above ground storage tank
air quality
asbestos/lead-based paint
baseline environmental assessment
brownfield redevelopment
building/infrastructure restoration
caisson/piles
coatings
concrete
construction materials services
corrosion
dewatering
drilling
due care analysis
earth retention system
environmental compliance
environmental site assessment
facility asset management
failure analyses
forensic engineering
foundation engineering
geodynamic/vibration
geophysical survey
geosynthetic
greyfield redevelopment
ground modification
hydrogeologic evaluation
industrial hygiene
indoor air quality/mold
instrumentation
masonry/stone
metals
nondestructive testing
pavement evaluation/design
property condition assessment
regulatory compliance
remediation
risk assessment
roof system management
sealants/waterproofing
settlement analysis
slope stability
storm water management
structural steel/welding
underground storage tank

DESIGN/BUILD GEOTECHNICAL DATA

M-222 SLOPE STABILIZATION
ALLEGAN, MICHIGAN
MDOT JN 107575C

SME Project No. KG59756
January 6, 2011

Soil and Materials Engineers, Inc.

Soil and Materials Engineers, Inc.
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

tel (269) 323-3555
fax (269) 323-3553
www.sme-usa.com

January 6, 2011

Mr. Gregory S. Bills, PE
Region Soils, Pavement and Materials Engineer
Michigan Department of Transportation
Southwest Region Office
1501 Kilgore Road
Kalamazoo, Michigan 49001

Via email: billsgr@michigan.gov (pdf file)

RE: Design/Build Geotechnical Data
M-222 Slope Stabilization
Allegan, Michigan
MDOT JN 107575C
SME Project No. KG59756

Dear Mr. Bills:

Soil and Materials Engineers, Inc. (SME) has completed four supplemental geotechnical borings at the toe of the slope along the south side of M-222 in Allegan, Michigan. This report describes the field and laboratory testing procedures and transmits the logs of the borings and our test results. Our services related to these supplemental geotechnical borings were performed in general accordance with the scope outlined in our letter titled "Revised Scope for Additional Soil Boring Services" dated November 3, 2010.

Project Background

The project site is situated along M-222 near Weeks Street in Allegan, Michigan. The approximate location of the site is depicted on Figure No. 1, Site Location Map, which is included in Appendix A. The project area includes the M-222 right-of-way and the adjacent slope to the south that descends from M-222 to the Kalamazoo River below. The toe of the slope is situated on an outside bend of the river. The slope area situated between the MDOT right-of-way (ROW) and the river is property that is not owned by MDOT.

SME's services for the project were initiated in May of 2009 after concern was raised about ongoing movements observed along the slope and the potential impact of these movements on M-222. Our initial services for the project included performing a geotechnical evaluation of the slope on behalf of MDOT and developing conceptual measures for stabilization of the slope. The scope of that evaluation included performing seven borings (B1 through B7) at the site, with two deep borings located within the eastbound lane of M-222 and five shallow hand-auger borings located along the slope to the south. The results of that evaluation, along with two concepts for stabilization of the slope, are summarized in our report titled "Geotechnical Evaluation Report, M-222 Slope Evaluation, Allegan, Michigan" dated September 4, 2009 (SME Project No. KG59756).

Project Description

Since completion of the referenced report by SME, MDOT elected to pursue a design/build approach for stabilization of the subject slope. To assist MDOT with providing geotechnical information to prospective design/build teams, SME was retained by MDOT to perform four supplemental geotechnical borings along the toe of the slope. These borings are termed "supplemental" because they supplement or add to the geotechnical data that was provided in the referenced SME report dated September 4, 2009.

The Kalamazoo River in the project area is considered part of a federal Superfund site since the site area is located downstream of former paper mills and many reaches of the river downstream of these former mills contain sediments that are impacted with PCB's (polychlorinated biphenyls). Part of SME's scope associated with performing the supplemental geotechnical borings included performing sampling of the sediment at the proposed boring locations in advance of the geotechnical field exploration and performing environmental characterization of these samples. The sediment sampling and environmental characterization were performed in advance of the geotechnical borings so that SME could plan for and take appropriate measures during the geotechnical field exploration to address potential environmental concerns.

The sediment sampling and environmental screening activities, along with the geotechnical field exploration and geotechnical laboratory testing are described in the report subsections that follow.

Sediment Sampling and Environmental Screening

Sampling of the river bottom sediments was performed by SME at each of the proposed geotechnical boring locations on November 10, 2010. Access to the boring locations was obtained by using a flat-bottomed (jon) boat that was launched from the City of Allegan canoe landing located about ½-mile upstream of the project site.

The geotechnical boring locations (and therefore the sediment sampling locations) were selected by SME based on approximate potential project limits along the Kalamazoo River provided by MDOT. The four boring locations were spread out at approximate equal intervals and were located in the water within several feet of the shoreline. As requested by MDOT, coordinates were obtained at each of the sediment sampling/boring locations by SME using a hand-held GPS unit. The coordinates are provided below in Table 1. The approximate locations of the borings are depicted on Figure No. 2, Boring Location Diagram, which is included in Appendix A.

Table 1: Coordinates for Geotechnical Borings

Boring No.	Northing	Easting
B101	379685.1	12725856.0
B102	379740.2	12726121.0
B103	379655.2	12726285.6
B104	379505.5	12726369.6

1. Coordinates are in feet and based on Michigan State Plane Grid Coordinates South Zone NAD83. Coordinates are accurate to within about 1 meter.

To mark the locations where sediment sampling was performed and to assist in finding these locations where the geotechnical borings would later be performed, wood stakes were placed on-shore adjacent to the sediment sampling locations. The stakes were labeled with the boring number and the offset distance to the sediment sampling location/boring location. Photograph Nos. 1 through 4 in Appendix A depict the approximate boring locations and the locations of the stakes on the shore.

A sediment sample collected from each of the proposed boring locations was submitted by SME to a laboratory for environmental analytical testing. Each sample was screened for VOC's, SVOC's, PCB's, and 10 Michigan metals. The analytical results are summarized in Table B1: Sediment Analytical Results, contained in Appendix B. The complete environmental analytical data are also contained in Appendix B.

Based on review of the results of the sediment sampling and environmental screening, MDOT and SME (along with input to MDOT from the MDNRE) jointly agreed that special environmental protocols would not be required to perform the geotechnical borings at the sediment sampling locations.

Geotechnical Field Exploration

SME performed four supplemental borings (B101 through B104) along the toe of the slope and in the Kalamazoo River on December 1 and 2, 2010. The borings were performed in water that ranged in depth from about 3 to 8 feet. Each of the borings extended about 40 feet below the river bottom for a total of 160 lineal feet of drilling. The approximate locations of the borings are depicted on Figure No. 2.

Since the borings were performed in the Kalamazoo River, access to the boring locations was provided by loading the SME drill rig on a barge and pushing the barge from a launch site with a tug boat. SME retained a contractor to provide the barge and tug boat and to operate the barge system while SME performed the borings. SME made arrangements to access the river from private property located downstream of the site. Originally, the launch site was planned from the City of Allegan Water Treatment Plant, which is located about ½-mile downstream of the project site, but soft ground conditions at the time of the field exploration precluded using that launch site.

MDOT determined the number of borings, while SME determined the locations and depths of the borings. The borings were located based upon the stakes placed on shore by SME to delineate the sediment sampling locations. The borings were performed within about 5 feet of the locations where sediment sampling was performed in advance of each boring. The existing river bottom elevations at the boring locations or the river water elevations during the field exploration were not determined by SME.

The borings were drilled through a hole in the barge deck using a rotary-type drill rig mounted on an all-terrain vehicle (ATV) and were advanced to the sampling depths using continuous-flight, hollow-stem augers. The borings included soil sampling based on the Split-Barrel Sampling Procedure. Soil samples collected from the borings were sealed in glass jars by the driller.

Groundwater level measurements in the boreholes were not recorded during the drilling operations since the borings were performed within the Kalamazoo River. After completion of drilling, the boreholes were grouted with a mixture of bentonite and cement. The drilling equipment (augers, drill rods, and sampler) were steam cleaned at the site of the last boring before demobilizing from the drill site.

Geotechnical Laboratory Testing

The soil samples recovered from the geotechnical borings were returned to the SME laboratory for further observation and testing. The general laboratory testing program consisted of visually classifying the recovered samples and performing moisture content and hand penetrometer tests on portions of cohesive samples obtained. Moisture content tests were also performed on samples that visually appeared to be organic in nature. In addition, a grain size distribution analysis (sieve and hydrometer) was performed on one sample collected from each boring (four tests total). The Laboratory Testing Procedures in Appendix A provides general descriptions of the laboratory tests that were performed.

Upon completion of the laboratory testing, boring logs were prepared and include information on materials encountered, penetration resistances, and pertinent field observations made during the drilling operations. Except for the grain size analyses, the results of the laboratory tests are included on the logs. The results of the grain size analyses are contained on the Particle Size Distribution Reports in Appendix A. The boring logs are contained in Appendix A. The soil descriptions included on the boring logs were developed from both visual classification and the results of laboratory tests, where applicable.

General Comments

Soil samples retained over a long time, even sealed in jars, are subject to moisture loss and are no longer representative of the conditions initially encountered in the field. Therefore, soil samples are normally retained in our laboratory for 60 days and then disposed, unless instructed otherwise.

The soil profiles and groundwater observations included on the boring logs in Appendix A are generalized descriptions of the conditions encountered at the boring locations. The stratification depths shown on the logs are intended to indicate a zone of transition from one soil type to another. It should also be noted that soil and groundwater conditions may vary between or away from the boring locations from those conditions noted on the logs.

Water levels in the river should be expected to fluctuate throughout the year. Water levels in the river should be expected to influence groundwater conditions at the site.

In the process of obtaining and testing samples, procedures are followed that represent reasonable and accepted practice in the field of soil and foundation engineering. Specifically, field logs are prepared during the field exploration that describe field occurrences, sampling locations, and other information. Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory and differences may exist between the field logs and the final logs. The engineer preparing the report reviews the field logs, laboratory classifications, and test data, and then prepares the final logs.

The geotechnical data in this report and in the referenced SME report dated September 4, 2009, are provided for informational purposes only for use by prospective design/build teams. SME is not responsible for the suitability of the field exploration, scope of services, or interpretation by

others of our boring logs. It should be noted that the concepts for stabilization presented in the SME report dated September 4, 2009, are conceptual only. These concepts were developed by SME before MDOT was contemplating a design/build approach for the project. These concepts should not be construed by prospective design/build teams to be required for the project and design/build teams should independently develop their own solutions for stabilization based on requirements provided by MDOT. We recommend the referenced SME report be provided to prospective design/build teams.

Engineering recommendations were not requested as part of the current scope of services. If geotechnical engineering services by SME are desired or if MDOT would like to retain SME to review design/build proposals and design plans, we would be pleased to assist. Environmental assessments or evaluations for the presence of hazardous or toxic materials at the site, except for the environmental screening performed to assess suitable environmental protocols for the geotechnical field exploration, were not included with our current scope of services. Design/build teams should perform their own environmental due diligence to assess potential impacts of environmental site conditions on their design/build proposals.

SME appreciates the opportunity to assist MDOT with this project. If you have questions regarding this report or the attached information, please contact us.

Very truly yours,

SOIL AND MATERIALS ENGINEERS, INC.

Jeffery M. Krusinga, PE, GE
Senior Consultant

Robert C. Rabeler, PE
Principal Consultant

Attachments: Appendix A
Figure No. 1: Site Location Map
Figure No. 2: Boring Location Diagram
Site Photographs (Nos. 1 through 4)
Geotechnical Notes
Unified Soil Classification System (USCS)
Particle Size Distribution Reports (4)
Boring Logs (B101 through B104)
General Comments
Laboratory Testing Procedures
Important Information about your Geotechnical Engineering Report

Appendix B
Table B1: Sediment Analytical Results
Environmental Analytical Data

Enclosures: Two originals

T:\PROJ\59000\KG59756\KG59756-010611-RPT.DOCX

APPENDIX A:

FIGURE NO. 1: SITE LOCATION MAP

FIGURE NO. 2: BORING LOCATION DIAGRAM

SITE PHOTOGRAPHS (NOS. 1 THROUGH 4)

GEOTECHNICAL NOTES

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

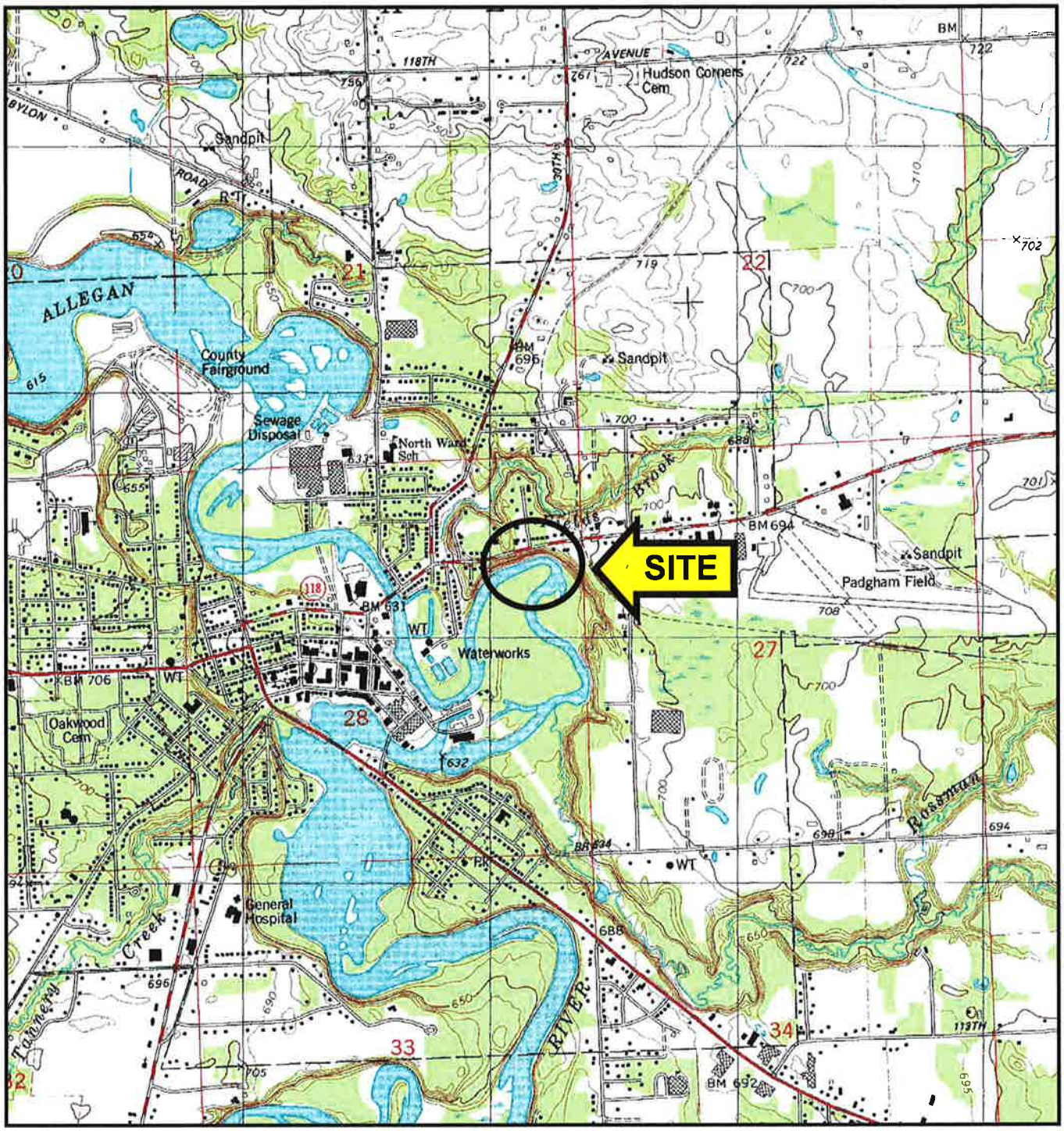
PARTICLE SIZE DISTRIBUTION REPORTS (4)

BORING LOGS (B101 THROUGH B104)

GENERAL COMMENTS

LABORATORY TESTING PROCEDURES

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT



Base map obtained from © DeLorme Topo North America™ 9.

