

**APPENDIX E**  
**IDW REPORT**

**THIS PAGE INTENTIONALLY LEFT BLANK**



**INVESTIGATION-DERIVED WASTE CHARACTERIZATION AND DISPOSAL  
PLAN**

***FOR THE***

**PHASE I/PHASE II REMEDIAL INVESTIGATION OF THE FUZE AND  
BOOSTER QUARRY LANDFILL/PONDS AT THE RAVENNA ARMY  
AMMUNITION PLANT, RAVENNA, OHIO**

***PREPARED FOR***

**US ARMY JOINT OPERATIONS COMMAND  
CONTRACT NO. DAAA09-01-G-0009  
DELIVERY ORDER NO. 0012**

**DECEMBER 2003**

**INVESTIGATION-DERIVED WASTE CHARACTERIZATION  
AND DISPOSAL PLAN**

**FOR THE  
PHASE I/PHASE II REMEDIAL INVESTIGATION  
OF THE FUZE AND BOOSTER QUARRY  
LANDFILL/PONDS  
AT THE  
RAVENNA ARMY AMMUNITION PLANT  
RAVENNA, OHIO**

**DECEMBER 2003**

**Prepared for**

**U.S. Army Joint Operations Command  
Contract No. DAAA09-01-G-0009  
Delivery Order No. 0012**

**Prepared by**

**SpecPro, Inc.  
8451 State Route 5  
Ravenna, OH 44266**

## CONTENTS

|   |    |
|---|----|
| CONTENTS .....                                    | 35 |
| TABLES .....                                      | 35 |
| ACRONYMS .....                                    | 36 |
| 1.0 INTRODUCTION .....                            | 37 |
| 2.0 OPERATIONAL HISTORY AND WASTE GENERATION..... | 37 |
| 3.0 MANAGEMENT OF ENVIRONMENTAL MEDIA .....       | 39 |
| 4.0 DISCUSSION OF ANALYTICAL RESULTS .....        | 39 |
| 5.0 RECOMMENDATIONS FOR DISPOSAL .....            | 39 |
| 5.1 Soils.....                                    | 40 |
| 5.2 Groundwater.....                              | 40 |
| 5.3 Decontamination Fluids .....                  | 40 |
| 5.4 Summary of Disposal Recommendations.....      | 41 |
| 6.0 REFERENCES .....                              | 43 |

## TABLES

|   |    |
|---|----|
| Table 2-1 IDW Inventory .....   | 37 |
| Table 5-1 Summary of Waste Classification and Disposal Recommendations... | 42 |

## ACRONYMS

|          |  |
|----------|--|
| DOD      | Department of Defense                      |
| EPA      | U.S. Environmental Protection Agency       |
| IDW      | investigation-derived wastes               |
| Ohio EPA | Ohio Environmental Protection Agency       |
| PPE      | personal protective equipment              |
| RVAAP    | Ravenna Army Ammunition Plant              |
| TCLP     | Toxicity Characteristic Leaching Procedure |
| USACE    | US Army Corps of Engineers                 |
| UXO      | unexploded ordnance                        |

## 1.0 INTRODUCTION

Investigative activities conducted during the Phase I/Phase II RI of the Fuze and Booster Quarry Landfill/Ponds at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio, resulted in the generation of investigation-derived wastes (IDW) consisting of soil and water wastes. The IDW was generated in the course of drilling, sampling, and decontamination activities. The purpose of this report is to characterize and classify the IDW for disposal. The report includes a summary of the IDW generated and its origin; classification of the IDW and recommendations for disposal; and a review of the analytical results used for waste characterization. This document follows guidance established by the USACE and the Ohio EPA regarding IDW disposition at RVAAP.

## 2.0 OPERATIONAL HISTORY AND WASTE GENERATION

Information regarding the operational history and suspected contaminants at the Fuze and Booster Quarry Landfill Ponds is presented in Section 1 of the *Work Plan and Sampling and Analysis Plan Addenda for the Phase I/Phase II Remedial Investigation of the Fuze & Booster Quarry Landfill/Ponds at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. Section 7 of this Addendum describes procedures used for sampling and managing IDW at RVAAP.

Soil and water (groundwater and decontamination water) IDW generated during activities at Demolition Area 2 are listed, by container, in Table 2-1 below.

