

**LIMITED PHASE II  
ENVIRONMENTAL SITE ASSESSMENT  
UNIVERSITY OF MINNESOTA CENTER FOR  
MAGNETIC RESONANCE RESEARCH  
2021 6<sup>TH</sup> STREET SOUTHEAST  
MINNEAPOLIS, MINNESOTA**

---

**MEISCH & ASSOCIATES, Ltd.**

UMR-648



**LIMITED PHASE II  
ENVIRONMENTAL SITE ASSESSMENT  
UNIVERSITY OF MINNESOTA CENTER FOR  
MAGNETIC RESONANCE RESEARCH  
2021 6<sup>TH</sup> STREET SOUTHEAST  
MINNEAPOLIS, MINNESOTA**

Prepared for:

**UNIVERSITY OF MINNESOTA**  
Department of Environmental Health and Safety  
W140 Boynton Health Service  
410 Church Street SE  
Minneapolis, Minnesota 55455

Prepared by:

**MEISCH & ASSOCIATES, Ltd.**  
7650 Currell Boulevard, Suite 300C  
Woodbury, Minnesota 55125

August 6, 2002


**This Report is Privileged and Confidential**

LIMITED PHASE II  
ENVIRONMENTAL SITE ASSESSMENT  
UNIVERSITY OF MINNESOTA CENTER FOR  
MAGNETIC RESONANCE RESEARCH  
2021 6<sup>TH</sup> STREET SOUTHEAST  
MINNEAPOLIS, MINNESOTA

I hereby certify that this plan, document, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Geologist under the laws of the State of Minnesota.

Paul G. Meisch

License #30016

  
Date 8/6/02

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION</b>	1
1.1	Project Objective	1
1.2	Scope of Services	1
1.3	Setting	1
<b>2.0</b>	<b>BACKGROUND INFORMATION</b>	3
2.1	Previous Assessment	3
2.2	Historic Use	4
2.3	Current Use	4
<b>3.0</b>	<b>GEOLOGIC SETTING</b>	5
3.1	Regional Geology	5
3.2	Local Geology	5
<b>4.0</b>	<b>SUBSURFACE INVESTIGATION</b>	6
4.1	Soil Borings	6
4.2	Hand-Auger Borings	6
<b>5.0</b>	<b>FINDINGS</b>	8
<b>6.0</b>	<b>CONCLUSIONS</b>	9
<b>7.0</b>	<b>REFERENCES</b>	10
<b>8.0</b>	<b>STANDARD OF CARE</b>	11

## LIST OF FIGURES

### Figure

- 1 Site Location Map
- 2 Site Map
- 3 Soil Boring Location Map
- 4 Geologic Cross-Section Line A-A'
- 5 Geologic Cross-Section A-A'

## LIST OF TABLES

### Table

- 1 Laboratory Results of Soil Samples

## APPENDICES

### Appendix

- A Soil Boring Logs
- B Benzo(a)pyrene (BaP) Equivalent Worksheets
- C Laboratory Reports/Chain-of-Custody Documentation

## 1.0 INTRODUCTION

### 1.1 Project Objective

Meisch & Associates, Ltd., (Meisch & Associates) was retained by the University of Minnesota to perform a Limited Phase II Environmental Site Assessment on the Center for Magnetic Resonance Research located at 2021 6<sup>th</sup> Street Southeast, Minneapolis, Minnesota, (Figures 1 and 2). The purpose of this investigation was to assess the presence of potential subsurface environmental impacts and recognized environmental conditions, near the northeast corner of the subject site building in accordance with Meisch & Associates proposal for conducting a Limited Phase II Environmental Site Assessment dated June 12, 2002.

### 1.2 Scope of Services

The scope of services performed during this Limited Phase II Environmental Site Assessment included the following:

- Preparation of a Health and Safety Plan.
- Advancement of three soil borings with a hollow-stem auger to a depth of 30 feet below ground surface (bgs) and four soil borings with a hand-auger to a maximum depth of 10 feet bgs (Figure 3). Following completion, all borings were sealed with bentonite grout.
- Collection of soil samples on a continuous basis from ground surface to a depth of 10 feet and at 5 foot intervals between 10 feet and 30 feet during auger advancement. Field screening for organic vapors using a photoionization detector (PID) equipped with a 10.6 eV lamp. Analysis of selected soil samples from borings for diesel range organics (DRO), gasoline range organics, benzene, toluene, ethylbenzene, and xylene (GRO/BTEX), RCRA 8 metals, and semi-volatile organic compounds (SVOCs).
- Preparation of soil boring logs classifying soil per ASTM standard D 2488-00.
- Preparation of this Phase II Environmental Site Assessment Report detailing the findings of the assessment and providing recommendations regarding environmental conditions identified at the subject site.

### 1.3 Setting

The subject site is located at 2021 6<sup>th</sup> Street Southeast, Minneapolis, Minnesota. The subject property consists of a parcel approximately three acres in size, which is situated on the north side of 6<sup>th</sup> Street Southeast between the University of Minnesota's Lions Research Lab to the west and the Huron Parking Complex to the east. The property is bounded to the north by Union Pacific Railroad Property. South of the subject site is 6<sup>th</sup> Street Southeast with the Hawkeye Parking Lot immediately beyond 6<sup>th</sup> Street Southeast. The subject property is situated in the northeast portion of the University of Minnesota campus in an industrial and commercial setting.

The topography in the vicinity of the site is generally flat.

The nearest significant body of surface water is the Mississippi River which is located approximately 0.6 miles southwest of the site. A drainage channel is located along the northern boundary of the subject site. This channel contains water which is slowly flowing toward the west. Water within this channel is from storm water runoff and groundwater dewatering. The Marquette Elevator Company situated east of the subject site is discharging groundwater to this channel.

## 2.0 BACKGROUND INFORMATION

### 2.1 Previous Assessment

Environmental site assessment reports and other documentation obtained by Meisch & Associates regarding the subject site included the following:

- *Phase I Environmental Site Assessment - Future Site of Translational Lab*, University of Minnesota, 6<sup>th</sup> Street Southeast, Minneapolis, Minnesota, dated May 17, 2001, prepared by Meisch & Associates, Ltd.
- *Subsurface Investigation Report, Former Republic Creosote Facility Site Near 23<sup>rd</sup> Avenue Southeast and 6<sup>th</sup> Street Southeast*, University of Minnesota, East Bank Campus, prepared for the University of Minnesota, dated December, 1997, prepared by Peer Environmental & Engineering Resource, Inc.
- *Remedial Action Workplan, for Chicago & North Western Transportation Company, Southeast Minneapolis Yards*, dated February 19, 1993, prepared by Dahl & Associates, Inc.
- *Phase I and Phase II Property Evaluation, Southeast Minneapolis Yards*, for Chicago & North Western Transportation Company, Chicago, Illinois, dated June 18, 1990, prepared by Dahl & Associates, Inc.

Based on information provided in the above reports, it appears that the University of Minnesota acquired a 23.8 acre parcel, including the subject site, from the Chicago Great Western Railroad. This parcel was historically a railroad switching yard. A portion of the 23.8 acres, located approximately 1,000 feet southeast of the subject site (current location of the University Buckeye parking lot) was leased to Republic Creosoting Company. Republic Creosoting Company apparently operated a creosote-treated wood manufacturing facility at that location from approximately 1903 to 1916. The facility included one 100,000-gallon and two 25,000-gallon above ground storage tanks that were used to store creosote oil. In addition, a creosote settling basin was present at the facility. The creosote oil was reportedly manufactured off-site and shipped to the facility by railroad cars. After the facility ceased operation, the structures were reportedly demolished and the creosote basin apparently filled with soil.

In 1994, approximately 8,000 tons (5,470 cubic yards) of creosote impacted soil was excavated in the vicinity of the former creosote basin. The impacted soil was thermally treated on site to remove contaminants and then returned to the excavation. Soil contamination in excess of the established cleanup goals was apparently left in place along the sidewalls and base of the excavation. Results of subsequent investigations completed in association with the former Republic Creosoting Company have revealed that additional soil and groundwater contamination is present in the vicinity of the former facility.

A Phase I site inspection of the original 23.8 acre parcel was completed by Dahl & Associates in



1990. Based on a summary of the inspection results that were included in Dahl & Associate's Phase I and Phase II reports, unused rail cars were parked on or near the subject site at the time of the inspection. Areas of stacked telephone poles, rails, scrap metal, discarded empty barrels, tires, pallets and trash were observed by Dahl & Associates in other areas of the 23.8 acre parcel. In addition, a heavily rusted incinerator filled with ash and rubble was apparently observed approximately 400 feet southeast of the subject site. Based on the descriptions and site map provided in Dahl & Associate's report, it does not appear that any of the observed items of concern were located on the subject site. However, discolored patches of soil and oil spots were reported in many areas along the rail lines on the 23.8 acre parcel.

## 2.2 Historic Use

Meisch & Associates' review of previous reports, aerial photographs, Sanborn fire insurance maps, and interviews indicate that the subject site was historically a railroad yard. Tracks that once crossed the site were part of Chicago Great Western Railroad. Additional railroad tracks existed to the north, east, and southeast of the subject site. Historic land use around the subject site included a grain elevator and silos, a flour mill, and an oil tank farm with multiple aboveground storage tanks.

Information regarding historical use of the site was obtained by interviewing Mr. Al Matson, with facilities management. Mr. Al Matson has been employed by the University of Minnesota for more than twenty years. According to Mr. Matson, the subject site was purchased by the University in 1990 from Chicago & Northwestern Railroad. The subject site was originally acquired by the University as part of a 23.8 acre parcel that is bounded by Burlington Northern railroad property to the north, 25<sup>th</sup> Avenue southeast to the east, 4<sup>th</sup> Street Southeast to the south and 17<sup>th</sup> Avenue Southeast to the west. The subject site was developed in 1998 and 1999 when the University constructed the Center for Magnetic Resonance Research on the property.

## 2.3 Current Use

The subject site is currently developed and is being used by the University as a Center for Magnetic Resonance Research. A single story building with roughly 37,000 square feet of space is present on the lot. The University is interested in constructing an addition along the northeast corner of the existing building in order to accommodate a new Magnetic Resonance Imaging (MRI) unit.

### 3.0 GEOLOGIC SETTING

#### 3.1 Regional Geology

Published geologic references indicate that surficial soil in the vicinity of the site are Middle Terrace deposits consisting of sand, gravelly sand, and loamy sand, overlain by thin deposits of silt, loam or organic sediment (Minnesota Geological Survey Atlas). In areas of heavy development, the native soils may be covered by thick layers of artificial fill. Bedrock below the site, which is estimated to occur at an approximate depth of 50 feet below the ground surface, consists of fine grained limestone of the Platteville Formation. The water table is estimated to be at an approximate depth of 10 to 20 feet below the ground surface. Regional groundwater flow in the vicinity of the site is generally reported to be to the southwest towards the Mississippi River.

#### 3.2 Local Geology

Subsurface lithology encountered during the soil boring advancement consisted of unconsolidated sediments from the ground surface to a depth of 30 feet below grade. The unconsolidated sediments are predominantly sands and silty sands to approximately 10-15 feet bgs. Near surface sediment appears to be fill material, some of which was apparently imported during the construction of the current building, and some of which appears to be historic fill or reworked historic fill associated with the former railroad yard. The historic fill contained wood debris and a slight hydrocarbon odor. Below 10 to 15 feet, the sediment coarsens and consists of gravelly sand interbedded with sand and sandy silt. An unconfined water table was encountered at approximately 12 feet bgs. A geologic cross-section is provided in Figures 4 and 5.

## 4.0 SUBSURFACE INVESTIGATION

### 4.1 Soil Borings

On July 12<sup>th</sup>, 2002, Meisch & Associates advanced 3 soil borings SB-1, SB-2, and SB-3 to depths of 30 feet bgs. The soil borings were advanced with a hollow-stem auger through unconsolidated sediments. Soil boring logs are presented in Appendix A. The borings were advanced within the area of the proposed addition in an attempt to evaluate potential soil contamination and to identify subsurface lithology.

During drilling, soil samples were continuously collected from the ground surface to 10 feet bgs. After 10 feet, soil samples were then collected at 5-foot intervals. Soil samples were retrieved with a split-spoon sampler driven two feet by a 140 pound hammer. Soil samples were described based on soil type, color, grain size, etc., according to ASTM standards. Soil cuttings and soil samples were screened with a PID using a 10.6 eV lamp for the presence of organic vapors. Soil samples were selected for laboratory analyses based on visual and effluvial indications of contamination.

All drilling and sampling equipment was thoroughly cleaned between drilling locations. The split-spoon sampler was washed between sampling intervals with an Alconox solution and rinsed with tap and deionized water.

Meisch & Associates collected soil samples for laboratory analysis during auger advancement. Soil samples collected from SB-1 at the 0-2 foot interval and SB-2 at the 0-2 foot and 13-15 foot intervals were analyzed for DRO and GRO/BTEX. Soil samples collected from SB-3 at the 2-4 foot interval were analyzed for DRO, GRO/BTEX, RCRA 8 metals, and SVOCs. Soil samples collected from SB-3 at the 13-15 foot interval were analyzed for DRO and SVOCs. Selected soil samples were placed in appropriate sample containers provided by the laboratory. The containers were labeled, placed on ice in a cooler and transported under Chain-of-Custody documentation to a certified laboratory. A method blank was analyzed for quality control/quality assurance purposes.

### 4.2 Hand-Auger Borings

On June 19<sup>th</sup>, 2002, Meisch & Associates advanced four soil borings, HB-1, HB-2, HB-3, HB-4 with a hand-auger around the perimeter of the proposed construction site to further assess potential soil contamination. Hand-auger boring logs are presented in Appendix A. Soil samples were collected at 1 foot intervals up to 10 feet. Soil samples were described based on soil type, color, grain size, etc., according to ASTM standards. Soil samples were screened with a PID equipped with a 10.6 eV lamp for the presence of organic vapors. Based on visual and effluvial indications of contamination, two soil samples one from HB-2 and one from HB-3, both at the 1-2 foot interval, were selected for laboratory analyses. These samples were analyzed for DRO and semi-volatile organics (Method PAH 8310). The selected samples were placed in appropriate containers provided by the laboratory. The containers were labeled, placed on ice in a cooler and transported under Chain-of-Custody documentation to a certified laboratory. A

method blank was analyzed for quality assurance/quality control purposes.

## 5.0 FINDINGS

Field screening with the PID detected organic vapors in soil samples collected from SB-3. Detectible concentrations were first observed in this soil boring at a depth of approximately two feet bgs. The highest organic vapor reading detected was 1.1 parts per million at a depth of approximately 13 feet bgs. All samples with elevated organic vapor readings were selected for laboratory analysis.

The laboratory analysis of soil samples collected from borings detected the presence of hydrocarbons, semi-volatile organic compounds, and metals. None of the metal results exceeded naturally occurring concentrations (Connor and Shacklette, 1975). The highest concentrations of DRO and GRO detected were 96 and 7 milligrams per kilogram (mg/kg), respectively, in the sample collected from SB-3 at a depth of 2-4 feet bgs. This sample also has a benzo(a)pyrene equivalent concentration of 2.7 mg/kg which exceeds the Minnesota Pollution Control Agency (MPCA) residential Soil Reference Value (SRV) for a benzo(a)pyrene equivalent of 2 mg/kg (Appendix B). Trace concentrations of other semi-volatile organic compounds including naphthalene, 2-methylnaphthalene, acenaphthalene, dibenzofuran, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, dibenz(a,h)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene were also detected in this soil sample. However, none of these contaminants exceed their respective residential SRV.

