 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Indeno(1,2,3-c,d)pyrene | 680 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Phenanthrene | 1500 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| Pyrene | 2900 | 140 | | µg/Kg-dry | 1 | 8/25/2006 8:49:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 7.10 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 18A |
| **Lab Order:** | 0608193 | **Tag Number:** | 5S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-18A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 14.5 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Anthracene | 150 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Benzo(a)anthracene | 620 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Benzo(a)pyrene | 760 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Benzo(b)fluoranthene | 1100 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Benzo(g,h,i)perylene | 510 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Benzo(k)fluoranthene | 350 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Chrysene | 650 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Dibenzo(a,h)anthracene | 160 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Fluoranthene | 980 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Indeno(1,2,3-c,d)pyrene | 430 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Phenanthrene | 380 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| Pyrene | 1400 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:15:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 7.00 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 19A |
| **Lab Order:** | 0608193 | **Tag Number:** | 6S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-19A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 11.6 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Benzo(a)anthracene | 79 | 140 | J | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Benzo(a)pyrene | 69 | 140 | J | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Benzo(b)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Chrysene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Fluoranthene | 130 | 140 | J | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Phenanthrene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| Pyrene | 190 | 140 | | µg/Kg-dry | 1 | 8/25/2006 9:42:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.40 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 20A |
| **Lab Order:** | 0608193 | **Tag Number:** | 22S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-20A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 13.0 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Benzo(a)anthracene | 110 | 140 | J | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Benzo(a)pyrene | 110 | 140 | J | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Benzo(b)fluoranthene | 150 | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Chrysene | 110 | 140 | J | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Fluoranthene | 190 | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Phenanthrene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| Pyrene | 210 | 140 | | µg/Kg-dry | 1 | 8/25/2006 10:08:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.40 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 21A |
| **Lab Order:** | 0608193 | **Tag Number:** | 7S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-21A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 9.55 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Acenaphthylene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Anthracene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Benzo(a)anthracene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Benzo(a)pyrene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Benzo(b)fluoranthene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Benzo(g,h,i)perylene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Benzo(k)fluoranthene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Chrysene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Dibenzo(a,h)anthracene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Fluoranthene | 110 | 130 | J | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Fluorene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Indeno(1,2,3-c,d)pyrene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Naphthalene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Phenanthrene | U | 130 | | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| Pyrene | 120 | 130 | J | µg/Kg-dry | 1 | 8/25/2006 10:34:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.60 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

# American Analytical Laboratories, LLC.

**Date:** *31-Aug-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | Willow Grove Site 5 22A |
| **Lab Order:** | 0608193 | **Tag Number:** | 8S |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Ar | **Collection Date:** | 8/15/2006 9:20:00 AM |
| **Lab ID:** | 0608193-22A | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 13.9 | 0 | | wt% | 1 | 8/17/2006 |
| **SEMIVOLATILE SW-846 METHOD 8270 (PAH)** | | **SW8270D** | | **SW3550A** | | Analyst: **PT** |
| Acenaphthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Acenaphthylene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Anthracene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Benzo(a)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Benzo(a)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Benzo(b)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Benzo(g,h,i)perylene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Benzo(k)fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Chrysene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Dibenzo(a,h)anthracene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Fluoranthene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Fluorene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Indeno(1,2,3-c,d)pyrene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Naphthalene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Phenanthrene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| Pyrene | U | 140 | | µg/Kg-dry | 1 | 8/25/2006 11:00:00 PM |
| **CORROSIVITY** | | **SW9045C** | | | | Analyst: **JC** |
| pH | 5.20 | 0 | | pH Units | 1 | 8/18/2006 |

| **Qualifiers:** | | | | |
|---|---|---|---|---|
| | B | Analyte detected in the associated Method Blank | E | Value above quantitation range |
| | H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| | ND | Not Detected at the Reporting Limit | S | Spike Recovery outside accepted recovery limits |
| | U | Indicates the compound was analyzed for but not detecte | X | Value exceeds Maximum Contaminant Level |

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.01 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-01A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 3100 | | 08/24/06 | 3000 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22243 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.02 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-02A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 6800 | | 08/24/06 | 1700 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22244 NYSDOH ID # 10320

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.03 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-03A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 6800 | | 08/24/06 | 1700 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22245 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.04 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-04A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1100 | * | 08/24/06 | 1300 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.
* Reported below method detection limit (MDL).

DIRECTOR

rn = 22246 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.05 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-05A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 4000 | | 08/24/06 | 900 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22247 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.06 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-06A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 2900 | | 08/24/06 | 1000 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22248 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.07 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-07A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 4100 | | 08/24/06 | 1000 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22249 NYSDOH ID # 10320

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.08 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-08A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 4700 | | 08/24/06 | 900 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22250 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.09 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-09A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX: Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1800 | | 08/24/06 | 1000 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22251 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.10 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-10A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1100 | | 08/24/06 | 900 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22252 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.11 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-11A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1100 | | 08/24/06 | 900 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22253 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.12 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-12A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 3600 | | 08/24/06 | 1700 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22254 NYSDOH ID # 10320

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.13 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-13A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1200 | | 08/24/06 | 1100 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22255 NYSDOH ID # 10320

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.14 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-14A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1100 | | 08/24/06 | 900 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22256 NYSDOH ID # 10320

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.15 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-15A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1100 | | 08/24/06 | 900 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22257 NYSDOH ID # 10320

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.16 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-16A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 650 | * | 08/24/06 | 1000 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.
* Reported below method detection limit (MDL).

DIRECTOR

rn = 22258 NYSDOH ID # 10320

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.17 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-17A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920

MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 3000 | | 08/24/06 | 1200 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22259 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.18 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-18A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920
MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1300 | | 08/24/06 | 1000 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR_____

rn = 22260 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.19 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-19A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920
MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 800 | * | 08/24/06 | 900 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.
* Reported below method detection limit (MDL).

DIRECTOR

rn = 22261 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.20 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-20A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920
MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1100 | | 08/24/06 | 900 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22262 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.21 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-21A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920
MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1000 | | 08/25/06 | 900 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22263 NYSDOH ID # 10320 

EcoTest Laboratories Inc
377 Sheffield Ave
North Babylon, NY 11703
631 422-5777

LAB NO.263159.22 08/28/06

American Analytical Laboratories
56 Toledo Street
Farmingdale, NY 11735
ATTN: Lori Beyer PO#:

SOURCE OF SAMPLE: AAL #0608193-22A
SOURCE OF SAMPLE:
COLLECTED BY: Client DATE COL'D:08/15/06 RECEIVED:08/17/06
TIME COL'D:0920
MATRIX:.Soil SAMPLE:

| ANALYTICAL PARAMETERS | UNITS | RESULT | FLAG | DATE OF ANALYSIS | LRL | ANALYTICAL METHOD |
|---|---|---|---|---|---|---|
| Tot Organic Carbon | mg/Kg | 1100 | | 08/25/06 | 1000 | EPA415.1 |

cc:

LRL=laboratory Reporting Limit

REMARKS: Results reported on dry weight basis.

DIRECTOR

rn = 22264 NYSDOH ID # 10320 

# APPENDIX H: LABORATORY ANALYSES FOR BORROW PILE (FILL DIRT AND TOPSOIL)

AMERICAN ANALYTICAL LABORATORIES

NYSDOH 11418
NJDEP NY050
CTDOH PH-0205
PADEP 68-00573

Tuesday, January 31, 2006

William T. Hall, P.E.
RMC Inc.
46970 Bradley Boulevard
Suite B
Lexington Park, MD 20653

TEL: (301) 862-7501
FAX

RE: Willow Grove NAS/JRB Site 5 Fire Fightin

Order No.: 0601263

Dear William T. Hall, P.E.:

American Analytical Laboratories, LLC. received 2 sample(s) on 1/24/2006 for the analyses presented in the following report.

Samples were analyzed in accordance with the test procedures documented on the chain of custody and detailed throughout the text of this report.

The limits provided in the data package are analytical reporting limits and not Federal or Local mandated values to which the sample results should be compared.

There were no problems with the analyses and all data for associated QC met laboratory specifications.

If you have any questions regarding these tests results, please do not hesitate to call (631) 454-6100 or email me directly at lbeyer@american-analytical.com.

Sincerely,

Lori Beyer
Lab Director

56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX: (631) 454-8027

# American Analytical Laboratories, LLC.

**Date:** *31-Jan-06*

**CLIENT:** RMC Inc.
**Project:** Willow Grove NAS/JRB Site 5 Fire Fighting Tr
**Lab Order:** 0601263

## Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Tag Number | Collection Date | Date Received |
|---|---|---|---|---|
| 0601263-01A | 1A Willow Grove Site | RMC01232006 | 1/12/2006 | 1/24/2006 |
| 0601263-02A | 1B-Willow Grove Site | RMC01232006 | 1/12/2006 | 1/24/2006 |

AMERICAN ANALYTICAL LABORATORIES

56 TOLEDO STREET • FARMINGDALE, NEW YORK 11735
(631) 454-6100 • FAX (631) 454-8027

TAG # / COC RMC 01232006

| | |
|---|---|
| NYSDOH | 11418 |
| CTDOH | PH-0205 |
| NJDEP | NY050 |
| PADEP | 68-573 |

# CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS
RMC, Inc.
46960 Bradley Blvd.
Lexington Park, MD 20653

CONTACT:
William T. Hall, P.E.

SAMPLER (SIGNATURE): William T. Hall

SAMPLER NAME (PRINT): William T. Hall

SAMPLE(S) SEALED: YES / NO

CORRECT CONTAINER(S): YES / NO

PROJECT LOCATION:
Willow Grove NAS/JRB Water Samples -- Site 5 Fire Fighting Training Area
Soil Samples -- Borrow Pile for backfill and top soil

| LABORATORY ID # | MATRIX | # CON-TAINERS | SAMPLING DATE/ TIME | SAMPLE # - LOCATION | ANALYSIS REQUIRED: RCRA METALS | SEMIVOLATILES | FOR METHANOL PRESERVED SAMPLES [VOLATILE VIAL #] |
|---|---|---|---|---|---|---|---|
| 0601263-1A | SC | 1 | 01/12/2006 | 1A – Willow Grove Site | X | | |
| 2A | SC | 1 | 01/12/2006 | 1B – Willow Grove Site | | X | |

COOLER TEMPERATURE:

MATRIX S=SOIL; L=LIQUID; SL=SLUDGE; A=AIR; W=WIPE; P=PAINT CHIPS; B=BULK MATERIAL
TYPE G=GRAB; C=COMPOSITE, SS=SPLIT SPOON

TURNAROUND REQUIRED:
NORMAL ☐ STAT ☒ BY / /

COMMENTS / INSTRUCTIONS

| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |
|---|---|---|---|---|---|
| | | | JH | 1/24/06 1025 | P. Artonio |
| RELINQUISHED BY (SIGNATURE) | DATE / TIME | PRINTED NAME | RECEIVED BY LAB (SIGNATURE) | DATE / TIME | PRINTED NAME |

WHITE-OFFICE / CANARY-LAB / PINK-SAMPLE CUSTODIAN / GOLDENROD-CLIENT

**AMERICAN ANALYTICAL LABORATORIES, LLC**
*56 TOLEDO STREET*
*FARMINGDALE, NEW YORK 11735*
*TELEPHONE: (631) 454-6100 FAX: (631) 454-8027*

## DATA REPORTING QUALIFIERS

For reporting results, the following "Results Qualifiers" are used:

| | |
|---|---|
| **Value** | If the result is greater than or equal to the detection limit, report the value |
| **U** | Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required. |
| **J** | Indicates an estimated value. The flag is used:<br>(1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.)<br>(2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3ug/L was calculated report as 3J. This flag is used when similar situations arise on any organic parameter i.e. Pesticide, PCBs and others. |
| **B** | Indicates the analyte was found in the blank as well as the sample report "10B". |
| **E** | Indicates the analytes concentration exceeds the calibrated range of the instrument for that specific analysis. |
| **D** | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| **P** | This flag is used for Pesticide / PCB target analyte when there is >25% difference for detected concentrations between the two GC Columns. The higher of the two values is reported on Form I and flagged with a "P". |
| **N** | This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used. |
| **H** | Indicates sample was received and/or analyzed outside of The method allowable holding time |