USGS QUADRANGLE(s) REFERENCED
ALLEGAN, MICHIGAN, 1981

0' 2000'
SCALE: 1" = 2000'

NORTH

Dec 22, 2010 - 4:45pm - MANDRILA S:\59000\KG59756\dwgs\-Diagrams\rev0\59756-09.dwg

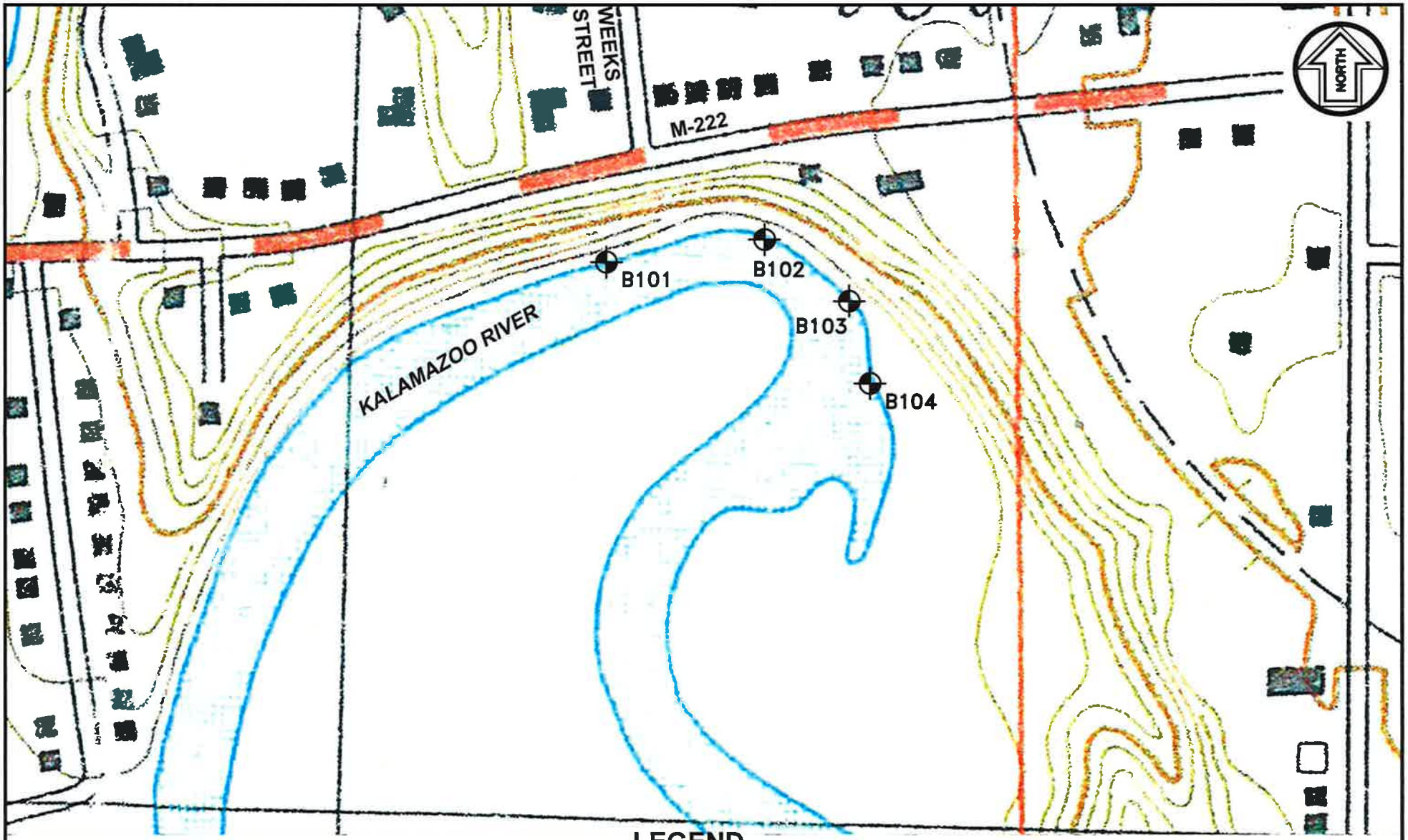
sme
www.sme-usa.com

Indiana
Michigan
Ohio

Date	12-22-10
Drawn By	GM
Scale	1" = 2000'
Project	KG59756

SITE LOCATION MAP
DESIGN/BUILD DATA FOR M-222
SLOPE STABILIZATION
ALLEGAN, MICHIGAN

Figure No. 1



NOTE:
DRAWING INFORMATION TAKEN FROM
USGS MAP–1981 ALLEGAN QUADRANGLE.

LEGEND

APPROXIMATE PROPERTY BOUNDARY

APPROXIMATE BORING LOCATION

Dec 27, 2010 - 2:29pm - MANDRILA S:\59000\KG59756\dwgs\-Diagrams\rev0\59756-08.dwg

sme
www.sme-usa.com

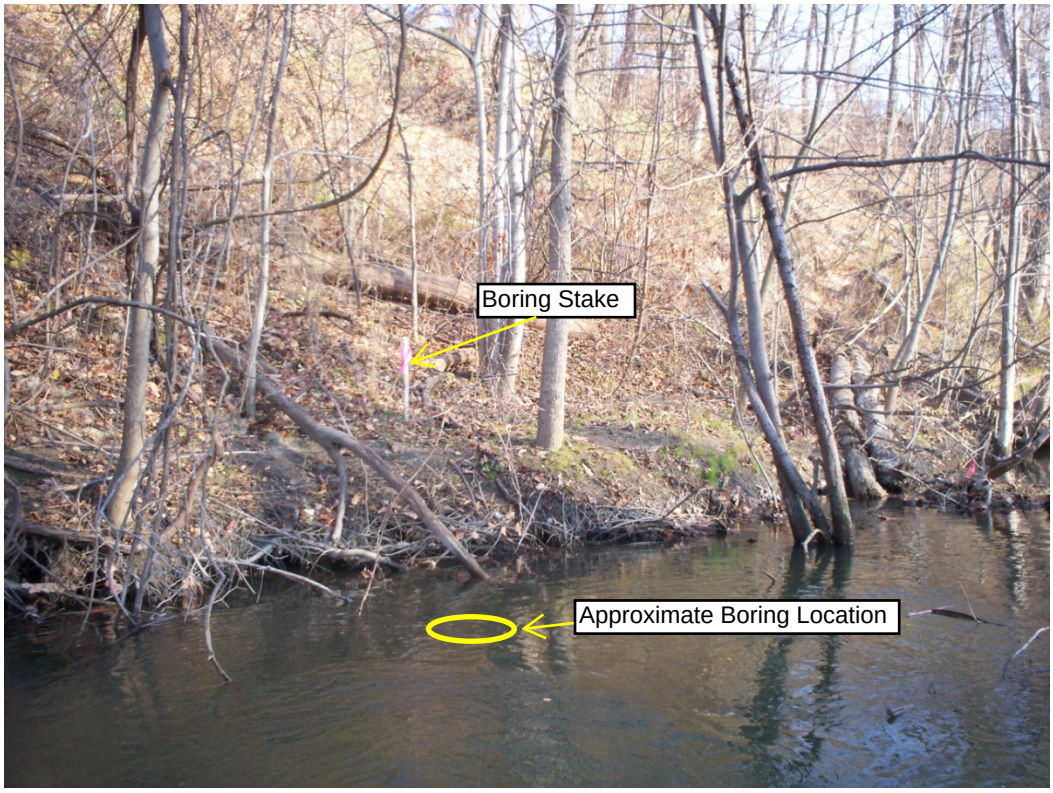
Indiana
Michigan
Ohio

Date	12-22-10
Drawn By	GM
Designed By	JMK
Scale	1" = 250'
Project	KG 59756

BORING LOCATION DIAGRAM
DESIGN/BUILD DATA FOR M-222
SLOPE STABILIZATION
ALLEGAN, MICHIGAN

No.	Revision Date

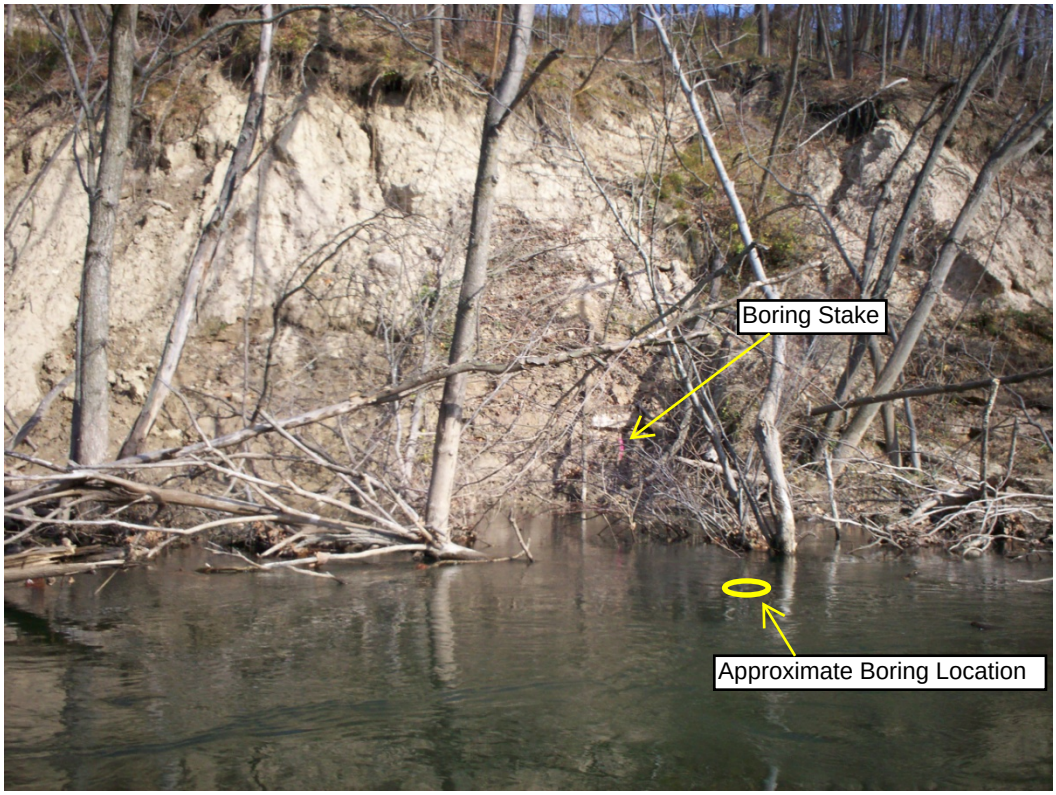
Figure No. 2



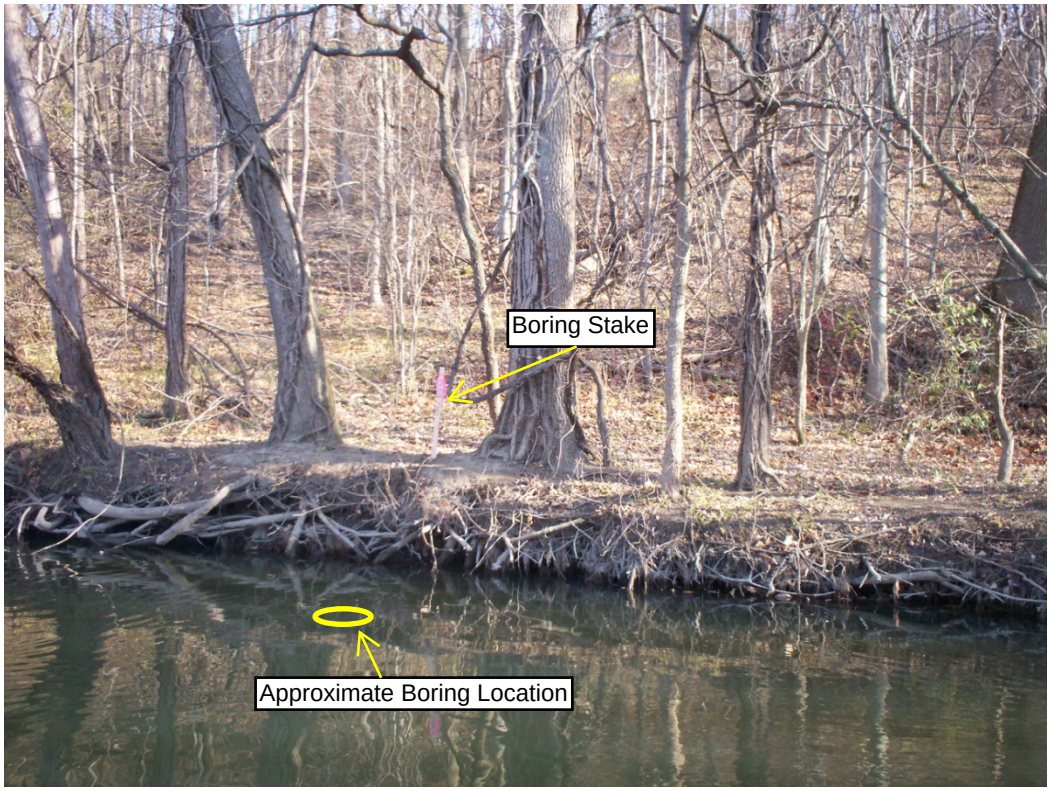
PHOTOGRAPH NO. 1: Shoreline at the location of boring B101. The stake on the shore indicates the distance to the boring.

PHOTOGRAPH NO. 2: Shoreline at the location of boring B102. The stake on the shore indicates the distance to the boring.

DATE:	November 10, 2010
SME PROJECT NO:	KG59756
SME PROJECT NAME:	M-222 Design/Build Geotechnical Data Allegan, Michigan



PHOTOGRAPH NO. 3: Shoreline at the location of boring B103. The stake on the shore indicates the distance to the boring.



PHOTOGRAPH NO. 4: Shoreline at the location of boring B104. The stake on the shore indicates the distance to the boring.

DATE:	November 10, 2010
SME PROJECT NO:	KG59756
SME PROJECT NAME:	M-222 Design/Build Geotechnical Data Allegan, Michigan

soil and materials engineers, inc.

GEOTECHNICAL NOTES

Drilling and Sampling Symbols

SS	–	Split-Spoon 1-3/8" I.D., 2" O.D. except where noted
LS	–	Liner Sample
AS	–	Power Auger Sample
2ST	–	Shelby Tube – 2" O.D.
3ST	–	Shelby Tube – 3" O.D.
PS	–	Piston Sample – 3" diameter
WS	–	Wash Sample
HA	–	Hand Auger Sample
BS	–	Bag or Bottle Sample
CS	–	Continuous Sample
NR	–	No Recovery
RC	–	Rock Core with diamond bit. NQ size, except where noted
RB	–	Rock Bit
VS	–	Vane Shear
PM	–	Pressuremeter
WOH	–	Weight of Hammer
SP	–	Soil Probe
PID	–	Photo Ionization Device
FID	–	Flame Ionization Device

Standard Penetration 'N' – Blows per foot of a 140-pound hammer falling 30 inches on a 2-inch O.D. split spoon, except where noted.

Particle Sizes

Boulders	-	Greater than 12 inches (305 mm)
Cobbles	-	3 inches (76.2 mm) to 12 inches (305 mm)
Gravel-Coarse	-	3/4 inches (19.05 mm) to 3 inches (76.2mm)
Fine	-	No. 4 (4.75 mm) to 3/4 inches (19.05 mm)
Sand- Coarse	-	No. 10 (2.00 mm) to No. 4 (4.75 mm)
Medium	-	No. 40 (0.425 mm) to No. 10 (2.00 mm)
Fine	-	No. 200 (0.074 mm) to No. 40 (0.425 mm)
Silt	-	0.005 mm to 0.074 mm
Clay	-	Less than (0.005 mm)

Depositional Features

Parting	-	as much as 1/16 inch (1.6 mm) thick
Seam	-	1/16 inch (1.6 mm) to 1/2 inch (12.7 mm) thick
Layer	-	1/2 inch (12.7 mm) to 12 (305 mm) inches thick
Stratum	-	greater than 12 inches (305 mm) thick
Pocket	-	small, erratic deposit of limited lateral extent
Lens	-	lenticular deposit
Varved	-	alternating seams or layers of silt and/or clay and sometimes fine sand
Occasional	-	one or less per foot (305 mm) of thickness
Frequent	-	more than one per foot (305 mm) of thickness
Interbedded	-	applied to strata of soil or beds of rock lying between or alternating with other strata of a different nature

Groundwater levels indicated on the boring log are the levels measured in the boring at the times indicated. The accurate determination of groundwater levels may not be possible with short term observations, especially in low permeability soils. The groundwater levels shown may fluctuate throughout the year with variation in precipitation, evaporation and runoff.

Classification

Cohesionless Soils (Blows per foot or 0.3 m)

Very Loose	:	0 to 4
Loose	:	5 to 9
Medium Dense	:	10 to 29
Dense	:	30 to 49
Very Dense	:	50 to 80
Extremely Dense	:	Over 80

Soil Constituents

Trace	:	Less than 5%
Trace to Some	:	5% to 12%
Some	:	12% to 25%
Use Descriptor (i.e., Silty, Clayey, etc.)	:	25% to 50%

Cohesive Soils

Consistency		Shear Strength
Very Soft	:	0.25 kips/ft^2 (12.0 kPa) or less
Soft	:	0.25 to 0.49 kips/ft^2 (12.0 to 23.8 kPa)
Medium	:	0.50 to 0.99 kips/ft^2 (23.9 to 47.7 kPa)
Stiff	:	1.00 to 1.99 kips/ft^2 (47.8 to 95.6 kPa)
Very Stiff	:	2.00 to 3.99 kips/ft^2 (95.7 to 191.3 kPa)
Hard	:	4.00 kips/ft^2 (191.4 kPa) or greater

Soil description

If clay content sufficiently dominates soil properties, then clay becomes the primary noun with the other major soil constituent as modifier: i.e. silty clay. Other minor soil constituents may be added according to estimates of soil constituents present, i.e., silty clay, trace to some sand, trace gravel.

