SUPPLEMENTAL LIMITED PHASE II INVESTIGATION

PARCEL IDENTIFICATION NUMBER
H-08-12-300-027
3013 WEST HURON RIVER DRIVE
ANN ARBOR, WASHTENAW, MICHIGAN

MAY 28, 2014

PREPARED FOR:
THE CITY OF ANN ARBOR
301 EAST HURON
ANN ARBOR, WASHTENAW COUNTY, MICHIGAN 48104

SUPPLEMENTAL LIMITED PHASE II INVESTIGATION

PARCEL IDENTIFICATION NUMBER
H-08-12-300-027
3013 WEST HURON RIVER DRIVE
ANN ARBOR, WASHTENAW, MICHIGAN

PREPARED BY: _____
RYAN E. MONTRI
SENIOR GEOLOGIST

REVIEWED AND APPROVED BY: _____
WALTER J. BOLT, CPG
SENIOR VICE PRESIDENT

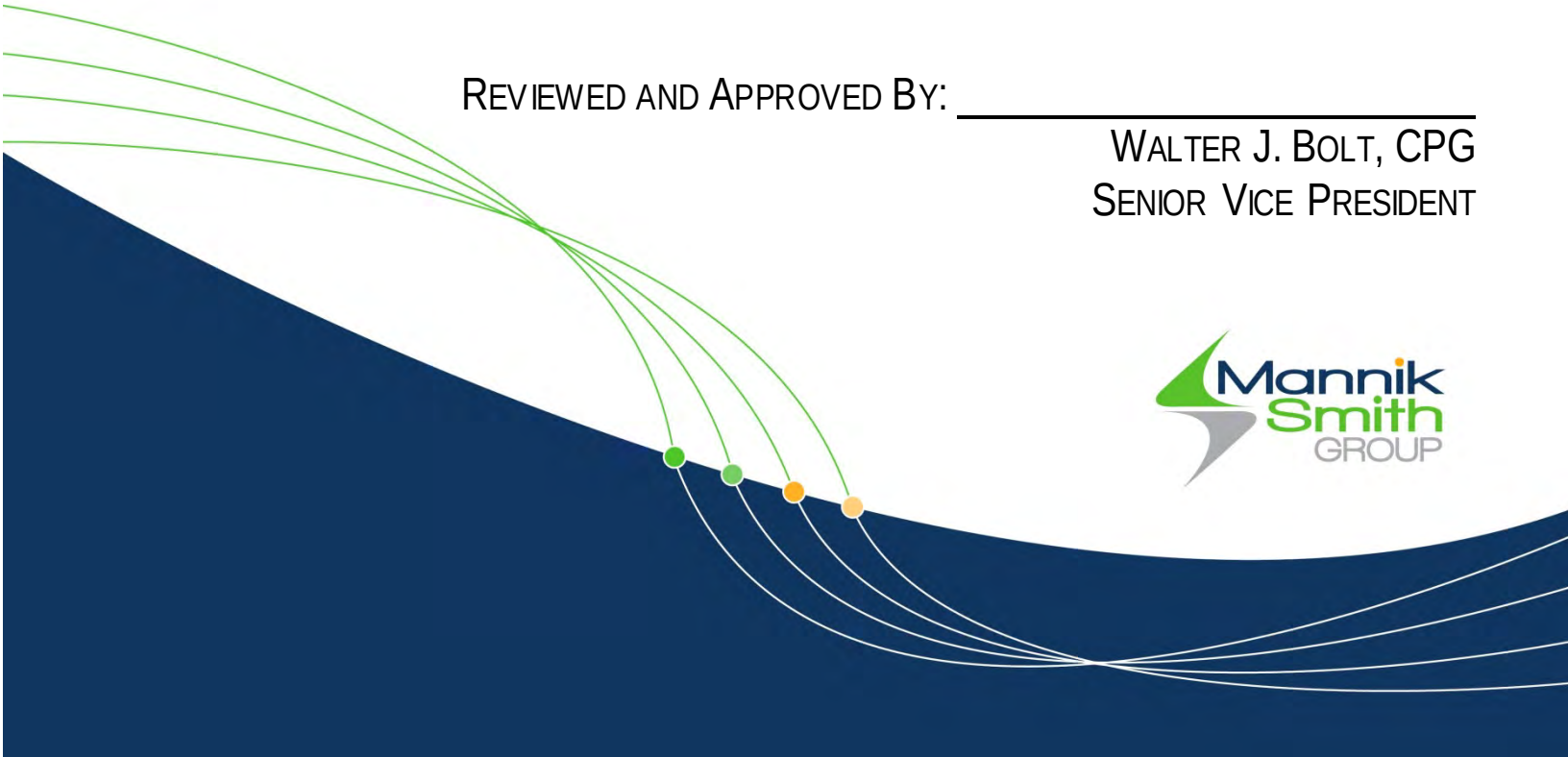


TABLE OF CONTENTS

1.0 INTRODUCTION

The Mannik and Smith Group, Inc. (MSG) is pleased to present the City of Ann Arbor (the City) with the results of the Supplemental Limited Phase II Investigation performed at 3013 West Huron River Drive, Ann Arbor, Washtenaw County, Michigan (Site). *Figure 1, Site Location Map*, depicts the site relative to nearby roads and major topographical features. *Figure 2, Site Schematic,* depicts the Site and investigation area.

2.0 SITE BACKGROUND

MSG conducted a Limited Phase II Investigation of the Site on November 20, 2013, which included the collection of soil samples SB-1 (4'-5'), SB-2 (4'-5'), SB-3 (0'-1'), SB-4 (4'-5') and SB-5 (4'-5'). The Site met the definition of a "facility" as defined under *Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act* (NREPA)*, 1994 PA 451,* as amended (Part 201) based on arsenic, lead, selenium, and zinc exceedences of the generic residential cleanup criteria (GRCC) for direct contact criteria (DCC), groundwater surface water interface protection criteria (GSIPC), and/or drinking water protection criteria (DWPC) in soil sample SB-3 (0'-1'). Subsequently, a Baseline Environmental Assessment (BEA) was submitted to the Michigan Department of Environmental Quality (MDEQ) and a Section 20107a Compliance Analysis (Due Care Plan) was written and provided to the City.

3.0 PURPOSE AND SCOPE OF WORK

The purpose of this Supplemental Limited Phase II Investigation is to further delineate the horizontal and vertical extent of lead-impacted soil identified in SB-3 (0'-1') as documented in the BEA and Due Care Plan. The sampling plan at the Site was developed, in part, on the location SB-3 and modified in the field based on encountered conditions and the professional judgment of MSG's field geologist. Because lead exceeded DCC, it is considered the primary chemical of concern. Soil sample results were compared to current Part 201 GRCC.

MSG performed the following scope of work to complete this Supplemental Limited Phase II Investigation:

- Advanced 22 soil borings to further delineate the horizontal and vertical extent of lead-impacted soil located on the Site.
- Submitted select soil samples for laboratory analysis of lead.
- Prepare this Supplemental Limited Phase II Investigation Report summarizing the activities and results of this investigation.

The findings of this report are valid as of the report date, subject to the Limitations presented in *Appendix A, Limitations*.

4.0 METHODOLOGIES

MSG completed the field activities associated with this investigation on December 3, 2013 and March 31, 2014. The following sections detail the methodologies used during the completion of this Supplemental Limited Phase II Investigation. Daily activity reports generated during the investigation are presented in *Appendix B, Daily Activity Reports.*

4.1 Soil Sample Collection

MSG advanced 22 soil borings [(SB-3 (1'-2'), and SB-6 through SB-25)] utilizing a hand auger. The soil boring locations (Figure 2) were selected to delineate the vertical and horizontal nature of the lead-impacted soils as identified in the BEA.

During soil boring activities, MSG field personnel visually classified and logged encountered soil conditions in general accordance with the Unified Soil Classification System (ASTM D 2488-00). The soil cuttings were observed for visual and/or olfactory indications of impact and were screened with a MiniRAE 10.6 eV photoionization detector (PID) calibrated with isobutylene span gas. The PID measures the concentration of

airborne ionizable gasses and vapors and automatically displays any detected concentrations in parts per million (ppm); however, is unable to distinguish between individual chemical constituents. Soil descriptions were based upon MSG's professional interpretation of the soils encountered and PID readings for each sample interval were recorded on individual soil boring logs (*Appendix C, Soil Boring Logs)*.

MSG collected soil samples from SB-3 and SB-6 through SB-25 at intervals from 0 feet below ground surface (bgs) to 1 feet bgs and 1 feet bgs to 2 feet bgs. Groundwater was not encountered during this investigation and therefore, was not collected.

Soil samples were collected from these intervals to delineate the vertical extent of lead-impacted soils. To minimize unnecessary laboratory costs, the shallow interval was submitted for laboratory analysis of lead using United Stated Environmental Protection Agency (USEPA) Test Method 0200.2/6020A. If the result from the shallow interval indicates lead impacts, the deeper interval would be submitted for laboratory analysis of lead. It was the goal of MSG to collect and analyze adequate samples to document the representative site conditions without analyzing unnecessary or gratuitous samples and avoiding additional mobilizations to the Site.

The hand auger was cleaned (decontaminated) by washing with a water/Alconox® solution and thoroughly rinsed with potable water between each soil boring location and, upon completion of soil sampling activities, each of the soil borings were filled with the remaining soil cuttings from the respective soil boring locations.

4.2 Suspect Asbestos Containing Material Sample Collection

Based on the former presence of buildings in the investigation area, asbestos containing material may be present. Therefore, during soil boring activities, MSG observed the soil for SACM. SACM samples were collected by State of Michigan Accredited Asbestos Inspector, Ryan Montri (Accreditation Number A41444) in general accordance with guidelines set forth in the Environmental Protection Agency (EPA) 40 Code of Federal Regulations (CFR) 763.

4.3 Analytical Methods

A total of 16 soil samples were collected and submitted to Fibertec Environmental Services (Fibertec) in Holt, Michigan, for laboratory analysis of lead.

The sample analytical results were compared to the current GRCC established pursuant to Part 201. The analytical results and comparisons for criteria are summarized in *Table 1, Soil Sample Analytical Detection Summary.* Copies of the laboratory analytical data reports and chain of custody are included in *Appendix D, Laboratory Analytical Reports and Chains of Custody*.

4.4 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) was achieved in the field by using MSG's standard operating procedures (SOPs) for sample collection, sample screening, sample preservation and strict chain-of-custody protocols to ensure sample integrity. Laboratory QA/QC was achieved by using standard analytical methods and internal laboratory quality assurance protocols.

5.0 RESULTS

The following subsections include a discussion of soil sampling activities that were conducted on December 3, 2013 and March 31, 2014. There were no observed indications of impact (elevated PID readings, soil staining, or odors) in the soil boring profiles SB-6 through SB-25.

5.1 Soil Sample Analytical Results

A total of 22 soil samples [SB-3 (1'-2'), SB-6 (0'-1'), SB-7 (0'-1'), SB-8 (0'-1'), SB-9 (0'-1'), SB-10 (0'-1'), SB-10 (1'-2'), SB-11 (0'-1'), SB-12 (0'-1'), SB-13 (0'-1'), SB-14 (0'-1'), SB-15 (0'-1'), SB-16 (0'-1'), SB-17 (0'-1'), SB-18 (0'-1'), SB-19 (0'-1'), SB-20 (0'-1'), SB-21 (0'-1'), SB-22 (0'-1'), SB-23 (0'-1'), SB-24 (0'-1'), and SB-25 (0'-1')] were submitted to Fibertec for laboratory analysis of lead.

MSG reviewed the soil analytical data and compared the laboratory analytical results to the current GRCC as established pursuant to Part 201 (Table 1). A summary of which is provided below:

1) Lead was detected in excess of GRCC for DCC [400,000 micrograms per kilogram (ug/kg)] as established pursuant to Part 201 in soil samples SB-6 through SB-10 and SB-12 through SB-15.

2) Lead was detected in SB-11, SB-16 through SB-20, and SB-22 through SB-25 above the statewide default background level of 21,000 ug/kg, respectively.