# American Analytical Laboratories, LLC.

**Date:** *31-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | 1A Willow Grove Site |
| **Lab Order:** | 0601263 | **Tag Number:** | RMC01232006 |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Tr | **Collection Date:** | 1/12/2006 |
| **Lab ID:** | 0601263-01A **Date Received:** 1/24/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **MERCURY SW-846 7471** | | **SW7471B** | | | | Analyst: **BK** |
| Mercury | 0.0307 | 0.0111 | | mg/Kg-dry | 1 | 1/27/2006 |
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 9.78 | 0 | | wt% | 1 | 1/25/2006 |
| **RCRA METALS** | | **SW6010B** | | **(SW3050A)** | | Analyst: **JP** |
| Arsenic | 5.51 | 0.537 | | mg/Kg-dry | 1 | 1/26/2006 4:31:34 PM |
| Barium | 158 | 0.430 | | mg/Kg-dry | 1 | 1/26/2006 4:31:34 PM |
| Cadmium | 0.454 | 0.215 | | mg/Kg-dry | 1 | 1/26/2006 4:31:34 PM |
| Chromium | 22.9 | 0.430 | | mg/Kg-dry | 1 | 1/26/2006 4:31:34 PM |
| Lead | 23.5 | 0.322 | | mg/Kg-dry | 1 | 1/26/2006 4:31:34 PM |
| Selenium | U | 0.537 | | mg/Kg-dry | 1 | 1/26/2006 4:31:34 PM |
| Silver | U | 0.430 | | mg/Kg-dry | 1 | 1/26/2006 4:31:34 PM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *31-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | 1B-Willow Grove Site |
| **Lab Order:** | 0601263 | **Tag Number:** | RMC01232006 |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Tr | **Collection Date:** | 1/12/2006 |
| **Lab ID:** | 0601263-02A **Date Received:** 1/24/2006 | **Matrix:** | SOIL |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **PERCENT MOISTURE** | | **D2216** | | | | Analyst: **PA** |
| Percent Moisture | 8.17 | 0 | | wt% | 1 | 1/25/2006 |
| **SEMIVOLATILES SW-846 8270** | | **SW8270D** | | **(SW3550A)** | | Analyst: **PT** |
| 1,2,4-Trichlorobenzene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 1,2-Dichlorobenzene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 1,3-Dichlorobenzene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 1,4-Dichlorobenzene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2,4,5-Trichlorophenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2,4,6-Trichlorophenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2,4-Dichlorophenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2,4-Dimethylphenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2,4-Dinitrophenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2,4-Dinitrotoluene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2,6-Dinitrotoluene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2-Chloronaphthalene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2-Chlorophenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2-Methylnaphthalene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2-Methylphenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2-Nitroaniline | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 2-Nitrophenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 3,3´-Dichlorobenzidine | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 3+4-Methylphenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 3-Nitroaniline | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 4,6-Dinitro-2-methylphenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 4-Bromophenyl phenyl ether | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 4-Chloro-3-methylphenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 4-Chloroaniline | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 4-Chlorophenyl phenyl ether | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 4-Nitroaniline | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| 4-Nitrophenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Acenaphthene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Acenaphthylene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Aniline | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Anthracene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Azobenzene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Benzidine | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Benzo(a)anthracene | 460 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Benzo(a)pyrene | 480 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Benzo(b)fluoranthene | 730 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# American Analytical Laboratories, LLC.

**Date:** *31-Jan-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | RMC Inc. | **Client Sample ID:** | 1B-Willow Grove Site |
| **Lab Order:** | 0601263 | **Tag Number:** | RMC01232006 |
| **Project:** | Willow Grove NAS/JRB Site 5 Fire Fighting Tr | **Collection Date:** | 1/12/2006 |
| **Lab ID:** | 0601263-02A **Date Received:** 1/24/2006 | **Matrix:** | SOIL |

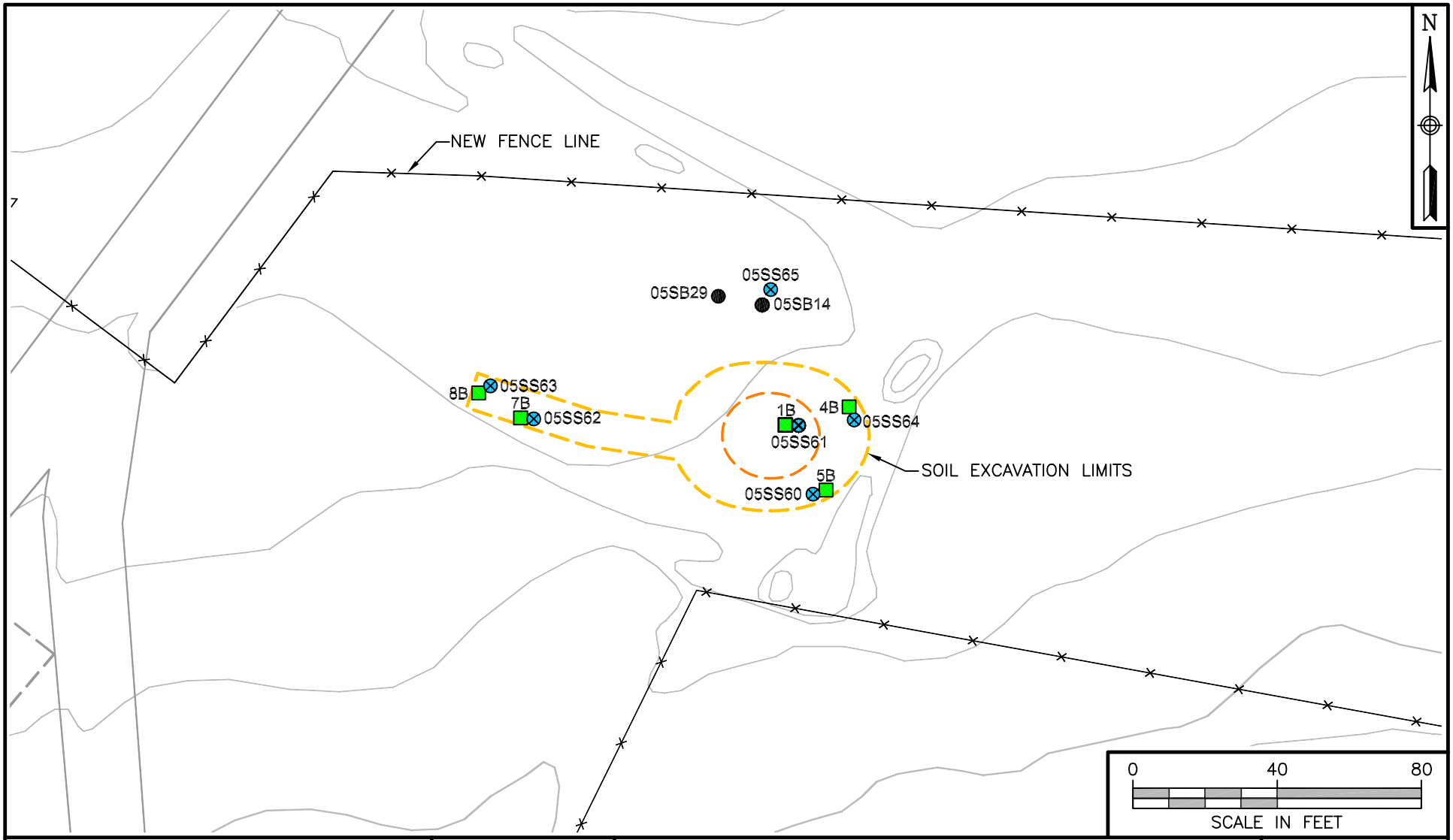
| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| Benzo(g,h,i)perylene | 500 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Benzo(k)fluoranthene | 250 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Benzoic acid | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Benzyl alcohol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Bis(2-chloroethoxy)methane | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Bis(2-chloroethyl)ether | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Bis(2-chloroisopropyl)ether | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Bis(2-ethylhexyl)phthalate | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Butyl benzyl phthalate | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Carbazole | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Chrysene | 500 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Dibenzo(a,h)anthracene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Dibenzofuran | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Diethyl phthalate | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Dimethyl phthalate | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Di-n-butyl phthalate | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Di-n-octyl phthalate | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Fluoranthene | 940 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Fluorene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Hexachlorobenzene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Hexachlorobutadiene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Hexachlorocyclopentadiene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Hexachloroethane | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Indeno(1,2,3-c,d)pyrene | 410 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Isophorone | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Naphthalene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Nitrobenzene | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| N-Nitrosodimethylamine | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| N-Nitrosodi-n-propylamine | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| N-Nitrosodiphenylamine | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Pentachlorophenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Phenanthrene | 380 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Phenol | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Pyrene | 870 | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |
| Pyridine | U | 130 | | µg/Kg-dry | 3 | 1/28/2006 4:29:00 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| S | Spike Recovery outside accepted recovery limits | U | Indicates the compound was analyzed for but not detecte |

# APPENDIX I: DIOXIN DATA SUPPLIED BY THE NAVY

2192/0110/2192CM01.DWG 09/26/06 MKB




LEGEND

- PROPOSED SAMPLE LOCATION
- RMC BOTTOM CONFIRMATION SAMPLE
- PREVIOUS RI SOIL SAMPLE LOCATION

TETRA TECHNUS, INC.

PROPOSED DIOXIN SAMPLE LOCATIONS
SITE 5 – FIRE TRAINING AREA
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

| | |
|---|---|
| SCALE | AS NOTED |
| FILE | 2192CM01.DWG |
| REV | 0 |
| DATE | 09/26/06 |
| FIGURE NUMBER | FIGURE 1 |

TETRA TECH NUS

PHIL-20604

| | | | |
|---|---|---|---|
| **TO:** | **RUSS TURNER** | **DATE:** | **NOVEMBER 30, 2006** |
| **FROM:** | **MEGAN RITCHIE** | **COPIES:** | **FILE** |

**SUBJECT:** **ORGANIC DATA REVIEW – CHLORINATED DIOXINS/FURANS**
**SITE 05 SOIL SAMPLES – NAS JRB WILLOW GROVE, PENNSYLVANIA**
**SDG 67189**

**SAMPLES:** **6/Solid/**

| | |
|---|---|
| 05SS60 | 05SS63 |
| 05SS61 | 05SS64 |
| 05SS62 | 05SS65 |

## OVERVIEW

The sample set for Site 5 Soil Samples, NAS JRB Willow Grove, Pennsylvania, SDG 67189, consists of 6 solid environmental samples (designated 05SS-). All samples were analyzed for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans. One field duplicate pair (05SS60 and 05SS65) was included in this SDG.

The samples were collected by Tetra Tech NUS on September 28, 2006 and analyzed by Eno River Labs, LLC of Durham, North Carolina.

All analyses were conducted by high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS) using EPA SW-846 Method 8290.

## SUMMARY

All analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, instrument performance checks, initial/continuing calibrations, laboratory and field quality control blank results, field duplicate results, compound identification, compound quantitation, and detection limits.

## MINOR PROBLEMS

The laboratory qualified results for PCDDs/PCDFs as estimated maximum possible concentrations (EMPCs) if method QC requirements for compound identification were not met with respect to molecular ion ratios exceeding plus or minus 15% from the theoretical chlorine isotope-based mass abundance ratios, in cases where all other criteria were met for PCDD/PCDF peak identification (signal-to-noise, retention times coincident with expected values from calibration standards, and absence of chlorinated diphenyl ether interferences).

In accordance with Region 3 dioxin validation guidance, these EMPC values were handled during data validation in one of two ways: Those PCDD/PCDF results associated with ion ratios outside of plus or minus 25% of theoretical were not considered as positively identified concentrations and retained the EMPC qualifier. In contrast, results associated with ion ratios within the expanded ion ratio criteria of plus or minus 25% (but outside of plus or minus 15%) were considered positively identified and qualified as estimated values (J), and the EMPC qualifier was removed from results in this category.

Total PCDF values are qualified (I) if the total DPE contribution to the total PCDF value is greater than 10%. All PCDF peaks that are significantly influenced by the presence of DPE peaks are either reported as EMPC values without regard to the isotopic abundance ratio, or are included in the detection limit value.

**NOTES**

OCDD was detected in the laboratory method blank at a concentration of 0.62 pg/g. No results were within 10 times the blank concentration, therefore no action was taken.

The MS/MSD recoveries were outside criteria for 1,2,3,4,6,7,8-HpCDD and OCDD. No qualifications were made on MS/MSD data alone.

The laboratory reported a set of results for 2,3,7,8-TCDF in sample 05SS64 because a second column (DB-225) analysis was used after the first column (DB-5) indicated the presence of this isomer. The DB-225 column results were retained for presentation in the data summary because this column has superior performance for resolving 2,3,7,8-TCDF from potential nearby TCDF isomers.

Two laboratory results (samples 05SS61 and 05SS64) for OCDD were reported from a 10-fold dilution analysis because the detected concentrations were greater than the upper calibration limit.

The sample cooler was received at the laboratory at 7°C, which is over the temperature criteria range of 2-6°C. No qualifications were made based upon professional judgement.