**Table 2-1. IDW Inventory**

| Container Number | Container Type & Size | Contents                | Volume | Source of Waste     |
|------------------|-----------------------|-------------------------|--------|---------------------|
| FBQ-166-001      | 55 Gal. Closed Top    | Development/Purge Water | Full   | Monitoring Well 166 |
| FBQ-166-002      | 55 Gal. Closed Top    | Development/Purge Water | Full   | Monitoring Well 166 |
| FBQ-167-001      | 55 Gal. Closed Top    | Development/Purge Water | Full   | Monitoring Well 167 |
| FBQ-167-002      | 55 Gal. Closed Top    | Development/Purge Water | ¾ Full | Monitoring Well 167 |
| FBQ-168-001      | 55 Gal. Closed Top    | Development/Purge Water | Full   | Monitoring Well 168 |
| FBQ-168-002      | 55 Gal. Closed Top    | Development/Purge Water | Full   | Monitoring Well 168 |
| FBQ-169-001      | 55 Gal. Closed Top    | Development/Purge Water | Full   | Monitoring Well 169 |

| Container Number | Container Type & Size | Contents                   | Volume    | Source of Waste         |
|------------------|-----------------------|----------------------------|-----------|-------------------------|
| FBQ-169-002      | 55 Gal. Closed Top    | Development/Purge Water    | Full      | Monitoring Well 169     |
| FBQ-169-003      | 55 Gal. Closed Top    | Development/Purge Water    | ¾ Full    | Monitoring Well 169     |
| FBQ-170-001      | 55 Gal. Closed Top    | Development/Purge Water    | Full      | Monitoring Well 170     |
| FBQ-170-002      | 55 Gal. Closed Top    | Development/Purge Water    | Full      | Monitoring Well 170     |
| FBQ-171          | 55 Gal. Closed Top    | Development/Purge Water    | Full      | Monitoring Well 171     |
| FBQ-172-001      | 55 Gal. Closed Top    | Development/Purge Water    | Full      | Monitoring Well 172     |
| FBQ-172-002      | 55 Gal. Closed Top    | Development/Purge Water    | 2/3 Full  | Monitoring Well 172     |
| FBQ-173-001      | 55 Gal. Closed Top    | Development/Purge Water    | <1/2 Full | Monitoring Well 173     |
| FBQ-173-002      | 55 Gal. Closed Top    | Development/Purge Water    | ¾ Full    | Monitoring Well 173     |
| FBQ-174-001      | 55 Gal. Closed Top    | Development/Purge Water    | ½ Full    | Monitoring Well 174     |
| FBQ-174-002      | 55 Gal. Closed Top    | Development/Purge Water    | ¾ Full    | Monitoring Well 174     |
| FBQ-174-003      | 55 Gal. Closed Top    | Development/Purge Water    | Full      | Monitoring Well 174     |
| FBQ-175-001      | 55 Gal. Closed Top    | Development/Purge Water    | ¾ Full    | Monitoring Well 175     |
| FBQ-175-002      | 55 Gal. Closed Top    | Development/Purge Water    | <1/2 Full | Monitoring Well 175     |
| FBQ-176-001      | 55 Gal. Closed Top    | Development/Purge Water    | Full      | Monitoring Well 176     |
| FBQ-176-002      | 55 Gal. Closed Top    | Development/Purge Water    | ½ Full    | Monitoring Well 176     |
| FBQ-177-001      | 55 Gal. Closed Top    | Development/Purge Water    | ¾ Full    | Monitoring Well 177     |
| FBQ-177-002      | 55 Gal. Closed Top    | Development/Purge Water    | ½ Full    | Monitoring Well 177     |
| FBQ-DECON-001    | 55 Gal. Closed Top    | Drill Rig Decon Water/Soil | Full      | Drill Rig Decon         |
| FBQ-DECON-002    | 55 Gal. Closed Top    | Drill Rig Decon Water/Soil | Full      | Drill Rig Decon         |
| FBQ-DECON-003    | 55 Gal. Closed Top    | Drill Rig Decon Water/Soil | Full      | Drill Rig Decon         |
| FBQ-DECON-004    | 55 Gal. Closed Top    | Drill Rig Decon Water/Soil | Full      | Drill Rig Decon         |
| FBQ-DECON-005    | 55 Gal. Closed Top    | Decon Water/Soil           | Full      | Equipment Decon         |
| FBQ-RO           | 15 Cu. Yd. Roll-off   | Soil Cuttings              | ½ Full    | Surface/Subsurface Soil |



### **3.0 MANAGEMENT OF ENVIRONMENTAL MEDIA**

All environmental media were managed in a manner that minimized potential risk to human health and the environment. IDW was handled as nonhazardous material pending waste characterization and classification based on analytical results. The Facility-Wide SAP (USACE 2001) and the Phase I/Phase II RI Work Plan/Sampling and Analysis Plan (2003) contain approved procedures used for containerizing and handling IDW.

Indigenous solid IDW (soil and rock cuttings) generated during the Phase I/Phase II RI from soil and sediment samples were collected and contained in a lined roll-off box. The roll-off box was covered with a tarp to prevent the introduction of rainwater to the soils, and was staged at the Fuze and Booster Quarry Landfill/Pond area.

All liquid indigenous (groundwater) IDW generated from monitoring well installation, development, and purging was segregated by sample station and placed into closed-top 55-gallon drums. All groundwater containers were staged at the Fuze and Booster Quarry Landfill/Pond area and will be moved to Building 1037 for staging prior to pick-up for disposal. All liquid non-indigenous (decontamination rinse water) IDW was segregated by waste stream and was contained in labeled DOT-approved, 55-gallon closed-top drums.