A DRO concentration of 68 mg/kg and trace concentrations of semi-volatile organic compounds were also detected in the laboratory analysis of soil sample SB-3 collected at the 13-15 foot interval. This soil sample was collected below the static water table and suggests that groundwater has been impacted by these contaminants. Trace concentrations of various semi-volatile organic compounds were also detected in soil samples collected from hand-auger borings HB-2 at 1-2 feet bgs and HB-3 at 1-2 feet bgs, but none of these concentrations exceed their respective SRVs. A summary of the laboratory results is presented in Table 1. Complete laboratory analyses and data sheets are presented in Appendix C.

Subsurface lithology encountered during the soil boring advancement consisted of unconsolidated sediments from the ground surface to a depth of 30 feet below grade. The unconsolidated sediments are predominantly sands and silty sands to approximately 10-15 feet bgs. Near surface sediment appears to be fill material, some of which was apparently imported during the construction of the current building, and some of which appears to be historic fill, or reworked historic fill, associated with the former railroad yard. The historic fill contained wood debris and a slight hydrocarbon odor. What is considered to be historic fill was observed at depths as shallow as 1 foot bgs. Below 10 to 15 feet, the sediment coarsens and consists of gravelly sand interbedded with sand and sandy silt. An unconfined water table was observed at approximately 12 feet bgs.

## 6.0 CONCLUSIONS & RECOMMENDATIONS

Laboratory analyses of soil samples collected at the subject site detected elevated concentrations of diesel range organic and semi-volatile organic compounds within the area of the proposed addition. A Benzo(a)pyrene equivalent concentration greater than the residential SRV was also detected in this area. Based on these results, Meisch & Associates notified the MPCA Duty Officer that a release of potentially hazardous materials has been identified at the subject site. These impacts are apparently related to the historic use of the subject site as a railroad yard.

These laboratory results reveal that soil impacts are present within the area proposed for the new addition. Soil impacts are present from just below the ground surface to a depth exceeding fifteen feet below grade. Shallow groundwater was observed at a depth of twelve feet below grade. The depth of soil contamination observed at SB-3, which was observed to extend beneath the shallow water table, indicates that groundwater has been impacted by these contaminants.

As it appears that excavation for the construction of the new addition will encounter contaminated soil, Meisch & Associates recommends that a Site Contingency Plan be prepared to properly manage contaminated materials encountered during site construction. If site construction requires dewatering contaminated groundwater, discharge permits and monitoring will be required for regulatory compliance. Due to the presence of contaminants below the water table, Meisch & Associates also recommends that an additional assessment be performed to quantify groundwater impacts.

## 7.0 REFERENCES

Dahl & Associates, Inc., June 18, 1990, *Phase I and Phase II Property Evaluation, Southeast Minneapolis Yards*, for Chicago & North Western Transportation Company, Chicago, Illinois

Dahl & Associates, Inc. February 19, 1993, *Remedial Action Workplan, for Chicago & North Western Transportation Company, Southeast Minneapolis Yards*

Connor, J.J. and Schacklette, H.T., 1975, *Background Geochemistry of Some Rocks, Soils, Plants, and Vegetables in the Conterminous United States*, U.S. Geological Survey Profess. Paper 574-F.

Meisch & Associates, Ltd., May 17, 2001, *Phase I Environmental Site Assessment - Future Site of Translational Lab*, University of Minnesota, 6<sup>th</sup> Street Southeast, Minneapolis, Minnesota

Minnesota Geological Survey, *Geologic Atlas Hennepin County, Minnesota*, County Atlas Series Atlas C-4

Peer Environmental & Engineering Resource, Inc., December, 1997, *Subsurface Investigation Report, Former Republic Creosote Facility Site Near 23<sup>rd</sup> Avenue Southeast and 6<sup>th</sup> Street Southeast, University of Minnesota, East Bank Campus*

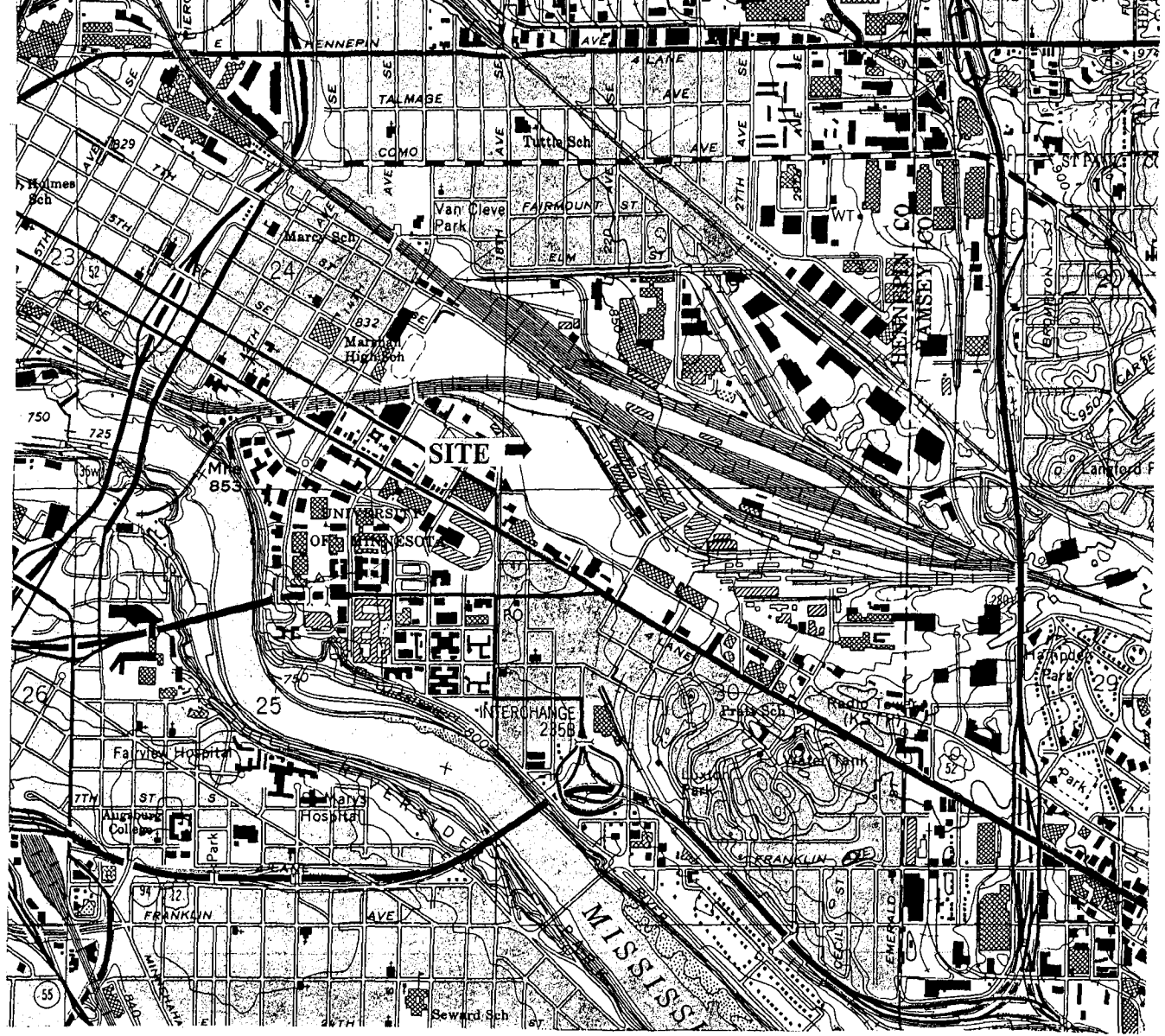
## 8.0 STANDARD OF CARE

The findings and conclusions of this report are based on analytical results provided by Pace Analytical Services. This report should only be deemed conclusive with respect to the information obtained. Meisch & Associates does not warrant that this assessment will provide legal defense for or satisfy the mandates of an environmental regulation or law. No warranty, expressed or implied, is made. All services were provided in general accordance with the accepted professional standards of care which existed at the time the investigation was performed.



# FIGURES

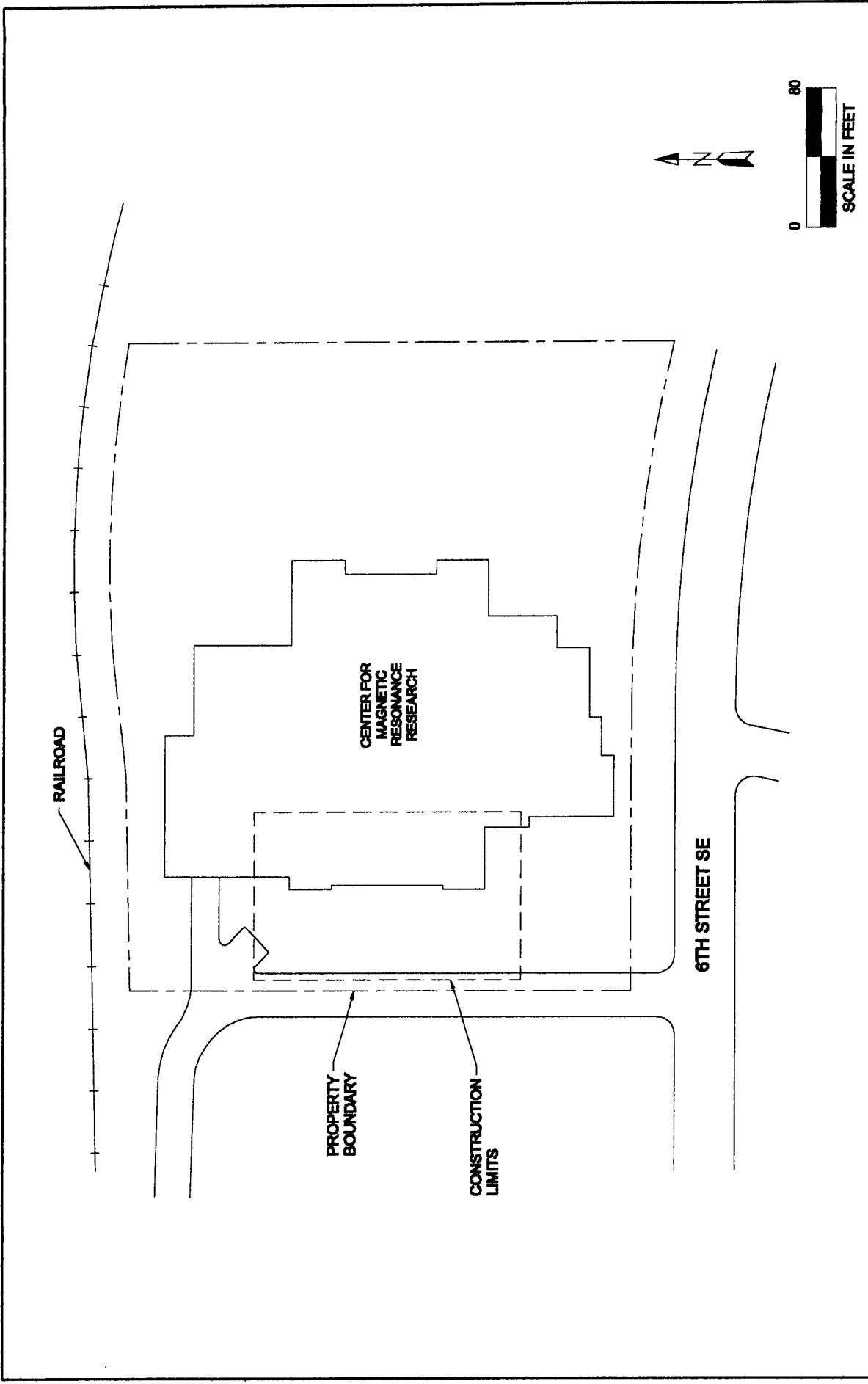
**ST PAUL WEST QUADRANGLE**  
**MINNESOTA**  
**7.5 MINUTE SERIES (TOPOGRAPHIC)**  
 NW/4 ST PAUL 15' QUADRANGLE



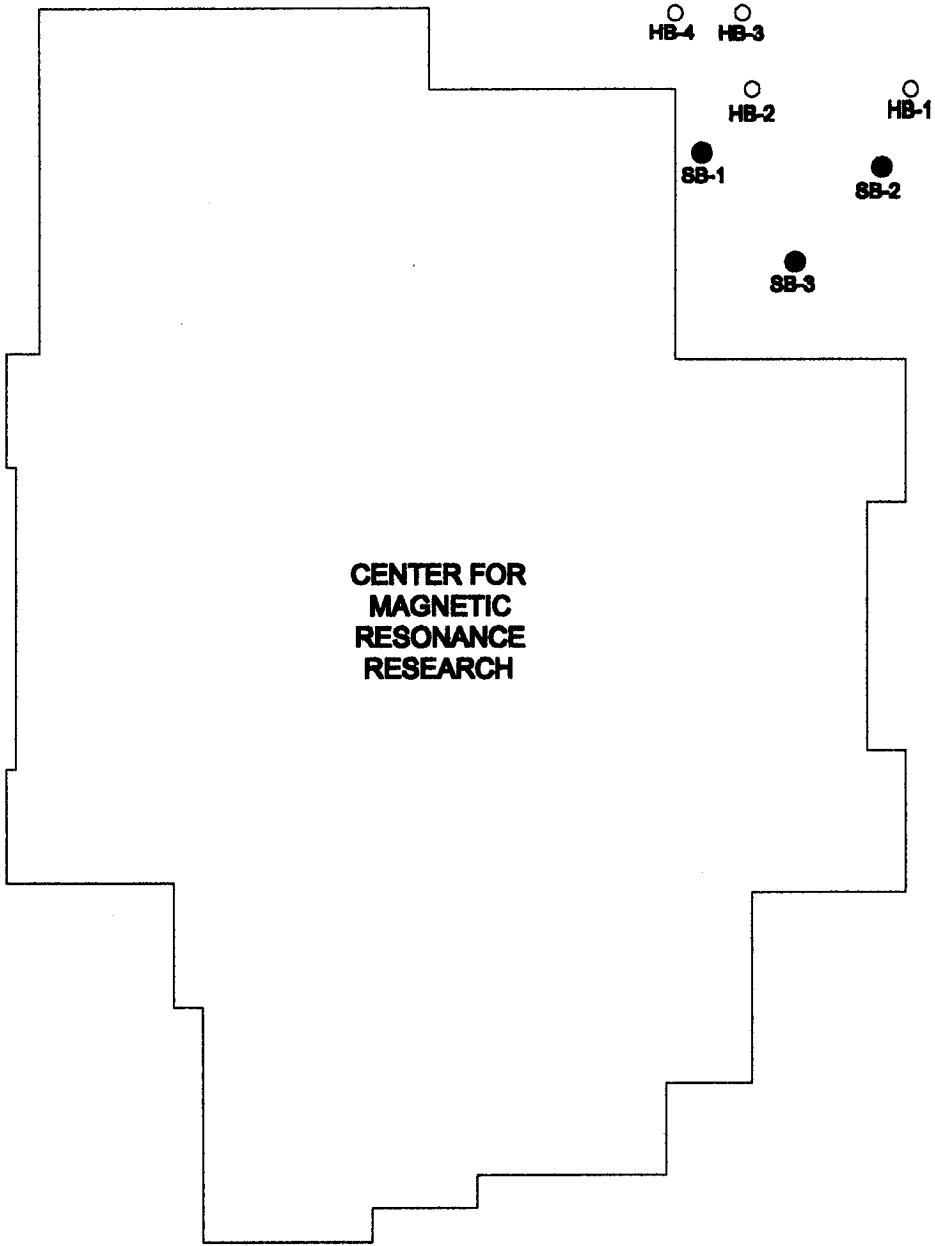
**MEISCH & ASSOCIATES, Ltd.**  
 ENVIRONMENTAL CONSULTANTS