3) Lead was detected in SB-21 and SB-22 below the statewide default background level.

Based on the results of this investigation, lead-impacted soils extend to a depth of approximately one (1) foot below ground surface (bgs) covering an areas of approximately 2,500 square feet. MSG estimates that approximately 2,500 cubic feet (130 tons) are impacted with lead exceeding Part 201 GRCC for DCC. MSG based this estimate on the volume of lead-impacted soil and converted to pounds using a density of 105 pounds per cubic foot.

Copies of the laboratory analytical data reports and chains of custody are included in Appendix D.

5.2 Lead Toxicity Characteristic Leaching Procedure Analytical Results

Lead concentrations were analyzed following leach testing using the Lead Toxicity Characteristic Leaching (TCLP) method from the soil sample SB-3 (0'-'1), which exhibited the highest detected concentration of lead (3,900,000 ug/kg). Concentrations are summarized and compared to current GRCC as established pursuant to Part 201 in *Table 2, TCLP Analytical Summary for Lead*. Upon comparison, the analytical result following TCLP testing was below method detection limits for lead and therefore can be eliminated as a concern relative to the Part 201 groundwater surface water interface pathway.

Copies of the laboratory analytical data reports and chains of custody are included in Appendix D.

5.3 SACM Results

Seven (7) bulk samples were collected from SB-3 (1'-2'), SB-10 (1'-2'), SB-16 (0'-1'), SB-18 (0'-1'), SB-20 (0'-1'), SB-22 (0'-1'), and SB-24 (0'-1') and were submitted to Fibetec for laboratory analysis of bulk materials by Polarized Light Microscopy (PLM) using USEPA Method 600/R-93/116. Fibetec is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) to analyzed bulk samples for asbestos content. The EPA defines asbestos containing materials (ACM) as materials containing greater than 1% asbestos. Of the aforementioned bulk samples, none contained asbestos greater than 1%.

Copies of the laboratory analytical data reports and chains of custody are included in Appendix D.

6.0 RECOMMENDATIONS

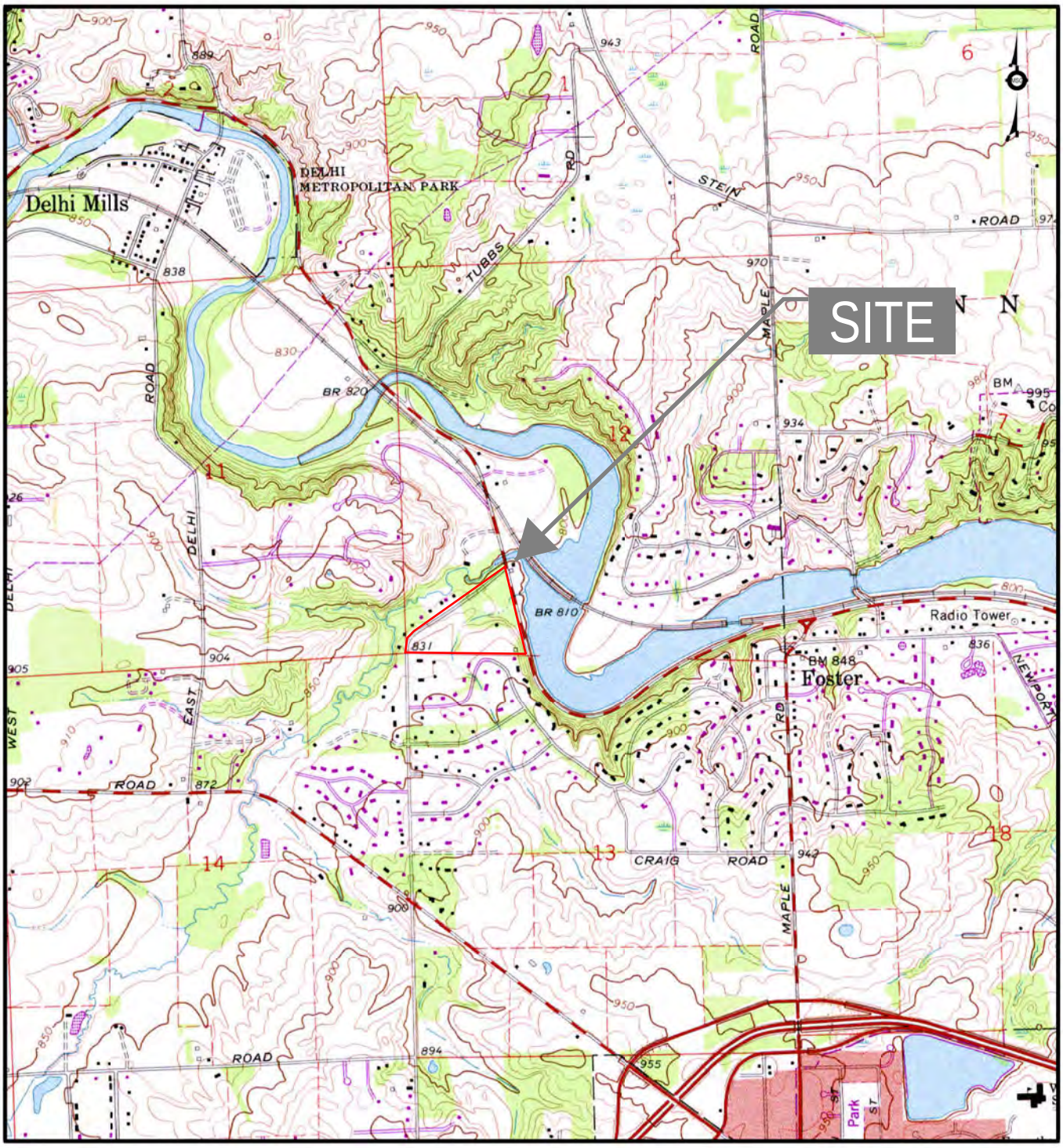
Pursuant to a request by the City, MSG has completed a Supplemental Limited Phase II Investigation of the Site to further delineate the horizontal and vertical extent of lead-impacted soil. As previously stated, a BEA has been submitted to the MDEQ and a DCP has been written and provided to the City.

Based on the results of this investigation, MSG recommends the following:

1) Lead-impacted soils extend to a depth of approximately one (1) foot bgs covering an areas of approximately 2,500 square feet. MSG estimates that approximately 2,500 cubic feet (130 tons) are impacted with lead exceeding Part 201 GRCC for DCC.
2) Soil removal within the vicinity of SB-3 should be performed to eliminate or reduce lead concentrations below applicable Part 201 GRCC for lead. Upon completion of limited soil removal activities, confirmation soil samples should be collected and submitted for laboratory analysis of lead using USEPA Test Method 0200.2/6020A. The excavation should be backfilled with clean sand as appropriate. Results will be documented and maintained in the file for the Site and managed as appropriate by the City.

3) Copies of the BEA and Due Care Plan will be provided to all construction workers, maintenance personnel and individuals responsible for implementing planned response activities and/or due care at the Site. Access to the Site will be limited during implementation of response activities.
4) Provide updated information to the MDEQ upon completion of the response activities.

FIGURES



CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Approximate Site Boundary

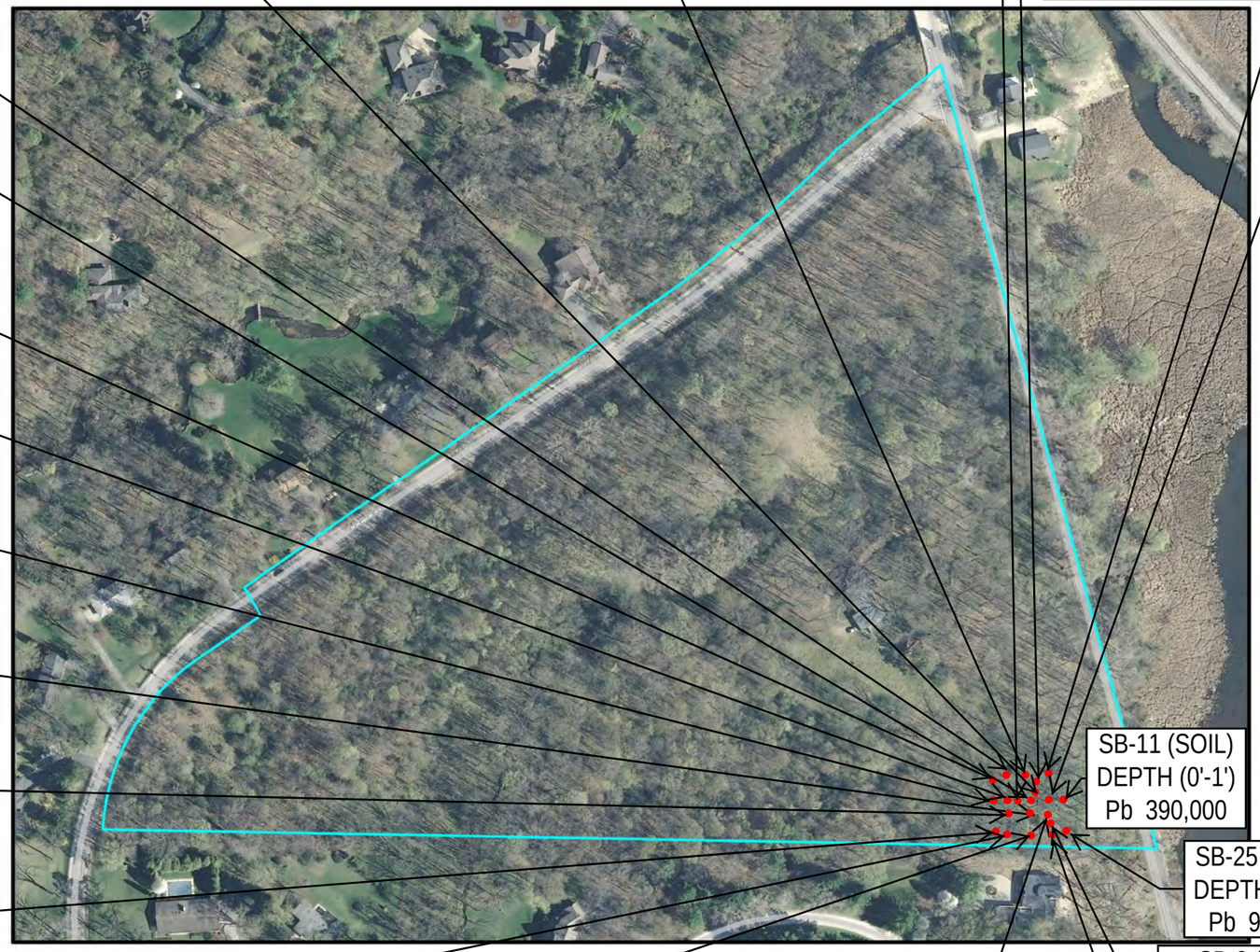
Mannik Smith GROUP
TECHNICAL SKILL. CREATIVE SPIRIT.
www.MannikSmithGroup.com

FIGURE 1
SITE LOCATION MAP

PARCEL TAX IDENTIFICATION NUMBER H-08-012-300-027
3013 WEST HURON RIVER DRIVE, ANN ARBOR, WASHTENAW COUNTY, MI

DATE	DRAWN BY	DESIGNED BY	PROJECT NO
1/8/2014	SAH	REM	ANNA0026

$TIME$
$DATE$ $FILEL$



SB-13 (SOIL)
DEPTH (0'-1')
Pb 2,000,000 (XIX)

SB-17 (SOIL)
DEPTH (0'-1')
Pb 95,000

SB-14 (SOIL)
DEPTH (0'-1')
Pb 1,100,000 (XIX)

SB-12 (SOIL)
DEPTH (0'-1')
Pb 1,600,000 (XIX)

SB-16 (SOIL)
DEPTH (0'-1')
Pb 55,000

SB-10 (SOIL)
DEPTH (0'-1')
Pb 1,100,000 (XIX)

SB-18 (SOIL)
DEPTH (0'-1')
Pb 82,000

SB-8 (SOIL)
DEPTH (0'-1')
Pb 2,800,000 (XIX)

