

**R&R**

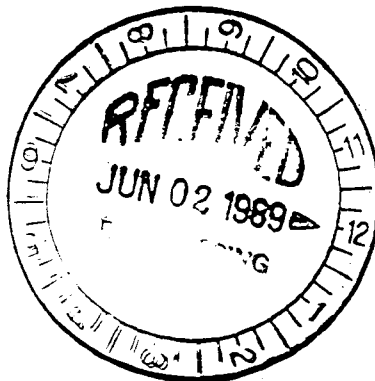
INTERNATIONAL, INC.

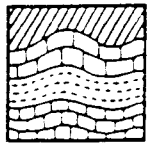
**A TEAM...**  
**Dedicated to serving your needs**

SOIL BORING AND ANALYSIS  
AT RAVENNA ARSENAL REPORT

PREPARED FOR

RAVENNA ARSENAL, INC.





# R&R

INTERNATIONAL, INC.

1234 S. CLEVELAND-MASSILLON ROAD  
P.O. BOX 4383,  
AKRON, OHIO 44321  
(216) 666-2200

June 1, 1989

Mr. T. Chanda  
Ravenna Arsenal, Inc.  
8451 State Route 5  
Ravenna, OH 44266-9297

Reference: Soil Boring and Analysis at Ravenna Arsenal  
P.O. No. 17908

Dear Mr. Chanda,

Please find enclosed our report for the above referenced project. This report includes the following in accordance with your purchase order and our scope of services dated May 10, 1989.

- I. Scope of Services
- II. Drilling Log
- III. Analytical Report

We have enjoyed working with you on this project and invite you to contact our office when we can be of further assistance.

Respectfully,

R & R INTERNATIONAL, INC.

G. M. Rana, P.E.  
President

GMR/ad  
Enclosure



### SCOPE OF SERVICES

The following scope of services was provided by R & R International, Inc. to the Ravenna Arsenal for the Product Release Subsurface Investigation on May 11, 1989. The services provided were based on the purchase requisition from the Ravenna Arsenal dated May 3, 1989.

1. Advance one (1) soil boring to a depth of no greater than 20 feet and obtain 18 inch split spoon samples continuously. Each sample was screened for VOAs using a Photoionization Detector (PID). The boring was terminated after two (2) samples were scanned with the PID and did not have a significant reading on the instrument. Split spoon were decontaminated between uses in the following manner:

- a. Potable Water Rinse
- b. Potable Water and Detergent Rinse
- c. Distilled Water Rinse

2. Two (2) soil samples were collected using standard sampling protocols and were analyzed for the following parameters:

- a. BTX , Test Method 8020
- b. Pb (total lead), Test Method 7420
- c. TPH, Test Method 418.1/9071

All sampling was done within the guidelines provided by the State Fire Marshal Bureau of Underground Storage Tank Regulations Sampling Guidelines released in April, 1989.



Page 2

3. The laboratory's analytical report and the drilling log are enclosed as part of this report.



**R&R**  
INTERNATIONAL, INC.

HOLE NO. B-1  
ELEV. NA

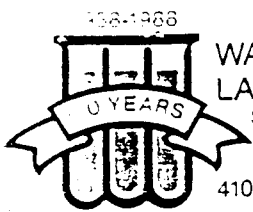
## DRILLING LOG

Client Ravenna Arsenal, Inc.  
Project Subsurface Investigation For Product Leak Project No. 030509  
Location Ravenna, Ohio

Date: Started 5-11-89 Completed 5-11-89 Driller J.R.  
Sampler: Dia 2.00 ins. Type SS Hammer Wt. 140 lbs. Fall 30 ins.  
Casing: Dia 3.25 ins. Type HSA Hammer Wt. --- lbs. Fall -- ins.  
Water/Mud used in drilling Yes        No        \* Other       