**FIGURE 1**  
**SITE LOCATION MAP**

<p><b>PROJECT NAME:</b>                  UNIVERSITY OF MINNESOTA                  CENTER FOR MAGNETIC RESONANCE RESEARCH                  2021 6TH STREET SE                  MINNEAPOLIS, MN</p>	<p><b>DATE</b>                  5/02</p>	<p><b>FILENAME</b>                  BASE</p>	
---	--	--	--



<p><b>MEISCH &amp; ASSOCIATES, Ltd.</b> ENVIRONMENTAL CONSULTANTS</p>	<p><b>FIGURE 2</b> SITE MAP</p>
<p>PROJECT NAME: UNIVERSITY OF MINNESOTA CENTER FOR MAGNETIC RESONANCE RESEARCH 2021 6TH STREET SE MINNEAPOLIS, MN</p>	<p>DATE 5/02</p>
<p>FILENAME SITE</p>	



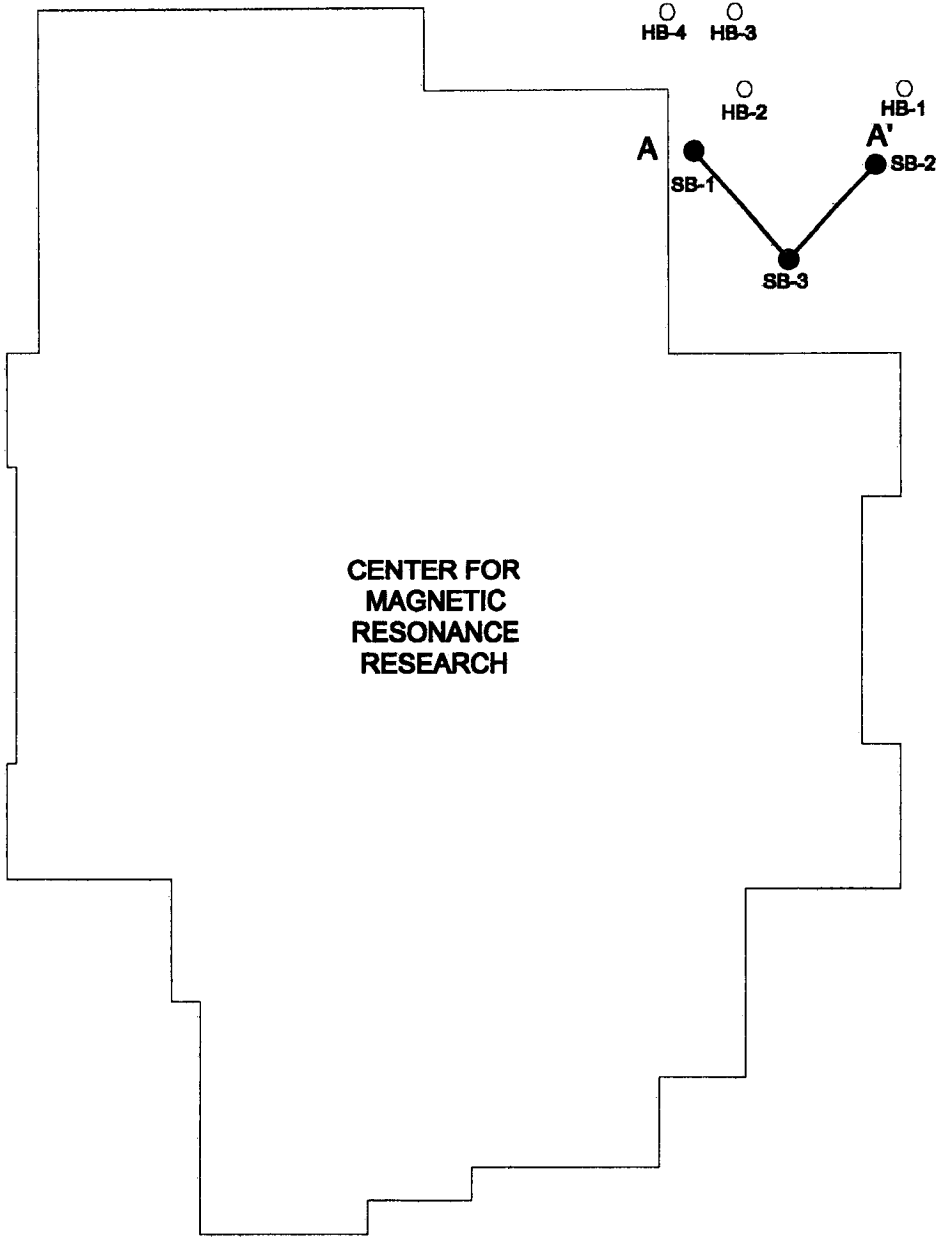
**MEISCH & ASSOCIATES, Ltd.**  
ENVIRONMENTAL CONSULTANTS

**FIGURE 3**  
**SOIL BORING LOCATION MAP**

**PROJECT NAME:** UNIVERSITY OF MINNESOTA  
CENTER FOR MAGNETIC RESONANCE RESEARCH  
2021 6TH STREET SE  
MINNEAPOLIS, MN

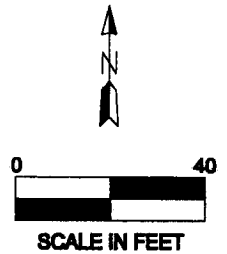
**DATE**  
5/02

**FILENAME**  
CFMR\_SITE



**LEGEND**

- SOIL BORING LOCATION
- HAND BORING LOCATION



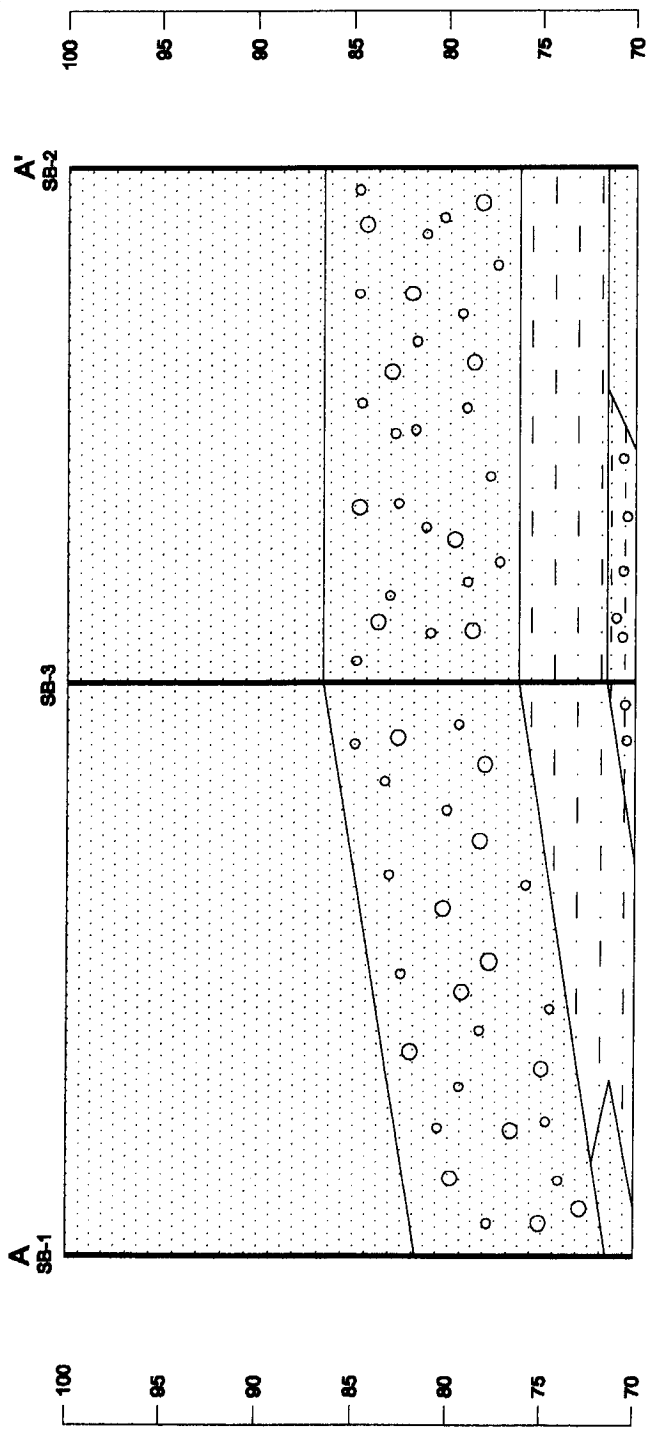
**MEISCH & ASSOCIATES, Ltd.**  
ENVIRONMENTAL CONSULTANTS

**FIGURE 4**  
**CROSS-SECTION LINE A-A'**

**PROJECT NAME:** UNIVERSITY OF MINNESOTA  
CENTER FOR MAGNETIC RESONANCE RESEARCH  
2021 8TH STREET SE  
MINNEAPOLIS, MN

**DATE**  
8/02

**FILENAME**  
CFMR\_SITE



**FIGURE 5**  
CROSS-SECTION A-A'

**MEISCH & ASSOCIATES, Ltd.**  
ENVIRONMENTAL CONSULTANTS

UNIVERSITY OF MINNESOTA  
CENTER FOR MAGNETIC RESONANCE RESEARCH  
2021 6TH STREET SE  
MINNEAPOLIS, MN

PROJECT NAME:

DATE  
5/02

FILENAME  
CFMR\_A-A

**TABLES**

TABLE 1

Laboratory Results of Soil Samples  
 Center for Magnetic Resonance Research  
 2021 6th Street S.E., Minneapolis, MN

Measurements are reported in Milligrams per Kilogram (mg/kg)

Parameter	SB-3 2-4'	SB-3 13-15'	SB-2 13-15'	SB-2 0-2'	SB-1 0-2'	HB-2 1-2'	HB-3 1-2'	SRV
Date Collected	7/12/02	7/12/02	7/12/02	7/12/02	7/12/02	7/19/02	7/19/02	
DRO	96	68	<8.3	<19.0	<630	<7.5	<42.0	NE
GRO	7	<5.9	<5.9	<5.2	<6.2	<0.18	<0.18	NE
Naphthalene	3.9	2						25
2-Methylnaphthalene	1.5	0.81						NE
Acenaphthene	3.6	2.1				<0.18	<0.18	2,000
Dibenzofuran	2.4	1.7						NE
Fluorene	2.6	1.7				<0.035	<0.036	1,140
Phenanthrene	13	9.6				0.069	0.2	NE
Anthracene	3.2	2				0.025	0.068	8,000
Fluoranthene	8.9	3.9				0.083	<0.036	1,080
Pyrene	6.9	3.9				0.08	0.018	800
Benzo(a)anthracene	2.4	0.77				<0.018	0.13	20
Chrysene	2.7	0.75				0.032	0.27	2,000
Dibenz(a,h)anthracene	<0.39	<0.39				0.089	0.65	
Benzo(b)fluoranthene	4.9	0.99				0.045	0.36	20
Benzo(k)fluoranthene	1.6	0.4				0.022	0.17	200
Benzo(a)pyrene	1.9	0.42				0.064	0.34	2
Indeno(1,2,3-cd)pyrene	0.48	<0.39				0.052	0.37	20
Benzo(g,h,i)perylene	0.47	<0.39				0.042	0.32	NE
Benzo(a)pyrene equivalent	2.7	0.6						2

Notes:

< = Compound not detected above the laboratory reporting limit

Blank cells indicate that sample was not analyzed for the indicated compound/parameter

SRV = Soil Reference Value based on the Residential Standard

NE = Not Established

DRO = Diesel Range Organics

GRO = Gasoline Range Organics

Exceeds Soil Reference Value



**APPENDIX A**

Meisch & Associates, Ltd. Environmental Consultants				BOREHOLE / WELL LOG				Number: SB-1			
Date: Started 7/12/02 9:30 a.m.				Date: Finished 7/12/02 11:15 a.m.		Client: U of M				Sheet: 1 of 2	
Date: Started 7/12/02 9:30 a.m.				Date: Finished 7/12/02 11:15 a.m.				Location: Center for Magnetic Resonance Research 2021 6th Street Southeast, Minneapolis, Minnesota			
Sampler: Meisch & Associates				Drill Rig / Sampling Method: CME 55 Hollow Stem Auger				Borehole Dia. 3 3/4" ID 7 1/2" OD		Surface Elevation:	
SAMPLE LOG			BOREHOLE LOG						WELL LOG		
Sample Number	OVA/PID (ppm)	Lab	Density Plows Per 6"	Depth in Feet	USCS Symbol	Geological Description <small>(Soil Type, Color, Grain, Minor Component, Sorting, Shape, Moisture, Odor, Etc.)</small>			Well Description		
SB-1 0-2'	0	X	2-2-5-8	0		Fill - Aggregate					
				1	SP	Fill - silty sand, fine to medium grained, black (10YR) well sorted sub-rounded, moist, no hydrocarbon odor					
SB 1 2-4'	0		8-9-7-4	2	SP	Silty sand, yellowish brown (10YR), coarse grained, minor gravel moderately sorted, sub-rounded to rounded, moist, no hydrocarbon odor					
				3							
SB-1 4-6'	0		11-2-7-11	4	SP	Sand, light brownish gray (10YR), medium to coarse grained, well sorted, sub-rounded to rounded, moist, wood debris no hydrocarbon odor					
				5							
SB-1 6-8'	0		6-7-9-12	6	SM	Silty sand, brown (10YR), medium to coarse grained, well sorted, sub-rounded to rounded, moist, no hydrocarbon odor					
				7							
SB-1 8-10'	0		3-5-10-9	8	SM	Silty sand, grayish brown (2.5 YR), coarse grained, Well sorted, sub-rounded, moist, no hydrocarbon odor					
				9							
				10							
				11							
				12							
SB-1 13-15'	0		5-5-20-R	13	SP	Sand, light olive brown (2.5Y), medium to very coarse grained minor gravel, moderately sorted, rounded to sub-angular, wet, no hydrocarbon odor					
				14							
				15							
				16							
				17							
SB-1 18-20'	0		6-12-20-18	18	SW	Gravelly sand, dark brown (10YR), medium to coarse grained, poorly sorted, sub-rounded, wet, no hydrocarbon odor					
				19							
				20							
				21							
				22							
SB-1 23-25'	0		19-18-16-18	23	SW	Gravelly sand, brown (10YR), medium to coarse grained, poorly sorted, sub-rounded, wet, no hydrocarbon odor					
				24							
				25							
				26							
				27							
SB-1 28-30'	0		5-8-10-12	28	SP	Sand, brown (10YR), fine to coarse grained, well sorted, Sub-rounded wet, no hydrocarbon odor					
				29							
				30							