SB-19 (SOIL)
DEPTH (0'-1')
Pb 23,000

SB-15 (SOIL)
DEPTH (0'-1')
Pb 630,000 (XIX)

SB-20 (SOIL)
DEPTH (0'-1')
Pb 80,000

SB-6 (SOIL)
DEPTH (0'-1')
Pb 3,500,000 (XIX)

SB-7 (SOIL)
DEPTH (0'-1')
Pb 490,000 (XIX)

SB-21 (SOIL)
DEPTH (0'-1')
Pb 4,500

SB-22 (SOIL)
DEPTH (0'-1')
Pb 20,000

SB-23 (SOIL)
DEPTH (0'-1')
Pb 69,000

SB-11 (SOIL)
DEPTH (0'-1')
Pb 390,000

SB-25 (SOIL)
DEPTH (0'-1')
Pb 96,000

SB-9 (SOIL)
DEPTH (0'-1')
Pb 580,000 (XIX)

SB-24 (SOIL)
DEPTH (0'-1')
Pb 69,000

SB-3 (SOIL)
DEPTH (0'-1')

VOCs	NS
PNAs	NS
As 9,000	(XIX)
Pb 3,900,000	(XIX)
Se 680	(XII)
Zn 3,400,000	(XIX)
TCLP <1.0	

GRAPHIC SCALE
0' 100' 200' 400'
SCALE: 1" = 200'

MSG

CHEMICAL ABBREVIATIONS
As = Arsenic
Pb = Lead
Se = Selenium
Zn = Zinc
VOCs = Volatile Organic Compounds
PNAs = Polynuclear Aromatic Hydrocarbons
MI 10 = 10 Michigan Metals
ND = Not Detected
BC = Below Criteria
NS = Not Sampled

SOILCOMPOUND CONCENTRATIONS
XI Drinking Water Protection Criteria
XII Groundwater Surface Water Interface Protection Criteria
XIX Direct Contact Criteria
Exceedance of the current generic residential cleanup criteria as established pursuant to Part 201 (Revised September 28, 2012). All units are in micrograms per kilogram (*ug/kg*).

Approximate Site Boundary

Mannik Smith GROUP
TECHNICAL SKILL. CREATIVE SPIRIT.
www.MannikSmithGroup.com

FIGURE 2

SITE SCHEMATIC MAP

PARCEL TAX IDENTIFICATION NUMBER H-08-012-300-027
3013 WEST HURON RIVER DRIVE, ANN ARBOR, WASHTENAW COUNTY, MI

DATE	DRAWN BY	DESIGNED BY	PROJECT NO.
1/8/2014	SAH	REM	ANNA0026

1/8/2014 2:26:47 PM
W:\Projects\Projects A-E\ANNA0026\CAD\BEA\ANNA0026_Figure 2_Site Schematic Map.dgn

TABLES

Table 1
Soil Sample Analytical Detection Summary

Brokaw Property
3013 West Huron River Drive
Ann Arbor, Washtenaw County, Michigan

SOIL: Part 201/213 Generic Residential Cleanup Criteria Revised September 28, 2012 and Guidance Document for the Vapor Intrusion Pathway May 2013 Units: µg/kg			Volatile Organic Compounds (VOCs)																												
			Acetone	Acrylonitrile	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane (Dichlorobromomethane)	Bromoform	Bromomethane	2-Butanone (MEK)	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	p-Chlorotoluene (2-Chlorotoluene)	Dibromochloromethane	Dibromochloropropane (1,2-Dibromo-3-Chloropropane)	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethylene
CAS Number			67-64-1	107-13-1	71-43-2	108-86-1	74-97-5	75-27-4	75-25-2	74-83-9	78-93-3	104-51-8	135-98-8	98-06-6	75-15-0	56-23-5	108-90-7	75-00-3	67-66-3	74-87-3	95-49-8	124-48-1	96-12-8	74-95-3	95-50-1	541-73-1	106-46-7	75-71-8	75-34-3	107-06-2	75-35-4
Statewide Default Background Levels (X)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Drinking Water Protection Criteria (XI)			15,000	100 (M); 52	100	550	NA	1,600 (W)	1,600 (W)	200	2.60E+05	1,600	1,600	1,600	16,000	100	2,000	8,600	1,600 (W)	5,200	3,300	1,600 (W)	10 (M); 4.0	1,600	14,000	170	1,700	95,000	18,000	100	140
Groundwater Surface Water Interface Protection Criteria (XII)			34,000	100 (M, X); 40	4,000 (X)	NA	NA	ID	ID	700	44,000	ID	ID	ID	ID	900 (X)	500	22,000 (X)	7,000	ID	ID	ID	ID	NA	280	680	360	ID	15,000	7,200 (X)	2,600
Groundwater Contact Protection Criteria (XIII)			1.1E+08 (C)	2.8E+05	2.2E+05	3.6E+05	NA	2.8E+05	8.7E+05 (C)	1.4E+06	2.7E+07 (C)	1.2E+05	88,000	1.8E+05	2.8E+05 (C)	92,000	2.6E+05 (C)	9.5E+05 (C)	1.5E+06 (C)	1.1E+06 (C)	5.0E+05 (C)	3.6E+05	1,200 (C)	2.0E+06 (C)	2.1E+05 (C)	51,000	1.4E+05	1.0E+06 (C)	8.9E+05 (C)	3.8E+05	2.2E+05
Soil Vapor Intrusion Concentration ($S_{v(i-res)}$) (c)			3.11E+05	100 (t)	50.0 (t)	771	NA	100 (t)	564	200 (t)	1.81E+05	450	50.0 (t)	76.5	250 (t)	50.0 (t)	349	4,000	50.0 (t)	250 (t)	764	100 (t)	11.5	NA	5,770	100 (t)	100 (t)	4,060	437	50.0 (t)	73.3
Soil Volatilization to Indoor Air Inhalation (XIV)			1.1E+08 (C)	6,600	1,600	3.1E+05	NA	1,200	1.5E+05	860	2.7E+07 (C)	ID	ID	ID	76,000	190	1.2E+05	9.5E+05 (C)	7,200	2,300	2.7E+05	3,900	220	ID	2.1E+05 (C)	26,000	19,000	9.0E+05	2.3E+05	2,100	62
Infinite Source Volatile Soil Inhalation Criteria (XV)			1.3E+08	5,000	13,000	4.5E+05	NA	9,100	9.0E+05	11,000	2.90E+07	ID	ID	ID	1.3E+06	3,500	7.7E+05	3.0E+07	45,000	40,000	1.2E+06	24,000	260	ID	3.9E+07	79,000	77,000	5.3E+07	2.1E+06	6,200	1,100
Finite Source Source Volatile Soil Inhalation Criteria (5 m) (XVI)			1.3E+08	5,100	34,000	4.5E+05	NA	9,700	9.0E+05	57,000	2.90E+07	ID	ID	ID	7.9E+06	12,000	9.9E+05	1.2E+08	1.2E+05	4.1E+05	2.9E+06	24,000	260	ID	3.9E+07	79,000	77,000	5.5E+08	5.9E+06	11,000	5,300
Finite Source Source Volatile Soil Inhalation Criteria (2 m) (XVII)			1.9E+08	10,000	79,000	4.5E+05	NA	19,000	9.0E+05	1.4E+05	3.50E+07	ID	ID	ID	1.9E+07	28,000	2.1E+06	2.8E+08	2.7E+05	1.0E+06	6.3E+06	33,000	260	ID	5.2E+07	1.1E+05	1.1E+05	1.4E+09	1.4E+07	26,000	13,000
Particulate Soil Inhalation Criteria (XVIII)			3.9E+11	4.6E+07	3.8E+08	5.3E+08	NA	8.4E+07	2.8E+09	3.3E+08	6.7E+10	2.0E+09	4.0E+08	6.7E+08	4.7E+10	1.3E+08	4.7E+09	6.7E+11	1.3E+09	4.9E+09	4.7E+09	1.3E+08	5.6E+05	ID	1.0E+11	2.0E+08	4.5E+08	3.3E+12	3.3E+10	1.2E+08	6.2E+07
Direct Contact Criteria (XIX)			2.3E+07	16,000	1.8E+05	5.4E+05	NA	1.1E+05	8.2E+05	3.2E+05	2.7E+07 (C, DD)	2.5E+06	2.5E+06	2.5E+06	2.8E+05 (C, DD)	96,000	2.6E+05 (C)	9.5E+05 (C)	1.2E+06	1.1E+06 (C)	5.0E+05 (C)	1.1E+05	1,200 (C)	2.0E+06 (C)	2.1E+05 (C)	1.7E+05 (C)	4.0E+05	1.0E+06 (C)	8.9E+05 (C)	91,000	2.0E+05
Soil Saturation Concentration Screening Levels (C_{sat}) (XX)			1.1E+08	8.3E+06	4.0E+05	7.6E+05	NA	1.5E+06	8.7E+05	2.2E+06	2.70E+07	1.0E+07	1.0E+07	1.0E+07	2.8E+05	3.9E+05	2.6E+05	9.5E+05	1.5E+06	1.1E+06	5.0E+05	6.1E+05	1,200	2.0E+06	2.1E+05	1.7E+05	NA	1.0E+06	8.9E+05	1.2E+06	5.7E+05
SAMPLE ID	DEPTH	SAMPLE DATE																													
SB-1	4'-5'	11/20/2013	<1,000	<120	<50	<100	<100	<100	<120	<200	<750	<50	<58	<50	<290	<58	<58	<290	<58	<250	<50	<120	<29	<250	<100	<100	<100	<250	<58	<58	<50
SB-2	4'-5'	11/20/2013	<1,000	<110	<50	<100	<110	<100	<110	<200	<750	<50	<55	<50	<270	<55	<55	<270	<55	<250	<50	<110	<27	<250	<100	<100	<100	<250	<55	<55	<50
SB-3	0'-1'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-3	1'-2'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-4	4'-5'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-5	4'-5'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-6	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-7	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-8	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-9	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-10	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-10	1'-2'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-11	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-12	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-13	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-14	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-15	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-16	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-17	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-18	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-19	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-20	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-21	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-22	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-23	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-24	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-25	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
Bold indicates concentration above laboratory reporting limits.
Roman numerals indicate DEQ criterion number
Gray indicates indicates sample location subsequently removed
Exceeds Drinking Water Protection Criteria (XI)
Exceeds Groundwater Surface Water Interface Protection Criteria (XII)
Exceeds Applicable Soil Vapor Inhalation Criteria (XIV, c)
Exceeds Two or More DWP (XI), GSIP (XII) and/or Applicable Soil Vapor Inhalation Criteria (XIV, c)
Exceeds Generic Groundwater Contact Protection Criteria (XIII)
Exceeds Direct Contact Criteria (XIX) and/or Soil Saturation Concentration Screening Levels (Csat) (XX)
ND = Not Detected above laboratory reporting limits
NS = Not Sampled or Not Analyzed
NR = Not Reported (Data missing from provided report)
Notes in parentheses and standard abbreviations from MDEQ Operational Memorandum 1, Attachment 1, dated September 28, 2012 or MDEQ Guidance Document for the Vapor Intrusion Pathway, dated May 2013

Table 1
Soil Sample Analytical Detection Summary

Brokaw Property
3013 West Huron River Drive
Ann Arbor, Washtenaw County, Michigan