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels; sandy gravels, little or no fines
		GP	Poorly-graded gravels; sandy gravels, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, some sand or sandy gravels, some silt
		GC	Clayey gravels, some sand or sandy gravels, some silt
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands or sands, some silt
		SC	Clayey sands or sands, some clay
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic sandy silts or clayey silts with slight plasticity
		CL	Inorganic clays of low plasticity, sandy clays, silty clays
		OL	Organic silts and organic clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts of high plasticity
		CH	Inorganic clays of high plasticity
		OH	Organic silts and organic clays of high plasticity
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

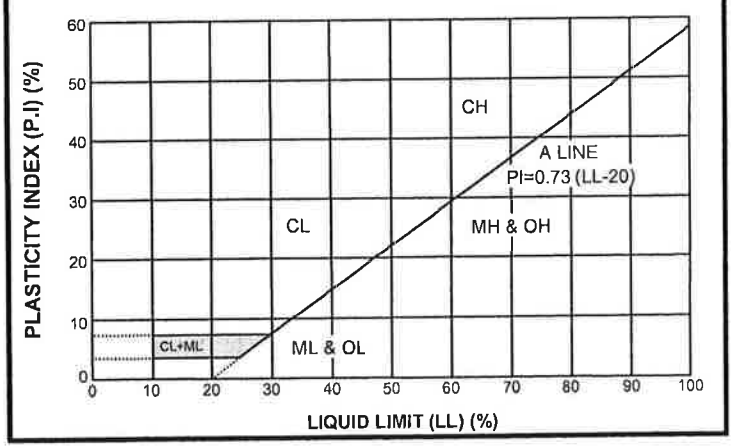
LABORATORY CLASSIFICATION CRITERIA

GW	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_U = \frac{D_{60}}{D_{10}}$ greater than 6; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
SC	Atterberg limits above "A" line with P.I. greater than 7	

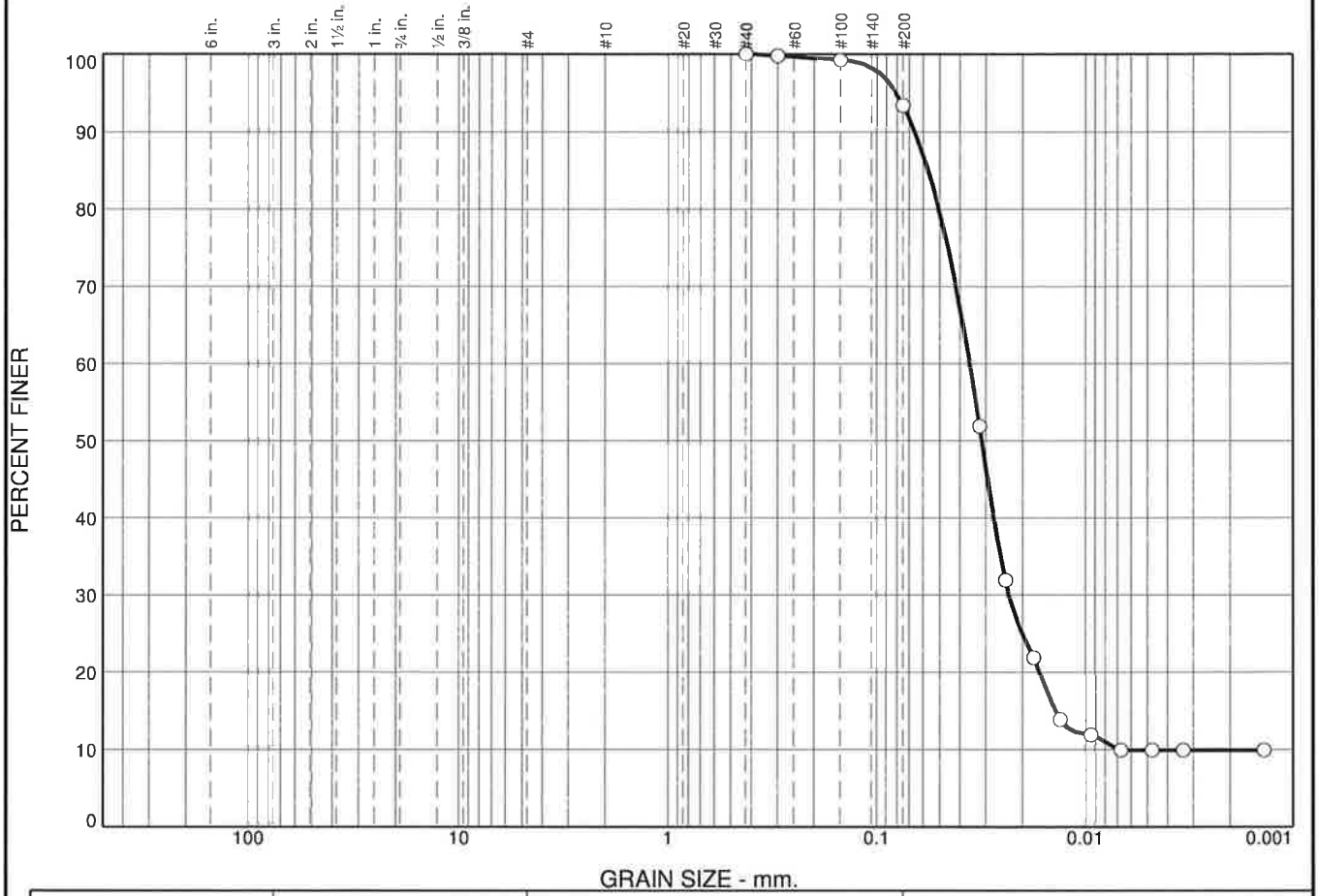
Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent.....GW, GP, SW, SP
More than 12 percent.....GM, GC, SM, SC
5 to 12 percent.....Borderline cases requiring dual symbols

PLASTICITY CHART



Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	6.6	83.5	9.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.0571	0.0360	0.0314	0.0234	0.0140	0.0069	2.23	5.25

	Material Description	USCS	AASHTO
○	SILT-TRACE TO SOME CLAY AND FINE SAND-GRAYISH BROWN	ML	

Project No. KG59756 **Client:** MDOT

Project: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION

○ **Sample Number:** SS2 & SS3

Remarks:

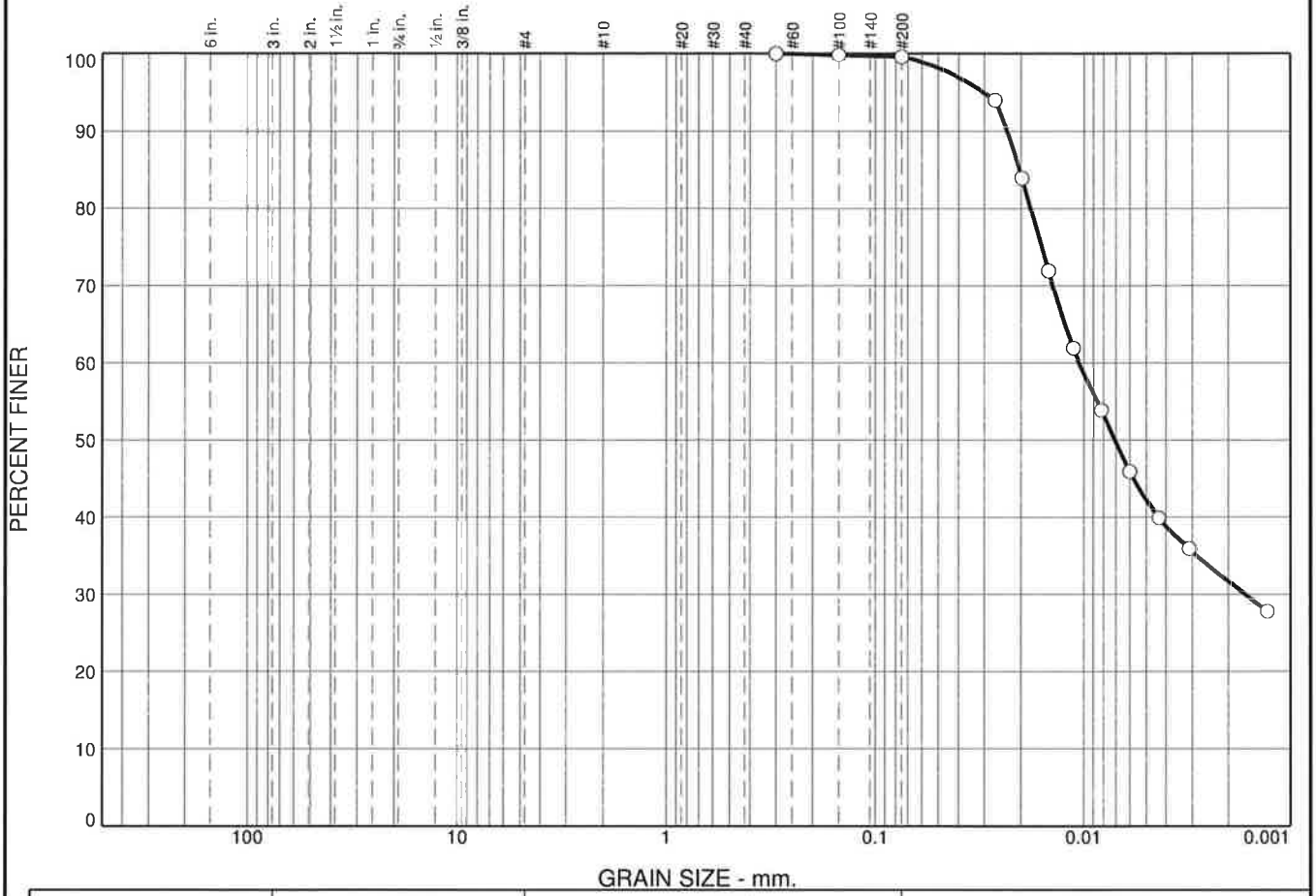
○ BORING B101

Soil and Materials Engineers, Inc.

Figure

Tested By: ERROL GILBERT **Checked By:** JEFF KRUSINGA, PE, GE

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	0.4	57.4	42.2

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.0205	0.0106	0.0071	0.0017				

Material Description	USCS	AASHTO
○ CLAYEY SILT-TRACE FINE SAND-GRAY	ML	

Project No. KG59756 **Client:** MDOT

Project: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION

○ **Sample Number:** SS2 & SS3

Remarks:

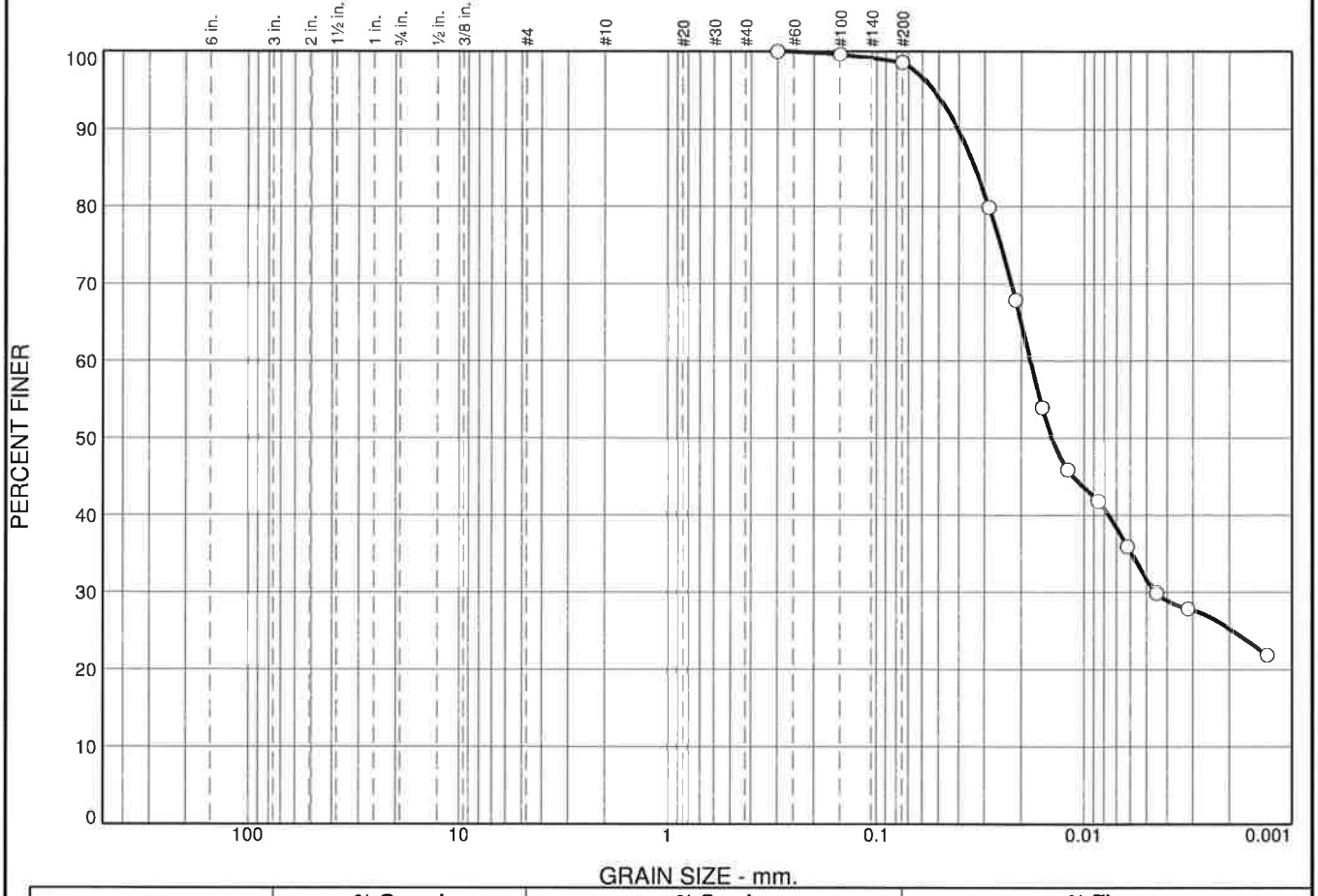
○ BORING B102

Soil and Materials Engineers, Inc.

Figure

Tested By: ERROL GILBERT **Checked By:** JEFF KRUSINGA, PE, GE

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	1.4	67.0	31.6

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.0336	0.0182	0.0143	0.0045				

	Material Description	USCS	AASHTO
○	CLAYEY SILT-TRACE FINE SAND-GRAY	ML	

Project No. KG59756 **Client:** MDOT

Project: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION

○ **Sample Number:** SS5

Remarks:

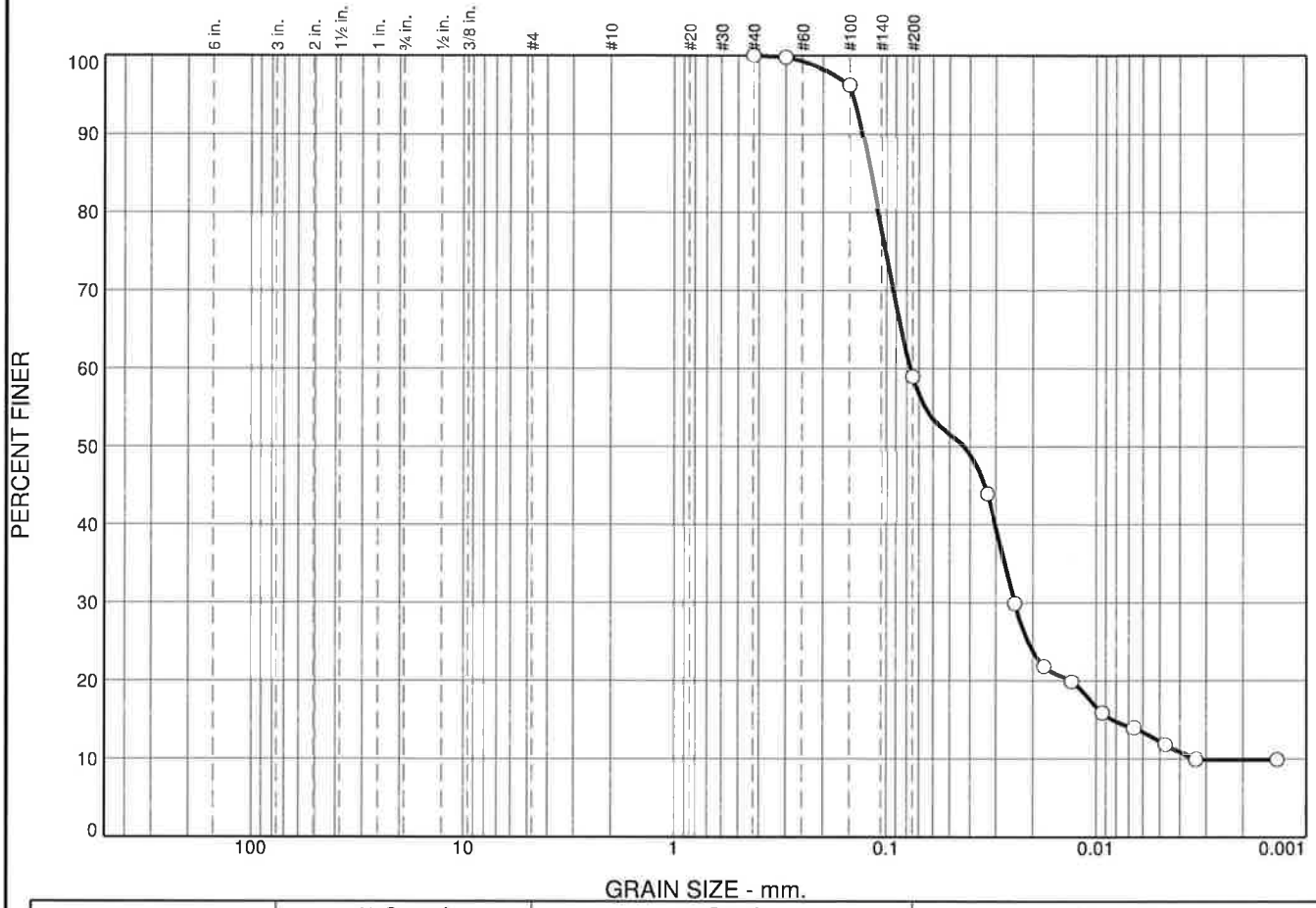
○ BORING B103

Soil and Materials Engineers, Inc.

Figure

Tested By: ERROL GILBERT **Checked By:** JEFF KRUSINGA, PE, GE

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	41.0	46.7	12.3

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1194	0.0769	0.0429	0.0246	0.0083	0.0034	2.29	22.46

	Material Description	USCS	AASHTO
○	FINE SANDY SILT-SOME CLAY-GRAY	ML	

Project No. KG59756 **Client:** MDOT

Project: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION

○ **Sample Number:** SS5

Remarks:

○ BORING B104

Soil and Materials Engineers, Inc.