Depth (Ft.)	Material Description	Sample		Blows/0.5'	N	Rec (ft.)
		No	Depth			
5.3	FILL	1	2-4	HW-HW-HW	0	1.0
		2	4-6	1-1-5-9	6	1.0
9.0	Stiff, mottled brown and gray <u>CLAY</u> , trace silt, trace sand, damp.  NOTE: Sand from 6.9 - 7.1 feet. Sample #3 = 25.0 ppm on PID  NOTE: Thin lenses of sand present from 7.5 - 9.0 feet. Sample #4 = 2.5 PPM on PID	3	6-7.5	10-15-24	39	1.2
		4	7.5-9	11-15-20	35	1.5
		5	9-10.5	12-18-25	43	1.5
		6	10.5-12.0	9-15-23	38	1.2
12.0	TERMINATION DEPTH 12.0 FEET					

Water Depth: During Drilling \_\_\_\_\_ Ft.; Upon Compl. \_\_\_\_\_ Ft.; \_\_\_\_\_ Hrs. after Compl. \_\_\_\_\_ Ft.  
Weather/Remarks: PID = Photoionization Detector



1938-1988  
WADSWORTH/ALERT  
LABORATORIES, INC.  
Sampling, testing, mobile labs

4101 Shuffel Drive N.W. / North Canton, Ohio 44720

**ANALYTICAL REPORT**

**PROJECT NO. 030509**

**RAVENNA ARSENAL**

**Presented to :**

**R & B INTERNATIONAL**

**WADSWORTH/ALERT LABORATORIES, INC.**

*Richard Mauch*

**Richard Mauch  
Project Manager**

*Marvin W. Stephens*

**Marvin W. Stephens, Ph.D.  
Vice President & Corporate Technical Director**

**May 30, 1989**



CORPORATE AND LABORATORY: North Canton, Ohio (216) 497-9396  
LABORATORY: Cleveland, Ohio (216) 642-9151  
LABORATORY: Bartow, Florida (813) 533-2150  
SOUTHEAST REGIONAL OFFICE: Lexington, South Carolina (803) 957-6590



WADSWORTH/ALERT  
LABORATORIES, INC.



WADSWORTH/ALERT  
LABORATORIES, INC.

#### NARRATIVE

The following report contains the analytical results for three solid samples submitted to Wadsworth/ALERT Laboratories, Inc. by R & R International from the Ravenna Arsenal Site, project number 030509. The samples were received on May 11, 1989, according to documented sample acceptance procedures.

Two of the samples were analyzed for the parameters listed below in accordance with the USEPA approved methods indicated. As requested by the client on the chain-of-custody, the sample identified as "B-1 S-5 DP 9-10.5 5-11-89 9:30" is on hold for possible future testing. A summary of QC data for the analyses presented in this study is included at the rear of the report.

#### ANALYTICAL METHODS

<u>Parameters</u>	<u>Methods</u>
Benzen, Toluene, Xylenes	SW846 8020
Total Recoverable Petroleum Hydrocarbons	USEPA 418.1 (modified)
Lead	SW846 6010
Total Solids	USEPA 160.3

SW846. "Test Methods for Evaluating Solid Waste Physical/Chemical Methods," Third Edition, September, 1986.

USEPA. EPA 600/4-82-057. "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater," July, 1982.





WADSWORTH/ALERT  
LABORATORIES, INC.

COMPANY: R & R INTERNATIONAL  
LAB #: 5427-17930  
MATRIX: SOLID

DATE RECEIVED: 5/11/89  
DATE EXTRACTED: 5/22/89  
DATE ANALYZED: 5/22/89

SAMPLE ID: B-1 S-3 DP 6-7.5 5-11-89 9:10

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

---

PARAMETER	RESULT (mg/kg)	DETECTION LIMIT
Benzene	ND	1
Toluene	ND	1
Xylenes	ND	1

NOTE: ND (None Detected)  
J (Detected, but below quantitation limit; quantitation suspect)



WADSWORTH/ALERT  
LABORATORIES, INC.

COMPANY : R & R INTERNATIONAL  
LAB #: 5427-17930  
MATRIX : SOLID

DATE RECEIVED: 5/11/89

SAMPLE ID : B-1 S-3 DP 6-7.5 5-11-89 9:10

**METALS ANALYTICAL REPORT  
SELECTED LIST**

---

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	5/16- 5/18/89	8.2	2.5 mg/kg
Total Solids	5/16- 5/17/89	67	0.5 %

NOTE: ND (None Detected)



WADSWORTH/ALERT  
LABORATORIES, INC.