SOIL: Part 201/213 Generic Residential Cleanup Criteria Revised September 28, 2012 and Guidance Document for the Vapor Intrusion Pathway May 2013 Units: µg/kg			VOCs Continued																														
			cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	Ethylbenzene	Ethylene Dibromide (EDB, 1,2-Dibromoethane)	2-Hexanone	Iodomethane (Methyl iodide)	Isopropylbenzene (Cumene)	4-Methyl-2-Pentanone (MIBK)	Methylene Chloride	Methyl tert-butyl ether (MTBE)	Naphthalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethylene	Toluene	1,2,4-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethylene	Trichlorofluoromethane	1,2,3-Trichloropropane	1,2,3-Trimethylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl Chloride	Total Xylenes
CAS Number			156-59-2	156-60-5	78-87-5	542-75-6	542-75-6	100-41-4	106-93-4	591-78-6	74-88-4	98-82-8	108-10-1	75-09-2	1634-04-4	91-20-3	103-65-1	100-42-5	630-20-6	79-34-5	127-18-4	108-88-3	120-82-1	71-55-6	79-00-5	79-01-6	75-69-4	96-18-4	526-73-8	95-63-6	108-67-8	75-01-4	1330-20-7
Statewide Default Background Levels (X)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Drinking Water Protection Criteria (XI)			1,400	2,000	100	NA	NA	1,500	20 (M); 1.0	20,000	NA	91,000	36,000	100	800	35,000	1,600	2,700	1,500	170	100	16,000	4,200	4,000	100	100	52,000	840	NA	2,100	1,800	40	5,600
Groundwater Surface Water Interface Protection Criteria (XII)			12,000	30,000 (X)	4,600 (X)	NA	NA	360	110 (X)	ID	NA	3,200	ID	30,000 (X)	1.4E+05 (X)	730	ID	2,100 (X)	ID	1,600 (X)	1,200 (X)	5,400	5,900 (X)	1,800	6,600 (X)	4,000 (X)	NA	NA	NA	570	1,100	260 (X)	820
Groundwater Contact Protection Criteria (XIII)			6.4E+5 (C)	1.4E+6 (C)	3.2E+05	NA	NA	1.4E+05 (C)	500	2.5E+06 (C)	NA	3.9E+05 (C)	2.7E+06 (C)	2.3E+06 (C)	5.9E+06 (C)	2.1E+06	3.0E+05	2.7E+05	4.4E+05 (C)	94,000	88,000 (C)	2.5E+05 (C)	1.1E+06	4.6E+05 (C)	4.2E+05	4.4E+05	5.6E+05 (C)	8.3E+05 (C)	NA	1.1E+05 (C)	94,000 (C)	20,000	1.5E+05 (C)
Soil Vapor Intrusion Concentration ($S_{vi\text{-}res}$) (c)			50.0 (t)	50.0 (t)	50.0 (t)	NA	NA	198	20.0 (t)	2,500 (t)	NA	250 (t)	61,900	100 (t)	14,200	443	141	1,500	100 (t)	50.0 (t)	52.4	10,100	349	3,970	50.0 (t)	50.0 (e,t)	7,050	NA	3,180	2,200	1,660	40.0 (t,f)	291
Soil Volatilization to Indoor Air Inhalation (XIV)			22,000	23,000	4,000	NA	NA	87,000	670	9.9E+05	NA	3.9E+05 (C)	2.7E+06 (C)	45,000	5.9E+06 (C)	2.5E+05	ID	2.5E+05	6,200	4,300	11,000	2.5E+05 (C)	1.1E+06 (C)	2.5E+05	4,600	1,000	5.6E+05 (C)	4,000	NA	1.1E+05 (C)	94,000 (C)	270	1.5E+05 (C)
Infinite Source Volatile Soil Inhalation Criteria (XV)			1.8E+05	2.8E+05	25,000	NA	NA	7.2E+05	1,700	1.1E+06	NA	1.7E+06	4.5E+07	2.1E+05	2.5E+07	3.0E+05	ID	9.7E+05	36,000	10,000	1.7E+05	2.8E+06	2.8E+07	3.8E+06	17,000	11,000	9.2E+07	9,200	NA	2.1E+07	1.60E+07	4,200	4.6E+07
Finite Source Source Volatile Soil Inhalation Criteria (5 m) (XVI)			4.2E+05	8.3E+05	50,000	NA	NA	1.0E+06	1,700	1.1E+06	NA	1.7E+06	4.5E+07	5.9E+05	3.9E+07	3.0E+05	ID	9.7E+05	54,000	10,000	4.8E+05	5.1E+06	2.8E+07	1.2E+07	21,000	25,000	6.3E+08	9,200	NA	5.0E+08	3.80E+08	30,000	6.1E+07
Finite Source Source Volatile Soil Inhalation Criteria (2 m) (XVII)			9.9E+05	2.0E+06	1.1E+05	NA	NA	2.2E+06	3,300	1.4E+06	NA	2.8E+06	6.7E+07	1.4E+06	8.7E+07	3.0E+05	ID	1.4E+06	1.0E+05	14,000	1.1E+06	1.2E+07	2.8E+07	2.8E+07	44,000	57,000	1.5E+09	11,000	NA	5.0E+08	3.80E+08	73,000	1.3E+08
Particulate Soil Inhalation Criteria (XVIII)			2.3E+09	4.7E+09	2.7E+08	NA	NA	1.0E+10	1.4E+07	2.7E+09	NA	5.8E+09	1.4E+11	6.6E+09	2.0E+11	2.0E+08	1.3E+09	5.5E+09	4.2E+08	5.4E+07	2.7E+09	2.7E+10	2.5E+10	6.7E+10	1.9E+08	1.3E+08	3.8E+12	2.0E+07	NA	8.2E+10	8.20E+10	3.5E+08	2.9E+11
Direct Contact Criteria (XIX)			6.4E+5 (C)	1.4E+6 (C)	1.4E+05	NA	NA	1.4E+05 (C)	92	2.5E+06 (C)	NA	3.9E+05 (C)	2.7E+06 (C)	1.3E+06	1.5E+06	1.6E+07	2.5E+06	4.0E+05	4.4E+05 (C)	53,000	88,000 (C)	2.5E+05 (C)	9.9E+05 (DD)	4.6E+05 (C)	1.8E+05	5.0E+5 (C,DD)	5.6E+05 (C)	8.3E+05 (C)	NA	1.1E+05 (C)	94,000 (C)	3,800	1.5E+05 (C)
Soil Saturation Concentration Screening Levels (C_{sat}) (XX)			6.4E+05	1.4E+06	5.5E+05	NA	NA	1.4E+05	8.9E+05	2.5E+06	NA	3.9E+05	2.7E+06	2.3E+06	5.9E+06	NA	1.0E+07	5.2E+05	4.4E+05	8.7E+05	88,000	2.5E+05	1.1E+06	4.6E+05	9.2E+05	5.0E+05	5.6E+05	8.3E+05	NA	1.1E+05	94,000	4.9E+05	1.5E+05
SAMPLE ID	DEPTH	SAMPLE DATE																															
SB-1	4'-5'	11/20/2013	<50	<50	<58	<58	<58	<50	<58	<2,500	<120	<250	<2,500	<100	<250	<330	<100	<58	<120	<58	<50	<50	<330	<58	<58	<58	<100	<120	<100	<100	<100	<58	<150
SB-2	4'-5'	11/20/2013	<50	<50	<55	<55	<55	<50	<55	<2,500	<110	<250	<2,500	<100	<250	<330	<100	<55	<110	<55	<50	<50	<330	<55	<55	<55	<100	<110	<100	<100	<100	<55	<150
SB-3	0'-1'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-3	1'-2'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-4	4'-5'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-5	4'-5'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-6	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-7	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-8	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-9	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-10	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-10	1'-2'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-11	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-12	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-13	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-14	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-15	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-16	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-17	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-18	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-19	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-20	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-21	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-22	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-23	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-24	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-25	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
Bold indicates concentration above laboratory reporting limits.
Roman numerals indicate DEQ criterion number
Gray indicates indicates sample location subsequently removed
Exceeds Drinking Water Protection Criteria (XI)
Exceeds Groundwater Surface Water Interface Protection Criteria (XII)
Exceeds Applicable Soil Vapor Inhalation Criteria (XIV, c)
Exceeds Two or More DWP (XI), GSIP (XII) and/or Applicable Soil Vapor Inhalation Criteria (XIV, c)
Exceeds Generic Groundwater Contact Protection Criteria (XIII)
Exceeds Direct Contact Criteria (XIX) and/or Soil Saturation Concentration Screening Levels (Csat) (XX)
ND = Not Detected above laboratory reporting limits
NS = Not Sampled or Not Analyzed
NR = Not Reported (Data missing from provided report)

Table 1
Soil Sample Analytical Detection Summary

Brokaw Property
3013 West Huron River Drive
Ann Arbor, Washtenaw County, Michigan

SOIL: Part 201/213 Generic Residential Cleanup Criteria Revised September 28, 2012 and Guidance Document for the Vapor Intrusion Pathway May 2013 Units: µg/kg			Polynuclear Aromatic Compounds (PNAs)															
			Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzo(a)pyrene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Phenanthrene	Pyrene
CAS Number			83-32-9	208-96-8	120-12-7	56-55-3	205-99-2	207-08-9	191-24-2	50-32-8	218-01-9	53-70-3	206-44-0	86-73-7	193-39-5	91-57-6	85-01-8	129-00-0
Statewide Default Background Levels (X)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Drinking Water Protection Criteria (XI)			3.0E+05	5,900	41,000	NLL	NLL	NLL	NLL	NLL	NLL	NLL	7.3E+05	3.9E+05	NLL	57,000	56,000	4.8E+05
Groundwater Surface Water Interface Protection Criteria (XII)			8,700	ID	ID	NLL	NLL	NLL	NLL	NLL	NLL	NLL	5,500	5,300	NLL	4,200	2,100	ID
Groundwater Contact Protection Criteria (XIII)			9.7E+05	4.4E+05	41,000	NLL	NLL	NLL	NLL	NLL	NLL	NLL	7.3E+05	8.9E+05	NLL	5.5E+06	1.1E+06	4.8E+05
Soil Vapor Intrusion Concentration ($S_{vl\text{-}res}$) (c)			4.32E+05	1.68E+05	3.56E+07	NA	NA	NA	NA	NA	NA	NA	NA	7.09E+05	NA	7,480	5,140	6.47E+07
Soil Volatilization to Indoor Air Inhalation (XIV)			1.9E+08	1.6E+06	1.0E+09 (D)	NLV	ID	NLV	NLV	NLV	ID	NLV	1.0E+09 (D)	5.8E+08	NLV	2.7E+06	2.8E+06	1.0E+09 (D)
Infinite Source Volatile Soil Inhalation Criteria (XV)			8.1E+07	2.2E+06	1.4E+09	NLV	ID	NLV	NLV	NLV	ID	NLV	7.4E+08	1.3E+08	NLV	1.5E+06	1.6E+05	6.5E+08
Finite Source Source Volatile Soil Inhalation Criteria (5 m) (XVI)			8.1E+07	2.2E+06	1.4E+09	NLV	ID	NLV	NLV	NLV	ID	NLV	7.4E+08	1.3E+08	NLV	1.5E+06	1.6E+05	6.5E+08
Finite Source Source Volatile Soil Inhalation Criteria (2 m) (XVII)			8.1E+07	2.2E+06	1.4E+09	NLV	ID	NLV	NLV	NLV	ID	NLV	7.4E+08	1.3E+08	NLV	1.5E+06	1.6E+05	6.5E+08
Particulate Soil Inhalation Criteria (XVIII)			1.4E+10	2.3E+09	6.7E+10	ID	ID	ID	8.0E+08	1.5E+06	ID	ID	9.3E+09	9.3E+09	ID	6.7E+08	6.7E+06	6.7E+09
Direct Contact Criteria (XIX)			4.1E+07	1.6E+06	2.3E+08	20,000	20,000	2.0E+05	2.5E+06	2,000	2.0E+06	2,000	4.6E+07	2.7E+07	20,000	8.1E+06	1.6E+06	2.9E+07
Soil Saturation Concentration Screening Levels (C_{sat}) (XX)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SAMPLE ID	DEPTH	SAMPLE DATE																
SB-1	4'-5'	11/20/2013	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-2	4'-5'	11/20/2013	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-3	0'-1'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-3	1'-2'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-4	4'-5'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-5	4'-5'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-6	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-7	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-8	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-9	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-10	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-10	1'-2'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-11	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-12	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-13	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-14	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-15	0'-1'	12/3/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-16	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-17	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-18	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-19	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-20	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-21	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-22	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-23	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-24	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-25	0'-1'	3/31/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
Bold indicates concentration above laboratory reporting limits.
Roman numerals indicate DEQ criterion number
Gray indicates indicates sample location subsequently removed
Exceeds Drinking Water Protection Criteria (XI)
Exceeds Groundwater Surface Water Interface Protection Criteria (XII)
Exceeds Applicable Soil Vapor Inhalation Criteria (XIV, c)
Exceeds Two or More DWP (XI), GSIP (XII) and/or Applicable Soil Vapor Inhalation Criteria (XIV, c)
Exceeds Generic Groundwater Contact Protection Criteria (XIII)
Exceeds Direct Contact Criteria (XIX) and/or Soil Saturation Concentration Screening Levels (Csat) (XX)
ND = Not Detected above laboratory reporting limits
NS = Not Sampled or Not Analyzed
NR = Not Reported (Data missing from provided report)