Figure

Tested By: ERROL GILBERT **Checked By:** JEFF KRUSINGA, PE, GE

soil and materials engineers, inc.

PROJECT NAME: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION **A/E:**

PROJECT LOCATION: ALLEGAN, MICHIGAN **BY:** JMK **DATE:** 12/2/10 **BORING** B101

CLIENT: MDOT **PROJECT NUMBER:** KG59756 **SHEET:** 1

NORTHING= 379685.1
EASTING= 12725856.0

GROUND SURFACE ELEVATION=

DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER	BLOWS PER SIX INCHES
0	Water (7 feet deep)		
5	Driller reported 13 inches of Fine to Medium Sand- Gray		
	Silty Clay- Gray- Stiff (CL)	SS1	3 3 4
10	Silt- Trace to Some Clay & Fine Sand- Grayish Brown- Wet- Loose to Medium Dense (ML)	SS2	3 3 3
		SS3	3 4 4
15		SS4	5 5 6
20	Clayey Silt- Gray- Stiff (ML)	SS5	11 14 16
	Silt- Trace to Some Sand- Trace Clay- Grayish Brown- Wet- Dense (ML)		
25	Silt- Trace to Some Clay & Sand- Frequent Clayey Silt Layers- Grayish Brown- Wet- Medium Dense (ML)	SS6	3 4 6
30		SS7	5 6 19
35	See next page for description		

STANDARD PENETRATION TEST RESISTANCES (N-values) -- ○
10 20 30 40 50

NATURAL DRY DENSITY -- ■ (pcf)
90 100 110

MOISTURE, % -- ◆
ATTERBERG ⊢⊣ LIMITS
0 10 20 30 40

LEGEND
- ▽ HAND PENETROMETER TEST
- ⊠ TORVANE SHEAR TEST
- ○ UNCONFINED COMPRESSION TEST
- ▣ VANE SHEAR TEST
- × REMOLDED VANE SHEAR
- ⊕ TRIAXIAL TEST

SHEAR STRENGTH (KSF)
0.0 1.0 2.0 3.0 4.0 5.0

WATER LEVEL OBSERVATIONS
- GROUNDWATER ENCOUNTERED DURING DRILLING
- GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes:
1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. ACCURATE GROUNDWATER READINGS IN THE BOREHOLE COULD NOT BE COLLECTED SINCE THE BORING WAS PERFORMED IN THE KALAMAZOO RIVER FROM A BARGE.
3. MOISTURE CONTENT & SHEAR STRENGTH TESTS FOR SAMPLES SS6 & SS7 PERFORMED ON CLAYEY SILT LAYERS.
4. COORDINATES BASED ON MICHIGAN STATE PLANE GRID COORDINATES SOUTH ZONE NAD83.

DRILLER: RM **DRILL METHOD:** Hollow-stem Augers **WATER LEVEL DURING DRILLING:** Note 2 **WATER LEVEL** **ONE DAY AFTER COMPLETION**

RIG NO.: ATV **BACKFILL METHOD:** Cement/Bent. Grout **WATER LEVEL UPON COMPLETION:** Note 2 **CAVE OF BOREHOLE AT**

soil and materials engineers, inc.

PROJECT NAME: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION **A/E:**

PROJECT LOCATION: ALLEGAN, MICHIGAN **BY:** JMK **DATE:** 12/2/10 **BORING** B101

CLIENT: MDOT **PROJECT NUMBER:** KG59756 **SHEET:** 2

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	BLOWS PER SIX INCHES
35		NORTHING= 379685.1 EASTING= 12725856.0 GROUND SURFACE ELEVATION=		
		Sandy Fine to Coarse Gravel- Trace to Some Silt- Driller reported Occasional Cobbles & Occasional Silty Clay Layers from 34 to 36.5 feet- Gray- Wet- Medium Dense to Extremely Dense (GP-GM)	SS8	13 18 8
40			SS9	15 18 21
45			SS10	66 85/2"
		END OF BORING AT 46.2 FEET.		
50				
55				
60				
65				
70				

STANDARD PENETRATION TEST RESISTANCES (N-values) -- ○
10 20 30 40 50

○85/2" →

NATURAL DRY DENSITY -- ■ (pcf)
90 100 110

MOISTURE, % -- ◆
ATTERBERG ⊢⊣ LIMITS
0 10 20 30 40

LEGEND
- ▽ HAND PENETROMETER TEST
- ⊠ TORVANE SHEAR TEST
- ○ UNCONFINED COMPRESSION TEST
- ▣ VANE SHEAR TEST
- × REMOLDED VANE SHEAR
- ⊕ TRIAXIAL TEST

SHEAR STRENGTH (KSF)
0.0 1.0 2.0 3.0 4.0 5.0

WATER LEVEL OBSERVATIONS
- ▼ GROUNDWATER ENCOUNTERED DURING DRILLING
- ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes:
1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. ACCURATE GROUNDWATER READINGS IN THE BOREHOLE COULD NOT BE COLLECTED SINCE THE BORING WAS PERFORMED IN THE KALAMAZOO RIVER FROM A BARGE.
3. MOISTURE CONTENT & SHEAR STRENGTH TESTS FOR SAMPLES SS6 & SS7 PERFORMED ON CLAYEY SILT LAYERS.
4. COORDINATES BASED ON MICHIGAN STATE PLANE GRID COORDINATES SOUTH ZONE NAD83.

DRILLER: RM **DRILL METHOD:** Hollow-stem Augers **WATER LEVEL DURING DRILLING:** Note 2 **WATER LEVEL** **ONE DAY AFTER COMPLETION**

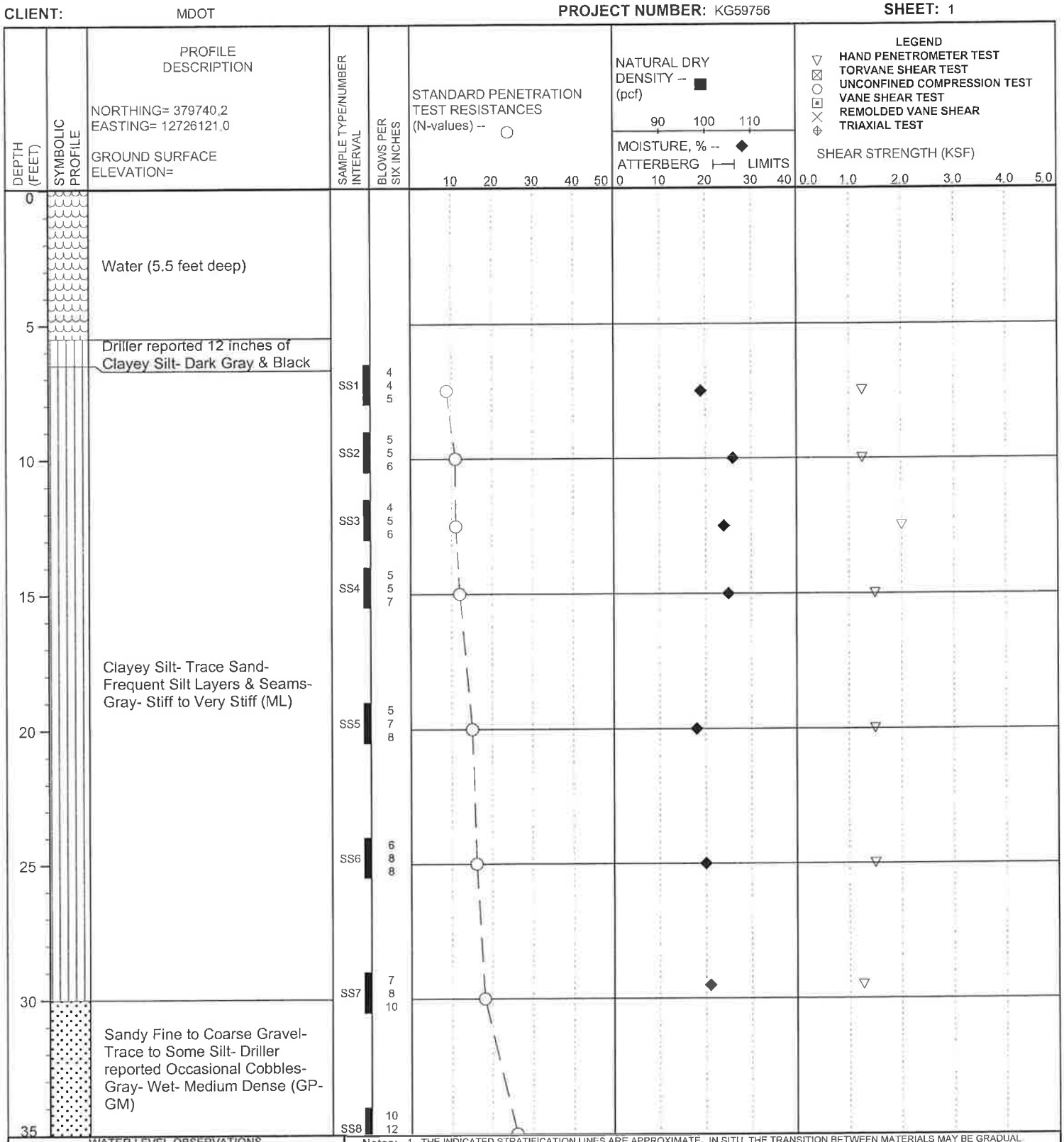
RIG NO.: ATV **BACKFILL METHOD:** Cement/Bent. Grout **WATER LEVEL UPON COMPLETION:** Note 2 **CAVE OF BOREHOLE AT**

soil and materials engineers, inc.

PROJECT NAME: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION **A/E:**

PROJECT LOCATION: ALLEGAN, MICHIGAN **BY:** JMK **DATE:** 12/2/10 **BORING** B102

CLIENT: MDOT **PROJECT NUMBER:** KG59756 **SHEET:** 1



WATER LEVEL OBSERVATIONS

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes:
1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. ACCURATE GROUNDWATER READINGS IN THE BOREHOLE COULD NOT BE COLLECTED SINCE THE BORING WAS PERFORMED IN THE KALAMAZOO RIVER FROM A BARGE.
3. COORDINATES BASED ON MICHIGAN STATE PLANE GRID COORDINATES SOUTH ZONE NAD83.

DRILLER: RM **DRILL METHOD:** Hollow-stem Augers **WATER LEVEL DURING DRILLING:** Note 2 **WATER LEVEL** **ONE DAY AFTER COMPLETION**

RIG NO.: ATV **BACKFILL METHOD:** Cement/Bent. Grout **WATER LEVEL UPON COMPLETION:** Note 2 **CAVE OF BOREHOLE AT**

soil and materials engineers, inc.

PROJECT NAME: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION **A/E:**

PROJECT LOCATION: ALLEGAN, MICHIGAN **BY:** JMK **DATE:** 12/2/10 **BORING** B102

CLIENT: MDOT **PROJECT NUMBER:** KG59756 **SHEET:** 2

DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER	BLOWS PER SIX INCHES
	NORTHING= 379740.2 EASTING= 12726121.0 GROUND SURFACE ELEVATION=		
35	Sandy Fine to Coarse Gravel- Trace to Some Silt- Driller reported Occasional Cobbles- Gray- Wet- Medium Dense (GP-GM)		14
40		SS9	10 12 13
	Sandy Clay- Some Silt- Trace Gravel- Gray- Hard (CL/Hardpan)		17
45		SS10	32 59
	END OF BORING AT 45.5 FEET.		
50			
55			
60			
65			
70			

STANDARD PENETRATION TEST RESISTANCES (N-values) -- ○
10 20 30 40 50

91

NATURAL DRY DENSITY -- ■ (pcf)
90 100 110

MOISTURE, % -- ◆
ATTERBERG ⊢⊣ LIMITS
0 10 20 30 40

LEGEND
- ▽ HAND PENETROMETER TEST
- ⊠ TORVANE SHEAR TEST
- ○ UNCONFINED COMPRESSION TEST
- ▣ VANE SHEAR TEST
- × REMOLDED VANE SHEAR
- ⊕ TRIAXIAL TEST

SHEAR STRENGTH (KSF)
0.0 1.0 2.0 3.0 4.0 5.0

4.5+

WATER LEVEL OBSERVATIONS
- ▼ GROUNDWATER ENCOUNTERED DURING DRILLING
- ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes:
1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. ACCURATE GROUNDWATER READINGS IN THE BOREHOLE COULD NOT BE COLLECTED SINCE THE BORING WAS PERFORMED IN THE KALAMAZOO RIVER FROM A BARGE.
3. COORDINATES BASED ON MICHIGAN STATE PLANE GRID COORDINATES SOUTH ZONE NAD83.

DRILLER: RM **DRILL METHOD:** Hollow-stem Augers **WATER LEVEL DURING DRILLING:** Note 2 **WATER LEVEL** **ONE DAY AFTER COMPLETION**

RIG NO.: ATV **BACKFILL METHOD:** Cement/Bent. Grout **WATER LEVEL UPON COMPLETION:** Note 2 **CAVE OF BOREHOLE AT**

soil and materials engineers, inc.

PROJECT NAME: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION **A/E:**

PROJECT LOCATION: ALLEGAN, MICHIGAN **BY:** JMK **DATE:** 12/2/10 **BORING** B103

CLIENT: MDOT **PROJECT NUMBER:** KG59756 **SHEET:** 1

PROFILE DESCRIPTION

NORTHING= 379655.2
EASTING= 12726285.6

GROUND SURFACE ELEVATION=

DEPTH (FEET)	SAMPLE TYPE/NUMBER	BLOWS PER SIX INCHES	PROFILE DESCRIPTION
0			Water (8 feet deep)
10	SS1	1 2 2	Silty Clay- Trace Sand & Gravel Gray (CL)
	SS2	5 6 7	
15	SS3	5 5 6	
	SS4	5 5 6	
20	SS5	5 5 6	Clayey Silt- Trace Sand- Frequent Silt Layers & Seams- Gray- Stiff to Very Stiff (ML)
25	SS6	5 5 8	
30	SS7	5 7 24	
35			Silty Fine Sand- Gray- Wet- Dense (SM)
			See next page for description

STANDARD PENETRATION TEST RESISTANCES (N-values) -- ○
10 20 30 40 50

NATURAL DRY DENSITY -- ■ (pcf)
90 100 110

MOISTURE, % -- ◆
ATTERBERG ⊢⊣ LIMITS
0 10 20 30 40

SHEAR STRENGTH (KSF)
0.0 1.0 2.0 3.0 4.0 5.0

LEGEND
- ▽ HAND PENETROMETER TEST
- ⊠ TORVANE SHEAR TEST
- ○ UNCONFINED COMPRESSION TEST
- ▣ VANE SHEAR TEST
- ⨯ REMOLDED VANE SHEAR
- ⊕ TRIAXIAL TEST

WATER LEVEL OBSERVATIONS
- ▽ GROUNDWATER ENCOUNTERED DURING DRILLING
- ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes:
1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. ACCURATE GROUNDWATER READINGS IN THE BOREHOLE COULD NOT BE COLLECTED SINCE THE BORING WAS PERFORMED IN THE KALAMAZOO RIVER FROM A BARGE.
3. SAMPLE SS1 WAS TOO DISTURBED TO PERFORM A SHEAR STRENGTH TEST.
4. COORDINATES BASED ON MICHIGAN STATE PLANE GRID COORDINATES SOUTH ZONE NAD83.

DRILLER: RM **DRILL METHOD:** Hollow-stem Augers **WATER LEVEL DURING DRILLING:** Note 2 **WATER LEVEL** **ONE DAY AFTER COMPLETION**

RIG NO.: ATV **BACKFILL METHOD:** Cement/Bent. Grout **WATER LEVEL UPON COMPLETION:** Note 2 **CAVE OF BOREHOLE AT**

soil and materials engineers, inc.

PROJECT NAME: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION **A/E:**

PROJECT LOCATION: ALLEGAN, MICHIGAN **BY:** JMK **DATE:** 12/2/10 **BORING** B103

CLIENT: MDOT **PROJECT NUMBER:** KG59756 **SHEET:** 2

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	BLOWS PER SIX INCHES
35		NORTHING= 379655.2 EASTING= 12726285.6 GROUND SURFACE ELEVATION=		
			SS8	10 10 12
40		Sandy Fine to Coarse Gravel- Trace to Some Silt- Driller reported Occasional Cobbles- Gray- Wet- Medium Dense to Dense (GP-GM)	SS9	10 14 25
45			SS10	10 12 12
		END OF BORING AT 48 FEET.		
50				
55				
60				
65				
70				

STANDARD PENETRATION TEST RESISTANCES (N-values) -- ○
10 20 30 40 50

NATURAL DRY DENSITY -- ■ (pcf)
90 100 110

MOISTURE, % -- ◆
ATTERBERG ⊢⊣ LIMITS
0 10 20 30 40

LEGEND
- ▽ HAND PENETROMETER TEST
- ☒ TORVANE SHEAR TEST
- ○ UNCONFINED COMPRESSION TEST
- ▣ VANE SHEAR TEST
- × REMOLDED VANE SHEAR
- ⊕ TRIAXIAL TEST

SHEAR STRENGTH (KSF)
0.0 1.0 2.0 3.0 4.0 5.0

WATER LEVEL OBSERVATIONS
- ▼ GROUNDWATER ENCOUNTERED DURING DRILLING
- ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes:
1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. ACCURATE GROUNDWATER READINGS IN THE BOREHOLE COULD NOT BE COLLECTED SINCE THE BORING WAS PERFORMED IN THE KALAMAZOO RIVER FROM A BARGE.
3. SAMPLE SS1 WAS TOO DISTURBED TO PERFORM A SHEAR STRENGTH TEST.
4. COORDINATES BASED ON MICHIGAN STATE PLANE GRID COORDINATES SOUTH ZONE NAD83.