COMPANY : R & R INTERNATIONAL  
LAB #: 5427-17930  
MATRIX : SOLID

DATE RECEIVED: 5/11/89

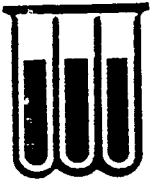
SAMPLE ID : B-1 S-3 DP 6-7.5 5-11-89 9:10

**ANALYTICAL REPORT**

---

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	5/16- 5/17/89	160	15	mg/kg
Total Solids	5/16- 5/17/89	67	0.5	%

NOTE: ND (None Detected)



WADSWORTH/ALERT  
LABORATORIES, INC.

COMPANY: R & R INTERNATIONAL  
LAB #: 5427-17931  
MATRIX: SOLID

DATE RECEIVED: 5/11/89  
DATE EXTRACTED: 5/22/89  
DATE ANALYZED: 5/22/89

SAMPLE ID: B-1 S-4 DP 7.5-9 5-11-89 9:20

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

---

PARAMETER	RESULT (mg/kg)	DETECTION LIMIT
Benzene	ND	1
Toluene	ND	1
Xylenes	ND	1

NOTE: ND (None Detected)  
J (Detected, but below quantitation limit; quantitation suspect)



WADSWORTH/ALERT  
LABORATORIES, INC.

COMPANY : R & R INTERNATIONAL  
LAB #: 5427-17931  
MATRIX : SOLID

DATE RECEIVED: 5/11/89

SAMPLE ID : B-1 S-4 DP 7.5-9 5-11-89 9:20

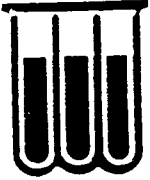
**METALS ANALYTICAL REPORT  
SELECTED LIST**

---

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	5/16- 5/18/89	10	2.5 mg/kg
Total Solids	5/16- 5/17/89	100	0.5 %

NOTE: ND (None Detected)



WADSWORTH/ALERT  
LABORATORIES, INC.

COMPANY : R & R INTERNATIONAL  
LAB #: 5427-17931  
MATRIX : SOLID

DATE RECEIVED: 5/11/89

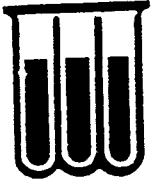
SAMPLE ID : B-1 S-4 DP 7.5-9 5-11-89 9:20

ANALYTICAL REPORT

---

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	5/16- 5/17/89	93	15	mg/kg
Total Solids	5/16- 5/17/89	100	0.5	%

NOTE: ND (None Detected)



WADSWORTH/ALERT  
LABORATORIES, INC.

COMPANY : R & R INTERNATIONAL  
LAB #: 5427-17932  
MATRIX : SOLID

DATE RECEIVED: 5/11/89

SAMPLE ID : B-1 S-5 DP 9-10.5 5-11-89 9:30

ANALYTICAL REPORT

---

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
ARCHIVE(ANALYSIS ON HOLD)			

NOTE: ND (None Detected)

CHAIN OF CUSTODY RECORD

PROJECT NO:		SITE NAME:		NO. OF CONTAINERS	REMARKS
030509		Ravenha Arsenal			
SAMPLERS (SIGNATURE): <i>Doug Dawah</i>					
STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION
B-1	5/11	9:10		X	S-3 DP. 6-7.5
B-1	5/11	9:20		X	S-4 DP. 7.5-9
B-1	5/11	9:30		X	S-5 DP. 9-10.5
RELINQUISHED BY (SIGNATURE): _____ RECEIVED BY (SIGNATURE): _____ DATE / TIME: _____ DATE / TIME: _____					BTX X X X LFRD X X X TPH X
RELINQUISHED BY (SIGNATURE): _____ RECEIVED BY (SIGNATURE): _____ DATE / TIME: _____ DATE / TIME: _____					<del>ARCHIVE</del> Archive for <del>possible</del> future testing
RELINQUISHED BY (SIGNATURE): <i>Doug Dawah</i> RECEIVED FOR LABORATORY BY _____ DATE / TIME: 5/11 1:15 PM SIGNATURE: _____					5-11-07 1:15 TPH/ITR recipient SS T.M. TOL - AC/BM