### **4.0 DISCUSSION OF ANALYTICAL RESULTS**

Per Section 7.4 of the Facility-Wide SAP (2001), the analytical results from environmental samples collected during the Phase I/Phase II RI were used to characterize IDW for each sampling medium. Where correlative environmental samples do not exist, waste characterization samples were collected in accordance with Section 7 of the Work Plan and Sampling and Analysis Plan Addendum. The IDW characterization results are presented in Appendix A.

### **5.0 RECOMMENDATIONS FOR DISPOSAL**

Table 7-1 of the Facility-Wide SAP (2001) shows the maximum concentration of contaminants for the toxicity characteristic for hazardous wastes per 40 CFR 261.24. Analytical results for the IDW are compared with these criteria to determine whether waste containers are potentially hazardous or non-hazardous.

For the characterization of IDW solid wastes (e.g., soils) as non-hazardous or hazardous, the Resource Conservation and Recovery Act (RCRA)

regulatory limit will be compared to the mean contaminant level as presented in Appendix A. Although the analysis conducted on the materials was a total analysis, the Toxicity Characteristic Leaching Procedure (TCLP) methodology will be used for waste classification by applying a twenty-fold dilution factor to total results for comparison to TCLP. For purposes of hazardous waste determination, if a given analyte is found to exceed 20 times the regulatory limit, it is being considered a RCRA-hazardous waste due to the dilution factor inherent in the TCLP method for solid materials. Analytical results for liquids were directly compared to the regulatory limits to determine hazardous waste applicability.

## **5.1 Soils**

As previously discussed, excess soils were generated from the monitoring well installations and from the soils sample locations. All excess soils generated during the Phase I/Phase II RI were placed in a roll-off container staged within the Fuze and Booster Quarry Landfill/Ponds area (FBQss-TCLP). Analytical data generated from these sample points were compared to regulatory TCLP criteria and to sitewide background criteria to properly characterize FBQ-RO for disposal. Based on this comparison, it was recommended that this container be classified as contaminated, non-hazardous and sent off-site for non-hazardous disposal to a licensed solid waste facility.

## **5.2 Groundwater**

Excess groundwater was generated during the well installation, development, and sampling activities associated with the Phase I/Phase II RI at the Fuze and Booster Quarry Landfill/Ponds area. A comparison of analytical data generated from groundwater sampling activities and TCLP data indicated that no regulatory criteria for RCRA hazardous waste determinations were exceeded. It is recommended that all containers of excess groundwater be classified as contaminated, non-hazardous and that they be sent off-site for disposal to a permitted water treatment facility.

## **5.3 Decontamination Fluids**

A waste sample collected from decontamination fluids generated during the decontamination of the drill rig and other decontamination fluids generated from cleaning of daily soil sampling equipment used during the Phase I/Phase II RI (container numbers FBQ-DECON-001 through FBQ-DECON-005) indicated that all analytes were below TCLP threshold values and therefore is classified as non-hazardous. It is recommended that this container be classified as

contaminated, non-hazardous, and that it be sent off-site for disposal to a permitted water treatment facility.

#### ***5.4 Summary of Disposal Recommendations***

Table 5-1 presents a summary of the waste classification and recommended disposal options presented in Section 5.

Table 5.1 Summary of Waste Classification and Disposal Recommendations

| Container Number | Media | Waste Criteria                                 | Disposal Recommendation                          |
|------------------|-------|--|--|
| FBQ-166-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-166-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-167-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-167-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-168-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-168-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-169-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-169-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-169-003      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-170-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-170-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-171          | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-172-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-172-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-173-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-173-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-174-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-174-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-174-003      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-175-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-175-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-176-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-176-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-177-001      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-177-002      | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-DECON-001    | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-DECON-002    | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-DECON-003    | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-DECON-004    | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQ-DECON-005    | Water | Explosives Detected OR Metals Above Background | Consolidated for Off-Site Non-Hazardous Disposal |
| FBQss-TCLP       | Soil  | Explosives Detected OR Metals Above Background | Off-Site Non-Hazardous Disposal                  |

## **6.0 REFERENCES**

USACE 2001. *Facility-Wide Sampling and Analysis Plan for Environmental Investigations at the Ravenna Army Ammunition Plant, Ravenna, Ohio.*

**APPENDIX A**

**INVESTIGATION-DERIVED WASTE  
ANALYTICAL RESULTS SUMMARY**

**Summary of Analytical Results**

Client ID: FBQSS-TCLP  
GPL ID: 311103-001-003-1/2  
Matrix: SOIL  
Date Collected: 11/17/2003  
Date Received: 11/18/2003

Prep Method: SW3010A  
Prep Date: 11/25/2003  
Prep Time: 00:00  
Prep Batch: 63785

Analytical Method: SW6010B\_TCLP  
Date Analyzed: 12/01/2003  
Time Analyzed: 15:32  
Analysis Batch: 15748