End of Boring  
30 ft bgs

Meisch & Associates, Ltd. Environmental Consultants				BOREHOLE / WELL LOG				Number: SB-2			
Date: Started 7/12/02 11:45 a.m.				Date: Finished 7/12/02 1:15 p.m.				Client: U of M		Sheet: 1 of 2	
Date: Started 7/12/02 11:45 a.m.				Date: Finished 7/12/02 1:15 p.m.				Location: Center for Magnetic Resonance Research 2021 6th Street Southeast, Minneapolis, Minnesota			
Sampler: Meisch & Associates				Drill Rig / Sampling Method: CME 55 Hollow Stem Auger				Borehole Dia. 3 3/4" ID 7 1/2" OD		Surface Elevation:	
SAMPLE LOG			BOREHOLE LOG						WELL LOG		
Sample Number	OVA/PID (ppm)	Lab	Density Plows Per 6"	Depth in Feet	USCS Symbol	Geological Description <small>(Soil Type, Color, Grain, Minor Soil Component, Moisture, Density, Odor, Etc.)</small>			Well Description		
SB-2 0-1'	0		7-11-13-16	0		Fill - aggregate					
SB-2 1-2'	0	X		1	SM	Fill - silty sand, black (10YR), medium grained, minor gravel, well sorted, moist, no hydrocarbon odor					
SB-2 2-4'	0		15-17-15-18	2	SP	sand, brown (7.5 YR), fine to medium grained, minor gravel moderately sorted, sub-rounded, moist, no hydrocarbon odor					
				3	SM	Silty Sand, brown (10YR), fine to medium grained, well sorted, sub-rounded to rounded, moist, no hydrocarbon odor					
SB-2 4-6'	0		3-7-9-11	4	SM	Silty sand, yellowish brown (10YR), medium grained, well sorted sub-rounded, moist, no hydrocarbon odor					
				5							
SB-2 6-8'	0		3-5-7-11	6	SM	Silty sand, yellowish brown (10YR), medium grained, well sorted sub-rounded, moist, no hydrocarbon odor					
				7							
SB-2 8-10'	0		5-6-6-11	8	SM	Silty sand, brown (10YR), fine to medium grained, well sorted, Sub-rounded, moist, no hydrocarbon odor					
				9							
				10							
				11							
				12							
SB-2 13-15'	0	X	2-4-13-25	13	SW	Gravelly sand, dark yellowish brown (10 YR), coarse to very coarse grained, poorly sorted, sub-rounded to sub-angular, wet, slight hydrocarbon odor					
				14							
				15							
				16							
				17							
SB-2 18-20'	0		7-7-7-11	18	SW	Gravelly sand, dark yellowish brown (10YR), coarse to very coarse grained, poorly sorted, sub-rounded to sub-angluar, wet, no hydrocarbon odor					
				19							
				20							
				21							
				22							
SB-2 23-25'	0		4-7-9-15	23	ML	Sandy silt, gray (10YR), fine grained sand, minor gravel, moderately sorted, wet, no hydrocarbon odor					
				24							
				25							
				26							
				27							
SB-2 28-30'	0		5-9-11-8	28	SM	Silty sand, grayish brown (10YR), medium grained, minor gravel, poorly sorted, sub-rounded, wet, no hydrocarbon odor					
				29							
				30					End of Boring 30 ft bgs		

Meisch & Associates, Ltd. Environmental Consultants				BOREHOLE / WELL LOG				Number: SB-3			
Date: Started 7/12/02 1:25 p.m.				Date: Finished 7/12/02 3:00 p.m.				Client: U of M		Sheet: 1 of 2	
Date: Started 7/12/02 1:25 p.m.				Date: Finished 7/12/02 3:00 p.m.				Location: Center for Magnetic Resonance Research 2021 6th Street Southeast, Minneapolis, Minnesota			
Sampler: Meisch & Associates				Drill Rig / Sampling Method: CME 55 Hollow Stem Auger				Borehole Dia. 3 3/4" ID 7 1/2" OD		Surface Elevation:	
SAMPLE LOG			BOREHOLE LOG						WELL LOG		
Sample Number	OVA/PID (ppm)	Lab	Density Plows Per 6"	Depth in Feet	USCS Symbol	Geological Description <small>(Soil Type, Color, Grain, Minor Soil Component, Moisture, Density, Odor, Etc.)</small>			Well Description		
SB-3 0-2'	0		3-5-7-8	0		Fill - aggregate					
				1	SM	Fill, silty sand, black (10YR), fine to medium grained, minor gravel poorly sorted, sub-rounded to sub-angular, moist, no hydrocarbon odor					
SB-3 2-4'	0.9	X	5-5-7-9	2	SM	Fill - silty sand, black (10YR), fine to medium grained, minor gravel, poorly sorted, sub-rounded, moist, wood debris, moderate to strong hydrocarbon odor					
				3							
SB-3 4-6'	0		7-9-17-20	4	SM	Silty sand, light yellowish brown (2.5Y), medium to coarse grained, minor gravel, Moderately sorted, sub-rounded, moist, no hydrocarbon odor					
				5							
SB-3 6-8'	0		10-16-22-24	6	SM	Silty sand, pale brown (10YR), fine to medium grained, well sorted, rounded to sub-rounded, moist, no hydrocarbon odor					
				7							
SB-3 8-10'			10-13-16-18	8	SM	Silty sand, brown (10YR), medium grained, minor gravel, poorly sorted, sub-rounded, moist, no hydrocarbon odor					
				9							
				10							
				11							
				12							
				13							
SB-3 13-15'	1.1	X	2-3-6-12	13	SW	Gravelly sand, dark yellowish brown (10YR), moderately sorted, sub-rounded to sub-angular, wet, wood debris, moderate to strong hydrocarbon odor					
				14							
				15							
				16							
				17							
SB-3 18-20'	0		3-3-3-7	18	SW	Gravelly sand, dark yellowish brown (10YR), moderately sorted, sub-rounded to sub-angular, wet, no hydrocarbon odor					
				19							
				20							
				21							
				22							
SB-3 23-25'	0		8-7-9-11	23	ML	Sandy silt, grayish brown (10YR), fine grained sand, minor gravel, moderately sorted, wet, no hydrocarbon odor					
				24							
				25							
				26							
				27							
SB-3 23-25'	0		6-6-12-11	28	GM	Silty gravel, very dark grayish brown (10YR), poorly sorted, sub-angular to angular, wet, no hydrocarbon odor					
				29							
				30							
									End of boring 30 ft bgs		

Meisch & Associates, Ltd. Environmental Consultants				BOREHOLE / WELL LOG				Number: HB-1			
Date: Started 7/19/02 11:40a.m.				Date: Finished 7/19/02 12:10p.m.		Client: U of M				Sheet: 1 of 2	
Date: Started 7/19/02 11:40a.m.				Date: Finished 7/19/02 12:10p.m.		Location: Center for Magnetic Resonance Research 2021 6th Street Southeast, Minneapolis, Minnesota					
Sampler: Meisch & Associates				Drill Rig / Sampling Method: Hand Auger			Borehole Dia. 3" ID		Surface Elevation:		
SAMPLE LOG			BOREHOLE LOG						WELL LOG		
Sample Number	OVA/PID (ppm)	Lab	Density Plows Per 6"	Depth in Feet	USCS Symbol	Geological Description <small>(Soil Type, Color, Grain, Minor Soil Component, Sorting, Roundness, Moisture, Odor, Etc.)</small>			Well Description		
HB-1 0-1'	0			0	SM	Fill, silty Sand, Black (2.5Y), medium to coarse grained, minor gravel poorly sorted, sub-rounded, moist, no hydrocarbon odor					
HB-1 1-2'	0			1	SP	Sand, grayish brown (2.5Y), fine to medium grained, minor gravel, moderately sorted, sub-rounded, Moist, no hydrocarbon odor					
HB-1 2-3'	0			2	SP	Sand, grayish brown (2.5Y), fine to medium grained, minor gravel well sorted, sub-rounded, moist, wood debris, no hydrocarbon odor					
HB-1 3-4'	0			3	SM	Silty sand, grayish brown (2.5Y), fine to medium grained, minor gravel, moderately well sorted, sub-rounded, moist, no hydrocarbon odor					
HB-1 4-5'	0			4	SP	Sand, grayish brown (2.5Y), fine to medium grained, minor gravel well sorted, sub-rounded, moist, no hydrocarbon odor					
HB-1 5-6'	0			5	SM	Silty sand, light olive brown (2.5Y), fine to medium grained, well sorted, sub-rounded, moist, no hydrocarbon odor					
HB-1 6-7'	0			6	SP	Silty sand, light brownish gray (2.5Y), fine to medium grained, minor gravel, moderately well sorted, sub-rounded, moist, no hydrocarbon odor.					
HB-1 7-8'	0			7	SP	Sand, yellowish brown (10YR), fine to medium grained, minor gravel, moderately well sorted, sub-rounded, moist, wood debris, no hydrocarbon odor					
HB-1 8-9'	0			8	SP	Sand, dark yellowish brown (10YR), coarse grained, minor gravel, moderately well sorted, sub-rounded to sub-angular, moist, no hydrocarbon odor.					
HB-1 9-10'	0			9	SP	Sand, dark yellowish brown (10YR), coarse to very coarse grained, minor gravel, moderately well sorted, sub-rounded to sub-angular, moist, no hydrocarbon odor					
				10	SP				End of boring 10 ft bgs		
				11							
				12							
				13							
				14							
				15							
				16							
				17							
				18							
				19							
				20							
				21							
				22							
				23							
				24							
				25							
				26							
				27							
				28							
				29							
				30							

Meisch & Associates, Ltd. Environmental Consultants				BOREHOLE / WELL LOG				Number: HB-2			
Date: Started 7/19/02 12:20p.m.				Date: Finished 7/19/02 1:00p.m.		Client: U of M				Sheet: 1 of 2	
Date: Started 7/19/02 12:20p.m.				Date: Finished 7/19/02 1:00p.m.				Location: Center for Magnetic Resonance Research 2021 6th Street Southeast, Minneapolis, Minnesota			
Sampler: Meisch & Associates				Drill Rig / Sampling Method: Hand Auger				Borehole Dia. 3" ID		Surface Elevation:	
SAMPLE LOG			BOREHOLE LOG							WELL LOG	
Sample Number	OVA/PID (ppm)	Lab	Density Plows Per 6"	Depth in Feet	USCS Symbol	Geological Description <small>(Soil Type, Color, Grain, Minor Soil Component, Sorting, Roundness, Moisture, Odor, Etc.)</small>				Well Description	
HB-2 01'	0			0	SW	Fill, gravelly sand, black (10YR), fine to coarse grained, poorly sorted, sub-rounded to sub-angular, moist, wood debris, slight hydrocarbon odor					
HB-2 1-2'	0	X		1	SW	Sand, dark grayish brown (10YR), fine to very coarse grained, minor gravel, moderately to poorly sorted, sub-angular to sub-rounded, moist, slight hydrocarbon odor					
HB-2 2-3'	0			2	SP	Sand, light yellowish brown (2.5Y), fine to medium grained, minor gravel, moderately well sorted, sub-rounded to rounded, moist, no hydrocarbon odor					
HB-2 3-4'	0			3	SP	Sand, grayish brown (2.5Y), fine to coarse grained, minor gravel moderately sorted, sub-rounded to sub-angular, moist					
HB-2 4-5'	0			4	SW	Gravelly sand, light olive brown (2.5Y), fine to very coarse grained poorly sorted, sub-rounded to sub-angular, moist, no hydrocarbon odor					
HB-2 5-6'	0			5	SM	Silty sand, light yellowish brown (2.5Y), fine to medium grained minor gravel, moderately sorted, sub-angular, moist, no hydrocarbon odor					
HB-2 6-7'	0			6	SP	Sand, light yellowish brown (2.5Y), fine to medium grained minor gravel, moderately well sorted, sub-rounded, moist					
HB-2 7-8'	0			7	SP	Sand, yellowish brown (10YR), fine to medium grained, minor gravel moderately well sorted, sub-rounded, moist, no hydrocarbon odor					
HB-2 8-9'	0			8	SP	Sand, yellowish brown (10YR), medium grained, minor gravel moderately sorted, sub-rounded to sub-angular, moist					
HB-2 9-10'	0			9	SP	Sand, yellowish brown (10YR), coarse to very coarse grained, minor gravel, moderately sorted, sub-rounded to sub-angular, moist, no hydrocarbon odor					
				10	SP	Sand, yellowish brown (10YR), fine to medium grained, minor gravel moderately well sorted, sub-rounded, moist, no hydrocarbon odor				End of boring 10 ft bgs	
				11	SP	Sand, yellowish brown (10YR), medium grained, minor gravel moderately sorted, sub-rounded to sub-angular, moist					
				12		no hydrocarbon odor					
				13		Sand, yellowish brown (10YR), coarse to very coarse grained, minor gravel, moderately sorted, sub-rounded to sub-angular, moist, no hydrocarbon odor					
				14							
				15							
				16							
				17							
				18							
				19							
				20							
				21							
				22							
				23							
				24							
				25							
				26							
				27							
				28							
				29							
				30							

<b>Meisch &amp; Associates, Ltd.</b>				<b>BOREHOLE / WELL LOG</b>				Number: HB-3	
Environmental Consultants				Client: U of M				Sheet: 1 of 2	
Date: Started 7/19/02 1:20p.m.		Date: Finished 7/19/02 1:30p.m.		Location: Center for Magnetic Resonance Research 2021 6th Street Southeast, Minneapolis, Minnesota					
Sampler: Meisch & Associates				Drill Rig / Sampling Method: Hand Auger		Borehole Dia. 3" ID		Surface Elevation:	
<b>SAMPLE LOG</b>			<b>BOREHOLE LOG</b>					<b>WELL LOG</b>	
Sample Number	OVA/PID (ppm)	Lab	Density Plows Per 6"	Depth in Feet	USCS Symbol	Geological Description <small>(Soil Type, Color, Grain, Minor Soil Component, Moisture, Density, Odor, Etc.)</small>		Well Description	
HB-3 0-1'	0			0	SW	Fill, gravelly sand, (10YR), medium grained, poorly sorted, sub-rounded, moist, no hydrocarbon odor		<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto;"></div>	
HB-3 1-2'	0	X		1					
HB-3 2-3'				2		Refusal		End of boring 2 ft bgs	
				3					
				4					
				5					
				6					
				7					
				8					
				9					
				10					
				11					
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					
				26					
				27					
				28					
				29					
				30					

Meisch & Associates, Ltd. Environmental Consultants				BOREHOLE / WELL LOG				Number: HB-4	
				Client: U of M				Sheet: 1 of 2	
Date: Started 7/19/02 1:40p.m.		Date: Finished 7/19/02 2:30p.m.		Location: Center for Magnetic Resonance Research 2021 6th Street Southeast, Minneapolis, Minnesota					
Sampler: Meisch & Associates				Drill Rig / Sampling Method: Hand Auger		Borehole Dia. 3" ID		Surface Elevation:	
SAMPLE LOG			BOREHOLE LOG					WELL LOG	
Sample Number	OVA/PID (ppm)	Lab	Density Plows Per 6"	Depth in Feet	USCS Symbol	Geological Description <small>(Soil Type, Color, Grain, Minor Soil Component, Moisture, Density, Odor, Etc.)</small>		Well Description	
HB-4 0-1'	0			0	SM	Silty sand, very dark brown (10YR), medium grained, moderately to poorly sorted, sub-rounded, moist, no hydrocarbon odor			
HB-4 1-2'	0			1					
HB-4 2-3'	0			2	SP	Sand, light yellowish brown (2.5Y), fine to medium grained, minor gravel, moderately well sorted, sub-rounded, moist no hydrocarbon odor			
HB-4 3-4'	0			3					
HB-4 4-5'	0			4	SM	Silty sand, light olive brown (2.5Y), fine to medium grained, minor gravel, moderately well sorted, sub-rounded, moist, no hydrocarbon odor			
HB-4 5-6'	0			5	SM	Silty sand, light yellowish brown (2.5Y), fine to medium grained minor gravel, moderately well sorted, sub-rounded to sub-angular, moist, no hydrocarbon odor			
HB-4 6-7'	0			6	SM	Silty sand, light yellowish brown (2.5Y), fine to medium grained moderately well sorted, sub-rounded, moist, no hydrocarbon odor			
HB-4 7-8'	0			7	SM	Silty sand, light yellowish brown (2.5Y), fine to medium grained moderately well sorted, sub-rounded, moist, no hydrocarbon odor			
HB-4 8-9'	0			8					
HB-4 9-10'	0			9					
				10				End of Boring 10 ft bgs	
				11					
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					
				26					
				27					
				28					
				29					
				30					