**EXECUTIVE SUMMARY**

**Laboratory Performance:** One analyte was detected in the laboratory blank.

**Other Factors Affecting Data Quality:** Several results were considered estimated due to ion ratios outside method criteria for compound identification but within an expanded identification window. A few results did not meet expanded ion ratio criteria and were qualified as EMPCs.

The data for these analyses were reviewed to evaluate usability with reference to the EPA "National Functional Guidelines for Chlorinated Dioxin/Furan Data Review" (2005), as amended for use within EPA Region 3 following the document, "Region III Dioxin/Furan Data Validation Guidance" (1999), and the NFESC document entitled "Navy IRCDQM" (9/99).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were reviewed according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Megan Ritchie

Tetra Tech NUS, Inc.
Megan Ritchie
Data Validator

Tetra Tech NUS, Inc.
Russell Sloboda
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

# PROJ_NO: 2192

SDG: 67189 MEDIA: SOIL DATA FRACTION: DIOX

| | |
|---|---|
| nsample | 05SS60 |
| samp_date | 9/28/2006 |
| lab_id | 423-96-1 |
| qc_type | NM |
| units | NG/KG |
| Pct_Solids | 74.8 |
| DUP_OF: | |

| Parameter | Result | Val Qual | Qual Code |
|---|---|---|---|
| 1,2,3,4,6,7,8,9-OCDD | 2060 | | |
| 1,2,3,4,6,7,8,9-OCDF | 0.88 | J | WP |
| 1,2,3,4,6,7,8-HPCDD | 23.3 | | |
| 1,2,3,4,6,7,8-HPCDF | 0.72 | J | WP |
| 1,2,3,4,7,8,9-HPCDF | 0.2 | U | |
| 1,2,3,4,7,8-HXCDD | 0.2 | U | |
| 1,2,3,4,7,8-HXCDF | 0.2 | U | |
| 1,2,3,6,7,8-HXCDD | 0.52 | J | |
| 1,2,3,6,7,8-HXCDF | 0.1 | U | |
| 1,2,3,7,8,9-HXCDD | 0.5 | J | P |
| 1,2,3,7,8,9-HXCDF | 0.2 | U | |
| 1,2,3,7,8-PECDD | 0.3 | U | |
| 1,2,3,7,8-PECDF | 0.2 | U | |
| 2,3,4,6,7,8-HXCDF | 0.1 | U | |
| 2,3,4,7,8-PECDF | 0.2 | U | |
| 2,3,7,8-TCDD | 0.3 | U | |
| 2,3,7,8-TCDF | 0.2 | U | |
| TOTAL HPCDD | 46.8 | | |
| TOTAL HPCDF | 3.4 | EMPC | W |
| TOTAL HXCDD | 6.5 | EMPC | W |
| TOTAL HXCDF | 3.6 | IEMPC | QW |
| TOTAL PECDD | 0.3 | U | |
| TOTAL PECDF | 3.4 | IEMPC | QW |
| TOTAL TCDD | 0.3 | U | |
| TOTAL TCDF | 4.2 | IEMPC | QW |

| | |
|---|---|
| nsample | 05SS61 |
| samp_date | 9/28/2006 |
| lab_id | 423-96-2 |
| qc_type | NM |
| units | NG/KG |
| Pct_Solids | 78.3 |
| DUP_OF: | |

| Parameter | Result | Val Qual | Qual Code |
|---|---|---|---|
| 1,2,3,4,6,7,8,9-OCDD | 5820 | | |
| 1,2,3,4,6,7,8,9-OCDF | 0.52 | J | P |
| 1,2,3,4,6,7,8-HPCDD | 24.4 | | |
| 1,2,3,4,6,7,8-HPCDF | 0.45 | J | P |
| 1,2,3,4,7,8,9-HPCDF | 0.07 | U | |
| 1,2,3,4,7,8-HXCDD | 0.24 | EMPC | Q |
| 1,2,3,4,7,8-HXCDF | 0.12 | J | P |
| 1,2,3,6,7,8-HXCDD | 0.4 | J | P |
| 1,2,3,6,7,8-HXCDF | 0.05 | U | |
| 1,2,3,7,8,9-HXCDD | 0.42 | J | WP |
| 1,2,3,7,8,9-HXCDF | 0.05 | U | |
| 1,2,3,7,8-PECDD | 0.11 | EMPC | Q |
| 1,2,3,7,8-PECDF | 0.05 | U | |
| 2,3,4,6,7,8-HXCDF | 0.04 | U | |
| 2,3,4,7,8-PECDF | 0.05 | U | |
| 2,3,7,8-TCDD | 0.07 | U | |
| 2,3,7,8-TCDF | 0.06 | U | |
| TOTAL HPCDD | 45.6 | | |
| TOTAL HPCDF | 2.1 | IEMPC | QW |
| TOTAL HXCDD | 8.4 | EMPC | W |
| TOTAL HXCDF | 1.8 | IEMPC | QW |
| TOTAL PECDD | 2.1 | EMPC | W |
| TOTAL PECDF | 1.4 | IEMPC | QW |
| TOTAL TCDD | 0.18 | EMPC | W |
| TOTAL TCDF | 1.9 | IEMPC | QW |

| | |
|---|---|
| nsample | 05SS62 |
| samp_date | 9/28/2006 |
| lab_id | 423-96-3 |
| qc_type | NM |
| units | NG/KG |
| Pct_Solids | 72.3 |
| DUP_OF: | |

| Parameter | Result | Val Qual | Qual Code |
|---|---|---|---|
| 1,2,3,4,6,7,8,9-OCDD | 3880 | | |
| 1,2,3,4,6,7,8,9-OCDF | 0.27 | J | WP |
| 1,2,3,4,6,7,8-HPCDD | 12.6 | | |
| 1,2,3,4,6,7,8-HPCDF | 0.15 | EMPC | Q |
| 1,2,3,4,7,8,9-HPCDF | 0.1 | U | |
| 1,2,3,4,7,8-HXCDD | 0.1 | U | |
| 1,2,3,4,7,8-HXCDF | 0.07 | U | |
| 1,2,3,6,7,8-HXCDD | 0.1 | U | |
| 1,2,3,6,7,8-HXCDF | 0.07 | U | |
| 1,2,3,7,8,9-HXCDD | 0.1 | U | |
| 1,2,3,7,8,9-HXCDF | 0.08 | U | |
| 1,2,3,7,8-PECDD | 0.1 | U | |
| 1,2,3,7,8-PECDF | 0.08 | U | |
| 2,3,4,6,7,8-HXCDF | 0.06 | U | |
| 2,3,4,7,8-PECDF | 0.08 | U | |
| 2,3,7,8-TCDD | 0.1 | U | |
| 2,3,7,8-TCDF | 0.09 | U | |
| TOTAL HPCDD | 24.7 | | |
| TOTAL HPCDF | 0.15 | EMPC | W |
| TOTAL HXCDD | 4.4 | EMPC | W |
| TOTAL HXCDF | 0.11 | EMPC | W |
| TOTAL PECDD | 0.48 | EMPC | W |
| TOTAL PECDF | 2.3 | IEMPC | QW |
| TOTAL TCDD | 0.34 | EMPC | W |
| TOTAL TCDF | 6.2 | IEMPC | QW |

# PROJ_NO: 2192

SDG: 67189 MEDIA: SOIL DATA FRACTION: DIOX

| | |
|---|---|
| nsample | 05SS63 |
| samp_date | 9/28/2006 |
| lab_id | 423-96-4 |
| qc_type | NM |
| units | NG/KG |
| Pct_Solids | 74.9 |
| DUP_OF: | |

| Parameter | Result | Val Qual | Qual Code |
|---|---|---|---|
| 1,2,3,4,6,7,8,9-OCDD | 3600 | | |
| 1,2,3,4,6,7,8,9-OCDF | 0.4 | J | P |
| 1,2,3,4,6,7,8-HPCDD | 13.9 | | |
| 1,2,3,4,6,7,8-HPCDF | 0.2 | J | P |
| 1,2,3,4,7,8,9-HPCDF | 0.09 | U | |
| 1,2,3,4,7,8-HXCDD | 0.08 | U | |
| 1,2,3,4,7,8-HXCDF | 0.12 | J | P |
| 1,2,3,6,7,8-HXCDD | 0.18 | J | WP |
| 1,2,3,6,7,8-HXCDF | 0.05 | U | |
| 1,2,3,7,8,9-HXCDD | 0.08 | U | |
| 1,2,3,7,8,9-HXCDF | 0.06 | U | |
| 1,2,3,7,8-PECDD | 0.08 | U | |
| 1,2,3,7,8-PECDF | 0.06 | U | |
| 2,3,4,6,7,8-HXCDF | 0.05 | U | |
| 2,3,4,7,8-PECDF | 0.06 | U | |
| 2,3,7,8-TCDD | 0.08 | U | |
| 2,3,7,8-TCDF | 0.07 | U | |
| TOTAL HPCDD | 26.8 | | |
| TOTAL HPCDF | 0.64 | | |
| TOTAL HXCDD | 5.9 | EMPC | W |
| TOTAL HXCDF | 0.45 | IEMPC | QW |
| TOTAL PECDD | 1.1 | EMPC | W |
| TOTAL PECDF | 0.86 | IEMPC | QW |
| TOTAL TCDD | 0.23 | EMPC | W |
| TOTAL TCDF | 1.5 | IEMPC | QW |

| | |
|---|---|
| nsample | 05SS64 |
| samp_date | 9/28/2006 |
| lab_id | 423-96-5A |
| qc_type | NM |
| units | NG/KG |
| Pct_Solids | 82.7 |
| DUP_OF: | |

| Parameter | Result | Val Qual | Qual Code |
|---|---|---|---|
| 1,2,3,4,6,7,8,9-OCDD | 8670 | | |
| 1,2,3,4,6,7,8,9-OCDF | 45.3 | | |
| 1,2,3,4,6,7,8-HPCDD | 338 | | |
| 1,2,3,4,6,7,8-HPCDF | 32.1 | | |
| 1,2,3,4,7,8,9-HPCDF | 2.6 | J | P |
| 1,2,3,4,7,8-HXCDD | 4.3 | J | P |
| 1,2,3,4,7,8-HXCDF | 9.4 | J | |
| 1,2,3,6,7,8-HXCDD | 10.9 | | |
| 1,2,3,6,7,8-HXCDF | 3.9 | J | P |
| 1,2,3,7,8,9-HXCDD | 6.4 | | |
| 1,2,3,7,8,9-HXCDF | 0.2 | U | |
| 1,2,3,7,8-PECDD | 3 | J | P |
| 1,2,3,7,8-PECDF | 17.1 | IEMPC | QW |
| 2,3,4,6,7,8-HXCDF | 4.7 | J | P |
| 2,3,4,7,8-PECDF | 2.8 | J | PW |
| 2,3,7,8-TCDD | 2.7 | | |
| 2,3,7,8-TCDF | 2.4 | | |
| TOTAL HPCDD | 695 | | |
| TOTAL HPCDF | 106 | IEMPC | QW |
| TOTAL HXCDD | 128 | | |
| TOTAL HXCDF | 110 | IEMPC | QW |
| TOTAL PECDD | 41.2 | EMPC | W |
| TOTAL PECDF | 79.7 | IEMPC | QW |
| TOTAL TCDD | 25.2 | | |
| TOTAL TCDF | 69.4 | IEMPC | QW |

| | |
|---|---|
| nsample | 05SS65 |
| samp_date | 9/28/2006 |
| lab_id | 423-96-6 |
| qc_type | NM |
| units | NG/KG |
| Pct_Solids | 79.5 |
| DUP_OF: | 05SS60 |

| Parameter | Result | Val Qual | Qual Code |
|---|---|---|---|
| 1,2,3,4,6,7,8,9-OCDD | 2880 | | |
| 1,2,3,4,6,7,8,9-OCDF | 1.5 | J | WP |
| 1,2,3,4,6,7,8-HPCDD | 37.4 | | |
| 1,2,3,4,6,7,8-HPCDF | 1.4 | J | P |
| 1,2,3,4,7,8,9-HPCDF | 0.2 | U | |
| 1,2,3,4,7,8-HXCDD | 0.2 | U | |
| 1,2,3,4,7,8-HXCDF | 0.29 | J | P |
| 1,2,3,6,7,8-HXCDD | 0.79 | J | P |
| 1,2,3,6,7,8-HXCDF | 0.1 | U | |
| 1,2,3,7,8,9-HXCDD | 0.63 | J | P |
| 1,2,3,7,8,9-HXCDF | 0.2 | U | |
| 1,2,3,7,8-PECDD | 0.2 | U | |
| 1,2,3,7,8-PECDF | 0.2 | U | |
| 2,3,4,6,7,8-HXCDF | 0.1 | U | |
| 2,3,4,7,8-PECDF | 0.2 | U | |
| 2,3,7,8-TCDD | 0.2 | U | |
| 2,3,7,8-TCDF | 0.41 | J | P |
| TOTAL HPCDD | 73.8 | | |
| TOTAL HPCDF | 5.2 | IEMPC | QW |
| TOTAL HXCDD | 8.9 | | |
| TOTAL HXCDF | 5.3 | IEMPC | QW |
| TOTAL PECDD | 0.55 | | |
| TOTAL PECDF | 5.3 | IEMPC | QW |
| TOTAL TCDD | 0.2 | U | |
| TOTAL TCDF | 6.3 | IEMPC | QW |