Table 1
Soil Sample Analytical Detection Summary

Brokaw Property
3013 West Huron River Drive
Ann Arbor, Washtenaw County, Michigan

SOIL: Part 201/213 Generic Residential Cleanup Criteria Revised September 28, 2012 and Guidance Document for the Vapor Intrusion Pathway May 2013 Units: µg/kg			Metals									
			Arsenic	Barium (B)	Cadmium (B)	Chromium	Copper (B)	Lead (B)	Mercury (B,Z)	Selenium (B)	Silver (B)	Zinc (B)
CAS Number			7440-38-2	7440-39-3	7440-43-9	7440-47-3	7440-50-8	7439-92-1	7439-97-6	7782-49-2	7440-22-4	7440-66-6
Statewide Default Background Levels (X)			5,800	75,000	1,200	18,000	32,000	21,000	130	410	1,000	47,000
Drinking Water Protection Criteria (XI)			4,600	1.3E+06	6,000	30,000	5.8E+06	7.0E+05	1,700	4,000	4,500	2.4E+06
Groundwater Surface Water Interface Protection Criteria (XII)			4,600	(G)	(G,X)	3,300	(G)	(G,X)	50 (M); 1.2	400	100 (M); 27	(G)
Groundwater Contact Protection Criteria (XIII)			2.0E+06	1.0E+09 (D)	2.3E+08	1.4E+08	1.0E+09 (D)	ID	47,000	7.8E+07	2.0E+08	1.0E+09 (D)
Soil Vapor Intrusion Concentration ($S_{VI\text{-}res}$) (c)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Soil Volatilization to Indoor Air Inhalation (XIV)			NLV	NLV	NLV	NLV	NLV	NLV	48,000	NLV	NLV	NLV
Infinite Source Volatile Soil Inhalation Criteria (XV)			NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV
Finite Source Source Volatile Soil Inhalation Criteria (5 m) (XVI)			NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV
Finite Source Source Volatile Soil Inhalation Criteria (2 m) (XVII)			NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV
Particulate Soil Inhalation Criteria (XVIII)			7.2E+05	3.3E+08	1.7E+06	2.6E+05	1.3E+08	1.0E+08	2.0E+07	1.3E+08	6.7E+06	ID
Direct Contact Criteria (XIX)			7,600	3.7E+07	5.5E+05	2.5E+06	2.0E+07	4.0E+05	1.6E+05	2.6E+06	2.5E+06	1.7E+08
Soil Saturation Concentration Screening Levels (C_{sat}) (XX)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SAMPLE ID	DEPTH	SAMPLE DATE										
SB-1	4'-5'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-2	4'-5'	11/20/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-3	0'-1'	11/20/2013	9,000	1,200,000	3,100	17,000	160,000	3,900,000	<50	680	190	3,400,000
SB-3	1'-2'	3/31/2014	NS	NS	NS	NS	NS	230,000	NS	NS	NS	NS
SB-4	4'-5'	11/20/2013	2,800	9,800	100	3,800	5,300	3,800	<50	<200	<100	18,000
SB-5	4'-5'	11/20/2013	4,400	13,000	100	6,100	6,900	7,000	<50	<200	<100	21,000
SB-6	0'-1'	12/3/2013	NS	NS	NS	NS	NS	3,500,000	NS	NS	NS	NS
SB-7	0'-1'	12/3/2013	NS	NS	NS	NS	NS	490,000	NS	NS	NS	NS
SB-8	0'-1'	12/3/2013	NS	NS	NS	NS	NS	2,800,000	NS	NS	NS	NS
SB-9	0'-1'	12/3/2013	NS	NS	NS	NS	NS	580,000	NS	NS	NS	NS
SB-10	0'-1'	12/3/2013	NS	NS	NS	NS	NS	1,100,000	NS	NS	NS	NS
SB-10	1'-2'	3/31/2014	NS	NS	NS	NS	NS	60,000	NS	NS	NS	NS
SB-11	0'-1'	12/3/2013	NS	NS	NS	NS	NS	390,000	NS	NS	NS	NS
SB-12	0'-1'	12/3/2013	NS	NS	NS	NS	NS	1,600,000	NS	NS	NS	NS
SB-13	0'-1'	12/3/2013	NS	NS	NS	NS	NS	2,000,000	NS	NS	NS	NS
SB-14	0'-1'	12/3/2013	NS	NS	NS	NS	NS	1,100,000	NS	NS	NS	NS
SB-15	0'-1'	12/3/2013	NS	NS	NS	NS	NS	630,000	NS	NS	NS	NS
SB-16	0'-1'	3/31/2014	NS	NS	NS	NS	NS	55,000	NS	NS	NS	NS
SB-17	0'-1'	3/31/2014	NS	NS	NS	NS	NS	95,000	NS	NS	NS	NS
SB-18	0'-1'	3/31/2014	NS	NS	NS	NS	NS	82,000	NS	NS	NS	NS
SB-19	0'-1'	3/31/2014	NS	NS	NS	NS	NS	23,000	NS	NS	NS	NS
SB-20	0'-1'	3/31/2014	NS	NS	NS	NS	NS	80,000	NS	NS	NS	NS
SB-21	0'-1'	3/31/2014	NS	NS	NS	NS	NS	4,500	NS	NS	NS	NS
SB-22	0'-1'	3/31/2014	NS	NS	NS	NS	NS	20,000	NS	NS	NS	NS
SB-23	0'-1'	3/31/2014	NS	NS	NS	NS	NS	69,000	NS	NS	NS	NS
SB-24	0'-1'	3/31/2014	NS	NS	NS	NS	NS	69,000	NS	NS	NS	NS
SB-25	0'-1'	3/31/2014	NS	NS	NS	NS	NS	96,000	NS	NS	NS	NS

Notes:
Bold indicates concentration above laboratory reporting limits.
Roman numerals indicate DEQ criterion number
Gray indicates indicates sample location subsequently removed
Exceeds Drinking Water Protection Criteria (XI)
Exceeds Groundwater Surface Water Interface Protection Criteria (XII)
Exceeds Applicable Soil Vapor Inhalation Criteria (XIV, c)
Exceeds Two or More DWP (XI), GSIP (XII) and/or Applicable Soil Vapor Inhalation Criteria (XIV, c)
Exceeds Generic Groundwater Contact Protection Criteria (XIII)
Exceeds Direct Contact Criteria (XIX) and/or Soil Saturation Concentration Screening Levels (Csat) (XX)
ND = Not Detected above laboratory reporting limits
NS = Not Sampled or Not Analyzed
NR = Not Reported (Data missing from provided report)

Table 2
Soil Sample TCLP Analytical Detection Summary for Lead

Brokaw Property
3013 West Huron River Drive
Ann Arbor, Washtenaw County, Michigan

Act 307 Type B Cleanup Criteria for Groundwater (Revision 3) February 1994 Units: mg/L		TCLP LEAD
		Lead (B)
Health-Based Drinking Water Value [R 709(2)(a)(b)]		0.004 {C, O}
Aesthetic Drinking Water Value [R 709(2)(c)(d)]		NA
Groundwater Surfacewater Interface Value {A} [R 713]		0.0066 {C,E,Q}
SAMPLE ID	SAMPLE DATE	
SB-3	11/20/2013	<1.0

Notes:
Bold indicates concentration above method detection limits.
Exceeds Groundwater Surfacewater Interface Value {A} [R 713]
NS = Not Sampled

Michigan Department of Environmental Quality Footnotes

{C} Background, as defined in Rule 701(c), may be substituted as the cleanup criteria if higher than the Type B cleanup criterion.

{E} GSI value is dependant on water hardness. Value presented was calculated assuming a hardness of 178 mg/L of CaCO3. If site-specific water hardness is expected to be significantly different, contact ERD toxicologist.

{O} Higher level may be acceptable if soil concentration is less than 400 ppm and groundwater migrating off-site will not impact adjacent properties. Contact an ERD toxicologist for further explanation.

{Q} Basis for the GSI value is the National Toxics Rule (NTR). The NTR value was either more restrictive than the Rule 57 value or a Rule 57 value was not available.

APPENDIX A

Limitations

PHASE II ENVIRONMENTAL SITE ASSESSMENT LIMITATIONS

This Phase II Environmental Site Assessment (ESA) and related documentation are site-specific, which means they pertain to the environmental conditions of the subject property only.

The Mannik & Smith Group, Inc. (MSG) performed its services associated with the Phase II ESA in conformance with the care and skill ordinarily used by other reputable environmental consulting firms practicing under similar conditions, at the same time, and in the same or similar locality. In preparing this report, MSG may have relied on information obtained from or provided by others. MSG makes no representation or warranty regarding the accuracy or completeness of this information gathered through outside sources or subcontracted services. No warranty, guarantee, or certification of any kind, expressed or implied, at common law or created by statute, is extended, made, or intended by rendering these environmental consulting services or by furnishing this written report. Environmental conditions and regulations are subject to constant change and reinterpretation. One should not assume that any on-site conditions and/or regulatory statutes or rules will remain constant after MSG has completed the scope of work for this project. Furthermore, because the facts stated in these reports are subject to professional interpretation, differing conclusions could be reached by other environmental professionals.

Contaminants may be hidden in subsurface material, covered by pavement, vegetation, or other substances. Additionally, contamination may not be present in predictable locations. MSG has prepared a logical assessment program to reduce the client's risk of discovering unknown contamination. This risk may be reduced by more extensive exploration on the site. Even with additional exploration, it is not possible to completely eliminate the risk of discovering contamination on site. It can not be assumed that samples collected and conditions observed are representative of an area that has not been sampled and/or tested.

Some environmental assessments are undertaken to satisfy "due diligence", "all appropriate inquiry," or other regulatory requirements provided in federal, state, or local law. Although MSG strives to investigate a site in accordance with the scope of work as defined by written agreement with a client, it cannot warrant that the work undertaken for this report will satisfy "due diligence", "all appropriate inquiry," or any other similar standard under any federal, state, or local law.

Due to changing environmental regulatory conditions and potential on-site activities after the completion of the Phase II ESA field investigation, the client may rely upon the conclusions within this Phase II ESA report for a period of six months from the report's issuance date.

APPENDIX B

DAILY ACTIVITY REPORTS

DAILY FIELD REPORT

Client: City of Ann Arbor Report No.: 2

Project: Brokaw Limited Phase II Investigation Job No.: ANNA0026

Date: December 3, 2013	Day: Tuesday	Temp:	16°F (AM)	26° (PM)
MSG CQA Personnel: Ryan Montri		Cloud Cover:	PC (AM)	PC (PM)
		Precip:	1/10" (AM)	0 (PM)
MSG Hours On-Site: 6.00		Contractors:		

Contractors Information

Contractor:	No. Men and Type:	Equipment Type:
MSG	Ryan Montri	Hand Auger MiniRae 3000 PID

Supervisor: Ryan Montri Supervisor:

Summary of Work Performed

Supplemental Limited Phase II Investigation

Field Notes

0900 MSG onsite to perform Limited Supplemental Phase II Investigation associated with SB-3 that exceeded Part 201 Generic Residential Criteria for direct contact. The City of Ann Arbor granted MSG access to the site. Upon arrival to the site, MSG assessed that area surrounding SB-3 in an effort to delineate. MSG will utilize a hand auger to collect shallow soil samples in an effort to replicate the geology and depth encountered at SB-3. Note – soil descriptions were recorded on MSG standard soil boring description log sheets and therefore not included in this daily report.