**APPENDIX B**

<b>Benzo(a)pyrene (BaP) Equivalents(1999 Version)</b>					
<b>SB-3 2-4'</b>					
Chemical	CAS No.	Site Concen. (mg/kg) dry weight	Relative Potency Factor	BaP Equivalent (mg/kg)	
Benz(a)anthracene	56553	2.400	0.1	0.240	
Benzo(b)fluoranthene	205992	4.900	0.1	0.490	
Benzo(k)fluoranthene	207089	1.600	0.01	0.016	
Benzo[a]pyrene equiv. (see BaP equiv. Calculation)	50328	1.900	1	1.900	
Chrysene	218019	2.700	0.001	0.003	
Dibenz(a,h)anthracene	53703	0.000	1	0.000	
Indeno(1,2,3-c,d)pyrene	193395	0.480	0.1	0.048	
Total BaP equivalents =				2.697	
compare this value					
to the BaP SRV					

<b>Benzo(a)pyrene (BaP) Equivalents(1999 Version)</b>					
<b>SB-3 13-15'</b>					
Chemical	CAS No.	Site Concen. (mg/kg) dry weight	Relative Potency Factor	BaP Equivalent (mg/kg)	
Benz(a)anthracene	56553	0.770	0.1	0.077	
Benzo(b)fluoranthene	205992	0.990	0.1	0.099	
Benzo(k)fluoranthene	207089	0.400	0.01	0.004	
Benzo[a]pyrene equiv. (see BaP equiv. Calculation)	50328	0.420	1	0.420	
Chrysene	218019	0.750	0.001	0.001	
Dibenz(a,h)anthracene	53703	0.000	1	0.000	
Indeno(a,2,3-c,d)pyrene	193395	0.000	0.1	0.000	
Total BaP equivalents =				0.601	
compare this value					
to the BaP SRV					

<b>Benzo(a)pyrene (BaP) Equivalentents(1999 Version)</b>					
<b>HB-2 1-2'</b>					
Chemical	CAS No.	Site Concen. (mg/kg) dry weight	Relative Potency Factor	BaP Equivalent (mg/kg)	
Benz(a)anthracene	56553	0.000	0.1	0.000	
Benzo(b)fluoranthene	205992	0.045	0.1	0.005	
Benzo(k)fluoranthene	207089	0.022	0.01	0.000	
Benzo[a]pyrene equiv. (see BaP equiv. Calculati	50328	0.064	1	0.064	
Chrysene	218019	0.032	0.001	0.000	
Dibenz(a,h)anthracene	53703	0.089	1	0.089	
Indeno(a,2,3-c,d)pyrene	193395	0.000	0.1	0.000	
Total BaP equivalentents =				0.158	
compare this value					
to the BaP SRV					

<b>Benzo(a)pyrene (BaP) Equivalentents(1999 Version)</b>					
<b>HB-3 1-2'</b>					
Chemical	CAS No.	Site Concen. (mg/kg) dry weight	Relative Potency Factor	BaP Equivalent (mg/kg)	
Benz(a)anthracene	56553	0.130	0.1	0.013	
Benzo(b)fluoranthene	205992	0.360	0.1	0.036	
Benzo(k)fluoranthene	207089	0.170	0.01	0.002	
Benzo[a]pyrene equiv. (see BaP equiv. Calculati	50328	0.340	1	0.340	
Chrysene	218019	0.270	0.001	0.000	
Dibenz(a,h)anthracene	53703	0.650	1	0.650	
Indeno(a,2,3-c,d)pyrene	193395	0.000	0.1	0.000	
			Total BaP equivalentents =	1.041	
			compare this value		
			to the BaP SRV		

**APPENDIX C**



**Pace Analytical™**  
www.pacelabs.com

**Pace Analytical Services, Inc.**  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414  
Phone: 612.607.1700  
Fax: 612.607.6444

July 24, 2002

Mr. Paul Meisch  
Meisch & Associates, Ltd.  
7650 Currenll Blvd.  
Suite # 300C  
Woodbury, MN 55125

RE: Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

Dear Mr. Meisch:

Enclosed are the analytical results for sample(s) received by the laboratory on July 12, 2002. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report please feel free to contact me.

Sincerely,



Roxanne Patterson  
Roxanne.Patterson@pacelabs.com  
Project Manager

State of Minnesota laboratory 027-053-137

Enclosures

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



UMR-686

Solid results are reported on a dry weight basis

Lab Sample No: 103689733      Project Sample Number: 1060015-001      Date Collected: 07/12/02 13:30  
Client Sample ID: SB-3 2-4'      Matrix: Soil      Date Received: 07/12/02 18:14

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
------------	---------	-------	--------------	----------	----	---------	------	--------

**Metals**

Percent Moisture	Method:							
Percent Moisture	15.7	%		07/15/02	JDY			

Metals, Trace ICP      Prep/Method: EPA 3050 / EPA 6010

Arsenic	ND	mg/kg	1.13	07/19/02 15:11	BDA	7440-38-2		
Barium	56.4	mg/kg	1.13	07/19/02 15:11	BDA	7440-39-3		
Cadmium	1.32	mg/kg	0.113	07/19/02 15:11	BDA	7440-43-9		
Chromium	11.9	mg/kg	1.13	07/19/02 15:11	BDA	7440-47-3		
Lead	49.2	mg/kg	0.678	07/19/02 15:11	BDA	7439-92-1		
Selenium	ND	mg/kg	1.69	07/19/02 15:11	BDA	7782-49-2		
Silver	ND	mg/kg	1.13	07/19/02 15:11	BDA	7440-22-4		
Date Digested				07/17/02				

Mercury, CVAAS	Method: EPA 7471							
Mercury	ND	mg/kg	0.0222	07/15/02	JB1	7439-97-6		

**GC/MS Semivolatiles**

Semivolatile Organics      Prep/Method: EPA 3550 / EPA 8270

Phenol	ND	ug/kg	390	07/16/02 20:30	SMT	108-95-2		
bis(2-Chloroethyl) ether	ND	ug/kg	390	07/16/02 20:30	SMT	111-44-4		
2-Chlorophenol	ND	ug/kg	390	07/16/02 20:30	SMT	95-57-8		
1,3-Dichlorobenzene	ND	ug/kg	390	07/16/02 20:30	SMT	541-73-1		
1,4-Dichlorobenzene	ND	ug/kg	390	07/16/02 20:30	SMT	106-46-7		
Benzyl alcohol	ND	ug/kg	780	07/16/02 20:30	SMT	100-51-6		
1,2-Dichlorobenzene	ND	ug/kg	390	07/16/02 20:30	SMT	95-50-1		
2-Methylphenol (o-Cresol)	ND	ug/kg	390	07/16/02 20:30	SMT	95-48-7		
bis(2-Chloroisopropyl) ether	ND	ug/kg	390	07/16/02 20:30	SMT	39638-32-9		
4-Methylphenol (p-Cresol)	ND	ug/kg	390	07/16/02 20:30	SMT	106-44-5		
N-Nitroso-di-n-propylamine	ND	ug/kg	390	07/16/02 20:30	SMT	621-64-7		
Hexachloroethane	ND	ug/kg	390	07/16/02 20:30	SMT	67-72-1		
Nitrobenzene	ND	ug/kg	390	07/16/02 20:30	SMT	98-95-3		
Isophorone	ND	ug/kg	390	07/16/02 20:30	SMT	78-59-1		
2-Nitrophenol	ND	ug/kg	390	07/16/02 20:30	SMT	88-75-5		
2,4-Dimethylphenol	ND	ug/kg	390	07/16/02 20:30	SMT	105-67-9		
Benzoic acid	ND	ug/kg	2000	07/16/02 20:30	SMT	65-85-0		
bis(2-Chloroethoxy)methane	ND	ug/kg	390	07/16/02 20:30	SMT	111-91-1		
2,4-Dichlorophenol	ND	ug/kg	390	07/16/02 20:30	SMT	120-83-2		

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

Lab Sample No: 103689733 Project Sample Number: 1060015-001 Date Collected: 07/12/02 13:30  
Client Sample ID: SB-3 2-4' Matrix: Soil Date Received: 07/12/02 18:14

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
1,2,4-Trichlorobenzene	ND	ug/kg	390	07/16/02 20:30	SMT	120-82-1		
Naphthalene	3900	ug/kg	390	07/16/02 20:30	SMT	91-20-3		
4-Chloroaniline	ND	ug/kg	2000	07/16/02 20:30	SMT	106-47-8		
Hexachloro-1,3-butadiene	ND	ug/kg	390	07/16/02 20:30	SMT	87-68-3		
4-Chloro-3-methylphenol	ND	ug/kg	390	07/16/02 20:30	SMT	59-50-7		
2-Methylnaphthalene	1500	ug/kg	390	07/16/02 20:30	SMT	91-57-6		
Hexachlorocyclopentadiene	ND	ug/kg	2000	07/16/02 20:30	SMT	77-47-4		
2,4,6-Trichlorophenol	ND	ug/kg	390	07/16/02 20:30	SMT	88-06-2		
2,4,5-Trichlorophenol	ND	ug/kg	2000	07/16/02 20:30	SMT	95-95-4		
2-Chloronaphthalene	ND	ug/kg	390	07/16/02 20:30	SMT	91-58-7		
2-Nitroaniline	ND	ug/kg	2000	07/16/02 20:30	SMT	88-74-4		
Dimethylphthalate	ND	ug/kg	390	07/16/02 20:30	SMT	131-11-3		
Acenaphthylene	ND	ug/kg	390	07/16/02 20:30	SMT	208-96-8		
2,6-Dinitrotoluene	ND	ug/kg	390	07/16/02 20:30	SMT	606-20-2		
3-Nitroaniline	ND	ug/kg	2000	07/16/02 20:30	SMT	99-09-2		
Acenaphthene	3600	ug/kg	390	07/16/02 20:30	SMT	83-32-9		
2,4-Dinitrophenol	ND	ug/kg	2000	07/16/02 20:30	SMT	51-28-5		
4-Nitrophenol	ND	ug/kg	2000	07/16/02 20:30	SMT	100-02-7		
Dibenzofuran	2400	ug/kg	390	07/16/02 20:30	SMT	132-64-9		
2,4-Dinitrotoluene	ND	ug/kg	390	07/16/02 20:30	SMT	121-14-2		
Diethylphthalate	ND	ug/kg	390	07/16/02 20:30	SMT	84-66-2		
4-Chlorophenylphenyl ether	ND	ug/kg	390	07/16/02 20:30	SMT	7005-72-3		
Fluorene	2600	ug/kg	390	07/16/02 20:30	SMT	86-73-7		
4-Nitroaniline	ND	ug/kg	2000	07/16/02 20:30	SMT	100-01-6		
4,6-Dinitro-2-methylphenol	ND	ug/kg	2000	07/16/02 20:30	SMT	534-52-1		
N-Nitrosodiphenylamine	ND	ug/kg	390	07/16/02 20:30	SMT	86-30-6		
4-Bromophenylphenyl ether	ND	ug/kg	390	07/16/02 20:30	SMT	101-55-3		
Hexachlorobenzene	ND	ug/kg	390	07/16/02 20:30	SMT	118-74-1		
Pentachlorophenol	ND	ug/kg	1400	07/16/02 20:30	SMT	87-86-5		
Phenanthrene	13000	ug/kg	1900	07/16/02 20:30	SMT	85-01-8		
Anthracene	3200	ug/kg	390	07/16/02 20:30	SMT	120-12-7		
Di-n-butylphthalate	ND	ug/kg	390	07/16/02 20:30	SMT	84-74-2		
Fluoranthene	8900	ug/kg	1900	07/16/02 20:30	SMT	206-44-0		
Pyrene	6900	ug/kg	1900	07/16/02 20:30	SMT	129-00-0		
Butylbenzylphthalate	ND	ug/kg	390	07/16/02 20:30	SMT	85-68-7		
3,3'-Dichlorobenzidine	ND	ug/kg	790	07/16/02 20:30	SMT	91-94-1		
Benzo(a)anthracene	2400	ug/kg	390	07/16/02 20:30	SMT	56-55-3		
Chrysene	2700	ug/kg	390	07/16/02 20:30	SMT	218-01-9		
bis(2-Ethylhexyl)phthalate	ND	ug/kg	390	07/16/02 20:30	SMT	117-81-7		

Date: 07/24/02

Page: 2

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



UMR-688

Lab Project Number: 1060015

Client Project ID: Magnetic Resonance Research Ct

Lab Sample No: 103689733

Project Sample Number: 1060015-001

Date Collected: 07/12/02 13:30

Client Sample ID: SB-3 2-4'

Matrix: Soil

Date Received: 07/12/02 18:14

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Di-n-octylphthalate	ND	ug/kg	390	07/16/02 20:30	SMT	117-84-0		
Benzo(b)fluoranthene	4900	ug/kg	390	07/16/02 20:30	SMT	205-99-2		
Benzo(k)fluoranthene	1600	ug/kg	390	07/16/02 20:30	SMT	207-08-9		
Benzo(a)pyrene	1900	ug/kg	390	07/16/02 20:30	SMT	50-32-8		
Indeno(1,2,3-cd)pyrene	480	ug/kg	390	07/16/02 20:30	SMT	193-39-5		
Dibenz(a,h)anthracene	ND	ug/kg	390	07/16/02 20:30	SMT	53-70-3		
Benzo(g,h,i)perylene	470	ug/kg	390	07/16/02 20:30	SMT	191-24-2	1	
Nitrobenzene-d5 (S)	63	%		07/16/02 20:30	SMT	4165-60-0		
2-Fluorobiphenyl (S)	76	%		07/16/02 20:30	SMT	321-60-8		
Terphenyl-d14 (S)	156	%		07/16/02 20:30	SMT	1718-51-0	2	
Phenol-d6 (S)	77	%		07/16/02 20:30	SMT	13127-88-3		
2-Fluorophenol (S)	70	%		07/16/02 20:30	SMT	367-12-4		
2,4,6-Tribromophenol (S)	73	%		07/16/02 20:30	SMT	118-79-6		
Date Extracted				07/15/02				

GC Semivolatiles

WI DRO in Soil

Prep/Method: TPH DRO WI extraction / TPH DRO Wisconsin

Diesel Range Organics

96. mg/kg 38. 07/19/02 06:20 JMZ

Date Extracted

07/15/02

GC Volatiles

WI GRO and PVOC, soil

Prep/Method: TPH GRO/PVOC WI ext. / TPH GRO/PVOC WI

Benzene

ND mg/kg 0.059 07/16/02 10:30 RLP 71-43-2

Ethylbenzene

ND mg/kg 0.059 07/16/02 10:30 RLP 100-41-4

Toluene

ND mg/kg 0.059 07/16/02 10:30 RLP 108-88-3

Xylene (Total)