KSH  
5-15-07  
- N -  
- JAT





**AQUA TECH**  
ENVIRONMENTAL CONSULTANTS, INC.

ENVIRONMENTAL CONSULTANTS, INC. P.O. Box 76, Melmore, Ohio 44845 419-397-2659 or 397-2222  
P.O. Box 436, 181 South Main Street, Marion, Ohio 43302, 614-382-5991

LABORATORY ANALYSIS REPORT

DATE REC'D. 05-05-1989 LAB NO. 5481-89  
DATE REP'D. 05-11-1989 P.O.# 17845 CLIENT NO. 10232  
SAMPLE LOCATION 17845 #538 1037 DATE SAMPLED 05-03-1989  
SAMPLED BY J MOUND/J CONNERS TIME SAMPLED 14:35

MR. JOE MOUND  
RAVENNA ARSENAL, INC.  
8451 BR 5  
RAVENNA OH 44266

COMMENTS:

SAMPLE TAKEN FROM TRENCH IMPACT AREA  
FOLLOWING REMOVAL OF FUEL OIL  
CONTAMINATED SOIL.

STORET	ANALYSIS	RESULT	UNITS	DATE OF ANALYSIS
01051 00500	LEAD, TOTAL, PB RESIDUE, TOTAL (TS)	12 76.1	MG/KG %	05-11-1989 05-10-1989

**RECEIVED**  
MAINTENANCE DEPT.  
MAY 17 1989 PM  
AM 7 8 9 10 11 12 1 2 3 4 5 6

LABORATORY CERTIFICATION # 4053

SIGNED \_\_\_\_\_

COPY DISTRIBUTION: WHITE - CLIENT

YELLOW - FILE



**AQUA TECH**  
ENVIRONMENTAL CONSULTANTS, INC.

ENVIRONMENTAL CONSULTANTS, INC. P.O. Box 76, Melmore, Ohio 44845, 419-397-2659 or 397-2222  
P.O. Box 436, 181 South Main Street, Marion, Ohio 43302, 614-382-5391

LABORATORY ANALYSIS REPORT

DATE REC'D. 05-05-1989 LAB NO. 5480-89  
DATE REP'D. 05-15-1989 P.O.# 17845 CLIENT NO. 10232  
SAMPLE LOCATION 17845 \* 53A 1037 DATE SAMPLED 04-28-1989  
SAMPLED BY L JOHNSON/J.M. TIME SAMPLED 15:15

MR. JOE MOUND  
RAVENNA ARSENAL, INC.  
8451 SR 5  
RAVENNA OH 44266

COMMENTS:  
CONTAMINATED SOIL REMOVED FROM TRENCH  
AREA IMPACTED BY SUCTION LINE FAILURE.

STORET	ANALYSIS	RESULT	UNITS	DATE OF ANALYSIS
00004	FLASH POINT	>110	C	05-12-1989
00500	RESIDUE, TOTAL (TS)	80.9	%	05-08-1989
00001	EP TOXICITY TEST:	---	---	05-10-1989
01002	ARSENIC, TOTAL, AS	<0.03	MG/L	05-12-1989
01007	BARIUM, TOTAL, BA	0.7	MG/L	05-12-1989
01027	CADMIUM, TOTAL, CD	<0.05	MG/L	05-12-1989
01034	CHROMIUM, TOTAL, CR	<0.20	MG/L	05-12-1989
01051	LEAD, TOTAL, PB	<0.5	MG/L	05-12-1989
71900	MERCURY, TOTAL, HG	<2.0	UG/L	05-12-1989
01147	SELENIUM, TOTAL, SE	<0.03	MG/L	05-12-1989
01077	SILVER, TOTAL, AG	<0.05	MG/L	05-12-1989

**RECEIVED**  
MAINTENANCE DEPT.

MAY 17 1989  
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

LABORATORY CERTIFICATION # 4053

SIGNED \_\_\_\_\_

COPY DISTRIBUTION: WHITE - CLIENT

YELLOW - FILE