**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 | = | LSC/LSCD Noncompliance |
| f | = | Laboratory Duplicate Imprecision |
| g | = | Field Duplicate Imprecision |
| h | = | Holding Time Exceedance |
| i | = | ICP Serial Dilution Noncompliance |
| j | = | GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient) |
| k | = | ICP Interference – include ICSAB %Rs |
| l | = | Instrument Calibration Range Exceedance |
| m | = | Sample Preservation |
| n | = | Internal Standard Noncompliance |
| n01 | = | Internal Standard Recovery Noncompliance Dioxins |
| n02 | = | Recovery Standard Noncompliance Dioxins |
| n03 | = | Clean-up Standard Noncompliance Dioxins |
| o | = | Poor Instrument Performance (i.e. baseline drifting) |
| p | = | Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics) |
| q | = | Other Problems (can encompass of number of issues) |
| r | = | Surrogates Recovery Noncompliance |
| s | = | Pesticide/PCB Resolution |
| t | = | % Breakdown Noncompliance for DDT and Endrin |
| u | = | Pesticide/PCB % Difference Between Columns for Positive Results |
| v | = | Non-linear Calibrations, Tuning r <0.995 (correlation coefficient) |
| w | = | Ratios of primary monitored ions outside of theoretical +/-15 %, within +/- 25 % |
| x | = | Signal to noise response drop |
| y | = | Percent solids <30% |
| z | = | Uncertainty at 2 sigma deviation is greater than sample activity |

# APPENDIX B

Results as Reported by the Laboratory

# Tetra Tech/NUS

Lab Project: **67189**
Client Sample: **05SS60**

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: **W024202**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | | |
| Sample Matrix: | **SOIL** | Date Received: | **09/30/2006** | Spike File: | **SPMIT322** |
| Lab ID: | **423-96-1** | Date Extracted: | **10/11/2006** | ICal: | **WF5O166** |
| | | Date Analyzed: | **10/17/2006** | ConCal: | **W024102** |
| Sample Size: | **13.500 g** | Dilution Factor: | **n/a** | % Moisture: | **25.2** |
| Dry Weight: | **10.098 g** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-5** | Analyst: | **JSY** | % Solids: | **74.8** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.3 | | | | ___ |
| 1,2,3,7,8-PeCDD | ND | 0.3 | | | | ___ |
| 1,2,3,4,7,8-HxCDD | ND | 0.2 | | | | ___ |
| 1,2,3,6,7,8-HxCDD | 0.52 | | | 1.40 | 34:28 | J__ |
| 1,2,3,7,8,9-HxCDD | 0.50 | | | 1.22 | 34:46 | J__ |
| 1,2,3,4,6,7,8-HpCDD | 23.3 | | | 1.00 | 37:44 | ___ |
| 1,2,3,4,6,7,8,9-OCDD | 2060 | | | 0.87 | 41:24 | ___ |
| 2,3,7,8-TCDF | ND | 0.2 | | | | ___ |
| 1,2,3,7,8-PeCDF | ND | 0.2 | | | | ___ |
| 2,3,4,7,8-PeCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,7,8-HxCDF | ND | 0.2 | | | | ___ |
| 1,2,3,6,7,8-HxCDF | ND | 0.1 | | | | ___ |
| 2,3,4,6,7,8-HxCDF | ND | 0.1 | | | | ___ |
| 1,2,3,7,8,9-HxCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDF | EMPC | | 0.72 | | | J__ |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,6,7,8,9-OCDF | EMPC | | 0.88 | | | J__ |

| Totals | Conc. (pg/g) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | ND | | 0.3 | | ___ |
| Total PeCDD | ND | | 0.3 | | ___ |
| Total HxCDD | 5.4 | 4 | | 6.5 | ___ |
| Total HpCDD | 46.8 | 2 | | | ___ |
| Total TCDF | 0.72 | 1 | | 4.2 | X__ |
| Total PeCDF | 0.46 | 1 | | 3.4 | X__ |
| Total HxCDF | 0.60 | 2 | | 3.6 | X__ |
| Total HpCDF | 2.7 | 2 | | 3.4 | ___ |



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# Tetra Tech/NUS

Lab Project: **67189**
Client Sample: **05SS61**

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: **W024203**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | | |
| Sample Matrix: | **SOIL** | Date Received: | **09/30/2006** | Spike File: | **SPMIT322** |
| Lab ID: | **423-96-2** | Date Extracted: | **10/11/2006** | ICal: | **WF5O166** |
| | | Date Analyzed: | **10/17/2006** | ConCal: | **W024102** |
| Sample Size: | **13.100 g** | Dilution Factor: | **n/a** | % Moisture: | **21.7** |
| Dry Weight: | **10.257 g** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-5** | Analyst: | **JSY** | % Solids: | **78.3** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.07 | | | | ___ |
| 1,2,3,7,8-PeCDD | EMPC | | 0.11 | | | J__ |
| 1,2,3,4,7,8-HxCDD | EMPC | | 0.24 | | | J__ |
| 1,2,3,6,7,8-HxCDD | 0.40 | | | 1.17 | 34:28 | J__ |
| 1,2,3,7,8,9-HxCDD | EMPC | | 0.42 | | | J__ |
| 1,2,3,4,6,7,8-HpCDD | 24.4 | | | 0.99 | 37:44 | ___ |
| 1,2,3,4,6,7,8,9-OCDD | 5570 | | | 0.86 | 41:25 | E__ |
| 2,3,7,8-TCDF | ND | 0.06 | | | | ___ |
| 1,2,3,7,8-PeCDF | ND | 0.05 | | | | ___ |
| 2,3,4,7,8-PeCDF | ND | 0.05 | | | | ___ |
| 1,2,3,4,7,8-HxCDF | 0.12 | | | 1.10 | 33:41 | J__ |
| 1,2,3,6,7,8-HxCDF | ND | 0.05 | | | | ___ |
| 2,3,4,6,7,8-HxCDF | ND | 0.04 | | | | ___ |
| 1,2,3,7,8,9-HxCDF | ND | 0.05 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDF | 0.45 | | | 1.11 | 36:42 | J__ |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.07 | | | | ___ |
| 1,2,3,4,6,7,8,9-OCDF | 0.52 | | | 0.76 | 41:36 | J__ |

| Totals | Conc. (pg/g) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | EMPC | | | 0.18 | ___ |
| Total PeCDD | 1.4 | 3 | | 2.1 | ___ |
| Total HxCDD | 6.4 | 3 | | 8.4 | ___ |
| Total HpCDD | 45.6 | 2 | | | ___ |
| Total TCDF | EMPC | | | 1.9 | X__ |
| Total PeCDF | 0.43 | 1 | | 1.4 | X__ |
| Total HxCDF | 0.86 | 4 | | 1.8 | X__ |
| Total HpCDF | 1.6 | 2 | | 2.1 | X__ |



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# Tetra Tech/NUS

Lab Project: **67189**
Client Sample: **05SS61**

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: **T062557**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | | |
| Sample Matrix: | **SOIL** | Date Received: | **09/30/2006** | Spike File: | **SPMIT3J2** |
| Lab ID: | **423-96-2** | Date Extracted: | **10/11/2006** | ICal: | **TF57146** |
| | | Date Analyzed: | **10/19/2006** | ConCal: | **T062543** |
| Sample Size: | **13.100 g** | Dilution Factor: | **10X** | % Moisture: | **21.7** |
| Dry Weight: | **10.257 g** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-5** | Analyst: | **JSY** | % Solids: | **78.3** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 1,2,3,4,6,7,8,9-OCDD | 5820 | | | 0.91 | 41:24 | ___ |

| Internal Standard | Conc. (pg/g) | % Recovery | QC Limits | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| $^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD | 3100 | 72.2 | 40%-135% | 0.84 | 41:23 | ___ |

| Recovery Standard | Ratio | RT | Flags |
|---|---|---|---|
| $^{13}C_{12}$-1,2,3,7,8,9-HxCDD | 1.20 | 34:45 | ___ |

Data Reviewer: MCM 10/23/2006



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# Tetra Tech/NUS

Lab Project: **67189**
Client Sample: **05SS62**

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: **W024204**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | | |
| Sample Matrix: | **SOIL** | Date Received: | **09/30/2006** | Spike File: | **SPMIT322** |
| Lab ID: | **423-96-3** | Date Extracted: | **10/11/2006** | ICal: | **WF5O166** |
| | | Date Analyzed: | **10/17/2006** | ConCal: | **W024102** |
| Sample Size: | **14.100 g** | Dilution Factor: | **n/a** | % Moisture: | **27.7** |
| Dry Weight: | **10.194 g** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-5** | Analyst: | **JSY** | % Solids: | **72.3** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.1 | | | | ___ |
| 1,2,3,7,8-PeCDD | ND | 0.1 | | | | ___ |
| 1,2,3,4,7,8-HxCDD | ND | 0.1 | | | | ___ |
| 1,2,3,6,7,8-HxCDD | ND | 0.1 | | | | ___ |
| 1,2,3,7,8,9-HxCDD | ND | 0.1 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDD | 12.6 | | | 1.06 | 37:44 | ___ |
| 1,2,3,4,6,7,8,9-OCDD | 3880 | | | 0.86 | 41:24 | ___ |
| 2,3,7,8-TCDF | ND | 0.09 | | | | ___ |
| 1,2,3,7,8-PeCDF | ND | 0.08 | | | | ___ |
| 2,3,4,7,8-PeCDF | ND | 0.08 | | | | ___ |
| 1,2,3,4,7,8-HxCDF | ND | 0.07 | | | | ___ |
| 1,2,3,6,7,8-HxCDF | ND | 0.07 | | | | ___ |
| 2,3,4,6,7,8-HxCDF | ND | 0.06 | | | | ___ |
| 1,2,3,7,8,9-HxCDF | ND | 0.08 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDF | EMPC | | 0.15 | | | J__ |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.1 | | | | ___ |
| 1,2,3,4,6,7,8,9-OCDF | EMPC | | 0.27 | | | J__ |

| Totals | Conc. (pg/g) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | EMPC | | | 0.34 | ___ |
| Total PeCDD | EMPC | | | 0.48 | ___ |
| Total HxCDD | 3.1 | 2 | | 4.4 | ___ |
| Total HpCDD | 24.7 | 2 | | | ___ |
| Total TCDF | 0.69 | 1 | | 6.2 | X__ |
| Total PeCDF | EMPC | | | 2.3 | X__ |
| Total HxCDF | EMPC | | | 0.11 | ___ |
| Total HpCDF | EMPC | | | 0.15 | ___ |



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# Tetra Tech/NUS

Lab Project: **67189** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **05SS63** Analysis File: **W024205**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | | |
| Sample Matrix: | **SOIL** | Date Received: | **09/30/2006** | Spike File: | **SPMIT322** |
| Lab ID: | **423-96-4** | Date Extracted: | **10/11/2006** | ICal: | **WF5O166** |
| | | Date Analyzed: | **10/17/2006** | ConCal: | **W024102** |
| Sample Size: | **13.600 g** | Dilution Factor: | **n/a** | % Moisture: | **25.1** |
| Dry Weight: | **10.186 g** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-5** | Analyst: | **JSY** | % Solids: | **74.9** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.08 | | | | ___ |
| 1,2,3,7,8-PeCDD | ND | 0.08 | | | | ___ |
| 1,2,3,4,7,8-HxCDD | ND | 0.08 | | | | ___ |
| 1,2,3,6,7,8-HxCDD | EMPC | | 0.18 | | | J__ |
| 1,2,3,7,8,9-HxCDD | ND | 0.08 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDD | 13.9 | | | 0.98 | 37:44 | ___ |
| 1,2,3,4,6,7,8,9-OCDD | 3600 | | | 0.86 | 41:24 | ___ |
| 2,3,7,8-TCDF | ND | 0.07 | | | | ___ |
| 1,2,3,7,8-PeCDF | ND | 0.06 | | | | ___ |
| 2,3,4,7,8-PeCDF | ND | 0.06 | | | | ___ |
| 1,2,3,4,7,8-HxCDF | 0.12 | | | 1.15 | 33:42 | J__ |
| 1,2,3,6,7,8-HxCDF | ND | 0.05 | | | | ___ |
| 2,3,4,6,7,8-HxCDF | ND | 0.05 | | | | ___ |
| 1,2,3,7,8,9-HxCDF | ND | 0.06 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDF | 0.20 | | | 1.15 | 36:42 | J__ |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.09 | | | | ___ |
| 1,2,3,4,6,7,8,9-OCDF | 0.40 | | | 0.90 | 41:36 | J__ |

| Totals | Conc. (pg/g) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | EMPC | | | 0.23 | ___ |
| Total PeCDD | 0.74 | 1 | | 1.1 | ___ |
| Total HxCDD | 4.1 | 2 | | 5.9 | ___ |
| Total HpCDD | 26.8 | 2 | | | ___ |
| Total TCDF | EMPC | | | 1.5 | X__ |
| Total PeCDF | EMPC | | | 0.86 | X__ |
| Total HxCDF | 0.12 | 1 | | 0.45 | X__ |
| Total HpCDF | 0.64 | 3 | | | ___ |