0915 MSG begins hand auger activities at SB-6.

0930 SB-6 complete. MSG samples SB-6 (0'-1') at 0930. MSG begins hand auger activities at SB-7.

0935 SB-7 complete. MSG samples SB-7 (0'-1') at 0935. MSG begins hand auger activities at SB-8.

0940 SB-8 complete. MSG samples SB-8 (0'-1') at 0935. MSG begins hand auger activities at SB-9.

0945 SB-9 complete. MSG samples SB-9 (0'-1') at 0935. MSG begins hand auger activities at SB-10.

0950 SB-10 complete. MSG samples SB-10 (0'-1') at 0935. MSG begins hand auger activities at SB-11.

0955 SB-11 complete. MSG samples SB-11 (0'-1') at 0935. MSG begins hand auger activities at SB-12.

1000 SB-12 complete. MSG samples SB-12 (0'-1') at 0935. MSG begins hand auger activities at SB-13.

1005 SB-13complete. MSG samples SB-13 (0'-1') at 0935. MSG begins hand auger activities at SB-14.

1010 SB-14complete. MSG samples SB-14 (0'-1') at 0935. MSG begins hand auger activities at SB-15.

1015 SB-15 complete. MSG samples SB-15 (0'-1') at 0935.

1030 MSG offsite

Documents

	Yes	No		Yes	No		Yes	No
Photographs Taken	☒	☐	Samples Collected	☒	☐	Boring/MW Logs		
Photo Log Attached	☐	☒	COC Attached	☐	☒	Attached	☐	☒

DAILY FIELD REPORT

Client: City of Ann Arbor Report No.: 3

Project: Brokaw Limited Phase II Investigation Job No.: ANNA0026

Date: March 31, 2014	Day: Monday	Temp:	50°F (AM)	58° (PM)
MSG CQA Personnel: Ryan Montri		Cloud Cover:	Clear (AM)	PC (PM)
		Precip:	0 (AM)	0 (PM)
MSG Hours On-Site: 6.00		Contractors:		

Contractors Information

Contractor:	No. Men and Type:	Equipment Type:
MSG	Ryan Montri	Hand Auger, MiniRae 3000 PID, Water Level Meter, Measuring Wheel

Supervisor: Ryan Montri Supervisor:

Summary of Work Performed

Supplemental Limited Phase II Investigation

Field Notes

1020 MSG onsite to perform Limited Supplemental Phase II Investigation activities associated with soil boring locations in and around the former building foundation located in the southeast corner of the Site that exceeded Part 201 Generic Residential Cleanup Criteria for direct contact (Lead). The City of Ann Arbor granted MSG access to the site. Upon arrival to the site, MSG assessed the area surrounding the former building foundation and set up a sampling grid to further delineate the extent of lead impacted soils. MSG placed lathe at each soil boring location (SB-3 and SB-6 through SB-25). Note – SB-3 and SB-6 through SB-15 were completed during prior investigations. MSG will utilize a hand auger to collect shallow soil samples in an effort to replicate the geology and depth encountered at SB-3 and SB-6 through SB-15 and collect samples at intervals directly below the shallow interval to vertically delineate the lead impacts. Note – soil descriptions were recorded on MSG standard soil boring description log sheets and therefore not included in this daily report.

1040 MSG calibrates the MiniRae 3000 PID with 100 ppm isobutylene calibration gas. Calibrated to 100 ppm.

1045 MSG begins hand auger activities at SB-16.

1055 SB-16 complete. MSG samples SB-16 (0'-1') and (1'-2') at 1055.

1100 MSG begins hand auger activities at SB-17.

1110 SB-17 complete. MSG samples SB-17 (0'-1') and (1'-2') at 1110.

1115 MSG begins hand auger activities at SB-18.

1120 SB-18 complete. MSG samples SB-18 (0'-1') and (1'-2') at 1120.

1130 MSG begins hand auger activities at SB-19.

1140 SB-19 complete. MSG samples SB-19 (0'-1') and (1'-2') at 1140.

1145 MSG begins hand auger activities at SB-20.

1155 SB-20 complete. MSG samples SB-20 (0'-1') and (1'-2') at 1155.

1200 MSG begins hand auger activities at SB-21.

1210 SB-21 complete. MSG samples SB-21 (0'-1') and (1'-2') at 1210.

1220 MSG begins hand auger activities at SB-22.

1225 SB-22 complete. MSG samples SB-22 (0'-1') and (1'-2') at 1225.

1230 MSG begins hand auger activities at SB-23.

1240 SB-23 complete. MSG samples SB-23 (0'-1') and (1'-2') at 1240.

1245 MSG begins hand auger activities at SB-24.

1250 SB-24 complete. MSG samples SB-24 (0'-1') and (1'-2') at 1250.

1255 MSG begins hand auger activities at SB-25.

1310 SB-25 complete. MSG samples SB-25 (0'-1') and (1'-2') at 1310.

1315 MSG blind advances to 1'-2' at SB-10.

1320 MSG samples SB-10 (1'-2') at 1320.

Note – Location of SB-8, which is within the former building foundation and approximately 6 feet bgs, is filled with frozen water and snow; therefore, samples to be collected from SB-8 at a depth of 1'-2' were not able to be completed. SB-3 was chosen as an alternative location to vertically delineate lead impacted soil.

1330 MSG blind advances to 1'-2' at SB-3.

1335 MSG samples SB-3 (1'-2') at 1335

1400 MSG investigates the crock well. MSG utilized a water level meter to determine depth and if water is present. Upon investigation, it was determined that the crock well is dry and 30 feet in depth. The diameter of the crock well is 3'.

1420 MSG investigates the onsite water well. Upon investigation, MSG determined that no well driller identification tags were present and was unable to open up the well to determine depth. The only portion of the well that was above grade consisted of an approximate 3" steel pipe that protruded out through a concrete slab.
1500 MSG offsite.

Documents

	Yes	No		Yes	No		Yes	No
Photographs Taken	☒	☐	Samples Collected	☒	☐	Boring/MW Logs		
Photo Log Attached	☐	☒	COC Attached	☐	☒	Attached	☐	☒

APPENDIX C

SOIL BORING LOGS

BORING ID: SB-1

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 11/20/13 **COMPLETED** 11/20/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES Stained concrete by garage door
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Dark brown coarse grained Gravelly SAND, dry.	0.0		
				1.0			
	HA 2	1.0		Dark brown coarse grained SAND, some Gravel and Clay, dry.	0.0		
				2.0			
	HA 3	1.0		Dark brown Sandy CLAY, some Gravel, dry.	0.0		
				3.0			
	HA 4	1.0		Dark brown Gravelly CLAY, dry.	0.0		
	HA 5	1.0			0.0	X	Soil sample SB-1 (4'-5') collected at 0940.
5				5.0			
				Bottom of borehole at 5.0 feet.			

BORING ID: SB-2

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 11/20/13 **COMPLETED** 11/20/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES Three (3) empty 5-gallon containers by shed
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Dark gray to black Sandy CLAY, some Gravel, dry.	0.0		
1.0	HA 2	1.0		Brown to dark brown Sandy CLAY, some Gravel, dry.	0.0		
2.0	HA 3	1.0		Brown Gravelly SAND, dry.	0.0		
3.0	HA 4	1.0		Dark brown Sandy CLAY, some Gravel, dry.	0.0		
4.0	HA 5	1.0		Dark brown Gravelly SAND, dry.	0.0	X	Soil sample SB-2 (4'-5') collected at 1030.
5				Bottom of borehole at 5.0 feet.			

BORING ID: SB-3

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 11/20/13 **COMPLETED** 11/20/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES By demolished house
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Black Clayey SAND, trace coal and wood, dry.	0.0	X	Soil sample SB-3 (0'-1') collected at 1115.
				1.0			
	HA 2	1.0		Brown to light brown Sandy CLAY, some Gravel, dry.	0.0		Soil sample SB-3 (0'-1') collected at 1335 on March 31, 2014.
	HA 3	1.0			0.0		
	HA 4	1.0			0.0		
				4.0			
5	HA 5	1.0		Dark gray Sandy CLAY, dry.	0.0		
				5.0			
				Bottom of borehole at 5.0 feet.			

BORING ID: SB-4

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 11/20/13 **COMPLETED** 11/20/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES Glass and steel surficial debris area
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Dark brown to black SAND, trace Gravel, dry (TOPSOIL).	0.0		
				1.0			
	HA 2	1.0		Brown to light brown SAND, dry.	0.0		
	HA 3	1.0			0.0		
	HA 4	1.0			0.0		
				4.0			
5	HA 5	1.0		Light brown coarse grained SAND, trace gravel, dry.	0.0	X	Soil sample SB-4 (4'-5') collected at 1145.
				5.0			
				Bottom of borehole at 5.0 feet.			

Mannik Smith GROUP
CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

BORING ID: SB-5

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 11/20/13 **COMPLETED** 11/20/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES Steel and tractor surficial debris area
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Black Gravelly SAND, dry (TOPSOIL).	0.0		
				1.0			
	HA 2	1.0		Brown Gravelly SAND, dry.	0.0		
	HA 3	1.0			0.0		
				3.0			
	HA 4	1.0		Brown SAND, some Clay and Gravel, dry.	0.0		
	HA 5	1.0			0.0	X	Soil Sample SB-5 (4'-5') collect at 1220.
5				5.0			
				Bottom of borehole at 5.0 feet.			

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

BORING ID: SB-6

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Brown Clayey SAND; some Gravel and Roots; dry.	0.0		Soil sample SB-6 (0'-1') collected at 0930.
1				1.0			
				Bottom of borehole at 1.0 feet.			

BORING ID: SB-7

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Brown to light brown Clayey SAND; some Gravel; dry.	0.0		Soil sample SB-7 (0'-1') collected at 0935.
1				1.0			
				Bottom of borehole at 1.0 feet.			

BORING ID: SB-8

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Black Clayey SAND; some Gravel; dry (TOPSOIL).	0.0		Soil sample SB-8 (0'-1') collected at 0940.
1			1.0	Bottom of borehole at 1.0 feet.			

BORING ID: SB-9

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
▽ **GROUND WATER ENCOUNTERED DURING DRILLING:** Not Encountered
NOTES
▼ **WATER LEVEL AFTER DRILLING:** N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Bronw to dark brown Clayey SAND; trace Gravel; dry.	0.0	X	Soil sample SB-9 (0'-1') collected at 0945.
1				1.0			
				Bottom of borehole at 1.0 feet.			

Mannik Smith GROUP
CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

BORING ID: SB-10

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Dark gray to black Clayey SAND; some Gravel and roots; dry (TOPSOIL).	0.0		Soil sample SB-10 (0'-1') collected at 0950.
1			1.0	Gray Clayey SAND; some Gravel; moist. (Drilled on March 31, 2014).			Soil sample SB-10 (1'-2') collected at 1320 on March 31, 2014.
			2.0	Bottom of borehole at 1.0 feet.			

BORING ID: SB-11

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Brown to dark brown Clayey SAND; trace Gravel; dry.	0.0		Soil sample SB-11 (0'-1') collected at 0955.
1				1.0			
				Bottom of borehole at 1.0 feet.			

BORING ID: SB-12

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Black to brown Clayey SAND; some Gravel; dry.	0.0		Soil sample SB-12 (0'-1') collected at 1000.
1				1.0			
				Bottom of borehole at 1.0 feet.			

BORING ID: SB-13

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Brown to dark brown Clayey SAND; trace Gravel; dry.	0.0		Soil sample SB-13 (0'-1') collected at 1005.
1				1.0			
				Bottom of borehole at 1.0 feet.			

BORING ID: SB-14

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Dark brown to black Clayey SAND; dry (TOPSOIL).	0.0		Soil sample SB-14 (0'-1') collected at 1010.
1			1.0	Bottom of borehole at 1.0 feet.			

BORING ID: SB-15

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 12/13/13 **COMPLETED** 12/13/13
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Brown to dark brown Clayey SAND; some Gavel; dry.	0.0		Soil sample SB-15 (0'-1') collected at 1015.
1				1.0			
				Bottom of borehole at 1.0 feet.			