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------|--------|-----------|-------|-----------|------|
| Arsenic   | BQL    | 200       | ug/L  | U         | 1    |
| Barium    | BQL    | 1000      | ug/L  | U         | 1    |
| Cadmium   | BQL    | 60        | ug/L  | U         | 1    |
| Chromium  | BQL    | 50        | ug/L  | U         | 1    |
| Lead      | BQL    | 100       | ug/L  | U         | 1    |
| Selenium  | BQL    | 200       | ug/L  | U         | 1    |
| Silver    | BQL    | 30        | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQSS-TCLP  
GPL ID: 311103-001-003-1/2  
Matrix: SOIL  
Date Collected: 11/17/2003  
Date Received: 11/18/2003

Prep Method: SW7470A\_DIG  
Prep Date: 11/23/2003  
Prep Time: 13:00  
Prep Batch: 63750

Analytical Method: SW7471A\_TCLP  
Date Analyzed: 11/24/2003  
Time Analyzed: 11:11  
Analysis Batch: 15748

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------|--------|-----------|-------|-----------|------|
| Mercury   | BQL    | 2         | ug/L  | U         | 1    |



**Summary of Analytical Results**

Client ID: FBQSS-TCLP  
GPL ID: 311103-001-003-1/2  
Matrix: SOIL  
Date Collected: 11/17/2003  
Date Received: 11/18/2003

Prep Method: SW3510C  
Prep Date: 11/25/2003  
Prep Time: 11:57  
Prep Batch: 63814

Analytical Method: SW8081A\_TCLP  
Date Analyzed: 12/01/2003  
Time Analyzed: 10:10  
Analysis Batch: 64925

| Parameter           | Result | Rep Limit | Units | Qualifier | D.F. |
|---------------------|--------|-----------|-------|-----------|------|
| Chlordane           | BQL    | 5.0       | ug/L  | U         | 1    |
| Endrin              | BQL    | 0.25      | ug/L  | U         | 1    |
| Gamma-BHC (Lindane) | BQL    | 0.25      | ug/L  | U         | 1    |
| Heptachlor          | BQL    | 0.25      | ug/L  | U         | 1    |
| Heptachlor Epoxide  | BQL    | 0.25      | ug/L  | U         | 1    |
| Methoxychlor        | BQL    | 0.25      | ug/L  | U         | 1    |
| Toxaphene           | BQL    | 5.0       | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQSS-TCLP  
GPL ID: 311103-001-003-1/2  
Matrix: SOIL  
Date Collected: 11/17/2003  
Date Received: 11/18/2003

Prep Method: EXT\_SW8151  
Prep Date: 11/25/2003  
Prep Time: 12:10  
Prep Batch: 63815

Analytical Method: SW8151A\_TCLP  
Date Analyzed: 12/02/2003  
Time Analyzed: 22:28  
Analysis Batch: 64952

| Parameter         | Result | Rep Limit | Units | Qualifier | D.F. |
|-------------------|--------|-----------|-------|-----------|------|
| 2,4,5-TP (Silvex) | BQL    | 5.0       | ug/L  | U         | 1    |
| 2,4-D             | BQL    | 5.0       | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQSS-TCLP  
GPL ID: 311103-001-003-1/2  
Matrix: WATER  
Date Collected: 11/17/2003  
Date Received: 11/18/2003

Prep Method: SW5030B  
Prep Date: 11/25/2003  
Prep Time: 12:56  
Prep Batch: 63864

Analytical Method: SW8260B\_TCLP  
Date Analyzed: 11/25/2003  
Time Analyzed: 16:56  
Analysis Batch: 64896

| Parameter            | Result | Rep Limit | Units | Qualifier | D.F. |
|----------------------|--------|-----------|-------|-----------|------|
| 1,1-Dichloroethene   | BQL    | 100       | ug/L  | U         | 10   |
| 1,2-Dichloroethane   | BQL    | 100       | ug/L  | U         | 10   |
| 1,4-Dichlorobenzene  | BQL    | 100       | ug/L  | U         | 10   |
| 2-Butanone           | BQL    | 100       | ug/L  | U         | 10   |
| Benzene              | BQL    | 100       | ug/L  | U         | 10   |
| Carbon Tetrachloride | BQL    | 100       | ug/L  | U         | 10   |
| Chlorobenzene        | BQL    | 100       | ug/L  | U         | 10   |
| Chloroform           | BQL    | 100       | ug/L  | U         | 10   |
| Tetrachloroethylene  | BQL    | 100       | ug/L  | U         | 10   |
| Trichloroethene      | BQL    | 100       | ug/L  | U         | 10   |
| Vinyl Chloride       | BQL    | 100       | ug/L  | U         | 10   |

**Summary of Analytical Results**

Client ID: FBQSS-TCLP  
GPL ID: 311103-001-003-1/2  
Matrix: SOIL  
Date Collected: 11/17/2003  
Date Received: 11/18/2003