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# Tetra Tech/NUS

Lab Project: **67189**
Client Sample: **05SS64**

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: **T062496**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | ICal: | **TF57146** |
| Sample Matrix: | **SOIL** | Date Received: | **09/30/2006** | Spike File: | **SPMIT322** |
| Lab ID: | **423-96-5A** | Date Extracted: | **10/11/2006** | 1st CCal: | **T062493** |
| | | Date Analyzed: | **10/16/2006** | End CCal: | **T062508** |
| Sample Size: | **12.000 g** | Dilution Factor: | **n/a** | % Moisture: | **17.3** |
| Dry Weight: | **9.924 g** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-5** | Analyst: | **JSY** | % Solids: | **82.7** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 2.7 | | | 0.66 | 26:58 | ___ |
| 1,2,3,7,8-PeCDD | 3.0 | | | 1.60 | 31:11 | J__ |
| 1,2,3,4,7,8-HxCDD | 4.3 | | | 1.30 | 34:18 | J__ |
| 1,2,3,6,7,8-HxCDD | 10.9 | | | 1.27 | 34:23 | ___ |
| 1,2,3,7,8,9-HxCDD | 6.4 | | | 1.22 | 34:42 | ___ |
| 1,2,3,4,6,7,8-HpCDD | 338 | | | 1.01 | 37:40 | ___ |
| 1,2,3,4,6,7,8,9-OCDD | 8710 | | | 0.83 | 41:20 | E__ |
| 2,3,7,8-TCDF | 8.1 | | | 0.82 | 26:17 | ___ |
| 1,2,3,7,8-PeCDF | EMPC | | 17.1 | | | X__ |
| 2,3,4,7,8-PeCDF | EMPC | | 2.8 | | | J__ |
| 1,2,3,4,7,8-HxCDF | 9.4 | | | 1.31 | 33:35 | ___ |
| 1,2,3,6,7,8-HxCDF | 3.9 | | | 1.28 | 33:42 | J__ |
| 2,3,4,6,7,8-HxCDF | 4.7 | | | 1.23 | 34:12 | J__ |
| 1,2,3,7,8,9-HxCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDF | 32.1 | | | 1.04 | 36:37 | ___ |
| 1,2,3,4,7,8,9-HpCDF | 2.6 | | | 0.97 | 38:11 | J__ |
| 1,2,3,4,6,7,8,9-OCDF | 45.3 | | | 0.90 | 41:31 | ___ |

| Totals | Conc. (pg/g) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | 25.2 | 10 | | | ___ |
| Total PeCDD | 40.4 | 9 | | 41.2 | ___ |
| Total HxCDD | 128 | 8 | | | ___ |
| Total HpCDD | 695 | 2 | | | ___ |
| Total TCDF | 49.1 | 14 | | 69.4 | X__ |
| Total PeCDF | 47.7 | 13 | | 79.7 | X__ |
| Total HxCDF | 68.9 | 10 | | 110 | X__ |
| Total HpCDF | 85.6 | 3 | | 106 | X__ |



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# Tetra Tech/NUS

Lab Project: **67189** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **05SS64** Analysis File: **T062573**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | | |
| Sample Matrix: | **SOIL** | Date Received: | **09/30/2006** | Spike File: | **SPMIT3J2** |
| Lab ID: | **423-96-5A** | Date Extracted: | **10/11/2006** | ICal: | **TF57146** |
| | | Date Analyzed: | **10/20/2006** | ConCal: | **T062561** |
| Sample Size: | **12.000 g** | Dilution Factor: | **10X** | % Moisture: | **17.3** |
| Dry Weight: | **9.924 g** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-5** | Analyst: | **MCM** | % Solids: | **82.7** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 1,2,3,4,6,7,8,9-OCDD | 8670 | | | 0.85 | 41:17 | ___ |

| Internal Standard | Conc. (pg/g) | % Recovery | QC Limits | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| $^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD | 2710 | 61.1 | 40%-135% | 0.87 | 41:17 | ___ |

| Recovery Standard | Ratio | RT | Flags |
|---|---|---|---|
| $^{13}C_{12}$-1,2,3,7,8,9-HxCDD | 1.18 | 34:40 | ___ |

Data Reviewer: MCM 10/23/2006



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# Tetra Tech/NUS

Lab Project: **67189** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **05SS64** Analysis File: **P061018**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | | |
| Sample Matrix: | **SOIL** | Date Received: | **09/30/2006** | Spike File: | **SPC2NF22** |
| Lab ID: | **423-96-5A** | Date Extracted: | **10/11/2006** | ICal: | **PF27176** |
| | | Date Analyzed: | **10/18/2006** | ConCal: | **P061015** |
| Sample Size: | **12.000 g** | Dilution Factor: | **n/a** | % Moisture: | **17.3** |
| Dry Weight: | **9.924 g** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-225** | Analyst: | **JSY** | % Solids: | **82.7** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 2.4 | | | 0.82 | 22:10 | ___ |

| Internal Standard | Conc. (pg/g) | % Recovery | QC Limits | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| $^{13}C_{12}$-2,3,7,8-TCDF | 153 | 75.9 | 40%-130% | 0.78 | 22:10 | ___ |

| Recovery Standard | Ratio | RT | Flags |
|---|---|---|---|
| $^{13}C_{12}$-1,2,3,4-TCDD | 0.81 | 21:05 | ___ |

Data Reviewer: _____ 10/20/2006



C2NF_PSR v2.03, LARS 6.25.06

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# Tetra Tech/NUS

Lab Project: **67189**
Client Sample: **05SS65**

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: **T062499**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | ICal: | **TF57146** |
| Sample Matrix: | **SOIL** | Date Received: | **09/30/2006** | Spike File: | **SPMIT322** |
| Lab ID: | **423-96-6** | Date Extracted: | **10/11/2006** | 1st CCal: | **T062493** |
| | | Date Analyzed: | **10/16/2006** | End CCal: | **T062508** |
| Sample Size: | **12.700 g** | Dilution Factor: | **n/a** | % Moisture: | **20.5** |
| Dry Weight: | **10.097 g** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-5** | Analyst: | **JSY** | % Solids: | **79.5** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.2 | | | | ___ |
| 1,2,3,7,8-PeCDD | ND | 0.2 | | | | ___ |
| 1,2,3,4,7,8-HxCDD | ND | 0.2 | | | | ___ |
| 1,2,3,6,7,8-HxCDD | 0.79 | | | 1.34 | 34:22 | J__ |
| 1,2,3,7,8,9-HxCDD | 0.63 | | | 1.36 | 34:42 | J__ |
| 1,2,3,4,6,7,8-HpCDD | 37.4 | | | 1.02 | 37:40 | ___ |
| 1,2,3,4,6,7,8,9-OCDD | 2880 | | | 0.83 | 41:20 | ___ |
| 2,3,7,8-TCDF | 0.41 | | | 0.70 | 26:16 | J__ |
| 1,2,3,7,8-PeCDF | ND | 0.2 | | | | ___ |
| 2,3,4,7,8-PeCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,7,8-HxCDF | 0.29 | | | 1.22 | 33:35 | J__ |
| 1,2,3,6,7,8-HxCDF | ND | 0.1 | | | | ___ |
| 2,3,4,6,7,8-HxCDF | ND | 0.1 | | | | ___ |
| 1,2,3,7,8,9-HxCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDF | 1.4 | | | 1.12 | 36:37 | J__ |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,6,7,8,9-OCDF | EMPC | | 1.5 | | | J__ |

| Totals | Conc. (pg/g) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | ND | | 0.2 | | ___ |
| Total PeCDD | 0.55 | 1 | | | ___ |
| Total HxCDD | 8.9 | 4 | | | ___ |
| Total HpCDD | 73.8 | 2 | | | ___ |
| Total TCDF | 0.41 | 1 | | 6.3 | X__ |
| Total PeCDF | 0.71 | 1 | | 5.3 | X__ |
| Total HxCDF | 1.7 | 3 | | 5.3 | X__ |
| Total HpCDF | 3.7 | 2 | | 5.2 | X__ |



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# APPENDIX C

Support Documentation

## Overview

The samples and associated QC samples were extracted and analyzed according to procedures described in EPA Method 8290 Rev. 0 (9/94). Any particular difficulties encountered during sample handling will be discussed in the QC Remarks section below. This report contains results from only the 8290 dioxin/furan analyses of six soil samples.

## Quality Control Samples

A laboratory method blank was prepared along with each batch of samples.

A laboratory control spike (LCS) sample was extracted and analyzed along with the sample. A report summarizing the analyte recoveries for this sample is included in the data package.

Matrix spike (MS) and matrix spike duplicate (MSD) samples were extracted and analyzed along with the samples. A report summarizing the analyte recoveries and relative percent differences for these samples is included in the data package.

## Quality Control Remarks

This release of this particular set of Tetra tech/NUS analytical data by Eno River Labs was authorized by the Quality Control Chemist who has reviewed each sample data package following a series of inspections/reviews. When applicable, general deviations from acceptable QC requirements are identified below and comments are made on the effect of these deviations upon the validity and reliability of the results. Specific QC issues associated with this particular project are:

***Sample receipt:*** Six soil samples were received from Tetra tech/NUS at 7 °C in good condition on September 30, 2006 and stored in a refrigerator at 4°C. The client's chain-of-custody did not indicate whether chemical preservatives were utilized prior to shipment.

***Sample Preparation Laboratory:*** None

***Mass Spectrometry:*** None

***Data Review:*** The concentration of the OCDD analytes (flagged "E") in samples 05SS61 and 05SS64 are above the calibration range in the DB-5 column analyses. The samples were diluted by adding internal standards to obtain analyte responses that are within the calibration range. As a result the concentrations for dilutions are not recovery corrected. Only those analytes that exceeded the calibration range are reported on the diluted analyses.

The percent recoveries for the 1,2,3,4,6,7,8-HpCDD and OCDD analyte in the matrix spike (MS) and matrix spike duplicate (MSD) analyses are outside method requirements. These variances are due to high levels of these analytes in the native sample. When the amounts in the native sample approaches more than one-forth the spiked analyte level, statistical analysis becomes unreliable and the percent recoveries can not be assessed using the QC samples.

***Other Comments:*** No 2,3,7,8-substituted target analytes were detected in the laboratory blank above the target detection limit (TDL).

Method 8290 contains separate criteria for beginning and ending continuing calibrations. When the ending calibration meets criteria established for the beginning calibration, the average response factor from the initial calibration is used. When the ending calibration only meets the less stringent criteria specified for an ending calibration, the average of the response factor from the beginning and ending calibration is used for analyte and internal standard calculations. Affected samples are identified by the listing of both the beginning and ending calibration filename on the sample report.

**EMPC** stands for **E**stimated **M**aximum **P**ossible **C**oncentration. A dioxin or furan analyte is quantitated as an EMPC when the detected analyte meets the retention time criteria of a dioxin or furan, but not the isotopic ratio criteria. Interferences, such as PCBs, may co-elute or cause quantitative interference, causing a peak ratio to be outside criteria. Low level peaks that are close to the detection limits can be significantly affected by instrument and chemical noise, causing the ratio to be outside criteria. As a result, the reported value(s) should be considered estimated at the highest level possible.

The analytical results presented in this report are consistent with the guidelines of EPA Method 8290 Rev. 0 (9/94) and NELAC standards. Any exceptions have been discussed in the QC Remarks section of this case narrative with emphasis on their effect on the results. Should Tetra tech/NUS have any questions or comments regarding this data package, please feel free to contact our customer service at (919) 281-4013.

Released by,

Kenneth Varley

Kenneth Varley

Report Preparation Chemist
Eno River Labs

The total number of pages in the data package is : _____ .