BORING ID: SB-16

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0				Black Clayey SAND; some Gravel, Roots; dry (TOPSOIL).			
	HA 1	1.0		0.5 Light brown Clayey SAND; some Gravel; dry.	0.0		Soil sample SB-16 (0'-1') collected at 1055.
1							
	HA 2	1.0			0.0		Soil sample SB-16 (1'-2') collected at 1055.
2				2.0			
				Bottom of borehole at 2.0 feet.			

BORING ID: SB-17

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Black Clayey SAND; some Gravel, Roots; dry (TOPSOIL).	0.0		Soil sample SB-17 (0'-1') collected at 1110.
0.5				Brown to dark brown Clayey SAND; some Gravel; dry.			
1	HA 2	1.0			0.0		Soil sample SB-17 (1'-2') collected at 1110.
2				2.0			
				Bottom of borehole at 2.0 feet.			

BORING ID: SB-18

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Black Clayey SAND; trace Gravel; dry (TOPSOIL).	0.0		Soil sample SB-18 (0'-1') collected at 1120.
1				1.0			
	HA 2	1.0		Light gray to dark gray Clayey SAND; dry.	0.0		Soil sample SB-3 (1'-2') collected at 1120.
2				2.0			
				Bottom of borehole at 2.0 feet.			

Mannik Smith GROUP
CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

BORING ID: SB-19

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0							
1	HA 1	1.0		Dark brown Clayey SAND; trace Gravel; moist.	0.0		Soil sample SB-19 (0'-1') collected at 1140.
				1.0			
2	HA 2	1.0		Brown coarse grained SAND; dry.	0.0		Soil sample SB-19 (1'-2') collected at 1140.
				2.0			
				Bottom of borehole at 2.0 feet.			

BORING ID: SB-20

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0							
1	HA 1	1.0		Black Clayey SAND; moist (TOPSOIL).	0.0		Soil sample SB-20 (0'-1') collected at 1155.
				1.0			
2	HA 2	1.0		Brown Clayey SAND; trace Gravel; dry.	0.0		Soil sample SB-20 (1'-2') collected at 1155.
				2.0			
				Bottom of borehole at 2.0 feet.			

BORING ID: SB-21

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0				Light brown coarse grained SAND; dry.			
1	HA 1	1.0			0.0		Soil sample SB-21 (0'-1') collected at 1210.
2	HA 2	1.0			0.0		Soil sample SB-21 (1'-2') collected at 1210.
				2.0 Bottom of borehole at 2.0 feet.			

BORING ID: SB-22

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Dark brown Clayey SAND; some Gravel; moist (TOPSOIL).	0.0		Soil sample SB-22 (0'-1') collected at 1225.
1				1.0			
2	HA 2	1.0		Light brown coarse grained SAND; dry.	0.0		Soil sample SB-22 (1'-2') collected at 1225.
				2.0			
				Bottom of borehole at 2.0 feet.			

BORING ID: SB-23

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0	HA 1	1.0		Brown to dark brown Clayey SAND; some Gravel; moist (TOPSOIL).	0.0		Soil sample SB-23 (0'-1') collected at 1240.
1				1.0			
	HA 2	1.0		Brown coarse grained SAND; dry.	0.0		Soil sample SB-23 (1'-2') collected at 1240.
2				2.0			
				Bottom of borehole at 2.0 feet.			

Mannik Smith GROUP
CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

BORING ID: SB-24

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0							
1	HA 1	1.0		Brown to dark brown Clayey SAND; some Gravel; moist becomming dry at 1'.	0.0		Soil sample SB-24 (0'-1') collected at 1250.
2	HA 2	1.0			0.0		Soil sample SB-24 (1'-2') collected at 1250.
				2.0 Bottom of borehole at 2.0 feet.			

BORING ID: SB-25

Mannik Smith GROUP

CANTON MAUMEE
DETROIT COLUMBUS
MONROE CLEVELAND
LANSING TRAVERSE CITY

The Mannik & Smith Group, Inc.
2365 Haggerty Road, Canton, Michigan 48188
ph: 734-397-3100 fax: 734-397-3131

CLIENT The City of Ann Arbor
PROJECT NAME Brokaw
PROJECT NUMBER ANNA0026
PROJECT LOCATION 3013 West Huron River Drive Scio Township, MI
DATE STARTED 3/31/14 **COMPLETED** 3/31/14
BORING DIAMETER:
DRILLING CONTRACTOR MSG
SURVEY COORDINATES: N/A
DRILLING METHOD Hand Auger
GROUND SURFACE ELEV.: N/A
LOGGED BY REM **CHECKED BY** DJA
GROUND WATER ENCOUNTERED DURING DRILLING: Not Encountered
NOTES
WATER LEVEL AFTER DRILLING: N/A

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY (FEET)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	LABORATORY SAMPLE	REMARKS
0							
1	HA 1	1.0		Brown to dark brown Clayey SAND; some Gravel; dry.	0.0		Soil sample SB-25 (0'-1') collected at 1310.
				1.0			
2	HA 2	1.0		Brown to light brown Sandy CLAY; trace Gravel; dry.	0.0		Soil sample SB-25 (1'-2') collected at 1310.
				2.0			
				Bottom of borehole at 2.0 feet.			

APPENDIX D

LABORATORY ANALYTICAL REPORTS AND CHAINS OF CUSTODY

Fibertec
environmental
services

Friday, December 20, 2013

Fibertec Project Number:	59510
Project Identification:	Brokaw /ANNA0026
Submittal Date:	12/04/2013

Mr. Walter Bolt
Mannik & Smith Group, Inc. - Canton
2365 Haggerty Road South
Canton, MI 48188

Dear Mr. Bolt,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note samples will be disposed of 30 days after reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

Daryl P. Strandbergh
Laboratory Director

DPS/kc

Enclosures

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-6 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**1**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**09:30**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-001** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**50**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-001** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**3500000**		µg/kg	2500	500	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-7 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**2**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**09:35**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-002** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**22**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-002** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**490000**		µg/kg	1000	100	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-8 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**3**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**09:40**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-003** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**53**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-003** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**2800000**		µg/kg	2500	500	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-9 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**4**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**09:45**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-004** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**20**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-004** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**580000**		µg/kg	1000	100	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-10 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**5**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**09:50**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-005** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**18**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-005** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**1100000**		µg/kg	2500	500	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-11 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**6**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**09:55**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-006** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**21**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-006** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**390000**		µg/kg	1000	100	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-12 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**7**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:00**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-007** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**29**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-007** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**1600000**		µg/kg	2500	500	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-13 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**8**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:05**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-008** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**13**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-008** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**2000000**		µg/kg	2500	500	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-14 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**9**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:10**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-009** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**15**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-009** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**1100000**		µg/kg	1000	200	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-15 (0'-1')**	Chain of Custody:	**107341**
Client Project Name:	**Brokaw**	Sample No:	**10**	Collect Date:	**12/03/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:15**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 59510-010** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Percent Moisture (Water Content)	**15**		%	0.1	1.0	12/06/13	MC131206	12/10/13	MC131206	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 59510-010** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1. Lead	**630000**		µg/kg	1000	200	12/09/13	PT13L09C	12/10/13	T213L10A	JLH

Definitions/ Qualifiers:

A: Spike recovery or precision unusable due to dilution.
B: The analyte was detected in the associated method blank.
E: The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
J: The concentration is an estimated value.
M: Modified Method
U: The analyte was not detected at or above the reporting limit.
X: Matrix Interference has resulted in a raised reporting limit or distorted result.
W: Results reported on a wet-weight basis.
***:** Value reported is outside QA limits

Exception Summary:

ACCREDITED IN ACCORDANCE WITH nelac

Accreditation Number(s):

E-10395 (KS)

T104704518-13-1 (TX)

Fibertec environmental services

Analytical Laboratory
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
email: lab@fibertec.us

8660 S. Mackinaw Trail
Cadillac, MI 49601
Phone: 231 775 8368
Fax: 231 775 8584

Industrial Hygiene Services, Inc.
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0382
email: asbestos@fibertec.us

Geoprobe
11766 E. Grand River
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody # 107341
PAGE 1 of 1

Client Name: The Mannik & Smith Group
Contact Person: Walter Bolt & Ryan Monto
Project Name/ Number: BROKAW ANNA0026
Purchase Order#

Lab Sample #	Date	Time	Client Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PRESERVED (Y/N)	PARAMETERS: Lead	Remarks
	12/3/13	0830		SB-6 (0'-1')	S	1	N	X	
		0835		SB-7 (0'-1')	S	1	N	X	
		0840		SB-8 (0'-1')	S	1	N	X	
		0845		SB-9 (0'-1')	S	1	N	X	
		0850		SB-10 (0'-1')	S	1	N	X	
		0855		SB-11 (0'-1')	S	1	N	X	
		1000		SB-12 (0'-1')	S	1	N	X	
		1005		SB-13 (0'-1')	S	1	N	X	
		1010		SB-14 (0'-1')	S	1	N	X	
		1015		SB-15 (0'-1')	S	1	N	X	

Turnaround:
- 24 hour RUSH (surcharge applies)
- 48 hour RUSH (surcharge applies)
- 72 hour RUSH (surcharge applies)
- [X] Standard (5-7 bus. days)
- Other: Specify

Matrix Code: S Soil; W Water; A Air; O Oil; P Wipe; GW Ground Water; SW Surface Water; WW Waste Water; X Other: Specify

Comments:

	Date/ Time	
Relinquished By: Ryan Monto	12/3/13 1400	Received By: MSG Fridge
Relinquished By: Ryan Monto	12/4/13 1150	Received By: 12/4/13 1150
Relinquished By: 12/4/13 3:45		Received By Laboratory:

LAB USE ONLY:
Fibertec project number:
Laboratory Tracking:
Temperature at Receipt: 3.5

RCV'D ON ICE

COC Revision: April, 2006

TERMS & CONDITIONS ON BACK

5610

Fibertec
environmental
services

Tuesday, April 08, 2014

Fibertec Project Number:	61178
Project Identification:	Brokaw /ANNA0026
Submittal Date:	04/01/2014

Mr. Ryan Montri
Mannik & Smith Group, Inc. - Canton
2365 Haggerty Road South
Canton, MI 48188

Dear Mr. Montri,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note samples will be disposed of 30 days after reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

Daryl P. Strandbergh
Laboratory Director

DPS/kc

Enclosures

Analytical Laboratory Report
Laboratory Project Number: 61178
Laboratory Sample Number: 61178-001

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-16 (0-1)**	Chain of Custody:	**116741**
Client Project Name:	**Brokaw**	Sample No:	**1**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:55**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-001** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**12**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-001** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**55000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-17 (0-1)**	Chain of Custody:	**116741**
Client Project Name:	**Brokaw**	Sample No:	**3**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**11:10**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-003** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**13**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-003** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**95000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-18 (0-1)**	Chain of Custody:	**116741**
Client Project Name:	**Brokaw**	Sample No:	**5**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**11:20**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-005** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**14**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-005** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**82000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-19 (0-1)**	Chain of Custody:	**116741**
Client Project Name:	**Brokaw**	Sample No:	**7**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**11:40**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-007** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**14**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-007** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**23000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-20 (0-1)**	Chain of Custody:	**116741**
Client Project Name:	**Brokaw**	Sample No:	**9**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**11:55**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-009** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**14**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-009** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**80000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-21 (0-1)**	Chain of Custody:	**107359**
Client Project Name:	**Brokaw**	Sample No:	**11**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**12:10**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-011** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**9.2**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-011** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**4500**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-22 (0-1)**	Chain of Custody:	**107359**
Client Project Name:	**Brokaw**	Sample No:	**13**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**12:25**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-013** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**12**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-013** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**20000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-23 (0-1)**	Chain of Custody:	**107359**
Client Project Name:	**Brokaw**	Sample No:	**15**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**12:40**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-015** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**12**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-015** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**69000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-24 (0-1)**	Chain of Custody:	**107359**
Client Project Name:	**Brokaw**	Sample No:	**17**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**12:50**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-017** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**14**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-017** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**69000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-25 (0-1)**	Chain of Custody:	**107359**
Client Project Name:	**Brokaw**	Sample No:	**19**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**13:10**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-019** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**16**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-019** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**96000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-10 (1-2)**	Chain of Custody:	**107363**
Client Project Name:	**Brokaw**	Sample No:	**21**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**13:20**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-021** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**14**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-021** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**60000**		µg/kg	1000	20	04/07/14	PT14D07A	04/07/14	T214D07A	JLP