ND mg/kg 0.18 07/16/02 10:30 RLP 1330-20-7

Gasoline Range Organics

7.0 mg/kg 5.9 07/16/02 10:30 RLP

a,a,a-Trifluorotoluene (S)

131 % 07/16/02 10:30 RLP 98-08-8

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

Lab Sample No: 103689741      Project Sample Number: 1060015-002      Date Collected: 07/12/02 14:35  
Client Sample ID: SB-3 13-15'      Matrix: Soil      Date Received: 07/12/02 18:14

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
------------	---------	-------	--------------	----------	----	---------	------	--------

**Metals**

Percent Moisture	Method:							
Percent Moisture	15.3	%		07/15/02	JDY			

**GC/MS Semivolatiles**

Semivolatile Organics	Prep/Method: EPA 3550 / EPA 8270							
Phenol	ND	ug/kg	390	07/16/02 21:11	SMT	108-95-2		
bis(2-Chloroethyl) ether	ND	ug/kg	390	07/16/02 21:11	SMT	111-44-4		
2-Chlorophenol	ND	ug/kg	390	07/16/02 21:11	SMT	95-57-8		
1,3-Dichlorobenzene	ND	ug/kg	390	07/16/02 21:11	SMT	541-73-1		
1,4-Dichlorobenzene	ND	ug/kg	390	07/16/02 21:11	SMT	106-46-7		
Benzyl alcohol	ND	ug/kg	780	07/16/02 21:11	SMT	100-51-6		
1,2-Dichlorobenzene	ND	ug/kg	390	07/16/02 21:11	SMT	95-50-1		
2-Methylphenol (o-Cresol)	ND	ug/kg	390	07/16/02 21:11	SMT	95-48-7		
bis(2-Chloroisopropyl) ether	ND	ug/kg	390	07/16/02 21:11	SMT	39638-32-9		
4-Methylphenol (p-Cresol)	ND	ug/kg	390	07/16/02 21:11	SMT	106-44-5		
N-Nitroso-di-n-propylamine	ND	ug/kg	390	07/16/02 21:11	SMT	621-64-7		
Hexachloroethane	ND	ug/kg	390	07/16/02 21:11	SMT	67-72-1		
Nitrobenzene	ND	ug/kg	390	07/16/02 21:11	SMT	98-95-3		
Isophorone	ND	ug/kg	390	07/16/02 21:11	SMT	78-59-1		
2-Nitrophenol	ND	ug/kg	390	07/16/02 21:11	SMT	88-75-5		
2,4-Dimethylphenol	ND	ug/kg	390	07/16/02 21:11	SMT	105-67-9		
Benzoic acid	ND	ug/kg	2000	07/16/02 21:11	SMT	65-85-0		
bis(2-Chloroethoxy)methane	ND	ug/kg	390	07/16/02 21:11	SMT	111-91-1		
2,4-Dichlorophenol	ND	ug/kg	390	07/16/02 21:11	SMT	120-83-2		
1,2,4-Trichlorobenzene	ND	ug/kg	390	07/16/02 21:11	SMT	120-82-1		
Naphthalene	2000	ug/kg	390	07/16/02 21:11	SMT	91-20-3		
4-Chloroaniline	ND	ug/kg	2000	07/16/02 21:11	SMT	106-47-8		
Hexachloro-1,3-butadiene	ND	ug/kg	390	07/16/02 21:11	SMT	87-68-3		
4-Chloro-3-methylphenol	ND	ug/kg	390	07/16/02 21:11	SMT	59-50-7		
2-Methylnaphthalene	810	ug/kg	390	07/16/02 21:11	SMT	91-57-6		
Hexachlorocyclopentadiene	ND	ug/kg	2000	07/16/02 21:11	SMT	77-47-4		
2,4,6-Trichlorophenol	ND	ug/kg	390	07/16/02 21:11	SMT	88-06-2		
2,4,5-Trichlorophenol	ND	ug/kg	2000	07/16/02 21:11	SMT	95-95-4		
2-Chloronaphthalene	ND	ug/kg	390	07/16/02 21:11	SMT	91-58-7		
2-Nitroaniline	ND	ug/kg	2000	07/16/02 21:11	SMT	88-74-4		
Dimethylphthalate	ND	ug/kg	390	07/16/02 21:11	SMT	131-11-3		
Acenaphthylene	ND	ug/kg	390	07/16/02 21:11	SMT	208-96-8		
2,6-Dinitrotoluene	ND	ug/kg	390	07/16/02 21:11	SMT	606-20-2		

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015

Client Project ID: Magnetic Resonance Research Ct

Lab Sample No: 103689741 Project Sample Number: 1060015-002 Date Collected: 07/12/02 14:35  
 Client Sample ID: SB-3 13-15 Matrix: Soil Date Received: 07/12/02 18:14

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
3-Nitroaniline	ND	ug/kg	2000	07/16/02 21:11	SMT	99-09-2		
Acenaphthene	2100	ug/kg	390	07/16/02 21:11	SMT	83-32-9		
2,4-Dinitrophenol	ND	ug/kg	2000	07/16/02 21:11	SMT	51-28-5		
4-Nitrophenol	ND	ug/kg	2000	07/16/02 21:11	SMT	100-02-7		
Dibenzofuran	1700	ug/kg	390	07/16/02 21:11	SMT	132-64-9		
2,4-Dinitrotoluene	ND	ug/kg	390	07/16/02 21:11	SMT	121-14-2		
Diethylphthalate	ND	ug/kg	390	07/16/02 21:11	SMT	84-66-2		
4-Chlorophenylphenyl ether	ND	ug/kg	390	07/16/02 21:11	SMT	7005-72-3		
Fluorene	1700	ug/kg	390	07/16/02 21:11	SMT	86-73-7		
4-Nitroaniline	ND	ug/kg	2000	07/16/02 21:11	SMT	100-01-6		
4,6-Dinitro-2-methylphenol	ND	ug/kg	2000	07/16/02 21:11	SMT	534-52-1		
N-Nitrosodiphenylamine	ND	ug/kg	390	07/16/02 21:11	SMT	86-30-6		
4-Bromophenylphenyl ether	ND	ug/kg	390	07/16/02 21:11	SMT	101-55-3		
Hexachlorobenzene	ND	ug/kg	390	07/16/02 21:11	SMT	118-74-1		
Pentachlorophenol	ND	ug/kg	1400	07/16/02 21:11	SMT	87-86-5		
Phenanthrene	9600	ug/kg	1900	07/16/02 21:11	SMT	85-01-8		
Anthracene	2000	ug/kg	390	07/16/02 21:11	SMT	120-12-7		
Di-n-butylphthalate	ND	ug/kg	390	07/16/02 21:11	SMT	84-74-2		
Fluoranthene	3900	ug/kg	390	07/16/02 21:11	SMT	206-44-0		
Pyrene	3900	ug/kg	390	07/16/02 21:11	SMT	129-00-0		
Butylbenzylphthalate	ND	ug/kg	390	07/16/02 21:11	SMT	85-68-7		
3,3'-Dichlorobenzidine	ND	ug/kg	790	07/16/02 21:11	SMT	91-94-1		
Benzo(a)anthracene	770	ug/kg	390	07/16/02 21:11	SMT	56-55-3		
Chrysene	750	ug/kg	390	07/16/02 21:11	SMT	218-01-9		
bis(2-Ethylhexyl)phthalate	ND	ug/kg	390	07/16/02 21:11	SMT	117-81-7		
Di-n-octylphthalate	ND	ug/kg	390	07/16/02 21:11	SMT	117-84-0		
Benzo(b)fluoranthene	990	ug/kg	390	07/16/02 21:11	SMT	205-99-2		
Benzo(k)fluoranthene	400	ug/kg	390	07/16/02 21:11	SMT	207-08-9		
Benzo(a)pyrene	420	ug/kg	390	07/16/02 21:11	SMT	50-32-8		
Indeno(1,2,3-cd)pyrene	ND	ug/kg	390	07/16/02 21:11	SMT	193-39-5		
Dibenz(a,h)anthracene	ND	ug/kg	390	07/16/02 21:11	SMT	53-70-3		
Benzo(g,h,i)perylene	ND	ug/kg	390	07/16/02 21:11	SMT	191-24-2	1	
Nitrobenzene-d5 (S)	64	%		07/16/02 21:11	SMT	4165-60-0		
2-Fluorobiphenyl (S)	78	%		07/16/02 21:11	SMT	321-60-8		
Terphenyl-d14 (S)	131	%		07/16/02 21:11	SMT	1718-51-0		
Phenol-d6 (S)	74	%		07/16/02 21:11	SMT	13127-88-3		
2-Fluorophenol (S)	74	%		07/16/02 21:11	SMT	367-12-4		
2,4,6-Tribromophenol (S)	84	%		07/16/02 21:11	SMT	118-79-6		
Date Extracted				07/15/02				

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
 without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

Lab Sample No: 103689741      Project Sample Number: 1060015-002      Date Collected: 07/12/02 14:35  
Client Sample ID: SB-3 13-15'      Matrix: Soil      Date Received: 07/12/02 18:14

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
GC Semivolatiles								
WI DRO in Soil	Prep/Method: TPH DRO WI extraction / TPH DRO Wisconsin							
Diesel Range Organics	68.	mg/kg	6.2	07/19/02 05:39	JMZ			
Date Extracted				07/15/02				

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

Lab Sample No: 103689758      Project Sample Number: 1060015-003      Date Collected: 07/12/02 12:35  
Client Sample ID: SB-2 13-15'      Matrix: Soil      Date Received: 07/12/02 18:14

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
------------	---------	-------	--------------	----------	----	---------	------	--------

**Metals**

Percent Moisture	Method:							
Percent Moisture	14.8	%		07/15/02	JDY			

**GC Semivolatiles**

WI DRO in Soil	Prep/Method: TPH DRO WI extraction / TPH DRO Wisconsin							
Diesel Range Organics	ND	mg/kg	8.3	07/19/02 00:11	JMZ			
Date Extracted				07/15/02				

**GC Volatiles**

WI GRO and PVOC, soil	Prep/Method: TPH GRO/PVOC WI ext. / TPH GRO/PVOC WI							
Benzene	ND	mg/kg	0.059	07/16/02 11:00	RLP	71-43-2		
Ethylbenzene	ND	mg/kg	0.059	07/16/02 11:00	RLP	100-41-4		
Toluene	ND	mg/kg	0.059	07/16/02 11:00	RLP	108-88-3		
Xylene (Total)	ND	mg/kg	0.18	07/16/02 11:00	RLP	1330-20-7		
Gasoline Range Organics	ND	mg/kg	5.9	07/16/02 11:00	RLP			
a,a,a-Trifluorotoluene (S)	114	%		07/16/02 11:00	RLP	98-08-8		

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.

Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

Lab Sample No: 103689766      Project Sample Number: 1060015-004      Date Collected: 07/12/02 11:50  
Client Sample ID: SB-2 0-2'      Matrix: Soil      Date Received: 07/12/02 18:14

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
------------	---------	-------	--------------	----------	----	---------	------	--------

**Metals**

Percent Moisture	Method:							
Percent Moisture	4.2	%		07/15/02	JDY			

**GC Semivolatiles**

WI DRO in Soil	Prep/Method: TPH DRO WI extraction / TPH DRO Wisconsin							
Diesel Range Organics	ND	mg/kg	19.	07/18/02 23:30	JMZ			
Date Extracted				07/15/02				

**GC Volatiles**

WI GRO and PVOC, soil	Prep/Method: TPH GRO/PVOC WI ext. / TPH GRO/PVOC WI							
Benzene	ND	mg/kg	0.052	07/16/02 12:03	RLP	71-43-2		
Ethylbenzene	ND	mg/kg	0.052	07/16/02 12:03	RLP	100-41-4		
Toluene	ND	mg/kg	0.052	07/16/02 12:03	RLP	108-88-3		
Xylene (Total)	ND	mg/kg	0.16	07/16/02 12:03	RLP	1330-20-7		
Gasoline Range Organics	ND	mg/kg	5.2	07/16/02 12:03	RLP			
a.a.a-Trifluorotoluene (S)	118	%		07/16/02 12:03	RLP	98-08-8		

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

Lab Sample No: 103689774      Project Sample Number: 1060015-005      Date Collected: 07/12/02 09:45  
Client Sample ID: SB-1 0-2'      Matrix: Soil      Date Received: 07/12/02 18:14

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>Metals</b>								
Percent Moisture	Method:							
Percent Moisture	19.2	%		07/15/02	JDY			
<b>GC Semivolatiles</b>								
WI DRO in Soil	Prep/Method: TPH DRO WI extraction / TPH DRO Wisconsin							
Diesel Range Organics	ND	mg/kg	630	07/19/02 04:17	JMZ			
Date Extracted				07/15/02				
<b>GC Volatiles</b>								
WI GRO and PVOC, soil	Prep/Method: TPH GRO/PVOC WI ext. / TPH GRO/PVOC WI							
Benzene	ND	mg/kg	0.062	07/16/02 11:31	RLP	71-43-2		
Ethylbenzene	ND	mg/kg	0.062	07/16/02 11:31	RLP	100-41-4		
Toluene	ND	mg/kg	0.062	07/16/02 11:31	RLP	108-88-3		
Xylene (Total)	ND	mg/kg	0.19	07/16/02 11:31	RLP	1330-20-7		
Gasoline Range Organics	ND	mg/kg	6.2	07/16/02 11:31	RLP			
a,a,a-Trifluorotoluene (S)	113	%		07/16/02 11:31	RLP	98-08-8		

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.





---

PARAMETER FOOTNOTES

- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- (S) Surrogate
- [1] The continuing calibration for this compound was outside the method control limits. The result for this compound should be considered an estimate.
- [2] The surrogate recovery was outside of acceptance limits.

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.

**QUALITY CONTROL DATA**

Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

QC Batch: 76113    Analysis Method: TPH DRO Wisconsin  
QC Batch Method: TPH DRO WI extraction      Analysis Description: WI DRO in Soil  
Associated Lab Samples:                              103689733    103689741    103689758    103689766    103689774

METHOD BLANK: 103691002  
Associated Lab Samples:                              103689733    103689741    103689758    103689766    103689774

<u>Parameter</u>	<u>Units</u>	<u>Blank Result</u>	<u>Reporting Limit</u>	<u>Footnotes</u>
Diesel Range Organics	mg/kg	ND	10.	