## CLIENT CHAIN OF CUSTODY

**SAMPLER'S SIGNATURE** Donald Whalen

**Quote 0600000302**

From (1): Tetra Tech/NUS
600 Clark Avenue
Suite 3
King of Prussia, PA 19406-1433

Project (1): CTO-003, NAS JRB Willow Grove

**(BRE07 /UN)**

Contact: Meg Price/~~Daniel Braccia~~
Phone: 610/491-9688
Fax: 610/491-9645
P.O.# (1): _____

Please provide any special reporting instructions.

**Analysis Wanted (2):** 8290:T-O

**Total Number of Containers:** 7

**Turn Around Time (In Calendar Days):**

| Sample ID (3) | Date / Time | Preservation (4) | Matrix | Sample Amt. | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 055560 | 9-28-06/1430 | ICE | Soil | 4 oz | ✓ | | | | | |
| 055561 | 9-28-06/1615 | ICE | Soil | 4 oz | ✓ | | | | | COPY |
| 055562 | 9-28-06/1555 | ICE | Soil | 4 oz | ✓ | | | | | |
| 055563 | 9-28-06/1607 | ICE | Soil | 4 oz | ✓ | | | | | |
| 055564 | 9-28-06/1622 | ICE | Soil | 2x 4 oz | ✓ | | | | | Do MS/MSD |
| 055565 | 9-28-06/1628 | ICE | Soil | 4 oz | ✓ | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| Relinquished By/Sign. | Date/Time | Received By/Sign. | Relinquished By/Sign. | Date/Time | Received By/Sign. |
|---|---|---|---|---|---|
| Donald Whalen | 1700 9-29-06 | | | | |

| Received for Laboratory By/Signature | Date/Time | Send Samples to: |
|---|---|---|
| C. Thurston | 9-30-06 945 | Eno River Labs, LLC<br>Attn: Sample Management Group<br>2445 S. Alston Ave.<br>Durham, NC 27713 USA<br>Phone: (919) 281-4040 • Fax: (919) 281-4070 |

Directions:
(1) Provide and/or correct client and project information.
(2) Verify analysis, check approriate boxes for each sample.
(3) Please be sure that this matches the ID on the sample container.
(4) Please indicate the preservation used for each sample.

+7

# Tetra Tech/NUS

Lab Project: **67189** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **BLANK** Analysis File: **T062495**

| | | | | | |
|---|---|---|---|---|---|
| Client Project: | **CTO #003-NASJRB Willow Grove** | | | ICal: | **TF57146** |
| Sample Matrix: | **SAND** | Date Received: | **/ /** | Spike File: | **SPMIT32S** |
| Lab ID: | **BLANK** | Date Extracted: | **10/11/2006** | 1st CCal: | **T062493** |
| | | Date Analyzed: | **10/16/2006** | End CCal: | **T062508** |
| Sample Size: | **10.000 g** | Dilution Factor: | **n/a** | % Moisture: | **n/a** |
| Dry Weight: | **n/a** | Blank File: | **T062495** | % Lipid: | **n/a** |
| GC Column: | **DB-5** | Analyst: | **JSY** | % Solids: | **n/a** |

| Analytes | Conc. (pg/g) | DL | EMPC | Ratio | RT | Flags |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.2 | | | | ___ |
| 1,2,3,7,8-PeCDD | ND | 0.3 | | | | ___ |
| 1,2,3,4,7,8-HxCDD | ND | 0.2 | | | | ___ |
| 1,2,3,6,7,8-HxCDD | ND | 0.2 | | | | ___ |
| 1,2,3,7,8,9-HxCDD | ND | 0.2 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDD | ND | 0.3 | | | | ___ |
| 1,2,3,4,6,7,8,9-OCDD | 0.62 | | | 0.98 | 41:22 | J___ |
| 2,3,7,8-TCDF | ND | 0.1 | | | | ___ |
| 1,2,3,7,8-PeCDF | ND | 0.2 | | | | ___ |
| 2,3,4,7,8-PeCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,7,8-HxCDF | ND | 0.2 | | | | ___ |
| 1,2,3,6,7,8-HxCDF | ND | 0.1 | | | | ___ |
| 2,3,4,6,7,8-HxCDF | ND | 0.2 | | | | ___ |
| 1,2,3,7,8,9-HxCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,6,7,8-HpCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.2 | | | | ___ |
| 1,2,3,4,6,7,8,9-OCDF | ND | 0.4 | | | | ___ |

| Totals | Conc. (pg/g) | Number | DL | EMPC | Flags |
|---|---|---|---|---|---|
| Total TCDD | ND | | 0.2 | | ___ |
| Total PeCDD | ND | | 0.3 | | ___ |
| Total HxCDD | ND | | 0.2 | | ___ |
| Total HpCDD | ND | | 0.3 | | ___ |
| Total TCDF | ND | | 0.1 | | ___ |
| Total PeCDF | ND | | 0.2 | | ___ |
| Total HxCDF | ND | | 0.2 | | ___ |
| Total HpCDF | ND | | 0.2 | | ___ |



MIT3_PSR v1.00, LARS 6.25.06

**Eno River Labs, LLC®**
2445 S. Alston Ave. • Durham, North Carolina 27713
Phone: (919) 281-4040 • Fax: (919) 281-4070

Printed: 08:39 10/17/2006

USEPA
3DFA - Form III-HR CDD
CDD/CDF LAB CONTROL SAMPLE SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS64 MS

Lab Name: Eno River Labs  Contract No: _____

Lab Code: ENORVR  Case No.: _____  TO No.: _____  SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL  Lab Sample ID: 423-96-5AMS

Sample wt/vol: 9.924 (g/ml) G  Lab File ID: T062497

Water Sample Prep: SEPF (SEPF/SPE)  Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL)  Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 82.7  Date Analyzed: 10/16/2006

GC Column: DB-5 ID: 0.25 (mm)  Dilution Factor: _____

CONCENTRATION UNITS: (pg/L or ng/Kg) NG/KG

| SPIKE ANALYTE | SPIKE ADDED | AMOUNT RECOVERED | PERCENT RECOVERY | # | QC LIMITS |
|---|---|---|---|---|---|
| 2378-TCDD | 400 | 360 | 83.4 | | 70-130 |
| 12378-PeCDD | 2000 | 1697 | 83.2 | | 70-130 |
| 123478-HxCDD | 2000 | 1925 | 94.2 | | 70-130 |
| 123678-HxCDD | 2000 | 2054 | 97.4 | | 70-130 |
| 123789-HxCDD | 2000 | 2005 | 96.8 | | 70-130 |
| 1234678-HpCDD | 2000 | 4238 | 43.9 | # | 70-130 |
| OCDD | 4000 | 64407 | -551 | # | 70-130 |
| 2378-TCDF | 400 | 431 | 87.5 | | 70-130 |
| 12378-PeCDF | 2000 | 1886 | 85.7 | | 70-130 |
| 23478-PeCDF | 2000 | 1747 | 85.8 | | 70-130 |
| 123478-HxCDF | 2000 | 1915 | 90.9 | | 70-130 |
| 123678-HxCDF | 2000 | 1945 | 95.1 | | 70-130 |
| 234678-HxCDF | 2000 | 1846 | 90.1 | | 70-130 |
| 123789-HxCDF | 2000 | 1757 | 87.9 | | 70-130 |
| 1234678-HpCDF | 2000 | 2263 | 97.2 | | 70-130 |
| 1234789-HpCDF | 2000 | 2114 | 105 | | 70-130 |
| OCDF | 4000 | 3612 | 79.0 | | 70-130 |

# Column to be used to flag values outside Quality Control (QC) limits.

Laboratory Control Sample Recovery: 2 Outside limits out of 17 total.

USEPA
3DFA - Form III-HR CDD
CDD/CDF LAB CONTROL SAMPLE SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS64 MSD

Lab Name: Eno River Labs Contract No: _____

Lab Code: ENORVR Case No.: _____ TO No.: _____ SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL Lab Sample ID: 423-96-5AMSD

Sample wt/vol: 9.924 (g/ml) G Lab File ID: T062498

Water Sample Prep: SEPF (SEPF/SPE) Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL) Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 82.7 Date Analyzed: 10/16/2006

GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: _____

CONCENTRATION UNITS: (pg/L or ng/Kg) NG/KG

| SPIKE ANALYTE | SPIKE ADDED | AMOUNT RECOVERED | PERCENT RECOVERY | # | QC LIMITS |
|---|---|---|---|---|---|
| 2378-TCDD | 400 | 358 | 82.7 | | 70-130 |
| 12378-PeCDD | 2000 | 1707 | 83.6 | | 70-130 |
| 123478-HxCDD | 2000 | 1945 | 95.2 | | 70-130 |
| 123678-HxCDD | 2000 | 2134 | 101 | | 70-130 |
| 123789-HxCDD | 2000 | 1955 | 94.6 | | 70-130 |
| 1234678-HpCDD | 2000 | 4128 | 38.6 | # | 70-130 |
| OCDD | 4000 | 62223 | -604 | # | 70-130 |
| 2378-TCDF | 400 | 436 | 88.7 | | 70-130 |
| 12378-PeCDF | 2000 | 1886 | 86.0 | | 70-130 |
| 23478-PeCDF | 2000 | 1647 | 81.0 | | 70-130 |
| 123478-HxCDF | 2000 | 1905 | 90.7 | | 70-130 |
| 123678-HxCDF | 2000 | 1945 | 95.1 | | 70-130 |
| 234678-HxCDF | 2000 | 1776 | 86.3 | | 70-130 |
| 123789-HxCDF | 2000 | 1737 | 86.9 | | 70-130 |
| 1234678-HpCDF | 2000 | 2263 | 97.2 | | 70-130 |
| 1234789-HpCDF | 2000 | 2074 | 102 | | 70-130 |
| OCDF | 4000 | 2699 | 81.0 | | 70-130 |

# Column to be used to flag values outside Quality Control (QC) limits.

Laboratory Control Sample Recovery: 2 Outside limits out of 17 total.

ENO RIVER LABS, LLC
MATRIX SPIKE RECOVERY ANALYSIS AND COMPARISON

Project: 67189
Matrix: SOIL
Method: 8290

| Isomer | T062496 ID: 423-96-5A Sample (pg/g) | T062497 ID: 423-96-5AMS With Spike (pg/g) | Percent Recovery | T062498 ID: 423-96-5AMSD Spike Dup (pg/g) | Percent Recovery | Relative Percent Difference |
|---|---|---|---|---|---|---|
| 2378-TCDD | 2.7 | 36.3 | 83.4 | 36.1 | 82.7 | 0.84 |
| 12378-PeCDD | 3.0 | 171 | 83.2 | 172 | 83.6 | 0.48 |
| 123478-HxCDD | 4.3 | 194 | 94.2 | 196 | 95.2 | 1.06 |
| 123678-HxCDD | 10.9 | 207 | 97.4 | 215 | 101 | 3.63 |
| 123789-HxCDD | 6.4 | 202 | 96.8 | 197 | 94.6 | 2.30 |
| 1234678-HpCDD | 338 | 427 | 43.9 | 416 | 38.6 | 12.8 |
| OCDD | 8710 | 6490 | -551 | 6270 | -604 | 9.18 |
| 2378-TCDF | 8.1 | 43.4 | 87.5 | 43.9 | 88.7 | 1.36 |
| 12378-PeCDF | [17.1] | 190 | 85.7 | 190 | 86.0 | 0.35 |
| 23478-PeCDF | [2.8] | 176 | 85.8 | 166 | 81.0 | 5.76 |
| 123478-HxCDF | 9.4 | 193 | 90.9 | 192 | 90.7 | 0.22 |
| 123678-HxCDF | 3.9 | 196 | 95.1 | 196 | 95.1 | 0.0 |
| 234678-HxCDF | 4.7 | 186 | 90.1 | 179 | 86.3 | 4.31 |
| 123789-HxCDF | ND | 177 | 87.9 | 175 | 86.9 | 1.14 |
| 1234678-HpCDF | 32.1 | 228 | 97.2 | 228 | 97.2 | 0.0 |
| 1234789-HpCDF | 2.6 | 213 | 105 | 209 | 102 | 2.90 |
| OCDF | 45.3 | 364 | 79.0 | 372 | 81.0 | 2.50 |

ND: Not Detected
NA: Not Applicable
[..]: EMPC Value

MILES 4.22.39
GRY_PSUM v1.12

Processed By: KW Date: 10/23/06

Percent Recovery QC Limits: 70 to 130 percent.
Relative Percent Difference QC Limits: +/- 20 percent.