Prep Method: SW3510C  
Prep Date: 11/25/2003  
Prep Time: 00:00  
Prep Batch: 63812

Analytical Method: SW8270C\_TCLP  
Date Analyzed: 12/01/2003  
Time Analyzed: 18:13  
Analysis Batch: 64931

| Parameter             | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------------------|--------|-----------|-------|-----------|------|
| 1,4-Dichlorobenzene   | BQL    | 50        | ug/L  | U         | 1    |
| 2,4,5-Trichlorophenol | BQL    | 50        | ug/L  | U         | 1    |
| 2,4,6-Trichlorophenol | BQL    | 50        | ug/L  | U         | 1    |
| 2,4-Dinitrotoluene    | BQL    | 50        | ug/L  | U         | 1    |
| 2-methylphenol        | BQL    | 50        | ug/L  | U         | 1    |
| 3 & 4-Methylphenol    | BQL    | 50        | ug/L  | U         | 1    |
| Hexachlorobenzene     | BQL    | 50        | ug/L  | U         | 1    |
| Hexachlorobutadiene   | BQL    | 50        | ug/L  | U         | 1    |
| Hexachloroethane      | BQL    | 50        | ug/L  | U         | 1    |
| Nitrobenzene          | BQL    | 50        | ug/L  | U         | 1    |
| Pentachlorophenol     | BQL    | 100       | ug/L  | U         | 1    |
| Pyridine              | BQL    | 50        | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQSS-TCLP  
GPL ID: 311103-001-001-1/2  
Matrix: SOIL  
Date Collected: 11/17/2003  
Date Received: 11/18/2003

Prep Method:  
Prep Date:  
Prep Time:  
Prep Batch:

Analytical Method: SW9014R  
Date Analyzed: 11/24/2003  
Time Analyzed: 13:00  
Analysis Batch: 64824

| Parameter         | Result | Rep Limit | Units | Qualifier | D.F. |
|-------------------|--------|-----------|-------|-----------|------|
| Cyanide, Reactive | BQL    | 0.030     | mg/kg | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQSS-TCLP  
GPL ID: 311103-001-001-1/2  
Matrix: SOIL  
Date Collected: 11/17/2003  
Date Received: 11/18/2003

Prep Method:  
Prep Date:  
Prep Time:  
Prep Batch:

Analytical Method: SW9034R  
Date Analyzed: 11/24/2003  
Time Analyzed: 08:00  
Analysis Batch: 64829

| Parameter         | Result | Rep Limit | Units | Qualifier | D.F. |
|-------------------|--------|-----------|-------|-----------|------|
| Sulfide, Reactive | BQL    | 10        | mg/kg | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQSS-TCLP  
GPL ID: 311103-001-001-1/2  
Matrix: SOIL  
Date Collected: 11/17/2003  
Date Received: 11/18/2003

Prep Method:  
Prep Date:  
Prep Time:  
Prep Batch:

Analytical Method: SW9045C  
Date Analyzed: 11/20/2003  
Time Analyzed: 15:30  
Analysis Batch: 64781

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------|--------|-----------|-------|-----------|------|
| pH        | 7.2    | 0         | pH    |           | 1    |

**Summary of Analytical Results**

Client ID: FBQ TCLPMW  
GPL ID: 311142-001-005-1/1  
Matrix: WATER  
Date Collected: 11/20/2003  
Date Received: 11/21/2003

Prep Method: SW3010A  
Prep Date: 11/25/2003  
Prep Time: 00:00  
Prep Batch: 63785

Analytical Method: SW6010B\_TCLP  
Date Analyzed: 12/01/2003  
Time Analyzed: 16:03  
Analysis Batch: 15749

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------|--------|-----------|-------|-----------|------|
| Arsenic   | BQL    | 200       | ug/L  | U         | 1    |
| Barium    | BQL    | 1000      | ug/L  | U         | 1    |
| Cadmium   | BQL    | 60        | ug/L  | U         | 1    |
| Chromium  | BQL    | 50        | ug/L  | U         | 1    |
| Lead      | BQL    | 100       | ug/L  | U         | 1    |
| Selenium  | BQL    | 200       | ug/L  | U         | 1    |
| Silver    | BQL    | 30        | ug/L  | U         | 1    |



**Summary of Analytical Results**

Client ID: FBQ TCLPMW  
GPL ID: 311142-001-005-1/1  
Matrix: WATER  
Date Collected: 11/20/2003  
Date Received: 11/21/2003

Prep Method: SW7470A\_DIG  
Prep Date: 11/25/2003  
Prep Time: 15:00  
Prep Batch: 63794

Analytical Method: SW7471A\_TCLP  
Date Analyzed: 11/26/2003  
Time Analyzed: 08:57  
Analysis Batch: 15749

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------|--------|-----------|-------|-----------|------|
| Mercury   | BQL    | 2         | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQ TCLPMW  
GPL ID: 311142-001-003-1/2  
Matrix: WATER  
Date Collected: 11/20/2003  
Date Received: 11/21/2003