LABORATORY CONTROL SAMPLE & LCSD: 103691010 103691028

<u>Parameter</u>	<u>Units</u>	<u>Spike Conc.</u>	<u>LCS Result</u>	<u>LCSD Result</u>	<u>LCS % Rec</u>	<u>LCSD % Rec</u>	<u>RPD</u>	<u>Footnotes</u>
Diesel Range Organics	mg/kg	200.00	145.2	139.9	73	70	4	

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



**QUALITY CONTROL DATA**

Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

QC Batch: 76139                      Analysis Method: TPH GRO/PVOC WI  
QC Batch Method: TPH GRO/PVOC WI ext.      Analysis Description: WI GRO and PVOC, soil  
Associated Lab Samples:            103689733    103689758    103689766    103689774

METHOD BLANK: 103692729  
Associated Lab Samples:            103689733    103689758    103689766    103689774

Parameter	Units	Blank	Reporting	Footnotes
		Result	Limit	
Benzene	mg/kg	ND	0.050	
Ethylbenzene	mg/kg	ND	0.050	
Toluene	mg/kg	ND	0.050	
Xylene (Total)	mg/kg	ND	0.15	
Gasoline Range Organics	mg/kg	ND	5.0	
a,a,a-Trifluorotoluene (S)	%	119		

LABORATORY CONTROL SAMPLE & LCSD: 103692737 103692745

Parameter	Units	Spike	LCS	LCSD	LCS	LCSD	RPD	Footnotes
		Conc.	Result	Result	% Rec	% Rec		
Benzene	mg/kg	5.000	5.407	5.178	108	104	4	
Ethylbenzene	mg/kg	5.000	5.534	5.298	111	106	4	
Toluene	mg/kg	5.000	5.533	5.294	111	106	4	
Xylene (Total)	mg/kg	15.00	16.77	16.05	112	107	4	
Gasoline Range Organics	mg/kg	50.00	57.85	55.33	116	111	4	
a,a,a-Trifluorotoluene (S)					132	116		

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015

Client Project ID: Magnetic Resonance Research Ct

QC Batch: 76097                      Analysis Method: EPA 8270  
QC Batch Method: EPA 3550           Analysis Description: Semivolatile Organics  
Associated Lab Samples:                103689733      103689741

METHOD BLANK: 103690616  
Associated Lab Samples:                103689733      103689741

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Phenol	ug/kg	ND	330	
bis(2-Chloroethyl) ether	ug/kg	ND	330	
2-Chlorophenol	ug/kg	ND	330	
1,3-Dichlorobenzene	ug/kg	ND	330	
1,4-Dichlorobenzene	ug/kg	ND	330	
Benzyl alcohol	ug/kg	ND	660	
1,2-Dichlorobenzene	ug/kg	ND	330	
2-Methylphenol (o-Cresol)	ug/kg	ND	330	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	
4-Methylphenol (p-Cresol)	ug/kg	ND	330	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	
Hexachloroethane	ug/kg	ND	330	
Nitrobenzene	ug/kg	ND	330	
Isophorone	ug/kg	ND	330	
2-Nitrophenol	ug/kg	ND	330	
2,4-Dimethylphenol	ug/kg	ND	330	
Benzoic acid	ug/kg	ND	1700	1
bis(2-Chloroethoxy)methane	ug/kg	ND	330	
2,4-Dichlorophenol	ug/kg	ND	330	
1,2,4-Trichlorobenzene	ug/kg	ND	330	
Naphthalene	ug/kg	ND	330	
4-Chloroaniline	ug/kg	ND	1700	
Hexachloro-1,3-butadiene	ug/kg	ND	330	
4-Chloro-3-methylphenol	ug/kg	ND	330	
2-Methylnaphthalene	ug/kg	ND	330	
Hexachlorocyclopentadiene	ug/kg	ND	1700	
2,4,6-Trichlorophenol	ug/kg	ND	330	
2,4,5-Trichlorophenol	ug/kg	ND	1700	
2-Chloronaphthalene	ug/kg	ND	330	
2-Nitroaniline	ug/kg	ND	1700	
Dimethylphthalate	ug/kg	ND	330	

Date: 07/24/02

Page: 13

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015

Client Project ID: Magnetic Resonance Research Ct

METHOD BLANK: 103690616

Associated Lab Samples: 103689733 103689741

<u>Parameter</u>	<u>Units</u>	<u>Blank Result</u>	<u>Reporting Limit</u>	<u>Footnotes</u>
Acenaphthylene	ug/kg	ND	330	
2,6-Dinitrotoluene	ug/kg	ND	330	
3-Nitroaniline	ug/kg	ND	1700	
Acenaphthene	ug/kg	ND	330	
2,4-Dinitrophenol	ug/kg	ND	1700	
4-Nitrophenol	ug/kg	ND	1700	
Dibenzofuran	ug/kg	ND	330	
2,4-Dinitrotoluene	ug/kg	ND	330	
Diethylphthalate	ug/kg	ND	330	
4-Chlorophenylphenyl ether	ug/kg	ND	330	
Fluorene	ug/kg	ND	330	
4-Nitroaniline	ug/kg	ND	1700	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	
N-Nitrosodiphenylamine	ug/kg	ND	330	
4-Bromophenylphenyl ether	ug/kg	ND	330	
Hexachlorobenzene	ug/kg	ND	330	
Pentachlorophenol	ug/kg	ND	1200	
Phenanthrene	ug/kg	ND	330	
Anthracene	ug/kg	ND	330	
Di-n-butylphthalate	ug/kg	ND	330	
Fluoranthene	ug/kg	ND	330	
Pyrene	ug/kg	ND	330	
Butylbenzylphthalate	ug/kg	ND	330	
3,3'-Dichlorobenzidine	ug/kg	ND	670	
Benzo(a)anthracene	ug/kg	ND	330	
Chrysene	ug/kg	ND	330	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	
Di-n-octylphthalate	ug/kg	ND	330	
Benzo(b)fluoranthene	ug/kg	ND	330	
Benzo(k)fluoranthene	ug/kg	ND	330	
Benzo(a)pyrene	ug/kg	ND	330	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	
Dibenz(a,h)anthracene	ug/kg	ND	330	
Benzo(g,h,i)perylene	ug/kg	ND	330	
Nitrobenzene-d5 (S)	%	69		
2-Fluorobiphenyl (S)	%	78		

Date: 07/24/02

Page: 14

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



UMR-700

Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

METHOD BLANK: 103690616  
Associated Lab Samples: 103689733 103689741

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Terphenyl-d14 (S)	%	143		2
Phenol-d6 (S)	%	68		
2-Fluorophenol (S)	%	55		
2,4,6-Trifluorophenol (S)	%	31		2

LABORATORY CONTROL SAMPLE: 103690640

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Phenol	ug/kg	1667.00	959.4	58	
bis(2-Chloroethyl) ether	ug/kg	1667.00	973.9	58	
2-Chlorophenol	ug/kg	1667.00	908.4	54	
1,3-Dichlorobenzene	ug/kg	1667.00	1083	65	
1,4-Dichlorobenzene	ug/kg	1667.00	1088	65	
Benzyl alcohol	ug/kg	1667.00	1046	63	
1,2-Dichlorobenzene	ug/kg	1667.00	1083	65	
2-Methylphenol (o-Cresol)	ug/kg	1667.00	637.3	38	3
bis(2-Chloroisopropyl) ether	ug/kg	1667.00	974.1	58	
4-Methylphenol (p-Cresol)	ug/kg	1667.00	748.2	45	3
N-Nitroso-di-n-propylamine	ug/kg	1667.00	1013	61	
Hexachloroethane	ug/kg	1667.00	1159	70	
Nitrobenzene	ug/kg	1667.00	1102	66	
Isophorone	ug/kg	1667.00	1202	72	
2-Nitrophenol	ug/kg	1667.00	1107	66	
2,4-Dimethylphenol	ug/kg	1667.00	134.4	8	3
Benzoic acid	ug/kg	1667.00	1092	66	1
bis(2-Chloroethoxy)methane	ug/kg	1667.00	1080	65	
2,4-Dichlorophenol	ug/kg	1667.00	1027	62	
1,2,4-Trichlorobenzene	ug/kg	1667.00	1242	74	
Naphthalene	ug/kg	1667.00	1188	71	
4-Chloroaniline	ug/kg	1667.00	421.8	25	3
Hexachloro-1,3-butadiene	ug/kg	1667.00	1145	69	
4-Chloro-3-methylphenol	ug/kg	1667.00	1113	67	
2-Methylnaphthalene	ug/kg	1667.00	1173	70	
Hexachlorocyclopentadiene	ug/kg	1667.00	427.1	26	3

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015

Client Project ID: Magnetic Resonance Research Ct

LABORATORY CONTROL SAMPLE: 103690640

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
2,4,6-Trichlorophenol	ug/kg	1667.00	1117	67	
2,4,5-Trichlorophenol	ug/kg	1667.00	1225	74	
2-Chloronaphthalene	ug/kg	1667.00	1262	76	
2-Nitroaniline	ug/kg	1667.00	1376	82	
Dimethylphthalate	ug/kg	1667.00	1251	75	
Acenaphthylene	ug/kg	1667.00	1331	80	
2,6-Dinitrotoluene	ug/kg	1667.00	1364	82	
3-Nitroaniline	ug/kg	1667.00	814.2	49	3
Acenaphthene	ug/kg	1667.00	1379	83	
2,4-Dinitrophenol	ug/kg	1667.00	1079	65	
4-Nitrophenol	ug/kg	1667.00	1319	79	
Dibenzofuran	ug/kg	1667.00	1358	82	
2,4-Dinitrotoluene	ug/kg	1667.00	1374	82	
Diethylphthalate	ug/kg	1667.00	1306	78	
4-Chlorophenylphenyl ether	ug/kg	1667.00	1239	74	
Fluorene	ug/kg	1667.00	1355	81	
4-Nitroaniline	ug/kg	1667.00	950.9	57	
4,6-Dinitro-2-methylphenol	ug/kg	1667.00	1236	74	
N-Nitrosodiphenylamine	ug/kg	1667.00	1144	69	
4-Bromophenylphenyl ether	ug/kg	1667.00	1330	80	
Hexachlorobenzene	ug/kg	1667.00	1473	88	
Pentachlorophenol	ug/kg	1667.00	1126	68	
Phenanthrene	ug/kg	1667.00	1501	90	
Anthracene	ug/kg	1667.00	1368	82	
Di-n-butylphthalate	ug/kg	1667.00	1246	75	
Fluoranthene	ug/kg	1667.00	1548	93	
Pyrene	ug/kg	1667.00	1700	102	
Butylbenzylphthalate	ug/kg	1667.00	1526	92	
3,3'-Dichlorobenzidine	ug/kg	1667.00	213.4	13	3
Benzo(a)anthracene	ug/kg	1667.00	1867	112	
Chrysene	ug/kg	1667.00	1849	111	
bis(2-Ethylhexyl)phthalate	ug/kg	1667.00	1536	92	
Di-n-octylphthalate	ug/kg	1667.00	2070	124	
Benzo(b)fluoranthene	ug/kg	1667.00	2315	139	3
Benzo(k)fluoranthene	ug/kg	1667.00	2299	138	3
Benzo(a)pyrene	ug/kg	1667.00	2068	124	
Indeno(1,2,3-cd)pyrene	ug/kg	1667.00	1789	107	

Date: 07/24/02

Page: 16

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015

Client Project ID: Magnetic Resonance Research Ct

LABORATORY CONTROL SAMPLE: 103690640

<u>Parameter</u>	<u>Units</u>	<u>Spike</u> <u>Conc.</u>	<u>LCS</u> <u>Result</u>	<u>LCS</u> <u>% Rec</u>	<u>Footnotes</u>
Dibenz(a,h)anthracene	ug/kg	1667.00	1729	104	
Benzo(g,h,i)perylene	ug/kg	1667.00	1843	111	
Nitrobenzene-d5 (S)				70	
2-Fluorobiphenyl (S)				78	
Terphenyl-d14 (S)				104	
Phenol-d6 (S)				61	
2-Fluorophenol (S)				56	
2,4,6-Tribromophenol (S)				71	

Date: 07/24/02

Page: 17

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



UMR-703



QUALITY CONTROL DATA

Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

QC Batch: 76112                      Analysis Method: EPA 7471  
QC Batch Method: EPA 7470        Analysis Description: Mercury, CVAAS  
Associated Lab Samples:            103689733

METHOD BLANK: 103690921  
Associated Lab Samples:            103689733

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Mercury	mg/kg	ND	0.0200	

LABORATORY CONTROL SAMPLE: 103690939

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Mercury	mg/kg	0.5000	0.5242	105	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 103690947 103690954

Parameter	Units	103689733 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Mercury	mg/kg	0.00022	0.5932	0.6100	0.5897	103	103	3	

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



**QUALITY CONTROL DATA**

Lab Project Number: 1060015

Client Project ID: Magnetic Resonance Research Ct

QC Batch: 76145	Analysis Method:				
QC Batch Method:	Analysis Description: Percent Moisture				
Associated Lab Samples:	103689733	103689741	103689758	103689766	103689774

METHOD BLANK: 103692919					
Associated Lab Samples:	103689733	103689741	103689758	103689766	103689774

<u>Parameter</u>	<u>Units</u>	<u>Blank Result</u>	<u>Reporting Limit</u>	<u>Footnotes</u>
Percent Moisture	%	0		

SAMPLE DUPLICATE: 103692927

<u>Parameter</u>	<u>Units</u>	<u>103686986 Result</u>	<u>DUP Result</u>	<u>RPD</u>	<u>Footnotes</u>
Percent Moisture	%	7.100	0	200	

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
 without the written consent of Pace Analytical Services, Inc.



**QUALITY CONTROL DATA**

Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

QC Batch: 76242                      Analysis Method: EPA 6010  
QC Batch Method: EPA 3050          Analysis Description: Metals, Trace ICP  
Associated Lab Samples:              103689733

METHOD BLANK: 103698890  
Associated Lab Samples:              103689733

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Arsenic	mg/kg	ND	0.500	
Barium	mg/kg	ND	0.500	
Cadmium	mg/kg	ND	0.0500	
Chromium	mg/kg	ND	0.500	
Lead	mg/kg	ND	0.300	
Selenium	mg/kg	ND	0.750	
Silver	mg/kg	ND	0.500	

LABORATORY CONTROL SAMPLE: 103698908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Arsenic	mg/kg	1.000	0.9361	94	
Barium	mg/kg	1.000	0.9610	96	
Cadmium	mg/kg	1.000	0.9146	92	
Chromium	mg/kg	1.000	0.9738	97	
Lead	mg/kg	1.000	0.9357	94	
Selenium	mg/kg	1.000	0.9119	91	
Silver	mg/kg	1.000	0.9184	92	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 103698916 103698924

Parameter	Units	103678611 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Arsenic	mg/kg	0.5699	59.57	53.58	49.43	89	84	8	
Barium	mg/kg	109.2	59.57	170.1	167.5	102	101	2	
Cadmium	mg/kg	0.1070	59.57	54.05	51.45	91	89	5	
Chromium	mg/kg	13.78	59.57	68.80	67.14	92	92	2	
Lead	mg/kg	13.62	59.57	66.96	64.35	90	88	4	

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



QUALITY CONTROL DATA

Lab Project Number: 1060015  
Client Project ID: Magnetic Resonance Research Ct

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 103698916 103698924

Parameter	Units	103678611 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Selenium	mg/kg	0	59.57	52.37	52.14	88	90	0	
Silver	mg/kg	0	59.57	54.07	51.81	91	90	4	

SAMPLE DUPLICATE: 103698932

Parameter	Units	103678629 Result	DUP Result	RPD	Footnotes
Arsenic	mg/kg	ND	ND	NC	
Barium	mg/kg	54.40	54.50	0	
Cadmium	mg/kg	ND	ND	NC	
Chromium	mg/kg	8.480	8.680	2	
Lead	mg/kg	6.300	6.810	8	
Selenium	mg/kg	ND	ND	NC	
Silver	mg/kg	ND	ND	NC	

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Lab Project Number: 1060015

Client Project ID: Magnetic Resonance Research Ct

---

**QUALITY CONTROL DATA PARAMETER FOOTNOTES**

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

- LCS(D) Laboratory Control Sample (Duplicate)
- MS(D) Matrix Spike (Duplicate)
- DUP Sample Duplicate
- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- RPD Relative Percent Difference
- (S) Surrogate
- [1] The initial calibration for this compound was outside the method control limits. The result for this compound should be considered an estimate.
- [2] The surrogate recovery was outside of acceptance limits.
- [3] The spike recovery was outside of acceptance limits.