DRILLER: RM **DRILL METHOD:** Hollow-stem Augers **WATER LEVEL DURING DRILLING:** Note 2 **WATER LEVEL** **ONE DAY AFTER COMPLETION**

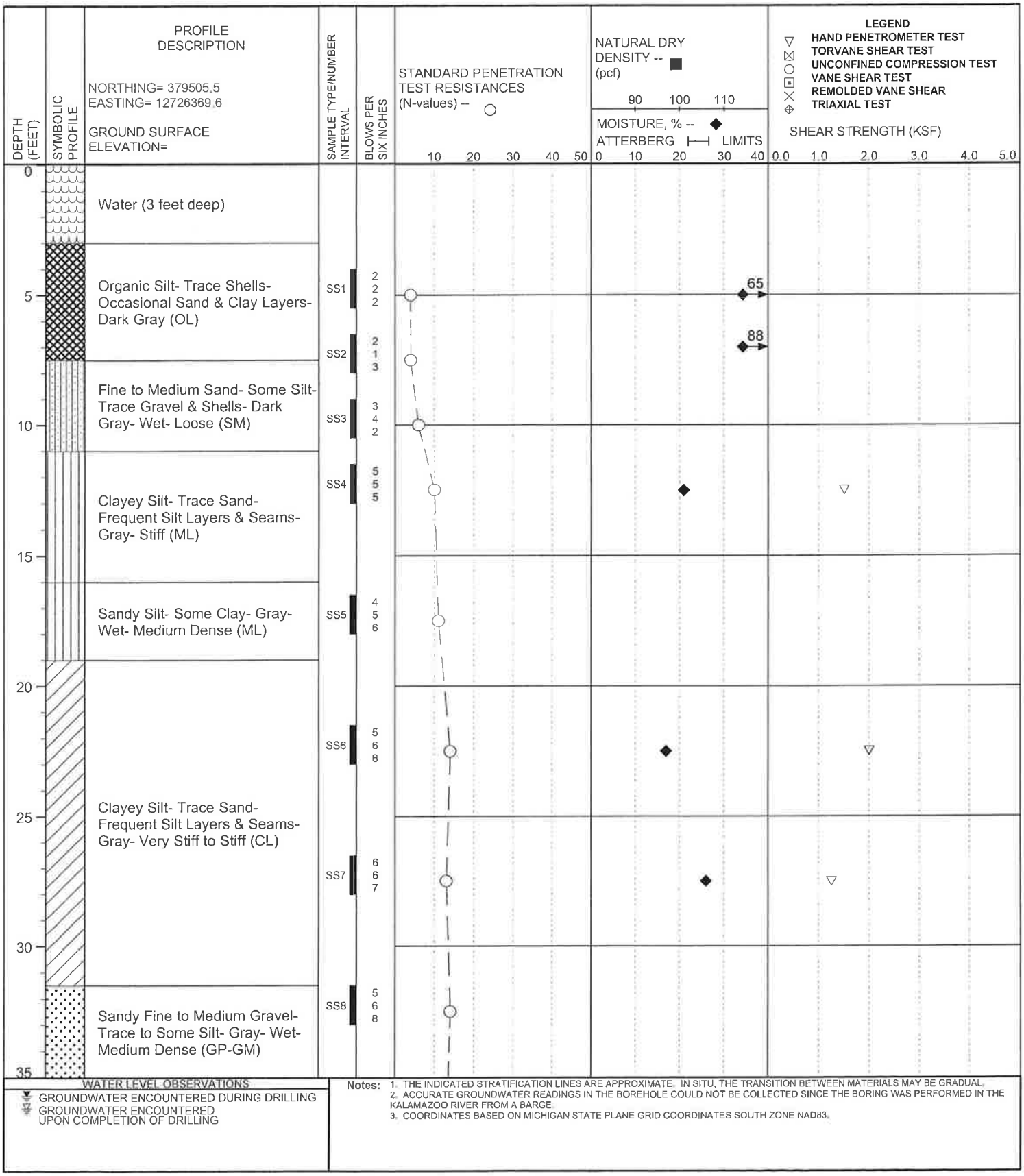
RIG NO.: ATV **BACKFILL METHOD:** Cement/Bent. Grout **WATER LEVEL UPON COMPLETION:** Note 2 **CAVE OF BOREHOLE AT**

soil and materials engineers, inc.

PROJECT NAME: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION **A/E:**

PROJECT LOCATION: ALLEGAN, MICHIGAN **BY:** JMK **DATE:** 12/1/10 **BORING** B104

CLIENT: MDOT **PROJECT NUMBER:** KG59756 **SHEET:** 1



WATER LEVEL OBSERVATIONS

GROUNDWATER ENCOUNTERED DURING DRILLING

GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes:
1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. ACCURATE GROUNDWATER READINGS IN THE BOREHOLE COULD NOT BE COLLECTED SINCE THE BORING WAS PERFORMED IN THE KALAMAZOO RIVER FROM A BARGE.
3. COORDINATES BASED ON MICHIGAN STATE PLANE GRID COORDINATES SOUTH ZONE NAD83.

DRILLER: RM **DRILL METHOD:** Hollow-stem Augers **WATER LEVEL DURING DRILLING:** Note 2 **WATER LEVEL** **ONE DAY AFTER COMPLETION**

RIG NO.: ATV **BACKFILL METHOD:** Cement/Bent. Grout **WATER LEVEL UPON COMPLETION:** Note 2 **CAVE OF BOREHOLE AT**

soil and materials engineers, inc.

PROJECT NAME: DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION **A/E:**

PROJECT LOCATION: ALLEGAN, MICHIGAN **BY:** JMK **DATE:** 12/1/10 **BORING** B104

CLIENT: MDOT **PROJECT NUMBER:** KG59756 **SHEET:** 2

PROFILE DESCRIPTION

NORTHING= 379505.5
EASTING= 12726369.6

GROUND SURFACE ELEVATION=

DEPTH (FEET) | SYMBOLIC PROFILE | SAMPLE TYPE/NUMBER INTERVAL | BLOWS PER SIX INCHES

STANDARD PENETRATION TEST RESISTANCES (N-values) -- ○ (10 20 30 40 50)

NATURAL DRY DENSITY -- ■ (pcf) (90 100 110)

MOISTURE, % -- ◆ ATTERBERG ⊢⊣ LIMITS (0 10 20 30 40)

LEGEND
- ▽ HAND PENETROMETER TEST
- ⊠ TORVANE SHEAR TEST
- ○ UNCONFINED COMPRESSION TEST
- ▣ VANE SHEAR TEST
- ⊗ REMOLDED VANE SHEAR
- ⊕ TRIAXIAL TEST

SHEAR STRENGTH (KSF) (0.0 1.0 2.0 3.0 4.0 5.0)

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	BLOWS PER SIX INCHES
35		Sandy Fine to Medium Gravel- Trace to Some Silt- Gray- Wet- Medium Dense (GP-GM)		
		Silty Clay- Gray- Stiff (CL)	SS9	5 6 7
40		Sandy Fine to Coarse Gravel- Trace to Some Silt- Gray- Wet- Medium Dense (GP-GM)	SS10	10 12 12
		END OF BORING AT 43 FEET.		
45				
50				
55				
60				
65				
70				

WATER LEVEL OBSERVATIONS
- ▼ GROUNDWATER ENCOUNTERED DURING DRILLING
- ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING

Notes:
1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. ACCURATE GROUNDWATER READINGS IN THE BOREHOLE COULD NOT BE COLLECTED SINCE THE BORING WAS PERFORMED IN THE KALAMAZOO RIVER FROM A BARGE.
3. COORDINATES BASED ON MICHIGAN STATE PLANE GRID COORDINATES SOUTH ZONE NAD83.

DRILLER: RM **DRILL METHOD:** Hollow-stem Augers **WATER LEVEL DURING DRILLING:** Note 2 **WATER LEVEL** **ONE DAY AFTER COMPLETION**

RIG NO.: ATV **BACKFILL METHOD:** Cement/Bent. Grout **WATER LEVEL UPON COMPLETION:** Note 2 **CAVE OF BOREHOLE AT**

GENERAL COMMENTS

Basis of Geotechnical Report

This report has been prepared in accordance with generally accepted geotechnical engineering practices to assist in the design and/or evaluation of this project. If the project plans, design criteria, and other project information referenced in this report and utilized by SME to prepare our recommendations are changed, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed, and the conclusions and recommendations of this report are modified or approved in writing by our office.

The discussions and recommendations submitted in this report are based on the available project information, described in this report, and the geotechnical data obtained from the field exploration at the locations indicated in the report. Variations in the soil and groundwater conditions commonly occur between or away from sampling locations. The nature and extent of the variations may not become evident until the time of construction. If significant variations are observed during construction, SME should be contacted to reevaluate the recommendations of this report. SME should be retained to continue our services through construction to observe and evaluate the actual subsurface conditions relative to the recommendations made in this report.

In the process of obtaining and testing samples and preparing this report, procedures are followed that represent reasonable and accepted practice in the field of soil and foundation engineering. Specifically, field logs are prepared during the field exploration that describe field occurrences, sampling locations, and other information. Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory and differences may exist between the field logs and the report logs. The engineer preparing the report reviews the field logs, laboratory classifications, and test data and then prepares the report logs. Our recommendations are based on the contents of the report logs and the information contained therein.

Review of Design Details, Plans, and Specifications

SME should be retained to review the design details, project plans, and specifications to verify those documents are consistent with the recommendations contained in this report.

Review of Report Information With Project Team

Implementation of our recommendations may affect the design, construction, and performance of the proposed improvements, along with the potential inherent risks involved with the proposed construction. The client and key members of the design team, including SME, should discuss the issues covered in this report so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for performance and maintenance.

Field Verification of Geotechnical Conditions

SME should be retained to verify the recommendations of this report are properly implemented during construction. This may avoid misinterpretation of our recommendations by other parties and will allow us to review and modify our recommendations if variations in the site subsurface conditions are encountered.

Project Information for Contractor

This report and any future addenda or other reports regarding this site should be made available to prospective contractors prior to submitting their proposals for their information only and to supply them with facts relative to the subsurface evaluation and laboratory test results. If the selected contractor encounters subsurface conditions during construction, which differ from those presented in this report, the contractor should promptly describe the nature and extent of the differing conditions in writing and SME should be notified so that we can verify those conditions. The construction contract should include provisions for dealing with differing conditions and contingency funds should be reserved for potential problems during earthwork and foundation construction. We would be pleased to assist you in developing the contract provisions based on our experience.

The contractor should be prepared to handle environmental conditions encountered at this site, which may affect the excavation, removal, or disposal of soil; dewatering of excavations; and health and safety of workers. Any Environmental Assessment reports prepared for this site should be made available for review by bidders and the successful contractor.

Third Party Reliance/Reuse of This Report

This report has been prepared solely for the use of our Client for the project specifically described in this report. This report cannot be relied upon by other parties not involved in the project, unless specifically allowed by SME in writing. SME also is not responsible for the interpretation by other parties of the geotechnical data and the recommendations provided herein.

LABORATORY TESTING PROCEDURES

Visual Engineering Classification

Visual classification was performed on recovered samples. The appended General Notes and Unified Soil Classification System (USCS) sheets include a brief summary of the general method used visually classify the soil and assign an appropriate USCS group symbol. The estimated group symbol, according to the USCS, is shown in parentheses following the textural description of the various strata on the boring logs appended to this report. The soil descriptions developed from visual classifications are sometimes modified to reflect the results of laboratory testing.

Moisture Content

Moisture content tests were performed by weighing samples from the field at their in-situ moisture condition. These samples were then dried at a constant temperature (approximately 110° C) overnight in an oven. After drying, the samples were weighed to determine the dry weight of the sample and the weight of the water that was expelled during drying. The moisture content of the specimen is expressed as a percent and is the weight of the water compared to the dry weight of the specimen.

Hand Penetrometer Tests

In the hand penetrometer test, the unconfined compressive strength of a cohesive soil sample is estimated by measuring the resistance of the sample to the penetration of a small calibrated, spring-loaded cylinder. The maximum capacity of the penetrometer is 4.5 tons per square-foot (tsf). Theoretically, the undrained shear strength of the cohesive sample is one-half the unconfined compressive strength. The undrained shear strength (based on the hand penetrometer test) presented on the boring logs is reported in units of kips per square-foot (ksf).

Torvane Shear Tests

In the Torvane test, the shear strength of a low strength, cohesive soil sample is estimated by measuring the resistance of the sample to a torque applied through vanes inserted into the sample. The undrained shear strength of the samples is measured from the maximum torque required to shear the sample and is reported in units of kips per square-foot (ksf).

Loss-on-Ignition (Organic Content) Tests

Loss-on-ignition (LOI) tests are conducted by first weighing the sample and then heating the sample to dry the moisture from the sample (in the same manner as determining the moisture content of the soil). The sample is then re-weighed to determine the dry weight and then heated for 4 hours in a muffle furnace at a high temperature (approximately 440° C). After cooling, the sample is re-weighed to calculate the amount of ash remaining, which in turn is used to determine the amount of organic matter burned from the original dry sample. The organic matter content of the specimen is expressed as a percent compared to the dry weight of the sample.

Atterberg Limits Tests

Atterberg limits tests consist of two components. The plastic limit of a cohesive sample is determined by rolling the sample into a thread and the plastic limit is the moisture content where a 1/8-inch thread begins to crumble. The liquid limit is determined by placing a ½-inch thick soil pat into the liquid limits cup and using a grooving tool to divide the soil pat in half. The cup is then tapped on the base of the liquid limits device using a crank handle. The number of drops of the cup to close the gap formed by the grooving tool ½ inch is recorded along with the corresponding moisture content of the sample. This procedure is repeated several times at different moisture contents and a graph of moisture content and the corresponding number of blows is plotted. The liquid limit is defined as the moisture content at a nominal 25 drops of the cup. From this test, the plasticity index can be determined by subtracting the plastic limit from the liquid limit.

Grain Size Distribution Analysis

Coarse-Grained (Granular) Samples with Low Fines Content

Grain size distribution tests performed on granular samples involves oven-drying a representative sample of soil and washing out the fines (passing the No. 200 sieve) with tap water. The sample retained on the No. 200 sieve is then oven-dried, cooled and sieved on a series of stacked sieves beginning with the largest sieve on top and progressing to the smallest on the bottom. The portions of the sample retained on each sieve are then weighed and used to develop the grain size distribution curve in the report for each sample tested.

Fine-Grained (Silt or Clay) Samples or Coarse-Grained Samples with High Fines Content

Particle size distribution tests performed on fine-grained or coarse-grained samples with a high fines content involves oven-drying a representative sample and mixing the sample with a liquid deflocculant to disperse the soil particles. The slurry is placed in a graduated cylinder and shaken to suspend the soil particles in the slurry. The graduated cylinder is then placed on a tabletop; a calibrated hydrometer is floated in the slurry to determine its density. The hydrometer measurements are made at selected time intervals as the soil in the cylinder settles and slurry density decreases. When the hydrometer measurements are completed, the slurry is poured onto a No. 200 sieve and the fines are washed out with tap water. The sample retained on the No. 200 sieve is then oven-dried, cooled and sieved on a series of stacked sieves beginning with the largest sieve on top and progressing to the smallest on the bottom. The portions of the sample retained on each sieve are then weighed and used with the hydrometer data to develop the grain size distribution curve in the report for each sample tested.

Wet/Dry Density Tests

Wet/dry density tests involve extracting a representative soil sample from either a Shelby tube or sample liner, trimming the ends perpendicular to the length of the sample and measuring the length and diameter. The sample is then weighed, oven-dried and weighed again after drying. The wet density is equal to the wet weight of the sample (prior to drying) divided by the volume, while the dry density is the dry weight of the sample divided by the volume.

Unconfined Compressive Strength Tests

In addition to the hand penetrometer and Torvane tests, unconfined compression tests were performed to better estimate the undrained shear strength of selected cohesive samples recovered from either Shelby tubes or liners taken in conjunction with the Standard Penetration Test. In the unconfined compression test, the unconfined compressive strength of a soil sample is determined by axially loading the soil sample at a slow, constant rate of strain. The unconfined compressive strength is the maximum compressive stress in the soil sample, up to 15 percent strain. Theoretically, the undrained shear strength of the cohesive sample is one-half the unconfined compressive strength. The undrained shear strength presented on the boring logs is reported in units of kips per square-foot (ksf).

Corrosion Tests

The soil corrosion tests may include measuring the electrical resistivity, pH and concentrations of soluble chlorides and sulfates. Soil samples tested are generally taken from a composite of two or more selected soil samples with generally similar visual characteristics. The electrical resistivity of the selected soil samples was performed on natural-state and saturated samples using a Miller multi-combination meter with a soil box configured in a four-pin arrangement. pH tests are conducted in general accordance with Brighton Analytical's method reference EPA 150.1. The soil samples for the soluble sulfates and chlorides were prepared at a water-to-soil ratio of 2:1 and tested in general accordance with Brighton Analytical's method reference SW846-9056.

Moisture-Dry Density Relationships (Compaction) Tests

Moisture-dry density tests involve the preparation of a bulk soil sample by compacting the sample at a given energy into a calibrated mold with a known volume of 0.0333 cubic feet at various moisture contents. A graph of the moisture content vs. dry density is developed, which results in an inverted U-shaped curve. The maximum dry density is the peak of the curve and the corresponding moisture content is the optimum moisture. Two methods can be performed, namely:

Standard Proctor Method

This method involves a standard energy of 12,400 ft-lbs per cubic foot of soil volume to compact the sample. The sample is compacted in three layers of equal thickness using a 5.5-pound hammer dropped 12 inches using 25 blows per layer.