Prep Method: SW3510C  
Prep Date: 11/25/2003  
Prep Time: 11:57  
Prep Batch: 63814

Analytical Method: SW8081A\_TCLP  
Date Analyzed: 12/01/2003  
Time Analyzed: 00:02  
Analysis Batch: 64925

| Parameter           | Result | Rep Limit | Units | Qualifier | D.F. |
|---------------------|--------|-----------|-------|-----------|------|
| Chlordane           | BQL    | 5.0       | ug/L  | U         | 1    |
| Endrin              | BQL    | 0.25      | ug/L  | U         | 1    |
| Gamma-BHC (Lindane) | BQL    | 0.25      | ug/L  | U         | 1    |
| Heptachlor          | BQL    | 0.25      | ug/L  | U         | 1    |
| Heptachlor Epoxide  | BQL    | 0.25      | ug/L  | U         | 1    |
| Methoxychlor        | BQL    | 0.25      | ug/L  | U         | 1    |
| Toxaphene           | BQL    | 5.0       | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQ TCLPMW  
GPL ID: 311142-001-003-1/2  
Matrix: WATER  
Date Collected: 11/20/2003  
Date Received: 11/21/2003

Prep Method: EXT\_SW8151  
Prep Date: 11/25/2003  
Prep Time: 12:10  
Prep Batch: 63815

Analytical Method: SW8151A\_TCLP  
Date Analyzed: 12/02/2003  
Time Analyzed: 23:19  
Analysis Batch: 64955

| Parameter         | Result | Rep Limit | Units | Qualifier | D.F. |
|-------------------|--------|-----------|-------|-----------|------|
| 2,4,5-TP (Silvex) | BQL    | 5.0       | ug/L  | U         | 1    |
| 2,4-D             | BQL    | 5.0       | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQ TCLPMW  
GPL ID: 311142-001-003-1/2  
Matrix: WATER  
Date Collected: 11/20/2003  
Date Received: 11/21/2003

Prep Method: SW5030B  
Prep Date: 11/25/2003  
Prep Time: 12:56  
Prep Batch: 63864

Analytical Method: SW8260B\_TCLP  
Date Analyzed: 11/25/2003  
Time Analyzed: 17:51  
Analysis Batch: 64896

| Parameter            | Result | Rep Limit | Units | Qualifier | D.F. |
|----------------------|--------|-----------|-------|-----------|------|
| 1,1-Dichloroethene   | BQL    | 100       | ug/L  | U         | 10   |
| 1,2-Dichloroethane   | BQL    | 100       | ug/L  | U         | 10   |
| 1,4-Dichlorobenzene  | BQL    | 100       | ug/L  | U         | 10   |
| 2-Butanone           | BQL    | 100       | ug/L  | U         | 10   |
| Benzene              | BQL    | 100       | ug/L  | U         | 10   |
| Carbon Tetrachloride | BQL    | 100       | ug/L  | U         | 10   |
| Chlorobenzene        | BQL    | 100       | ug/L  | U         | 10   |
| Chloroform           | BQL    | 100       | ug/L  | U         | 10   |
| Tetrachloroethylene  | BQL    | 100       | ug/L  | U         | 10   |
| Trichloroethene      | BQL    | 100       | ug/L  | U         | 10   |
| Vinyl Chloride       | BQL    | 100       | ug/L  | U         | 10   |

**Summary of Analytical Results**

Client ID: FBQ TCLPMW  
GPL ID: 311142-001-003-1/2  
Matrix: WATER  
Date Collected: 11/20/2003  
Date Received: 11/21/2003

Prep Method: SW3510C  
Prep Date: 11/25/2003  
Prep Time: 00:00  
Prep Batch: 63812

Analytical Method: SW8270C\_TCLP  
Date Analyzed: 12/01/2003  
Time Analyzed: 19:58  
Analysis Batch: 64932

| Parameter             | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------------------|--------|-----------|-------|-----------|------|
| 1,4-Dichlorobenzene   | BQL    | 50        | ug/L  | U         | 1    |
| 2,4,5-Trichlorophenol | BQL    | 50        | ug/L  | U         | 1    |
| 2,4,6-Trichlorophenol | BQL    | 50        | ug/L  | U         | 1    |
| 2,4-Dinitrotoluene    | BQL    | 50        | ug/L  | U         | 1    |
| 2-methylphenol        | BQL    | 50        | ug/L  | U         | 1    |
| 3 & 4-Methylphenol    | BQL    | 50        | ug/L  | U         | 1    |
| Hexachlorobenzene     | BQL    | 50        | ug/L  | U         | 1    |
| Hexachlorobutadiene   | BQL    | 50        | ug/L  | U         | 1    |
| Hexachloroethane      | BQL    | 50        | ug/L  | U         | 1    |
| Nitrobenzene          | BQL    | 50        | ug/L  | U         | 1    |
| Pentachlorophenol     | BQL    | 100       | ug/L  | U         | 1    |
| Pyridine              | BQL    | 50        | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQ TCLPMW  
GPL ID: 311142-001-001-1/2  
Matrix: WATER  
Date Collected: 11/20/2003  
Date Received: 11/21/2003