Nominal Spike Levels:
TCDD/TCDF..: 0.4 ng
PeCDD/PeCDF: 2.0 ng
HxCDD/HxCDF: 2.0 ng
HpCDD/HpCDF: 2.0 ng
OCDD/OCDF..: 4.0 ng

ENO RIVER LABS, LLC -- LOG IN RECORD/CHAIN OF CUSTODY

Custody Seal : Present/Intact
Chain of Custody : Present
Sample Tags : Absent
Sample Tag Numbers: Not Listed on Chain of Custody
SMO Forms : N/A

Sample Seals: Present
Container...: Intact

Lab Project Number 67189
Client: BRE07 - Tetra Tech/NUS

Date Received 09/30/06 By

Carrier and Number FEDEX 854568657730

Book 423

Page 96

Ice Chest ICE Temp 7.0 C

| Lab Number.. mR/H:CPM. | Client Sample ID..... Client COC ID.....* | Location..... | Matrix | To LAB Date/Init | To STORAGE Date/Init | To LAB Date/Init | To STORAGE Date/Init | To LAB Date/Init | To STORAGE Date/Init | To LAB Date/Init | To STORAGE Date/Init | DISPOSED Date/Init |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 423-96-1 | 05SS60 | | SOIL | | | | | | | | | |
| | 05SS60 | C02 | | | | | | | | | | |
| 423-96-2 | 05SS61 | | SOIL | | | | | | | | | |
| | 05SS61 | C02 | | | | | | | | | | |
| 423-96-3 | 05SS62 | | SOIL | | | | | | | | | |
| | 05SS62 | C02 | | | | | | | | | | |
| 423-96-4 | 05SS63 | | SOIL | | | | | | | | | |
| | 05SS63 | C02 | | | | | | | | | | |
| 423-96-5A | 05SS64 | | SOIL | | | | | | | | | |
| | 05SS64 | C02 | | | | | | | | | | |
| 423-96-5B | 05SS64 | | SOIL | | | | | | | | | |
| | 05SS64 | C02 | | | | | | | | | | |
| 423-96-6 | 05SS65 | | SOIL | | | | | | | | | |
| | 05SS65 | C02 | | | | | | | | | | |

CV 10/2/06

All samples OK 11/16/06

Receiving Remarks:

Archive Remarks:

Form Revised 05/27/1997 -- Page 1 OF 1

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS60

Lab Name: Eno River Labs  Contract No: _____

Lab Code: ENORVR  Case No.: _____  TO No.: _____  SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL  Lab Sample ID: 423-96-1

Sample wt/vol: 10.098 (g/ml) G  Lab File ID: W024202

Water Sample Prep: SEPF (SEPF/SPE)  Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL)  Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 74.8  Date Analyzed: 10/17/2006

GC Column: DB-5 ID: 0.25 (mm)  Dilution Factor: _____

CONCENTRATION UNITS: (pg/L or ng/Kg) NG/KG

| TARGET ANALYTE | SELECTED IONS | PEAK RT | ION RATIO # | CONCENTRATION | Q | EMPC/EDL |
|---|---|---|---|---|---|---|
| 2378-TCDD | 320/322 | | | | U | 0.3 |
| 12378-PeCDD | 356/358 | | | | U | 0.3 |
| 123478-HxCDD | 390/392 | | | | U | 0.2 |
| 123678-HxCDD | 390/392 | 34:28 | 1.40 | 0.52 | J | |
| 123789-HxCDD | 390/392 | 34:46 | 1.22 | 0.50 | J | |
| 1234678-HpCDD | 424/426 | 37:44 | 1.00 OK | 23.3 | | |
| OCDD | 458/460 | 41:24 | 0.87 | 2060 | | |
| 2378-TCDF | 304/306 | | | | U | 0.2 |
| 12378-PeCDF | 340/342 | | | | U | 0.2 |
| 23478-PeCDF | 340/342 | | | | U | 0.2 |
| 123478-HxCDF | 374/376 | | | | U | 0.2 |
| 123678-HxCDF | 374/376 | | | | U | 0.1 |
| 234678-HxCDF | 374/376 | | * | | U | 0.1 |
| 123789-HxCDF | 374/376 | | | | U | 0.2 |
| 1234678-HpCDF | 408/410 | 36:42 | 1.27 # | within 0.76-1.30 | J | 0.72 |
| 1234789-HpCDF | 408/410 | | * | | U | 0.2 |
| OCDF | 442/444 | 41:36 | 1.09 # | within 0.67-1.13 | J | 0.88 |

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

| INTERNAL LABELED COMPOUNDS | SELECTED IONS | PEAK RT | ION RATIO # | ION RATIO LIMITS | %REC # | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| 37Cl-2378-TCDD | 328/NA | 27:06 | NA | NA | 82.2 | 40-135 |
| 13C-2378-TCDF | 316/318 | 26:23 | 0.79 | 0.65-0.89 | 84.8 | 40-135 |
| 13C-2378-TCDD | 332/334 | 27:05 | 0.83 | 0.65-0.89 | 81.0 | 40-135 |
| 13C12-PeCDF 123 | 352/354 | 30:16 | 1.55 | 1.32-1.78 | 87.4 | 40-135 |
| 13C12-PeCDD 123 | 368/370 | 31:16 | 1.50 | 1.32-1.78 | 85.9 | 40-135 |
| 13C12-HxCDF 678 | 384/386 | 33:46 | 0.50 | 0.43-0.59 | 103 | 40-135 |
| 13C-123678-HxCDD | 402/404 | 34:27 | 1.23 | 1.05-1.43 | 98.3 | 40-135 |
| 13C-1234678-HpCDF | 418/420 | 36:41 | 0.45 | 0.37-0.51 | 106 | 40-135 |
| 13C12-HpCDD 678 | 436/438 | 37:44 | 1.04 | 0.88-1.20 | 102 | 40-135 |
| 13C-OCDD | 470/472 | 41:23 | 0.89 | 0.76-1.02 | 102 | 40-135 |

# Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS61

Lab Name: Eno River Labs  Contract No: _____

Lab Code: ENORVR  Case No.: _____  TO No.: _____  SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL  Lab Sample ID: 423-96-2

Sample wt/vol: 10.257 (g/ml) G  Lab File ID: W024203

Water Sample Prep: SEPF (SEPF/SPE)  Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL)  Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 78.3  Date Analyzed: 10/17/2006

GC Column: DB-5 ID: 0.25 (mm)  Dilution Factor: _____

CONCENTRATION UNITS: (pg/L or ng/Kg) NG/KG

| TARGET ANALYTE | SELECTED IONS | PEAK RT | ION RATIO # | CONCENTRATION | Q | EMPC/EDL |
|---|---|---|---|---|---|---|
| 2378-TCDD | 320/322 | | | | U | 0.07 |
| 12378-PeCDD | 356/358 | 41:16 | 2.79 # | outside ±25% | J | 0.11 |
| 123478-HxCDD | 390/392 | 34:22 | 1.60 | outside ±25% | J | 0.24 |
| 123678-HxCDD | 390/392 | 34:28 | 1.17 | 0.40 | J | |
| 123789-HxCDD | 390/392 | 34:46 | 1.02 # | * 0.93-1.55 within | | 0.42 |
| 1234678-HpCDD | 424/426 | 37:44 | 0.99 | 24.4 | | |
| OCDD | 458/460 | 41:25 | 0.86 | 5570 | E | |
| 2378-TCDF | 304/306 | | | | U | 0.06 |
| 12378-PeCDF | 340/342 | | | | U | 0.05 |
| 23478-PeCDF | 340/342 | | | | U | 0.05 |
| 123478-HxCDF | 374/376 | 33:41 | 1.10 | 0.12 | J | |
| 123678-HxCDF | 374/376 | | | | U | 0.05 |
| 234678-HxCDF | 374/376 | | | | U | 0.04 |
| 123789-HxCDF | 374/376 | | | | U | 0.05 |
| 1234678-HpCDF | 408/410 | 36:42 | 1.11 | 0.45 | J | |
| 1234789-HpCDF | 408/410 | | | | U | 0.07 |
| OCDF | 442/444 | 41:36 | 0.76 | 0.52 | J | |

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

| INTERNAL LABELED COMPOUNDS | SELECTED IONS | PEAK RT | ION RATIO # | ION RATIO LIMITS | %REC # | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| 37Cl-2378-TCDD | 328/NA | 27:06 | NA | NA | 86.4 | 40-135 |
| 13C-2378-TCDF | 316/318 | 26:22 | 0.76 | 0.65-0.89 | 87.1 | 40-135 |
| 13C-2378-TCDD | 332/334 | 27:05 | 0.82 | 0.65-0.89 | 88.1 | 40-135 |
| 13C12-PeCDF 123 | 352/354 | 30:14 | 1.56 | 1.32-1.78 | 86.7 | 40-135 |
| 13C12-PeCDD 123 | 368/370 | 31:15 | 1.52 | 1.32-1.78 | 90.1 | 40-135 |
| 13C12-HxCDF 678 | 384/386 | 33:46 | 0.51 | 0.43-0.59 | 97.6 | 40-135 |
| 13C-123678-HxCDD | 402/404 | 34:27 | 1.22 | 1.05-1.43 | 93.4 | 40-135 |
| 13C-1234678-HpCDF | 418/420 | 36:41 | 0.43 | 0.37-0.51 | 95.9 | 40-135 |
| 13C12-HpCDD 678 | 436/438 | 37:44 | 1.03 | 0.88-1.20 | 102 | 40-135 |
| 13C-OCDD | 470/472 | 41:24 | 0.88 | 0.76-1.02 | 125 | 40-135 |

# Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS62

Lab Name: Eno River Labs  Contract No: _____

Lab Code: ENORVR  Case No.: _____  TO No.: _____  SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL  Lab Sample ID: 423-96-3

Sample wt/vol: 10.194 (g/ml) G  Lab File ID: W024204

Water Sample Prep: SEPF (SEPF/SPE)  Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL)  Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 72.3  Date Analyzed: 10/17/2006

GC Column: DB-5 ID: 0.25 (mm)  Dilution Factor: _____

CONCENTRATION UNITS: (pg/L or ng/Kg) NG/KG

| TARGET ANALYTE | SELECTED IONS | PEAK RT | ION RATIO # | CONCENTRATION | Q | EMPC/EDL |
|---|---|---|---|---|---|---|
| 2378-TCDD | 320/322 | | | | U | 0.1 |
| 12378-PeCDD | 356/358 | | | | U | 0.1 |
| 123478-HxCDD | 390/392 | | | | U | 0.1 |
| 123678-HxCDD | 390/392 | | | | U | 0.1 |
| 123789-HxCDD | 390/392 | | | | U | 0.1 |
| 1234678-HpCDD | 424/426 | 37:44 | 1.06 | 12.6 | | |
| OCDD | 458/460 | 41:24 | 0.86 | 3880 | | |
| 2378-TCDF | 304/306 | | | | U | 0.09 |
| 12378-PeCDF | 340/342 | | | | U | 0.08 |
| 23478-PeCDF | 340/342 | | | | U | 0.08 |
| 123478-HxCDF | 374/376 | | | | U | 0.07 |
| 123678-HxCDF | 374/376 | | | | U | 0.07 |
| 234678-HxCDF | 374/376 | | | | U | 0.06 |
| 123789-HxCDF | 374/376 | | | | U | 0.08 |
| 1234678-HpCDF | 408/410 | 36:41 | 1.45 # | outside ±25% | J | 0.15 |
| 1234789-HpCDF | 408/410 | | | | U | 0.1 |
| OCDF | 442/444 | 41:36 | 1.03 # | * 0.67-1.13 | J within | 0.27 |

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

| INTERNAL LABELED COMPOUNDS | SELECTED IONS | PEAK RT | ION RATIO # | ION RATIO LIMITS | %REC # | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| 37Cl-2378-TCDD | 328/NA | 27:05 | NA | NA | 76.9 | 40-135 |
| 13C-2378-TCDF | 316/318 | 26:22 | 0.76 | 0.65-0.89 | 81.9 | 40-135 |
| 13C-2378-TCDD | 332/334 | 27:04 | 0.80 | 0.65-0.89 | 77.3 | 40-135 |
| 13C12-PeCDF 123 | 352/354 | 30:15 | 1.53 | 1.32-1.78 | 81.2 | 40-135 |
| 13C12-PeCDD 123 | 368/370 | 31:15 | 1.53 | 1.32-1.78 | 76.8 | 40-135 |
| 13C12-HxCDF 678 | 384/386 | 33:46 | 0.51 | 0.43-0.59 | 93.7 | 40-135 |
| 13C-123678-HxCDD | 402/404 | 34:26 | 1.25 | 1.05-1.43 | 90.0 | 40-135 |
| 13C-1234678-HpCDF | 418/420 | 36:41 | 0.43 | 0.37-0.51 | 91.3 | 40-135 |
| 13C12-HpCDD 678 | 436/438 | 37:43 | 1.04 | 0.88-1.20 | 92.7 | 40-135 |
| 13C-OCDD | 470/472 | 41:23 | 0.88 | 0.76-1.02 | 102 | 40-135 |

# Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS63

Lab Name: Eno River Labs  Contract No: _____

Lab Code: ENORVR  Case No.: _____  TO No.: _____  SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL  Lab Sample ID: 423-96-4

Sample wt/vol: 10.186 (g/ml) G  Lab File ID: W024205

Water Sample Prep: SEPF (SEPF/SPE)  Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL)  Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 74.9  Date Analyzed: 10/17/2006

GC Column: DB-5 ID: 0.25 (mm)  Dilution Factor: _____

CONCENTRATION UNITS: (pg/L or ng/Kg) NG/KG

| TARGET ANALYTE | SELECTED IONS | PEAK RT | ION RATIO # | CONCENTRATION | Q | EMPC/EDL |
|---|---|---|---|---|---|---|
| 2378-TCDD | 320/322 | | | | U | 0.08 |
| 12378-PeCDD | 356/358 | | | | U | 0.08 |
| 123478-HxCDD | 390/392 | | | | U | 0.08 |
| 123678-HxCDD | 390/392 | 34:27 | 1.55 # | * within 0.93-1.55 | J | 0.18 |
| 123789-HxCDD | 390/392 | | | | U | 0.08 |
| 1234678-HpCDD | 424/426 | 37:44 | 0.98 | 13.9 | | |
| OCDD | 458/460 | 41:24 | 0.86 | 3600 | | |
| 2378-TCDF | 304/306 | | | | U | 0.07 |
| 12378-PeCDF | 340/342 | | | | U | 0.06 |
| 23478-PeCDF | 340/342 | | | | U | 0.06 |
| 123478-HxCDF | 374/376 | 33:42 | 1.15 | 0.12 | J | |
| 123678-HxCDF | 374/376 | | | | U | 0.05 |
| 234678-HxCDF | 374/376 | | | | U | 0.05 |
| 123789-HxCDF | 374/376 | | | | U | 0.06 |
| 1234678-HpCDF | 408/410 | 36:42 | 1.15 | 0.20 | J | |
| 1234789-HpCDF | 408/410 | | | | U | 0.09 |
| OCDF | 442/444 | 41:36 | 0.90 | 0.40 | J | |

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

| INTERNAL LABELED COMPOUNDS | SELECTED IONS | PEAK RT | ION RATIO # | ION RATIO LIMITS | %REC # | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| 37Cl-2378-TCDD | 328/NA | 27:05 | NA | NA | 75.8 | 40-135 |
| 13C-2378-TCDF | 316/318 | 26:22 | 0.78 | 0.65-0.89 | 84.1 | 40-135 |
| 13C-2378-TCDD | 332/334 | 27:04 | 0.82 | 0.65-0.89 | 79.0 | 40-135 |
| 13C12-PeCDF 123 | 352/354 | 30:14 | 1.55 | 1.32-1.78 | 83.6 | 40-135 |
| 13C12-PeCDD 123 | 368/370 | 31:16 | 1.52 | 1.32-1.78 | 88.5 | 40-135 |
| 13C12-HxCDF 678 | 384/386 | 33:46 | 0.51 | 0.43-0.59 | 98.5 | 40-135 |
| 13C-123678-HxCDD | 402/404 | 34:27 | 1.23 | 1.05-1.43 | 90.8 | 40-135 |
| 13C-1234678-HpCDF | 418/420 | 36:41 | 0.44 | 0.37-0.51 | 100 | 40-135 |
| 13C12-HpCDD 678 | 436/438 | 37:44 | 1.04 | 0.88-1.20 | 99.8 | 40-135 |
| 13C-OCDD | 470/472 | 41:24 | 0.88 | 0.76-1.02 | 104 | 40-135 |

# Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS64

Lab Name: Eno River Labs  Contract No: _____

Lab Code: ENORVR  Case No.: _____  TO No.: _____  SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL  Lab Sample ID: 423-96-5A

Sample wt/vol: 9.924 (g/ml) G  Lab File ID: T062496

Water Sample Prep: SEPF (SEPF/SPE)  Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL)  Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 82.7  Date Analyzed: 10/16/2006

GC Column: DB-5 ID: 0.25 (mm)  Dilution Factor: _____

CONCENTRATION UNITS: (pg/L or ng/Kg) NG/KG

| TARGET ANALYTE | SELECTED IONS | PEAK RT | ION RATIO # | CONCENTRATION | Q | EMPC/EDL |
|---|---|---|---|---|---|---|
| 2378-TCDD | 320/322 | 26:58 | 0.66 | 2.7 | | |
| 12378-PeCDD | 356/358 | 31:11 | 1.60 | 3.0 | J | |
| 123478-HxCDD | 390/392 | 34:18 | 1.30 | 4.3 | J | |
| 123678-HxCDD | 390/392 | 34:23 | 1.27 | 10.9 | | |
| 123789-HxCDD | 390/392 | 34:42 | 1.22 | 6.4 | | |
| 1234678-HpCDD | 424/426 | 37:40 | 1.01 | 338 | | |
| OCDD | 458/460 | 41:20 | 0.83 | 8710 | E | |
| 2378-TCDF | 304/306 | 26:17 | 0.82 | 8.1 | | |
| 12378-PeCDF | 340/342 | 30:12 | 1.42 * w/min 1.16-1.94 | | X | 17.1 |
| 23478-PeCDF | 340/342 | 30:52 | 1.29 * w/min 1.16-1.94 | | J | 2.8 |
| 123478-HxCDF | 374/376 | 33:35 | 1.31 | 9.4 | | |
| 123678-HxCDF | 374/376 | 33:42 | 1.28 | 3.9 | J | |
| 234678-HxCDF | 374/376 | 34:12 | 1.23 | 4.7 | J | |
| 123789-HxCDF | 374/376 | | | | U | 0.2 |
| 1234678-HpCDF | 408/410 | 36:37 | 1.04 | 32.1 | | |
| 1234789-HpCDF | 408/410 | 38:11 | 0.97 | 2.6 | J | |
| OCDF | 442/444 | 41:31 | 0.90 | 45.3 | | |

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

| INTERNAL LABELED COMPOUNDS | SELECTED IONS | PEAK RT | ION RATIO # | ION RATIO LIMITS | %REC # | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| 37Cl-2378-TCDD | 328/NA | 26:58 | NA | NA | 85.8 | 40-135 |
| 13C-2378-TCDF | 316/318 | 26:14 | 0.73 | 0.65-0.89 | 81.6 | 40-135 |
| 13C-2378-TCDD | 332/334 | 26:56 | 0.84 | 0.65-0.89 | 86.6 | 40-135 |
| 13C12-PeCDF 123 | 352/354 | 30:09 | 1.44 | 1.32-1.78 | 95.5 | 40-135 |
| 13C12-PeCDD 123 | 368/370 | 31:11 | 1.50 | 1.32-1.78 | 108 | 40-135 |
| 13C12-HxCDF 678 | 384/386 | 33:41 | 0.50 | 0.43-0.59 | 93.6 | 40-135 |
| 13C-123678-HxCDD | 402/404 | 34:22 | 1.14 | 1.05-1.43 | 97.1 | 40-135 |
| 13C-1234678-HpCDF | 418/420 | 36:36 | 0.44 | 0.37-0.51 | 102 | 40-135 |
| 13C12-HpCDD 678 | 436/438 | 37:39 | 1.05 | 0.88-1.20 | 105 | 40-135 |
| 13C-OCDD | 470/472 | 41:19 | 0.88 | 0.76-1.02 | 120 | 40-135 |

# Column to be used to flag values outside QC limits.

* within expanded window of ±25 % theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS65

Lab Name: Eno River Labs  Contract No: _____

Lab Code: ENORVR  Case No.: _____  TO No.: _____  SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL  Lab Sample ID: 423-96-6

Sample wt/vol: 10.097 (g/ml) G  Lab File ID: T062499

Water Sample Prep: SEPF (SEPF/SPE)  Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL)  Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 79.5  Date Analyzed: 10/16/2006

GC Column: DB-5 ID: 0.25 (mm)  Dilution Factor: _____

CONCENTRATION UNITS: (pg/L or ng/Kg) NG/KG

| TARGET ANALYTE | SELECTED IONS | PEAK RT | ION RATIO # | CONCENTRATION | Q | EMPC/EDL |
|---|---|---|---|---|---|---|
| 2378-TCDD | 320/322 | | | | U | 0.2 |
| 12378-PeCDD | 356/358 | | | | U | 0.2 |
| 123478-HxCDD | 390/392 | | | | U | 0.2 |
| 123678-HxCDD | 390/392 | 34:22 | 1.34 | 0.79 | J | |
| 123789-HxCDD | 390/392 | 34:42 | 1.36 | 0.63 | J | |
| 1234678-HpCDD | 424/426 | 37:40 | 1.02 | 37.4 | | |
| OCDD | 458/460 | 41:20 | 0.83 | 2880 | | |
| 2378-TCDF | 304/306 | 26:16 | 0.70 | 0.41 | J | |
| 12378-PeCDF | 340/342 | | | | U | 0.2 |
| 23478-PeCDF | 340/342 | | | | U | 0.2 |
| 123478-HxCDF | 374/376 | 33:35 | 1.22 | 0.29 | J | |
| 123678-HxCDF | 374/376 | | | | U | 0.1 |
| 234678-HxCDF | 374/376 | | | | U | 0.1 |
| 123789-HxCDF | 374/376 | | | | U | 0.2 |
| 1234678-HpCDF | 408/410 | 36:37 | 1.12 | 1.4 | J | |
| 1234789-HpCDF | 408/410 | | | | U | 0.2 |
| OCDF | 442/444 | 41:31 | 1.06 # | * within 0.67-1.13 | J | 1.5 |

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

| INTERNAL LABELED COMPOUNDS | SELECTED IONS | PEAK RT | ION RATIO # | ION RATIO LIMITS | %REC # | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| 37Cl-2378-TCDD | 328/NA | 26:58 | NA | NA | 91.6 | 40-135 |
| 13C-2378-TCDF | 316/318 | 26:14 | 0.75 | 0.65-0.89 | 88.6 | 40-135 |
| 13C-2378-TCDD | 332/334 | 26:56 | 0.85 | 0.65-0.89 | 90.8 | 40-135 |
| 13C12-PeCDF 123 | 352/354 | 30:09 | 1.48 | 1.32-1.78 | 104 | 40-135 |
| 13C12-PeCDD 123 | 368/370 | 31:11 | 1.53 | 1.32-1.78 | 112 | 40-135 |
| 13C12-HxCDF 678 | 384/386 | 33:41 | 0.50 | 0.43-0.59 | 95.7 | 40-135 |
| 13C-123678-HxCDD | 402/404 | 34:21 | 1.19 | 1.05-1.43 | 99.8 | 40-135 |
| 13C-1234678-HpCDF | 418/420 | 36:36 | 0.45 | 0.37-0.51 | 101 | 40-135 |
| 13C12-HpCDD 678 | 436/438 | 37:39 | 1.03 | 0.88-1.20 | 103 | 40-135 |
| 13C-OCDD | 470/472 | 41:18 | 0.88 | 0.76-1.02 | 98.8 | 40-135 |

# Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical

# APPENDIX J: CONTACT LIST

| | |
|---|---|
| BRAC: | BRAC PMO Northeast<br>4911 South Broad Street<br>Building 679, PNBC<br>Philadelphia, PA 19112<br>Attn: Mr. Curt Frye |
| | BRAC Environmental Coordinator<br>Navy PMO Northeast<br>4911 South Broad Street<br>Bldg 679, PNBC<br>Philadelphia, PA 19112<br>Attn: Robert F. Lewandowski |
| | BRAC PMO Northeast<br>4911 South Broad Street<br>Building 679, PNBC<br>Philadelphia, PA 19112<br>Attn: Ms. Lisa Yeutter, E.I.T. |
| ROICC: | Resident Officer In Charge of Construction<br>NAS JRB Willow Grove<br>BLDG. 78<br>Willow Grove, PA 19090<br>ATTN: Mr. V. Martucci<br>Ph. 215-773-2651 |
| Environmental: | NAS JRB Willow Grove<br>Bldg. 78<br>Willow Grove, PA 19090<br>Environmental Dept.<br>ATTN: Mr. J. Edmond |
| EPA: | Ms. Lisa Bradford<br>Remedial Project Manager<br>Region III, U.S. EPA<br>1650 Arch St. (3HS13)<br>Philadelphia, PA 19103-2029 |
| PADEP: | Ms. April Flipse<br>Pennsylvania Department of<br>Environmental Protection (PADEP)<br>2 E. Main Street<br>Norristown, PA 19401 (2 copies) |