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



**Section A**

**Required Client Information:**

Company: Weisch Associates  
Address: 7650 Currier Blvd  
Suite 300C  
Woodbury, NJ 08825  
Phone: 651 730 9401  
Project Number: 651 731 9402

**Section B**

Report To: Meish  
Copy To:  
Invoice To: Meish  
P.O.: U of NJ  
Project Name: Magnetic Resonance  
Project Number: 2021 6th St SE Mpls MN

**Section C**

Client Information (Check quote/contract):  
Requested Due Date: STO TAT: 14  
\* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a rush turnaround surcharge.  
Requested Analysis: As follows in Comand C

653138

To Be Completed by Pace Analytical and Client

Project Manager:

Project #:

Profile #:

Requested Analysis:

**Section D**

Required Client Information:

**SAMPLE ID**

One character per box.  
(A-Z, 0-9 / -)

Sample IDs MUST BE UNIQUE

**Preservatives**

Valid Matrix Codes: ←  
MATRIX CODE  
WATER WT  
SOIL SL  
OIL OL  
WIPE WP  
AIR AR  
TISSUE TS  
OTHER OT

# Containers  
DATE COLLECTED mm / dd / yy  
TIME COLLECTED hh: mm a/p

MATRIX CODE

Unpreserved  
H<sub>2</sub>SO<sub>4</sub>  
HNO<sub>3</sub>  
HCl  
NaOH  
Na<sub>2</sub>O<sub>2</sub>  
Methanol  
Other

**Remarks / Lab ID**

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED	TIME COLLECTED	# Containers	Preservatives	Requested Analysis	Remarks / Lab ID
1	SB-3 2-4'	SL	7/12/02	130P	4	Unpreserved	XXX	10368 1733
2	SB-3 1B-1S'	SL	7/12/02	2:35P	3	Unpreserved	X	974
3	SB-2 1B-1S'	SL	7/12/02	2:35P	3	Unpreserved	X	975*
4	SB-2 0-2'	SL	7/12/02	1:15P	3	Unpreserved	X	976
5	SB-1 0-2'	SL	7/12/02	9:45P	3	Unpreserved	X	9774
6								
7								
8								
9								
10								
11								
12								

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					David Dean	7/12/02	6:14	Jean Olden	7/12/02	1814

**SAMPLE NOTES**

SAMPLE CONDITION	
Temp in °C	6
Received on Ice	Y/N
Sealed Cooler	Y/N
Samples Intact	Y/N

UMR-709

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

DATE Signed: (MM/DD/YY)



**Pace Analytical™**  
www.pacelabs.com

**Pace Analytical Services, Inc.**  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414  
Phone: 612.607.1700  
Fax: 612.607.6444

August 02, 2002

Mr. Paul Meisch  
Meisch & Associates, Ltd.  
7650 Curren Blvd.  
Suite # 300C  
Woodbury, MN 55125

RE: Lab Project Number: 1060308  
Client Project ID: Resonance Center U of M

Dear Mr. Meisch:

Enclosed are the analytical results for sample(s) received by the laboratory on July 19, 2002. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report please feel free to contact me.

Sincerely,



Roxanne Patterson  
Roxanne.Patterson@pacelabs.com  
Project Manager

State of Minnesota laboratory 027-053-137

Enclosures

## **REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



**UMR-710**

Lab Project Number: 1060308  
Client Project ID: Resonance Center U of M

Solid results are reported on a dry weight basis

Lab Sample No: 103706669      Project Sample Number: 1060308-001      Date Collected: 07/19/02 12:30  
Client Sample ID: HB-2 1-2'      Matrix: Soil      Date Received: 07/19/02 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
------------	---------	-------	--------------	----------	----	---------	------	--------

**Metals**

Percent Moisture	Method:							
Percent Moisture	5.4	%		07/22/02	JDY			

**GC Semivolatiles**

PAH's in Soil by 8310	Prep/Method: EPA 3550 / EPA 8310							
Acenaphthene	ND	mg/kg	0.18	07/30/02	06:07	CLM	83-32-9	
Acenaphthylene	ND	mg/kg	0.35	07/30/02	06:07	CLM	208-96-8	
Anthracene	0.025	mg/kg	0.018	07/30/02	06:07	CLM	120-12-7	
Benzo(k)fluoranthene	0.022	mg/kg	0.018	07/30/02	06:07	CLM	207-08-9	
Benzo(g,h,i)perylene	0.042	mg/kg	0.035	07/30/02	06:07	CLM	191-24-2	
Benzo(a)anthracene	ND	mg/kg	0.018	07/30/02	06:07	CLM	56-55-3	
Benzo(b)fluoranthene	0.045	mg/kg	0.035	07/30/02	06:07	CLM	205-99-2	
Benzo(a)pyrene	0.064	mg/kg	0.018	07/30/02	06:07	CLM	50-32-8	
Chrysene	0.032	mg/kg	0.018	07/30/02	06:07	CLM	218-01-9	
Dibenz(a,h)anthracene	0.089	mg/kg	0.035	07/30/02	06:07	CLM	53-70-3	
Fluorene	ND	mg/kg	0.035	07/30/02	06:07	CLM	86-73-7	
Fluoranthene	0.083	mg/kg	0.035	07/30/02	06:07	CLM	206-44-0	
Indeno(1,2,3-cd)pyrene	0.052	mg/kg	0.018	07/30/02	06:07	CLM	193-39-5	
Naphthalene	ND	mg/kg	0.18	07/30/02	06:07	CLM	91-20-3	
Phenanthrene	0.069	mg/kg	0.018	07/30/02	06:07	CLM	85-01-8	
Pyrene	0.080	mg/kg	0.018	07/30/02	06:07	CLM	129-00-0	
Carbazole (S)	83	%		07/30/02	06:07	CLM		
Terphenyl-d14 (S)	86	%		07/30/02	06:07	CLM	1718-51-0	
Date Extracted				07/25/02				

WI DRO in Soil	Prep/Method: TPH DRO WI extraction / TPH DRO Wisconsin						
Diesel Range Organics	ND	mg/kg	7.5	08/02/02	13:00	CLM	
Date Extracted				07/24/02			

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.





Lab Project Number: 1060308

\*Client Project ID: Resonance Center U of M

Lab Sample No: 103706677      Project Sample Number: 1060308-002      Date Collected: 07/19/02 13:30  
Client Sample ID: HB-3 1-2'      Matrix: Soil      Date Received: 07/19/02 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
------------	---------	-------	--------------	----------	----	---------	------	--------

**Metals**

Percent Moisture	Method:							
Percent Moisture	7.8	%		07/22/02	JDY			

**GC Semivolatiles**

PAH's in Soil by 8310

Prep/Method: EPA 3550 / EPA 8310

Acenaphthene	ND	mg/kg	0.18	07/30/02 12:57	CLM	83-32-9		
Acenaphthylene	ND	mg/kg	0.36	07/30/02 12:57	CLM	208-96-8		
Anthracene	0.068	mg/kg	0.018	07/30/02 12:57	CLM	120-12-7		
Benzo(k)fluoranthene	0.17	mg/kg	0.018	07/30/02 12:57	CLM	207-08-9		
Benzo(g,h,i)perylene	0.32	mg/kg	0.036	07/30/02 12:57	CLM	191-24-2		
Benzo(a)anthracene	0.13	mg/kg	0.018	07/30/02 12:57	CLM	56-55-3		
Benzo(b)fluoranthene	0.36	mg/kg	0.036	07/30/02 12:57	CLM	205-99-2		
Benzo(a)pyrene	0.34	mg/kg	0.018	07/30/02 12:57	CLM	50-32-8		
Chrysene	0.27	mg/kg	0.018	07/30/02 12:57	CLM	218-01-9		
Dibenz(a,h)anthracene	0.65	mg/kg	0.036	07/30/02 12:57	CLM	53-70-3		
Fluorene	ND	mg/kg	0.036	07/30/02 12:57	CLM	86-73-7		
Fluoranthene	ND	mg/kg	0.036	07/30/02 12:57	CLM	206-44-0		
Indeno(1,2,3-cd)pyrene	0.37	mg/kg	0.018	07/30/02 12:57	CLM	193-39-5		
Naphthalene	ND	mg/kg	0.18	07/30/02 12:57	CLM	91-20-3		
Phenanthrene	0.20	mg/kg	0.018	07/30/02 12:57	CLM	85-01-8		
Pyrene	ND	mg/kg	0.018	07/30/02 12:57	CLM	129-00-0		
Carbazole (S)	83	%		07/30/02 12:57	CLM			
Terphenyl-d14 (S)	90	%		07/30/02 12:57	CLM	1718-51-0		
Date Extracted				07/25/02				

WI DRO in Soil

Prep/Method: TPH DRO WI extraction / TPH DRO Wisconsin

Diesel Range Organics	ND	mg/kg	42.	08/02/02 13:37	CLM			1
Date Extracted				07/24/02				

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



PARAMETER FOOTNOTES

- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- (S) Surrogate
- [1] The elevated reporting limits are due to high levels of non-target analytes.

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



**QUALITY CONTROL DATA**

Lab Project Number: 1060308

Client Project ID: Resonance Center U of M

QC Batch: 76514

Analysis Method: TPH DRO Wisconsin

QC Batch Method: TPH DRO WI extraction

Analysis Description: WI DRO in Soil

Associated Lab Samples: 103706669

103706677

METHOD BLANK: 103713970

Associated Lab Samples: 103706669 103706677

<u>Parameter</u>	<u>Units</u>	<u>Blank Result</u>	<u>Reporting Limit</u>	<u>Footnotes</u>
Diesel Range Organics	mg/kg	ND	10.	

LABORATORY CONTROL SAMPLE & LCSD: 103713988 103713996

<u>Parameter</u>	<u>Units</u>	<u>Spike Conc.</u>	<u>LCS Result</u>	<u>LCSD Result</u>	<u>LCS % Rec</u>	<u>LCSD % Rec</u>	<u>RPD</u>	<u>Footnotes</u>
Diesel Range Organics	mg/kg	200.00	150.6	156.0	75	78	4	

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



QUALITY CONTROL DATA

Lab Project Number: 1060308  
Client Project ID: Resonance Center U of M

QC Batch: 76596 Analysis Method: EPA 8310  
QC Batch Method: EPA 3550 Analysis Description: PAH's in Soil by 8310  
Associated Lab Samples: 103706669 103706677

METHOD BLANK: 103719035  
Associated Lab Samples: 103706669 103706677

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Acenaphthene	mg/kg	ND	0.17	
Acenaphthylene	mg/kg	ND	0.33	
Anthracene	mg/kg	ND	0.017	
Benzo(k)fluoranthene	mg/kg	ND	0.017	
Benzo(g,h,i)perylene	mg/kg	ND	0.033	
Benzo(a)anthracene	mg/kg	ND	0.017	
Benzo(b)fluoranthene	mg/kg	ND	0.033	
Benzo(a)pyrene	mg/kg	ND	0.017	
Chrysene	mg/kg	ND	0.017	
Dibenz(a,h)anthracene	mg/kg	ND	0.033	
Fluorene	mg/kg	ND	0.033	
Fluoranthene	mg/kg	ND	0.033	
Indeno(1,2,3-cd)pyrene	mg/kg	ND	0.017	
Naphthalene	mg/kg	ND	0.17	
Phenanthrene	mg/kg	ND	0.017	
Pyrene	mg/kg	ND	0.017	
Carbazole (S)	%	83		
Terphenyl-d14 (S)	%	87		

LABORATORY CONTROL SAMPLE: 103719043

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	mg/kg	3.333	3.605	108	
Acenaphthylene	mg/kg	6.667	6.882	103	
Anthracene	mg/kg	0.3333	0.3318	100	
Benzo(k)fluoranthene	mg/kg	0.3333	0.3493	105	
Benzo(g,h,i)perylene	mg/kg	0.6667	0.7124	107	
Benzo(a)anthracene	mg/kg	0.3333	0.2850	86	
Benzo(b)fluoranthene	mg/kg	0.6667	0.6971	105	

Date: 08/02/02

Page: 5

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



UMR-715

QUALITY CONTROL DATA

Lab Project Number: 1060308  
Client Project ID: Resonance Center U of M

LABORATORY CONTROL SAMPLE: 103719043

<u>Parameter</u>	<u>Units</u>	<u>Spike Conc.</u>	<u>LCS Result</u>	<u>LCS % Rec</u>	<u>Footnotes</u>
Benzo(a)pyrene	mg/kg	0.3333	0.3655	110	
Chrysene	mg/kg	0.3333	0.3416	102	
Dibenz(a,h)anthracene	mg/kg	0.6667	0.7008	105	
Fluorene	mg/kg	0.6667	0.6949	104	
Fluoranthene	mg/kg	0.6667	0.6904	104	
Indeno(1,2,3-cd)pyrene	mg/kg	0.3333	0.3498	105	
Naphthalene	mg/kg	3.333	3.290	99	
Phenanthrene	mg/kg	0.3333	0.3353	101	
Pyrene	mg/kg	0.3333	0.3440	103	
Carbazole (S)				96	
Terphenyl-d14 (S)				89	

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



**QUALITY CONTROL DATA**

Lab Project Number: 1060308  
Client Project ID: Resonance Center U of M

QC Batch: 76434                      Analysis Method:  
QC Batch Method:                      Analysis Description: Percent Moisture  
Associated Lab Samples:              103706669              103706677

METHOD BLANK: 103709325  
Associated Lab Samples:              103706669              103706677

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Percent Moisture	%	0		

SAMPLE DUPLICATE: 103709333

Parameter	Units	20103667 Result	DUP Result	RPD	Footnotes
Percent Moisture	%	17.40	0	200	

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



---

**QUALITY CONTROL DATA PARAMETER FOOTNOTES**

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

- LCS(D) Laboratory Control Sample (Duplicate)
- MS(D) Matrix Spike (Duplicate)
- DUP Sample Duplicate
- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- RPD Relative Percent Difference
- (S) Surrogate

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.





# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

To Be Completed by Pace Analytical and Client **Section C**

Required Client Information: **Section B**

Report To: **Meisch + Associates**

Company: **Meisch + Associates**

Copy To: **Meisch + Associates**

Address: **7650 Curcell Blvd.**

Invoice To: **Meisch + Associates**

Address: **7650 Curcell Blvd.**

P.O. **14 days**

Address: **Suite 300c**

Project Name: **Vol. M Magnetic Resonance Center**

Address: **Woodbury, MN 55125**

Project Number: **30216**

Address: **651-231-9403**

Address: **Minneapolis, MN 55455**

Section D Required Client Information:

**SAMPLE ID**  
One character per box.  
(A-Z, 0-9 / -)

Sample IDs MUST BE UNIQUE

Client Information (Check quote/contract):  
Requested Due Date: **Std.** TAT: **14 days**  
\* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.  
Turn Around Time (TAT) in calendar days.

Requested Analysis:  
**PAH 8310**  
**Me. St. P.C.**  
**DRO**

ITEM #	SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION		DATE	TIME	REMARKS / Lab ID
						DATE	TIME	DATE	TIME			
1					SL	7/19/02	12:30p	2X				37066679
2					SL	7/19/02	1:30p	2X				37066677
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
SAMPLE CONDITION						SAMPLE NOTES						
Temp in °C						19						
Received on Ice						Y/N						
Sealed Cooler						Y/N						
Samples Intact						Y/N						
Additional Comments:												

Signature: *David J...* Date: 7/19/02 5:00p. 27. 26 / Acc

**SAMPLER NAME AND SIGNATURE**  
PRINT Name of SAMPLER:  
SIGNATURE of SAMPLER:  
DATE Signed: (MM / DD / YY)