Modified Proctor Method

This method involves a modified energy of 56,000 ft-lbs per cubic foot of soil volume to compact the sample. The sample is compacted in five layers of equal thickness using a 10-pound hammer dropped 18 inches using 25 blows per layer.

Specific Gravity Tests

This test involves the determination of the ratio of the weight of a known volume of soil particles in air to weight of the same volume of water in air. The test is performed by oven drying a soil sample and placing the sample with water into a calibrated pycnometer, boiling the soil/water mixture, filling the pycnometer with distilled water to its calibration mark, weighing the pycnometer and soil/water mixture and measuring the temperature of the mixture. The specific gravity is equal to the weight of the dry soil particles multiplied by the specific gravity of distilled water at the temperature measured for the soil/water mixture divided by the sum of the weight of the dry soil particles plus the weight of the pycnometer, soil/water mixture plus the weight of the pycnometer plus water from the calibration curve developed for the pycnometer.

Direct Shear Tests

A bulk samples is compacted in a direct shear mold at a specified density and moisture content. Shear tests are then performed using the direct shear procedure. The direct shear test is performed at several overburden pressures or normal stresses that represent approximate potential stresses in the proposed construction. Values of both peak friction angle and residual friction angle are determined from the tests for each overburden pressure. The results of the direct shear tests are tabulated and plotted on the Direct Shear Test Plots in Appendix A.

Consolidation Tests

Consolidation tests are used to evaluate the magnitude and rate of consolidation of soil when it is restrained laterally and drained on the top and bottom while subjected to vertical load applied in controlled increments. The range of test loads applied is generally selected to represent the anticipated vertical stress conditions resulting from existing conditions and the proposed construction. Plots of the percent strain vs. log pressure are constructed from the data to assess consolidation characteristics, while the rate of consolidation is evaluated from plots of deformation vs. time for each vertical load increment.

Permeability Tests

The permeability of either relatively undisturbed or compacted soils can be determined by various laboratory test equipment including a triaxial cell, permeameter mold or from a liner sample. The type of permeability equipment used and test performed will be based on the soil type being evaluated.

Clay, Silt and Other Low Permeable Soil Samples

For samples with relatively low permeability characteristics, an undisturbed or compacted soil sample is placed in a triaxial cell. Prior to performing the permeability test, the sample must be fully saturated by forcing water into the sample using a backpressure (water under pressure from an air supply) which is slightly less than the cell pressure. Once the sample is saturated, water is forced through the top of the sample with pressure from an air supply (which is slightly less than the cell pressure) and water forced out of the bottom of the sample is measured in a burette. The volume of water displaced from the sample is recorded with time and from that information, the coefficient of permeability is calculated. This method is a constant head permeability test.

Sand Samples

Due to the nature of relatively clean granular soils, the use of a triaxial cell is generally not practical and the permeability of these types of soils is typically determined from either a liner sample (either recovered directly from a split-spoon in the field or a sample compacted in the liner) or a bulk sample compacted in a 6-inch diameter permeameter mold. A falling head permeability test can be performed on most granular samples by filling a standpipe with water and measuring the head drop with time. For highly permeable soils, the rate of drop in a falling head test may be too rapid to obtain reliable volume and time measurements. Thus, a constant head test will be required where a constant head of water is maintained, and the volume of water discharged from the sample is measured with time.

Triaxial Tests

Triaxial tests were conducted on samples trimmed from Shelby tubes or liners. There are several types of triaxial tests which can be performed and each are described below:

Unconsolidated-Undrained Triaxial Test Method

The strength and stress-strain relationships of a cylindrical soil sample are determined for a sample subjected to a selected confining fluid pressure in a triaxial chamber. No drainage of the sample is permitted during the test and the sample is sheared in compression at a constant rate of axial deformation. The peak stress measured for the sample is recorded, up to a maximum 15 percent strain. At least three triaxial tests are performed at various confining fluid pressures to model in-situ stress conditions for loading. A plot of the Mohr circles at failure stress for each confining pressure is included in Appendix A.

Consolidated-Drained Triaxial Test Method

The strength and stress-strain relationships of a cylindrical soil sample are determined for a sample subjected to a selected confining fluid pressure in a triaxial chamber. The sample is isotropically consolidated prior to applying axial loads and sheared in compression at a slow constant rate of axial deformation while allowing the sample to drain. The peak stress measured for the sample is recorded, up to a maximum 15 percent strain. At least three triaxial tests are performed at various confining fluid pressures to model in-situ stress conditions for loading. A plot of the Mohr circles at failure stress for each confining pressure is included in Appendix A.

Consolidated-Undrained Triaxial Test Method

The strength and stress-strain relationships of a cylindrical soil sample are determined for a sample subjected to a selected confining fluid pressure in a triaxial chamber. The sample is isotropically consolidated prior to applying axial loads and sheared undrained in compression at a constant rate of axial deformation. Pore water pressure measurements can also be measured during the shearing of the sample. The peak stress measured for the sample is recorded, up to a maximum 15 percent strain. At least three triaxial tests are performed at various confining fluid pressures to model in-situ stress conditions for loading. A plot of the Mohr circles at failure stress for each confining pressure is included in Appendix A.

Density Tests on Rock Cores

Density tests involve trimming the ends of an intact rock core sample perpendicular to the length of the sample and measuring the length and diameter. The sample is then weighed and the weight is divided by the volume to calculate the density.

Unconfined Compressive Strength Tests on Rock Cores

Unconfined compression tests were performed to estimate the compressive strength of selected rock core samples. Representative rock cores were selected and cut perpendicular to the length of the sample on both ends to a specified length with a wet saw. In the unconfined compression test, the unconfined compressive strength of a rock core sample is determined by axially loading the rock core sample at a slow, constant rate of strain. The unconfined compressive strength is the maximum compressive stress in the rock core sample or the load applied when a predetermined amount of strain is achieved.

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

APPENDIX B:

TABLE B1: SEDIMENT ANALYTICAL RESULTS

ENVIRONMENTAL ANALYTICAL DATA

TABLE B1: SEDIMENT ANALYTICAL RESULTS
DESIGN/BUILD DATA FOR M-222 SLOPE STABILIZATION
ALLEGAN, MICHIGAN
SME Project No. KG59756

		Part 201 Soil Generic Residential and Commercial I Cleanup Criteria and Screening Levels							Sample ID Depth Below Grade (inches) Date Collected			
Constituent	**CAS Number**	**Drinking Water Protection Criteria**	**Groundwater Surface Water Interface Protection Criteria**	**Groundwater Contact Protection Criteria**	**Soil Volatilization to Indoor Air Inhalation Criteria**	**Infinite Source Volatile Soil Inhalation Criteria**	**Particulate Soil Inhalation Criteria**	**Direct Contact Criteria**	**B101 0" - 36" 11/10/2010**	**B102 0" - 26" 11/10/2010**	**B103 0" - 66" 11/10/2010**	**B104 0" - 26" 11/10/2010**
VOCs (ug/kg)												
VOCs	CS	CS	CS	CS	CS	CS	CS	CS	<RL	<RL	<RL	<RL
SVOCs (ug/kg)												
SVOCs	CS	CS	CS	CS	CS	CS	CS	CS	<RL	<RL	<RL	<RL
PCBs (ug/kg)												
PCBs	CS	CS	CS	CS	CS	CS	CS	CS	<330	<330	<330	<330
Metals (ug/kg)												
Arsenic	7440382	5,800^	23,000***	2,000,000	NLV	NLV	720,000	7,600	4,000	2,800	4,800	1,800
Barium	7440393	1,300,000	440,000*	1,000,000,000	NLV	NLV	330,000,000	37,000,000	34,000	32,000	39,000	100,000
Cadmium	7440439	6,000	3,000*	230,000,000	NLV	NLV	1,700,000	550,000	63	70	100	220
Chromium, total**	16065831	30,000	18,000^	140,000,000	NLV	NLV	330,000,000	2,500,000	11,000	8,400	11,000	16,000
Copper	7440508	5,800,000	73,000*	1,000,000,000	NLV	NLV	130,000,000	20,000,000	11,000	8,500	13,000	21,000
Lead	7439921	700,000	2,500,000*	ID	NLV	NLV	**100,000,000**	400,000	7,400	5,700	9,500	11,000
Mercury	7439966	1,700	130^	47000	48,000	52,000	20,000,000	160,000	<50	<50	67	54
Selenium	7782492	4,000	**410^**	78,000,000	NLV	NLV	130,000,000	2,600,000	280	220	310	**1,000**
Silver	7440224	4,500	1,000^	200,000,000	NLV	NLV	6,700,000	2,500,000	<100	<100	<100	<100
Zinc	7440666	2,400,000	170,000*	1,000,000,000	NLV	NLV	ID	170,000,000	43,000	24,000	45,000	79,000

NOTES:
1. VOCs - Volatile Organic Compounds; SVOCs - Semi-volatile Organic Compounds; PCBs - Polychlorinated Biphenyls
2. Concentrations reported in micrograms per kilogram (ug/kg).
3. Highlighted and bolded concentrations exceed the most restrictive applicable Part 201 cleanup criteria and screening levels, where available.
4. Criteria taken from RRD Operational Memorandum #1, Table 2, Soil: Residential and Commercial I Part 201 Generic Cleanup Criteria and Screening levels, dated January 23, 2006.
5. CS - Criterion is specific to individual constituent.
6. <RL - Analytical result was less than the respective reporting limit.
7. ID - Insufficient data to develop criterion.
8. NLV - Chemical is not likely to volatilize
9. ^ - Statewide Default Background Level used as criterion because it was greater than the listed Drinking Water Protection Criterion or the Groundwater Surface Water Interface Protection Criterion. For chromium, this is the statewide default value for total chromium.
10. * - Groundwater Surface Water Interface Protection Criterion depends on the water hardness of the receiving water. In accordance with MDEQ Operational Memo No. 5, a water hardness of 150 mg CaCO3/L was used for the waters of the southern lower peninsula of Michigan. The criteria are protective for surface water that is used as a drinking water source.
11. ** - Total chromium value is compared to the hexavalent chromium criteria.
12. *** - Criterion is protective of surface water that is used as a drinking water source.

Fibertec
environmental
services

November 19, 2010

Case Narrative

Customer: SME
Project Identification: M-222 Slope Evaluation/KG59756
Fibertec Project Number: 42026

Sample Collection/ Receipt
The following samples were collected on November 10, 2010 and received by Fibertec on November 12, 2010.
4 Soil Samples
All samples were received on ice and in good condition.

Analysis
Analyses were conducted in accordance with chain of custody and within hold times.

All applicable quality assurance / quality control parameters were within acceptance limits unless otherwise noted.

Sample data has been reviewed, and reported results remain valid.

Kyleen Crandall
Authorized Signature

11/19/10
Date

1914 Holloway Drive Holt, Michigan 48842
11766 Grand River Brighton, Michigan 48116
Telephone: (517) 699-0345
Telephone: (810) 220-3300
Facsimile: (517) 699-0388
Facsimile: (810) 220-3311

Fibertec
environmental
services

Monday, November 22, 2010

Fibertec Project Number:	42026
Project Identification:	M-222 Slope Evaluation /KG59756
Submittal Date:	11/12/2010

Mr. Davin Ojala
Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Dear Mr. Ojala,

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

1914 Holloway Drive *Holt, MI 48842* *T: (517) 699-0345* *F: (517) 699-0388*
11766 E. Grand River *Brighton, MI 48116* *T: (810) 220-3300* *F: (810) 220-3311*
8660 S. Mackinaw Trail *Cadillac, MI 49601* *T: (231) 775-8368* *F: (231) 775-8584*

lab@fibertec.us

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B101 0"-36"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**1**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) — **Aliquot ID: 42026-001A** — **Matrix: Soil/Solid** — **Analyst: BMG**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	**19**		%	0.1	1.0	11/16/10	MC101116	11/17/10	MC101116

Michigan 10 Elements by ICP/MS (EPA 3050B/EPA 6020A) — **Aliquot ID: 42026-001A** — **Matrix: Soil/Solid** — **Analyst: MAP**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	**4000**		µg/kg	100	20	11/17/10	PT10K17E	11/18/10	T210K18A
2. Barium	**34000**		µg/kg	1000	20	11/17/10	PT10K17E	11/18/10	T210K18A
3. Cadmium	**63**		µg/kg	50	20	11/17/10	PT10K17E	11/18/10	T210K18A
4. Chromium	**11000**		µg/kg	500	20	11/17/10	PT10K17E	11/18/10	T210K18A
5. Copper	**11000**		µg/kg	1000	20	11/17/10	PT10K17E	11/18/10	T210K18A
6. Lead	**7400**		µg/kg	1000	20	11/17/10	PT10K17E	11/18/10	T210K18A
7. Selenium	**280**		µg/kg	200	20	11/17/10	PT10K17E	11/18/10	T210K18A
8. Silver	U		µg/kg	100	20	11/17/10	PT10K17E	11/18/10	T210K18A
9. Zinc	**43000**		µg/kg	1000	20	11/17/10	PT10K17E	11/18/10	T210K18A

Mercury by CVAAS (EPA 7471A) — **Aliquot ID: 42026-001A** — **Matrix: Soil/Solid** — **Analyst: MAP**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	U		µg/kg	50	10	11/18/10	PM10K18A	11/18/10	M410K18A

Polychlorinated Biphenyls (PCBs) (EPA 3550B/EPA 8082A) — **Aliquot ID: 42026-001A** — **Matrix: Soil/Solid** — **Analyst: BDA**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Aroclor-1016	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
2. Aroclor-1221	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
3. Aroclor-1232	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
4. Aroclor-1242	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
5. Aroclor-1248	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
6. Aroclor-1254	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
7. Aroclor-1260	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
8. Aroclor-1262 (NN)	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
9. Aroclor-1268 (NN)	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) — **Aliquot ID: 42026-001** — **Matrix: Soil/Solid** — **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/kg	1000	1.0	11/16/10	V310K16B	11/16/10	V310K16B
2. Acrylonitrile	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
3. Benzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
4. Bromobenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
5. Bromochloromethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B101 0"-36"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**1**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) **Aliquot ID: 42026-001** **Matrix: Soil/Solid** **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
6. Bromodichloromethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
7. Bromoform	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
8. Bromomethane	U		µg/kg	200	1.0	11/16/10	V310K16B	11/16/10	V310K16B
9. 2-Butanone	U		µg/kg	750	1.0	11/16/10	V310K16B	11/16/10	V310K16B
10. n-Butylbenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
11. sec-Butylbenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
12. tert-Butylbenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
13. Carbon Disulfide	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
14. Carbon Tetrachloride	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
15. Chlorobenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
16. Chloroethane	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
17. Chloroform	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
18. Chloromethane	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
19. 2-Chlorotoluene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
20. Dibromochloromethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
21. 1,2-Dibromo-3-chloropropane	U		µg/kg	12	1.0	11/16/10	V310K16B	11/16/10	V310K16B
22. Dibromomethane	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
28. 1,2-Dichloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
35. Ethylbenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
36. Ethylene Dibromide	U		µg/kg	25	1.0	11/16/10	V310K16B	11/16/10	V310K16B
37. 2-Hexanone	U		µg/kg	2500	1.0	11/16/10	V310K16B	11/16/10	V310K16B
38. Isopropylbenzene	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
39. Methyl Iodide	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
40. Methylene Chloride	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
41. 2-Methylnaphthalene (NN)	U		µg/kg	330	1.0	11/16/10	V310K16B	11/16/10	V310K16B
42. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	11/16/10	V310K16B	11/16/10	V310K16B
43. MTBE	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
44. Naphthalene	U		µg/kg	330	1.0	11/16/10	V310K16B	11/16/10	V310K16B
45. n-Propylbenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B101 0"-36"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**1**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) **Aliquot ID: 42026-001** **Matrix: Soil/Solid** **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
46. Styrene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
47. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
48. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
49. Tetrachloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
50. Toluene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
51. 1,2,4-Trichlorobenzene	U		µg/kg	330	1.0	11/16/10	V310K16B	11/16/10	V310K16B
52. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
53. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
54. Trichloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
55. Trichlorofluoromethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
56. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
57. 1,2,3-Trimethylbenzene (NN)	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
58. 1,2,4-Trimethylbenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
59. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
60. Vinyl Chloride	U		µg/kg	40	1.0	11/16/10	V310K16B	11/16/10	V310K16B
61. Xylenes	U		µg/kg	150	1.0	11/16/10	V310K16B	11/16/10	V310K16B

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-001A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
2. Acenaphthylene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
3. Aniline	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
4. Anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
5. Azobenzene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
6. Benzo(a)anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
7. Benzo(a)pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
8. Benzo(b)fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
9. Benzo(ghi)perylene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
10. Benzo(k)fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
11. Benzyl Alcohol	U		µg/kg	3300	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
12. Bis(2-chloroethoxy)methane	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
13. Bis(2-chloroethyl)ether (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
14. Bis(2-chloroisopropyl) Ether	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
15. Bis(2-ethylhexyl)phthalate (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
16. 4-Bromophenyl Phenylether (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
17. Butyl Benzyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
18. Carbazole	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
19. 4-Chloro-3-methylphenol	U		µg/kg	280	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
20. 2-Chloronaphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
21. 2-Chlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B101 0"-36"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**1**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis.