Prep Method:  
Prep Date:  
Prep Time:  
Prep Batch:

Analytical Method: SW9014R  
Date Analyzed: 11/25/2003  
Time Analyzed: 17:00  
Analysis Batch: 64860

| Parameter         | Result | Rep Limit | Units | Qualifier | D.F. |
|-------------------|--------|-----------|-------|-----------|------|
| Cyanide, Reactive | BQL    | 0.030     | mg/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQ TCLPMW  
GPL ID: 311142-001-001-1/2  
Matrix: WATER  
Date Collected: 11/20/2003  
Date Received: 11/21/2003

Prep Method:  
Prep Date:  
Prep Time:  
Prep Batch:

Analytical Method: SW9034R  
Date Analyzed: 11/25/2003  
Time Analyzed: 08:30  
Analysis Batch: 64831

| Parameter         | Result | Rep Limit | Units | Qualifier | D.F. |
|-------------------|--------|-----------|-------|-----------|------|
| Sulfide, Reactive | BQL    | 10        | mg/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQ TCLPMW  
GPL ID: 311142-001-001-1/2  
Matrix: WATER  
Date Collected: 11/20/2003  
Date Received: 11/21/2003

Prep Method:  
Prep Date:  
Prep Time:  
Prep Batch:

Analytical Method: SW9040  
Date Analyzed: 11/21/2003  
Time Analyzed: 15:40  
Analysis Batch: 64785

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------|--------|-----------|-------|-----------|------|
| pH        | 7.1    | 0         | pH    |           | 1    |



**Summary of Analytical Results**

Client ID: FBQIDW-TCLP  
GPL ID: 312043-001-007-1/1  
Matrix: WATER  
Date Collected: 12/04/2003  
Date Received: 12/05/2003

Prep Method:  
Prep Date:  
Prep Time:  
Prep Batch:

Analytical Method: SW1010  
Date Analyzed: 12/12/2003  
Time Analyzed: 00:00  
Analysis Batch: 65153

| Parameter   | Result | Rep Limit | Units | Qualifier | D.F. |
|-------------|--------|-----------|-------|-----------|------|
| Flash Point | BQL    |           | DC    |           | 1    |

**Summary of Analytical Results**

Client ID: FBQIDW-TCLP  
GPL ID: 312043-001-009-1/1  
Matrix: WATER  
Date Collected: 12/04/2003  
Date Received: 12/05/2003

Prep Method: SW3010A  
Prep Date: 12/11/2003  
Prep Time: 00:00  
Prep Batch: 64127

Analytical Method: SW6010B\_TCLP  
Date Analyzed: 12/19/2003  
Time Analyzed: 22:58  
Analysis Batch: 15904

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------|--------|-----------|-------|-----------|------|
| Arsenic   | BQL    | 200       | ug/L  | U         | 1    |
| Barium    | BQL    | 1000      | ug/L  | U         | 1    |
| Cadmium   | BQL    | 60        | ug/L  | U         | 1    |
| Chromium  | BQL    | 50        | ug/L  | U         | 1    |
| Lead      | BQL    | 100       | ug/L  | U         | 1    |
| Selenium  | BQL    | 200       | ug/L  | U         | 1    |
| Silver    | BQL    | 30        | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQIDW-TCLP  
GPL ID: 312043-001-009-1/1  
Matrix: WATER  
Date Collected: 12/04/2003  
Date Received: 12/05/2003

Prep Method: SW7470A\_DIG  
Prep Date: 12/13/2003  
Prep Time: 14:00  
Prep Batch: 64132

Analytical Method: SW7470A\_TCLP  
Date Analyzed: 12/15/2003  
Time Analyzed: 11:06  
Analysis Batch: 15904

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------|--------|-----------|-------|-----------|------|
| Mercury   | BQL    | 2         | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQIDW-TCLP  
GPL ID: 312043-001-001-1/2  
Matrix: WATER  
Date Collected: 12/04/2003  
Date Received: 12/05/2003

Prep Method: SW3510C  
Prep Date: 12/11/2003  
Prep Time: 00:00  
Prep Batch: 64260

Analytical Method: SW8081A\_TCLP  
Date Analyzed: 12/21/2003  
Time Analyzed: 15:18  
Analysis Batch: 65381

| Parameter           | Result | Rep Limit | Units | Qualifier | D.F. |
|---------------------|--------|-----------|-------|-----------|------|
| Chlordane           | BQL    | 5.0       | ug/L  | U         | 1    |
| Endrin              | BQL    | 0.25      | ug/L  | U         | 1    |
| Gamma-BHC (Lindane) | BQL    | 0.25      | ug/L  | U         | 1    |
| Heptachlor          | BQL    | 0.25      | ug/L  | U         | 1    |
| Heptachlor Epoxide  | BQL    | 0.25      | ug/L  | U         | 1    |
| Methoxychlor        | BQL    | 0.25      | ug/L  | U         | 1    |
| Toxaphene           | BQL    | 5.0       | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQIDW-TCLP  
GPL ID: 312043-001-001-1/2  
Matrix: WATER  
Date Collected: 12/04/2003  
Date Received: 12/05/2003