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-3 (1-2)**	Chain of Custody:	**107363**
Client Project Name:	**Brokaw**	Sample No:	**22**	Collect Date:	**03/31/14**
Client Project No:	**ANNA0026**	Sample Matrix:	**Soil/Solid**	Collect Time:	**13:35**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) **Aliquot ID: 61178-022** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1 Percent Moisture (Water Content)	**14**		%	0.1	1.0	04/04/14	MC140404	04/07/14	MC140404	BMG

Trace Elements by ICP/MS (EPA 0200.2-M/EPA 6020A) **Aliquot ID: 61178-022** **Matrix: Soil/Solid**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
1 Lead	**230000**		µg/kg	1000	40	04/07/14	PT14D07A	04/08/14	T214D08A	JLP

Definitions/ Qualifiers:

A: Spike recovery or precision unusable due to dilution.
B: The analyte was detected in the associated method blank.
E: The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
J: The concentration is an estimated value.
M: Modified Method
U: The analyte was not detected at or above the reporting limit.
X: Matrix Interference has resulted in a raised reporting limit or distorted result.
W: Results reported on a wet-weight basis.
***:** Value reported is outside QA limits

Exception Summary:

Accreditation Number(s):

E-10395 (KS)

T104704518-13-1 (TX)

Fibertec environmental services

Analytical Laboratory
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
email: lab@fibertec.us

8660 S. Mackinaw Trail
Cadillac, MI 49601
Phone: 231 775 8368
Fax: 231 775 8584

Industrial Hygiene Services, Inc.
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0382
email: asbestos@fibertec.us

Geoprobe
11766 E. Grand River
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody # 116741
PAGE 1 of 3

Client Name: The Mannik & Smith Group
Contact Person: Ryan Martin & Walt Bolt
Project Name/ Number: BROKAW AWNA0026
Purchase Order#

Turnaround: [ ] 24 hour RUSH (surcharge applies) [ ] 48 hour RUSH (surcharge applies) [ ] 72 hour RUSH (surcharge applies) [X] Standard (5-7 bus days) [ ] Other: Specify

Matrix Code: S Soil; W Water; A Air; O Oil; P Wipe; GW Ground Water; SW Surface Water; WW Waste Water; X Other: Specify

Lab Sample #	Date	Time	Client Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PRESERVED (Y/N)	PARAMETERS: LEAD	PARAMETERS: ACM	Remarks
	3/31/14	1055		SB-16 (0-1')	S	1	N	X	X	
		1055		SB-16 (1-2')	S	1	N	X		HOLD
		1110		SB-17 (0-1')	S	1	N	X		
		1110		SB-17 (1-2')	S	1	N	X		HOLD
		1120		SB-18 (0-1')	S	1	N	X	X	
		1120		SB-18 (1-2')	S	1	N	X		HOLD
		1140		SB-19 (0-1')	S	1	N	X		
		1140		SB-19 (1-2')	S	1	N	X		HOLD
		1155		SB-20 (0-1')	S	1	N	X	X	
		1155		SB-20 (1-2')	S	1	N	X		HOLD

Comments:

	Date/ Time	Received By
Relinquished By:	3/31/14 1630	MSG Fridge
Relinquished By:	4/1/14 1215	
Relinquished By:	4/1/14 3:45	Received By Laboratory: 4/1/14 12:15

LAB USE ONLY:
Fibertec project number:
Laboratory Tracking:
Temperature at Receipt: @ 11.7°C

RCV'D ON ICE 3.DC

COC Revision: April, 2006

TERMS & CONDITIONS ON BACK

Fibertec environmental services

Analytical Laboratory
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
email: lab@fibertec.us

8660 S. Mackinaw Trail
Cadillac, MI 49601
Phone: 231 775 8368
Fax: 231 775 8584

Industrial Hygiene Services, Inc.
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0382
email: asbestos@fibertec.us

Geoprobe
11766 E. Grand River
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody # 107359

Client Name: The Mannik & Smith Group
Contact Person: Ryan Monti & Walt Bolt
Project Name/ Number: BROKAW
ANWA0026
Purchase Order#

Turnaround: [ ] 24 hour RUSH (surcharge applies) [ ] 48 hour RUSH (surcharge applies) [ ] 72 hour RUSH (surcharge applies) [X] Standard (5-7 bus days) [ ] Other: Specify

Matrix Code: S Soil; W Water; A Air; O Oil; P Wipe; GW Ground Water; SW Surface Water; WW Waste Water; X Other: Specify

Lab Sample #	Date	Time	Client Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PRESERVED (Y/N)	PARAMETERS: LEAD	PARAMETERS: ACM	Remarks
	3/31/14	1210		SB-21 (0'-1')	S	1	N	X		
		1210		SB-21 (1'-2')	S	1	N	X		HOLD
		1225		SB-22 (0'-1')	S	1	N	X	X	
		1225		SB-22 (1'-2')	S	1	N	X		HOLD
		1240		SB-23 (0'-1')	S	1	N	X		
		1240		SB-23 (1'-2')	S	1	N	X		HOLD
		1250		SB-24 (0'-1')	S	1	N	X	X	
		1250		SB-24 (1'-2')	S	1	N	X		HOLD
		1310		SB-25 (0'-1')	S	1	N	X		
		1310		SB-25 (1'-2')	S	1	N	X		HOLD

Comments:

	Date/ Time	Received By
Relinquished By: Ryan Monti	3/31/14 1630	MSB Fridge
Relinquished By:	4/1/14 1215	Received By: Debbie A. Shade 4/1/14 12:15
Relinquished By: Debbie A. Shade	4/1/14 3:45	Received By Laboratory: Debbie Shade

LAB USE ONLY:
Fibertec project number: 61178
Laboratory Tracking:
Temperature at Receipt: RCV'D ON ICE 3.0C

TERMS & CONDITIONS ON BACK

Fibertec environmental services

Analytical Laboratory
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
email: lab@fibertec.us

8660 S. Mackinaw Trail
Cadillac, MI 49601
Phone: 231 775 8368
Fax: 231 775 8584

Industrial Hygiene Services, Inc.
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0382
email: asbestos@fibertec.us

Geoprobe
11766 E. Grand River
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody # 107363
PAGE 3 of 3

Client Name: The Mannik & Smith Group
Contact Person: Ryan Montri & Walt Bolt
Project Name/ Number: BROKAW ANNA0026
Purchase Order#

Lab Sample #	Date	Time	Client Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PRESERVED (Y/N)	PARAMETERS: LEAD	PARAMETERS: ACM
	3/31/14	1320		SB-10 (1'-2')	S	1	N	X	X
	3/31/14	1335		SB-3 (1'-2')	S	1	N	X	X

Turnaround:
- [ ] 24 hour RUSH (surcharge applies)
- [ ] 48 hour RUSH (surcharge applies)
- [ ] 72 hour RUSH (surcharge applies)
- [X] Standard (5-7 bus days)
- [ ] Other: Specify

Matrix Code: S Soil; W Water; A Air; O Oil; P Wipe; GW Ground Water; SW Surface Water; WW Waste Water; X Other: Specify

Remarks:

Comments:

	Date/ Time	
Relinquished By:	3/31/14 1630	Received By: MSU Fridge
Relinquished By:	4/1/14 1215	Received By: Dale A. Shade 4/1/14 12:15
Relinquished By: Dale A. Shade	4/1/14 3:45	Received By Laboratory:

LAB USE ONLY:
Fibertec project number:
Laboratory Tracking: 61178
Temperature at Receipt: POWDON ICE 3.0C

COC Revision: April, 2006

TERMS & CONDITIONS ON BACK

Fibertec
environmental
services

Monday, January 13, 2014

Fibertec Project Number:	59357 Supplemental
Project Identification:	Brokaw /ANNA0026
Submittal Date:	11/22/2013

Mr. Walter Bolt
Mannik & Smith Group, Inc. - Canton
2365 Haggerty Road South
Canton, MI 48188

Dear Mr. Bolt,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note samples will be disposed of 30 days after reporting date.

TCLP (1311) extraction date is January 8, 2014.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

Daryl P. Strandbergh
Laboratory Director

DPS/kc

Enclosures

Client Identification:	**Mannik & Smith Group, Inc. - Canton**	Sample Description:	**SB-3 (0'-1')**	Chain of Custody:	**107337**
Client Project Name:	**Brokaw**	Sample No:	**3**	Collect Date:	**11/20/13**
Client Project No:	**ANNA0026**	Sample Matrix:	**TCLP Extract**	Collect Time:	**11:15**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TCLP Metals by ICP/MS (EPA 3005A-M/EPA 6020A) **Aliquot ID: 59357-003AA** **Matrix: TCLP Extract**

						Preparation		Analysis		
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	P. Date	P. Batch	A. Date	A. Batch	Init.
1. Lead	U		mg/L	1.0	10	01/13/14	PT14A13A	01/13/14	T214A13A	JLP

Definitions/ Qualifiers:

A: Spike recovery or precision unusable due to dilution.
B: The analyte was detected in the associated method blank.
E: The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
J: The concentration is an estimated value.
M: Modified Method
U: The analyte was not detected at or above the reporting limit.
X: Matrix Interference has resulted in a raised reporting limit or distorted result.
W: Results reported on a wet-weight basis.
***:** Value reported is outside QA limits

Exception Summary:

Accreditation Number(s):

E-10395 (KS)

T104704518-13-1 (TX)

Fibertec
industrial hygiene
services, inc.

BULK SAMPLE ANALYTICAL REPORT

Fibertec IHS Project #34907-1

NVLAP Accreditation #101510-0

Client Name: The Mannik & Smith Group

Project Name: BROKAW ANNA0026

Summary: 7 Submitted Bulk Samples, 7 Sample Layers Analyzed.

Date Sampled: 3/31/2014

Date Submitted: 4/2/2014

Date Analyzed: 4/4/2014

Client P.O. #: N/A

C.O.C. #: 116741, 107359, 107363

Fibertec Sample No.	Client I.D. No.	Description / Location	Asbestos Type	Non-Asbestos Containing Portion	Analyst
1	1	Brown granular material, SB-16 (0'-1').	NAD	Non-fibrous material 97% Cellulose fibers 3%	CBD
2	2	Brown granular material, SB-18 (0'-1').	NAD	Non-fibrous material 97% Cellulose fibers 3%	CBD
3	3	Brown granular material, SB-20 (0'-1').	NAD	Non-fibrous material 97% Cellulose fibers 3%	CBD
4	4	Brown granular material, SB-22 (0'-1').	NAD	Non-fibrous material 97% Cellulose fibers 3%	CBD
5	5	Brown granular material, SB-24 (0'-1').	NAD	Non-fibrous material 97% Cellulose fibers 3%	CBD
6	6	Brown granular material, SB-10 (1'-2').	NAD	Non-fibrous material 97% Cellulose fibers 3%	CBD
7	7	Brown granular material, SB-3 (1'-2').	NAD	Non-fibrous material 97% Cellulose fibers 3%	CBD

1914 Holloway Drive, Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0382

Fibertec
industrial hygiene
services, inc.

Comments

Bulk samples are analyzed using the USEPA Test Method EPA/600/R-93/116. The constituent percent reported represents an estimate of the area percent of the component. The test report relates only to items tested. This report is not intended to be used as a product endorsement by NVLAP or any agency of the U.S. Government. Fine fibers like those in floor tile may not be discernible by this method. This report shall not be reproduced, except in full, without the written approval of the laboratory. Individual sample layers are homogeneous, unless otherwise noted. Test items were received in acceptable condition. Revision 4.0 dated 12/8/2010.

If no asbestos was/were detected in the sample/samples the acronym NAD (no asbestos detected) will appear in the Asbestos Type column of the report.

Approved Signatory: 

Date: 4/8/2014