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-001A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
22. 4-Chlorophenyl Phenylether	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
23. Chrysene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
24. Dibenzo(a,h)anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
25. Dibenzofuran	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
26. 2,4-Dichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
27. Diethyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
28. Dimethyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
29. 2,4-Dimethylphenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
30. Di-n-butyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
31. 2,4-Dinitrophenol	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
32. 2,4-Dinitrotoluene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
33. 2,6-Dinitrotoluene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
34. Di-n-octyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
35. Fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
36. Fluorene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
37. Hexachlorobenzene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
38. Hexachlorobutadiene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
39. Hexachlorocyclopentadiene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
40. Indeno(1,2,3-cd)pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
41. Isophorone	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
42. 2-Methyl-4,6-dinitrophenol (NN)	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
43. 2-Methylnaphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
44. 2-Methylphenol (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
45. 3&4-Methylphenol (NN)	U		µg/kg	660	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
46. Naphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
47. 2-Nitroaniline	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
48. 3-Nitroaniline	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
49. 4-Nitroaniline	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
50. Nitrobenzene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
51. 2-Nitrophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
52. 4-Nitrophenol	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
53. N-Nitrosodimethylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
54. N-Nitrosodi-n-propylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
55. N-Nitrosodiphenylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
56. Pentachlorophenol	U		µg/kg	800	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
57. Phenanthrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
58. Phenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
59. Pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
60. Pyridine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
61. 2,4,5-Trichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B101 0"-36"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**1**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis.

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-001A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
62 2,4,6-Trichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B102 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**2**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) — **Aliquot ID: 42026-002A** — **Matrix: Soil/Solid** — **Analyst: BMG**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	**22**		%	0.1	1.0	11/16/10	MC101116	11/17/10	MC101116

Michigan 10 Elements by ICP/MS (EPA 3050B/EPA 6020A) — **Aliquot ID: 42026-002A** — **Matrix: Soil/Solid** — **Analyst: MAP**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	**2800**		µg/kg	100	20	11/17/10	PT10K17E	11/17/10	T210K17C
2. Barium	**32000**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C
3. Cadmium	**70**		µg/kg	50	20	11/17/10	PT10K17E	11/17/10	T210K17C
4. Chromium	**8400**		µg/kg	500	20	11/17/10	PT10K17E	11/17/10	T210K17C
5. Copper	**8500**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C
6. Lead	**5700**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C
7. Selenium	**220**		µg/kg	200	20	11/17/10	PT10K17E	11/17/10	T210K17C
8. Silver	U		µg/kg	100	20	11/17/10	PT10K17E	11/17/10	T210K17C
9. Zinc	**24000**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C

Mercury by CVAAS (EPA 7471A) — **Aliquot ID: 42026-002A** — **Matrix: Soil/Solid** — **Analyst: MAP**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	U		µg/kg	50	10	11/18/10	PM10K18A	11/18/10	M410K18A

Polychlorinated Biphenyls (PCBs) (EPA 3550B/EPA 8082A) — **Aliquot ID: 42026-002A** — **Matrix: Soil/Solid** — **Analyst: BDA**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Aroclor-1016	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
2. Aroclor-1221	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
3. Aroclor-1232	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
4. Aroclor-1242	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
5. Aroclor-1248	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
6. Aroclor-1254	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
7. Aroclor-1260	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
8. Aroclor-1262 (NN)	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
9. Aroclor-1268 (NN)	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) — **Aliquot ID: 42026-002** — **Matrix: Soil/Solid** — **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/kg	1000	1.0	11/16/10	V310K16B	11/16/10	V310K16B
2. Acrylonitrile	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
3. Benzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
4. Bromobenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
5. Bromochloromethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B

Client Identification:	**Soil and Materials Engineers, inc. - Kalamazoo**	Sample Description:	**B102 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**2**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) **Aliquot ID: 42026-002** **Matrix: Soil/Solid** **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
6. Bromodichloromethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
7. Bromoform	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
8. Bromomethane	U		µg/kg	200	1.0	11/16/10	V310K16B	11/16/10	V310K16B
9. 2-Butanone	U		µg/kg	750	1.0	11/16/10	V310K16B	11/16/10	V310K16B
10. n-Butylbenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
11. sec-Butylbenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
12. tert-Butylbenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
13. Carbon Disulfide	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
14. Carbon Tetrachloride	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
15. Chlorobenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
16. Chloroethane	U		µg/kg	260	1.0	11/16/10	V310K16B	11/16/10	V310K16B
17. Chloroform	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
18. Chloromethane	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
19. 2-Chlorotoluene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
20. Dibromochloromethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
21. 1,2-Dibromo-3-chloropropane	U		µg/kg	13	1.0	11/16/10	V310K16B	11/16/10	V310K16B
22. Dibromomethane	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
28. 1,2-Dichloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
35. Ethylbenzene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
36. Ethylene Dibromide	U		µg/kg	26	1.0	11/16/10	V310K16B	11/16/10	V310K16B
37. 2-Hexanone	U		µg/kg	2500	1.0	11/16/10	V310K16B	11/16/10	V310K16B
38. Isopropylbenzene	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
39. Methyl Iodide	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
40. Methylene Chloride	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
41. 2-Methylnaphthalene (NN)	U		µg/kg	330	1.0	11/16/10	V310K16B	11/16/10	V310K16B
42. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	11/16/10	V310K16B	11/16/10	V310K16B
43. MTBE	U		µg/kg	250	1.0	11/16/10	V310K16B	11/16/10	V310K16B
44. Naphthalene	U		µg/kg	330	1.0	11/16/10	V310K16B	11/16/10	V310K16B
45. n-Propylbenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B102 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**2**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) **Aliquot ID: 42026-002** **Matrix: Soil/Solid** **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
46. Styrene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
47. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
48. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
49. Tetrachloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
50. Toluene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
51. 1,2,4-Trichlorobenzene	U		µg/kg	330	1.0	11/16/10	V310K16B	11/16/10	V310K16B
52. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
53. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
54. Trichloroethene	U		µg/kg	50	1.0	11/16/10	V310K16B	11/16/10	V310K16B
55. Trichlorofluoromethane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
56. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
57. 1,2,3-Trimethylbenzene (NN)	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
58. 1,2,4-Trimethylbenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
59. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	11/16/10	V310K16B	11/16/10	V310K16B
60. Vinyl Chloride	U		µg/kg	40	1.0	11/16/10	V310K16B	11/16/10	V310K16B
61. Xylenes	U		µg/kg	150	1.0	11/16/10	V310K16B	11/16/10	V310K16B

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-002A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
2. Acenaphthylene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
3. Aniline	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
4. Anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
5. Azobenzene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
6. Benzo(a)anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
7. Benzo(a)pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
8. Benzo(b)fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
9. Benzo(ghi)perylene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
10. Benzo(k)fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
11. Benzyl Alcohol	U		µg/kg	3300	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
12. Bis(2-chloroethoxy)methane	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
13. Bis(2-chloroethyl)ether (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
14. Bis(2-chloroisopropyl) Ether	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
15. Bis(2-ethylhexyl)phthalate (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
16. 4-Bromophenyl Phenylether (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
17. Butyl Benzyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
18. Carbazole	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
19. 4-Chloro-3-methylphenol	U		µg/kg	280	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
20. 2-Chloronaphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
21. 2-Chlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B102 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**2**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis.

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-002A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
22. 4-Chlorophenyl Phenylether	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
23. Chrysene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
24. Dibenzo(a,h)anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
25. Dibenzofuran	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
26. 2,4-Dichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
27. Diethyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
28. Dimethyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
29. 2,4-Dimethylphenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
30. Di-n-butyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
31. 2,4-Dinitrophenol	U		µg/kg	860	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
32. 2,4-Dinitrotoluene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
33. 2,6-Dinitrotoluene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
34. Di-n-octyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
35. Fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
36. Fluorene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
37. Hexachlorobenzene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
38. Hexachlorobutadiene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
39. Hexachlorocyclopentadiene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
40. Indeno(1,2,3-cd)pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
41. Isophorone	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
42. 2-Methyl-4,6-dinitrophenol (NN)	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
43. 2-Methylnaphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
44. 2-Methylphenol (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
45. 3&4-Methylphenol (NN)	U		µg/kg	660	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
46. Naphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
47. 2-Nitroaniline	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
48. 3-Nitroaniline	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
49. 4-Nitroaniline	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
50. Nitrobenzene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
51. 2-Nitrophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
52. 4-Nitrophenol	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
53. N-Nitrosodimethylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
54. N-Nitrosodi-n-propylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
55. N-Nitrosodiphenylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
56. Pentachlorophenol	U		µg/kg	800	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
57. Phenanthrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
58. Phenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
59. Pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
60. Pyridine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
61. 2,4,5-Trichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B102 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**2**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	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 NN: Parameter not included in NELAC Scope of Analysis.

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-002A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
62 2,4,6-Trichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B103 0"-66"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**3**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**12:05**

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 NN: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) — **Aliquot ID: 42026-003A** — **Matrix: Soil/Solid** — **Analyst: BMG**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	**26**		%	0.1	1.0	11/16/10	MC101116	11/17/10	MC101116

Michigan 10 Elements by ICP/MS (EPA 3050B/EPA 6020A) — **Aliquot ID: 42026-003A** — **Matrix: Soil/Solid** — **Analyst: MAP**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	**4800**		µg/kg	100	20	11/17/10	PT10K17E	11/17/10	T210K17C
2. Barium	**39000**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C
3. Cadmium	**100**		µg/kg	50	20	11/17/10	PT10K17E	11/17/10	T210K17C
4. Chromium	**11000**		µg/kg	500	20	11/17/10	PT10K17E	11/17/10	T210K17C
5. Copper	**13000**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C
6. Lead	**9500**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C
7. Selenium	**310**		µg/kg	200	20	11/17/10	PT10K17E	11/17/10	T210K17C
8. Silver	U		µg/kg	100	20	11/17/10	PT10K17E	11/17/10	T210K17C
9. Zinc	**45000**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C

Mercury by CVAAS (EPA 7471A) — **Aliquot ID: 42026-003A** — **Matrix: Soil/Solid** — **Analyst: MAP**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	**67**		µg/kg	50	10	11/18/10	PM10K18A	11/18/10	M410K18A

Polychlorinated Biphenyls (PCBs) (EPA 3550B/EPA 8082A) — **Aliquot ID: 42026-003A** — **Matrix: Soil/Solid** — **Analyst: BDA**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Aroclor-1016	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
2. Aroclor-1221	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
3. Aroclor-1232	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
4. Aroclor-1242	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
5. Aroclor-1248	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
6. Aroclor-1254	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
7. Aroclor-1260	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
8. Aroclor-1262 (NN)	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
9. Aroclor-1268 (NN)	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) — **Aliquot ID: 42026-003** — **Matrix: Soil/Solid** — **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/kg	1000	1.0	11/18/10	V910K18B	11/19/10	V910K18B
2. Acrylonitrile	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
3. Benzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
4. Bromobenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
5. Bromochloromethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B103 0"-66"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**3**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**12:05**

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 NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) **Aliquot ID: 42026-003** **Matrix: Soil/Solid** **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
6. Bromodichloromethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
7. Bromoform	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
8. Bromomethane	U		µg/kg	200	1.0	11/18/10	V910K18B	11/19/10	V910K18B
9. 2-Butanone	U		µg/kg	750	1.0	11/18/10	V910K18B	11/19/10	V910K18B
10. n-Butylbenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
11. sec-Butylbenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
12. tert-Butylbenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
13. Carbon Disulfide	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
14. Carbon Tetrachloride	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
15. Chlorobenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
16. Chloroethane	U		µg/kg	340	1.0	11/18/10	V910K18B	11/19/10	V910K18B
17. Chloroform	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
18. Chloromethane	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
19. 2-Chlorotoluene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
20. Dibromochloromethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
21. 1,2-Dibromo-3-chloropropane	U		µg/kg	34	1.0	11/18/10	V910K18B	11/19/10	V910K18B
22. Dibromomethane	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
28. 1,2-Dichloroethane	U		µg/kg	68	1.0	11/18/10	V910K18B	11/19/10	V910K18B
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
35. Ethylbenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
36. Ethylene Dibromide	U		µg/kg	27	1.0	11/18/10	V910K18B	11/19/10	V910K18B
37. 2-Hexanone	U		µg/kg	2500	1.0	11/18/10	V910K18B	11/19/10	V910K18B
38. Isopropylbenzene	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
39. Methyl Iodide	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
40. Methylene Chloride	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
41. 2-Methylnaphthalene (NN)	U		µg/kg	330	1.0	11/18/10	V910K18B	11/19/10	V910K18B
42. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	11/18/10	V910K18B	11/19/10	V910K18B
43. MTBE	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
44. Naphthalene	U		µg/kg	330	1.0	11/18/10	V910K18B	11/19/10	V910K18B
45. n-Propylbenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B103 0"-66"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**3**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**12:05**

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 NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) **Aliquot ID: 42026-003** **Matrix: Soil/Solid** **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
46. Styrene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
47. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
48. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
49. Tetrachloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
50. Toluene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
51. 1,2,4-Trichlorobenzene	U		µg/kg	330	1.0	11/18/10	V910K18B	11/19/10	V910K18B
52. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
53. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
54. Trichloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
55. Trichlorofluoromethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
56. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
57. 1,2,3-Trimethylbenzene (NN)	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
58. 1,2,4-Trimethylbenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
59. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
60. Vinyl Chloride	U		µg/kg	40	1.0	11/18/10	V910K18B	11/19/10	V910K18B
61. Xylenes	U		µg/kg	150	1.0	11/18/10	V910K18B	11/19/10	V910K18B

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-003A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
2. Acenaphthylene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
3. Aniline	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
4. Anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
5. Azobenzene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
6. Benzo(a)anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
7. Benzo(a)pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
8. Benzo(b)fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
9. Benzo(ghi)perylene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
10. Benzo(k)fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
11. Benzyl Alcohol	U		µg/kg	3300	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
12. Bis(2-chloroethoxy)methane	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
13. Bis(2-chloroethyl)ether (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
14. Bis(2-chloroisopropyl) Ether	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
15. Bis(2-ethylhexyl)phthalate (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
16. 4-Bromophenyl Phenylether (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
17. Butyl Benzyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
18. Carbazole	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
19. 4-Chloro-3-methylphenol	U		µg/kg	280	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
20. 2-Chloronaphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
21. 2-Chlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B103 0"-66"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**3**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**12:05**

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 NN: Parameter not included in NELAC Scope of Analysis.

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-003A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
22. 4-Chlorophenyl Phenylether	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
23. Chrysene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
24. Dibenzo(a,h)anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
25. Dibenzofuran	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
26. 2,4-Dichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
27. Diethyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
28. Dimethyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
29. 2,4-Dimethylphenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
30. Di-n-butyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
31. 2,4-Dinitrophenol	U		µg/kg	900	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
32. 2,4-Dinitrotoluene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
33. 2,6-Dinitrotoluene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
34. Di-n-octyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
35. Fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
36. Fluorene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
37. Hexachlorobenzene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
38. Hexachlorobutadiene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
39. Hexachlorocyclopentadiene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
40. Indeno(1,2,3-cd)pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
41. Isophorone	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
42. 2-Methyl-4,6-dinitrophenol (NN)	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
43. 2-Methylnaphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
44. 2-Methylphenol (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
45. 3&4-Methylphenol (NN)	U		µg/kg	660	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
46. Naphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
47. 2-Nitroaniline	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
48. 3-Nitroaniline	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
49. 4-Nitroaniline	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
50. Nitrobenzene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
51. 2-Nitrophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
52. 4-Nitrophenol	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
53. N-Nitrosodimethylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
54. N-Nitrosodi-n-propylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
55. N-Nitrosodiphenylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
56. Pentachlorophenol	U		µg/kg	800	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
57. Phenanthrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
58. Phenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
59. Pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
60. Pyridine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
61. 2,4,5-Trichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B103 0"-66"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**3**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**12:05**

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 NN: Parameter not included in NELAC Scope of Analysis.

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-003A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
62 2,4,6-Trichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B104 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**4**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:20**

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 NN: Parameter not included in NELAC Scope of Analysis.