Prep Method: EXT\_SW8151  
Prep Date: 12/16/2003  
Prep Time: 00:00  
Prep Batch: 64258

Analytical Method: SW8151A\_TCLP  
Date Analyzed: 12/21/2003  
Time Analyzed: 16:40  
Analysis Batch: 65383

| Parameter         | Result | Rep Limit | Units | Qualifier | D.F. |
|-------------------|--------|-----------|-------|-----------|------|
| 2,4,5-TP (Silvex) | BQL    | 5.0       | ug/L  | U         | 1    |
| 2,4-D             | BQL    | 5.0       | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQIDW-TCLP  
GPL ID: 312043-001-001-1/2  
Matrix: WATER  
Date Collected: 12/04/2003  
Date Received: 12/05/2003

Prep Method: SW5030B  
Prep Date: 12/15/2003  
Prep Time: 09:53  
Prep Batch: 64187

Analytical Method: SW8260B\_TCLP  
Date Analyzed: 12/15/2003  
Time Analyzed: 14:44  
Analysis Batch: 65246

| Parameter            | Result | Rep Limit | Units | Qualifier | D.F. |
|----------------------|--------|-----------|-------|-----------|------|
| 1,1-Dichloroethene   | BQL    | 100       | ug/L  | U         | 10   |
| 1,2-Dichloroethane   | BQL    | 100       | ug/L  | U         | 10   |
| 1,4-Dichlorobenzene  | BQL    | 100       | ug/L  | U         | 10   |
| 2-Butanone           | BQL    | 100       | ug/L  | U         | 10   |
| Benzene              | BQL    | 100       | ug/L  | U         | 10   |
| Carbon Tetrachloride | BQL    | 100       | ug/L  | U         | 10   |
| Chlorobenzene        | BQL    | 100       | ug/L  | U         | 10   |
| Chloroform           | BQL    | 100       | ug/L  | U         | 10   |
| Tetrachloroethylene  | BQL    | 100       | ug/L  | U         | 10   |
| Trichloroethene      | BQL    | 100       | ug/L  | U         | 10   |
| Vinyl Chloride       | BQL    | 100       | ug/L  | U         | 10   |

**Summary of Analytical Results**

Client ID: FBQIDW-TCLP  
GPL ID: 312043-001-001-1/2  
Matrix: WATER  
Date Collected: 12/04/2003  
Date Received: 12/05/2003

Prep Method: SW3510C  
Prep Date: 12/11/2003  
Prep Time: 00:00  
Prep Batch: 64096

Analytical Method: SW8270C\_TCLP  
Date Analyzed: 12/19/2003  
Time Analyzed: 03:01  
Analysis Batch: 65426

| Parameter             | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------------------|--------|-----------|-------|-----------|------|
| 1,4-Dichlorobenzene   | BQL    | 50        | ug/L  | U         | 1    |
| 2,4,5-Trichlorophenol | BQL    | 50        | ug/L  | U         | 1    |
| 2,4,6-Trichlorophenol | BQL    | 50        | ug/L  | U         | 1    |
| 2,4-Dinitrotoluene    | BQL    | 50        | ug/L  | U         | 1    |
| 2-methylphenol        | BQL    | 50        | ug/L  | U         | 1    |
| 3 & 4-Methylphenol    | BQL    | 50        | ug/L  | U         | 1    |
| Hexachlorobenzene     | BQL    | 50        | ug/L  | U         | 1    |
| Hexachlorobutadiene   | BQL    | 50        | ug/L  | U         | 1    |
| Hexachloroethane      | BQL    | 50        | ug/L  | U         | 1    |
| Nitrobenzene          | BQL    | 50        | ug/L  | U         | 1    |
| Pentachlorophenol     | BQL    | 100       | ug/L  | U         | 1    |
| Pyridine              | BQL    | 50        | ug/L  | U         | 1    |

**Summary of Analytical Results**

Client ID: FBQIDW-TCLP  
GPL ID: 312043-001-005-1/1  
Matrix: WATER  
Date Collected: 12/04/2003  
Date Received: 12/05/2003

Prep Method:  
Prep Date:  
Prep Time:  
Prep Batch:

Analytical Method: SW9040  
Date Analyzed: 12/05/2003  
Time Analyzed: 15:00  
Analysis Batch: 65080

| Parameter | Result | Rep Limit | Units | Qualifier | D.F. |
|-----------|--------|-----------|-------|-----------|------|
| pH        | 8.1    | 0         | pH    |           | 1    |