Dry Weight Determination (ASTM D 2974-87) — **Aliquot ID: 42026-004A** — **Matrix: Soil/Solid** — **Analyst: BMG**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Percent Moisture (Water Content) (NN)	**43**		%	0.1	1.0	11/16/10	MC101116	11/17/10	MC101116

Michigan 10 Elements by ICP/MS (EPA 3050B/EPA 6020A) — **Aliquot ID: 42026-004A** — **Matrix: Soil/Solid** — **Analyst: MAP**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Arsenic	**1800**		µg/kg	100	20	11/17/10	PT10K17E	11/17/10	T210K17C
2. Barium	**100000**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C
3. Cadmium	**220**		µg/kg	50	20	11/17/10	PT10K17E	11/17/10	T210K17C
4. Chromium	**16000**		µg/kg	500	20	11/17/10	PT10K17E	11/17/10	T210K17C
5. Copper	**21000**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C
6. Lead	**11000**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C
7. Selenium	**1000**		µg/kg	200	20	11/17/10	PT10K17E	11/17/10	T210K17C
8. Silver	U		µg/kg	100	20	11/17/10	PT10K17E	11/17/10	T210K17C
9. Zinc	**79000**		µg/kg	1000	20	11/17/10	PT10K17E	11/17/10	T210K17C

Mercury by CVAAS (EPA 7471A) — **Aliquot ID: 42026-004A** — **Matrix: Soil/Solid** — **Analyst: MAP**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Mercury	**54**		µg/kg	50	10	11/18/10	PM10K18A	11/18/10	M410K18A

Polychlorinated Biphenyls (PCBs) (EPA 3550B/EPA 8082A) — **Aliquot ID: 42026-004A** — **Matrix: Soil/Solid** — **Analyst: BDA**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Aroclor-1016	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
2. Aroclor-1221	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
3. Aroclor-1232	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
4. Aroclor-1242	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
5. Aroclor-1248	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
6. Aroclor-1254	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
7. Aroclor-1260	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
8. Aroclor-1262 (NN)	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A
9. Aroclor-1268 (NN)	U		µg/kg	330	10	11/16/10	PS10K16E	11/17/10	SB10K17A

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) — **Aliquot ID: 42026-004** — **Matrix: Soil/Solid** — **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acetone	U		µg/kg	1000	1.0	11/18/10	V910K18B	11/19/10	V910K18B
2. Acrylonitrile	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
3. Benzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
4. Bromobenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
5. Bromochloromethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B104 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**4**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:20**

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 NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) **Aliquot ID: 42026-004** **Matrix: Soil/Solid** **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
6. Bromodichloromethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
7. Bromoform	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
8. Bromomethane	U		µg/kg	200	1.0	11/18/10	V910K18B	11/19/10	V910K18B
9. 2-Butanone	U		µg/kg	750	1.0	11/18/10	V910K18B	11/19/10	V910K18B
10. n-Butylbenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
11. sec-Butylbenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
12. tert-Butylbenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
13. Carbon Disulfide	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
14. Carbon Tetrachloride	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
15. Chlorobenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
16. Chloroethane	U		µg/kg	440	1.0	11/18/10	V910K18B	11/19/10	V910K18B
17. Chloroform	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
18. Chloromethane	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
19. 2-Chlorotoluene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
20. Dibromochloromethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
21. 1,2-Dibromo-3-chloropropane	U		µg/kg	44	1.0	11/18/10	V910K18B	11/19/10	V910K18B
22. Dibromomethane	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
28. 1,2-Dichloroethane	U		µg/kg	88	1.0	11/18/10	V910K18B	11/19/10	V910K18B
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
35. Ethylbenzene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
36. Ethylene Dibromide	U		µg/kg	35	1.0	11/18/10	V910K18B	11/19/10	V910K18B
37. 2-Hexanone	U		µg/kg	2500	1.0	11/18/10	V910K18B	11/19/10	V910K18B
38. Isopropylbenzene	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
39. Methyl Iodide	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
40. Methylene Chloride	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
41. 2-Methylnaphthalene (NN)	U		µg/kg	330	1.0	11/18/10	V910K18B	11/19/10	V910K18B
42. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	11/18/10	V910K18B	11/19/10	V910K18B
43. MTBE	U		µg/kg	250	1.0	11/18/10	V910K18B	11/19/10	V910K18B
44. Naphthalene	U		µg/kg	330	1.0	11/18/10	V910K18B	11/19/10	V910K18B
45. n-Propylbenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B104 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**4**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:20**

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 NN: Parameter not included in NELAC Scope of Analysis.

Volatile Organic Compounds (VOCs) by GC/MS, 5035 (EPA 5035/EPA 8260B) **Aliquot ID: 42026-004** **Matrix: Soil/Solid** **Analyst: JAS**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
46. Styrene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
47. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
48. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
49. Tetrachloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
50. Toluene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
51. 1,2,4-Trichlorobenzene	U		µg/kg	330	1.0	11/18/10	V910K18B	11/19/10	V910K18B
52. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
53. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
54. Trichloroethene	U		µg/kg	50	1.0	11/18/10	V910K18B	11/19/10	V910K18B
55. Trichlorofluoromethane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
56. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
57. 1,2,3-Trimethylbenzene (NN)	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
58. 1,2,4-Trimethylbenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
59. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	11/18/10	V910K18B	11/19/10	V910K18B
60. Vinyl Chloride	U		µg/kg	44	1.0	11/18/10	V910K18B	11/19/10	V910K18B
61. Xylenes	U		µg/kg	150	1.0	11/18/10	V910K18B	11/19/10	V910K18B

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-004A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
1. Acenaphthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
2. Acenaphthylene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
3. Aniline	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
4. Anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
5. Azobenzene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
6. Benzo(a)anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
7. Benzo(a)pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
8. Benzo(b)fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
9. Benzo(ghi)perylene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
10. Benzo(k)fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
11. Benzyl Alcohol	U		µg/kg	3300	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
12. Bis(2-chloroethoxy)methane	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
13. Bis(2-chloroethyl)ether (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
14. Bis(2-chloroisopropyl) Ether	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
15. Bis(2-ethylhexyl)phthalate (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
16. 4-Bromophenyl Phenylether (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
17. Butyl Benzyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
18. Carbazole	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
19. 4-Chloro-3-methylphenol	U		µg/kg	260	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
20. 2-Chloronaphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
21. 2-Chlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B104 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**4**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:20**

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 NN: Parameter not included in NELAC Scope of Analysis

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-004A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
22. 4-Chlorophenyl Phenylether	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
23. Chrysene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
24. Dibenzo(a,h)anthracene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
25. Dibenzofuran	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
26. 2,4-Dichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
27. Diethyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
28. Dimethyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
29. 2,4-Dimethylphenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
30. Di-n-butyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
31. 2,4-Dinitrophenol	U		µg/kg	1200	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
32. 2,4-Dinitrotoluene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
33. 2,6-Dinitrotoluene (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
34. Di-n-octyl Phthalate	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
35. Fluoranthene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
36. Fluorene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
37. Hexachlorobenzene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
38. Hexachlorobutadiene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
39. Hexachlorocyclopentadiene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
40. Indeno(1,2,3-cd)pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
41. Isophorone	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
42. 2-Methyl-4,6-dinitrophenol (NN)	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
43. 2-Methylnaphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
44. 2-Methylphenol (NN)	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
45. 3&4-Methylphenol (NN)	U		µg/kg	660	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
46. Naphthalene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
47. 2-Nitroaniline	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
48. 3-Nitroaniline	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
49. 4-Nitroaniline	U		µg/kg	630	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
50. Nitrobenzene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
51. 2-Nitrophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
52. 4-Nitrophenol	U		µg/kg	830	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
53. N-Nitrosodimethylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
54. N-Nitrosodi-n-propylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
55. N-Nitrosodiphenylamine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
56. Pentachlorophenol	U		µg/kg	800	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
57. Phenanthrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
58. Phenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
59. Pyrene	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
60. Pyridine	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A
61. 2,4,5-Trichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

Client Identification:	**Soil and Materials Engineers, Inc. - Kalamazoo**	Sample Description:	**B104 0"-26"**	Chain of Custody:	**102684**
Client Project Name:	**M-222 Slope Evaluation**	Sample No:	**4**	Collect Date:	**11/10/10**
Client Project No:	**KG59756**	Sample Matrix:	**Soil/Solid**	Collect Time:	**10:20**

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 NN: Parameter not included in NELAC Scope of Analysis.

Base/Neutral/Acid Semivolatiles by GC/MS (EPA 3550B/EPA 8270C) **Aliquot ID: 42026-004A** **Matrix: Soil/Solid** **Analyst: TMC**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Prep Date	Prep Batch	Analysis Date	Analysis Batch
62 2,4,6-Trichlorophenol	U		µg/kg	330	1.0	11/16/10	PS10K16E	11/16/10	S310K16A

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.
- **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:

100312

Fibertec environmental services

Quality Control Report
Preparation Batch QC Summary
Semivolatile Organics by GC/MS
Soil/Solid

Batch ID: PS10K16E
Page: 1 of 2
Date: 11/17/10

Preparation Batch: PS10K16E **Preparation Date: 11/16/10**

	Method Blank (MB)			Laboratory Control Sample (LCS)					LCS Duplicate (LCD)				Run Code		
Parameter	Result µg/kg	PQL µg/kg	Q	Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	Rec. %	RPD %	UCL %	Q	MB	LCS	LCD
1. Acenaphthene	U	33.3		2450	2670	92	44 - 132						MB-2	LCS-2	
2. Acenaphthylene	U	33.3		2520	2670	94	45 - 132						MB-2	LCS-2	
3. Aniline	U	66.7		1410	2670	53	21 - 84						MB-2	LCS-2	
4. Anthracene	U	33.3		2340	2670	88	46 - 131						MB-2	LCS-2	
5. Azobenzene	U	36.1		2460	2670	92	31 - 135						MB-2	LCS-2	
6. Benzo(a)anthracene	U	33.3		2560	2670	96	48 - 134						MB-2	LCS-2	
7. Benzo(a)pyrene	U	33.3		2650	2670	99	44 - 142						MB-2	LCS-2	
8. Benzo(b)fluoranthene	U	33.3		2710	2670	102	45 - 142						MB-2	LCS-2	
9. Benzo(ghi)perylene	U	33.3		2760	2670	103	36 - 149						MB-2	LCS-2	
10. Benzo(k)fluoranthene	U	33.3		2360	2670	88	43 - 143						MB-2	LCS-2	
11. Benzyl Alcohol	U	66.7		2390	2670	90	30 - 123						MB-2	LCS-2	
12. Bis(2-chloroethoxy)methane	U	33.3		2390	2670	89	26 - 127						MB-2	LCS-2	
13. Bis(2-chloroethyl)ether	U	34.9		2300	2670	86	29 - 120						MB-2	LCS-2	
14. Bis(2-chloroisopropyl) Ether	U	167		2280	2670	86	12 - 125						MB-2	LCS-2	
15. Bis(2-ethylhexyl)phthalate	74.0	33.3	*	2860	2670	107	28 - 154						MB-2	LCS-2	
16. 4-Bromophenyl Phenylether	U	35.8		2520	2670	94	40 - 151						MB-2	LCS-2	
17. Butyl Benzyl Phthalate	U	33.3		2800	2670	105	30 - 144						MB-2	LCS-2	
18. Carbazole	U	33.3		2590	2670	97	37 - 152						MB-2	LCS-2	
19. 4-Chloroaniline	U	33.3		1780	2670	67	25 - 101						MB-2	LCS-2	
20. 4-Chloro-3-methylphenol	U	66.7		2610	2670	98	27 - 136						MB-2	LCS-2	
21. 2-Chloronaphthalene	U	33.3		2290	2670	86	31 - 131						MB-2	LCS-2	
22. 2-Chlorophenol	U	36.0		2430	2670	91	31 - 123						MB-2	LCS-2	
23. 4-Chlorophenyl Phenylether	U	33.3		2460	2670	92	35 - 145						MB-2	LCS-2	
24. Chrysene	U	33.3		2550	2670	95	39 - 132						MB-2	LCS-2	
25. Dibenzo(a,h)anthracene	U	66.7		2830	2670	106	41 - 142						MB-2	LCS-2	
26. Dibenzofuran	U	33.3		2490	2670	93	29 - 126						MB-2	LCS-2	
27. 1,2-Dichlorobenzene	U	35.7		2280	2670	85	30 - 115						MB-2	LCS-2	
28. 1,3-Dichlorobenzene	U	39.9		2240	2670	84	29 - 112						MB-2	LCS-2	
29. 1,4-Dichlorobenzene	U	38.7		2230	2670	84	29 - 113						MB-2	LCS-2	
30. 2,4-Dichlorophenol	U	33.3		2430	2670	91	28 - 129						MB-2	LCS-2	
31. 2,6-Dichlorophenol	U	33.3		2490	2670	93	30 - 130						MB-2	LCS-2	
32. Diethyl Phthalate	U	33.3		2760	2670	103	30 - 142						MB-2	LCS-2	
33. Dimethyl Phthalate	U	33.3		2670	2670	100	31 - 136						MB-2	LCS-2	
34. 2,4-Dimethylphenol	U	33.3		2550	2670	95	30 - 136						MB-2	LCS-2	
35. Di-n-butyl Phthalate	U	33.3		2630	2670	98	28 - 144						MB-2	LCS-2	
36. 2,4-Dinitrophenol	U	667		1310	2670	49	10 - 95						MB-2	LCS-2	
37. 2,4-Dinitrotoluene	U	66.7		2680	2670	100	30 - 144						MB-2	LCS-2	
38. 2,6-Dinitrotoluene	U	66.7		2580	2670	97	31 - 132						MB-2	LCS-2	
39. Di-n-octyl Phthalate	U	33.3		2850	2670	107	27 - 152						MB-2	LCS-2	
40. Fluoranthene	U	33.3		2590	2670	97	48 - 143						MB-2	LCS-2	
41. Fluorene	U	33.3		2530	2670	95	46 - 133						MB-2	LCS-2	
42. Hexachlorobenzene	U	35.8		2530	2670	95	24 - 139						MB-2	LCS-2	
43. Hexachlorobutadiene	U	33.3		2700	2670	101	28 - 145						MB-2	LCS-2	
44. Hexachlorocyclopentadiene	U	66.7		2330	2670	87	10 - 130						MB-2	LCS-2	
45. Hexachloroethane	U	48.2		2450	2670	92	30 - 119						MB-2	LCS-2	
46. Indeno(1,2,3-cd)pyrene	U	33.3		3170	2670	119	40 - 147						MB-2	LCS-2	
47. Isophorone	U	66.7		2160	2670	81	26 - 137						MB-2	LCS-2	
48. 2-Methyl-4,6-dinitrophenol	U	167		2110	2670	79	15 - 130						MB-2	LCS-2	
49. 2-Methylnaphthalene	U	33.3		2300	2670	86	27 - 120						MB-2	LCS-2	
50. 2-Methylphenol	U	37.2		2490	2670	93	29 - 119						MB-2	LCS-2	
51. 3&4-Methylphenol	U	33.3		2420	2670	91	31 - 139						MB-2	LCS-2	
52. Naphthalene	U	33.3		2400	2670	90	37 - 125						MB-2	LCS-2	

1914 Holloway Drive, Holt, MI 48842, T: (517) 699-0345, F: (517) 699-0388
11766 E. Grand River, Brighton, MI 48116, T: (810) 220-3300, F: (810) 220-3311
8660 S. Mackinaw Trail, Cadillac, MI 49601, T: (231) 775-8368, F: (231) 775-8584
lab@fibertec.us

Fibertec environmental services

Quality Control Report
Preparation Batch QC Summary
Semivolatile Organics by GC/MS
Soil/Solid

Preparation Batch: PS10K16E **Preparation Date: 11/16/10**

Parameter	Method Blank (MB) Result µg/kg	PQL µg/kg	Q	Laboratory Control Sample (LCS) Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	LCS Duplicate (LCD) Rec. %	RPD %	UCL %	Q	Run Code MB	LCS	LCD
53. 2-Nitroaniline	U	167		3330	2670	125	33 - 149						MB-2	LCS-2	
54. 3-Nitroaniline	U	167		2350	2670	88	32 - 117						MB-2	LCS-2	
55. 4-Nitroaniline	U	167		2400	2670	90	35 - 131						MB-2	LCS-2	
56. Nitrobenzene	U	34.3		2590	2670	97	30 - 131						MB-2	LCS-2	
57. 2-Nitrophenol	U	66.7		2330	2670	87	29 - 129						MB-2	LCS-2	
58. 4-Nitrophenol	U	333		2570	2670	96	21 - 131						MB-2	LCS-2	
59. N-Nitrosodimethylamine	U	167		2550	2670	95	27 - 122						MB-2	LCS-2	
60. N-Nitrosodi-n-propylamine	U	167		2750	2670	103	28 - 135						MB-2	LCS-2	
61. N-Nitrosodiphenylamine	U	33.3		2590	2670	97	32 - 145						MB-2	LCS-2	
62. Pentachlorophenol	U	167		2440	2670	91	13 - 138						MB-2	LCS-2	
63. Phenanthrene	U	33.3		2440	2670	92	46 - 136						MB-2	LCS-2	
64. Phenol	U	33.3		2190	2670	82	30 - 122						MB-2	LCS-2	
65. Pyrene	U	33.3		2550	2670	96	47 - 143						MB-2	LCS-2	
66. Pyridine	U	167		1560	2670	58	10 - 76						MB-2	LCS-2	
67. 1,2,4-Trichlorobenzene	U	33.3		2380	2670	89	29 - 124						MB-2	LCS-2	
68. 2,4,5-Trichlorophenol	U	66.7		2750	2670	103	29 - 129						MB-2	LCS-2	
69. 2,4,6-Trichlorophenol	U	66.7		2430	2670	91	31 - 138						MB-2	LCS-2	

System Monitoring Compounds (Surrogates):	Method Blank (MB) Result µg/kg	Spike µg/kg	Rec. %	Q	Laboratory Control Sample (LCS) Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	LCS Duplicate (LCD) Rec. %	RPD %	UCL %	Q	Run Code MB	LCS	LCD
1. 2-Fluorobiphenyl(S)	2360	2670	89		2370	2670	89	28 - 123						MB-2	LCS-2	
2. 2-Fluorophenol(S)	4120	5330	77		4470	5330	84	37 - 113						MB-2	LCS-2	
3. Nitrobenzene-d5(S)	2340	2670	88		2550	2670	95	28 - 126						MB-2	LCS-2	
4. Phenol-d6(S)	4280	5330	80		4260	5330	80	44 - 116						MB-2	LCS-2	
5. 4-Terphenyl-d14(S)	2220	2670	83		2510	2670	94	41 - 148						MB-2	LCS-2	
6. 2,4,6-Tribromophenol(S)	4970	5330	93		5530	5330	104	38 - 122						MB-2	LCS-2	

Definitions/ Qualifiers:

U: The analyte was not detected at or above the PQL.
*: Value reported is outside QC limits

Run Code (Analysis Sequence/Run Time):

MB-2	S310K16A	11/16/10 16:17
LCS-2	S310K16A	11/16/10 17:12

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:

Tammy M. Coffman

Tammy Coffman
Chemist, Semivolatile Organics
Wednesday, November 17, 2010
11:49:25 AM

Fibertec
Environmental
Services

QUALITY ASSURANCE REPORT
for
LABORATORY BATCH NUMBER

ps10k16e

SEMI-VOLATILES

Sample Matrix :	**SOIL/SOLID**	Preparation Method :	**SW-846 3550B**	Analytical Method :	**SW-846 8082A**
Inclusive Projects :	**VARIOUS**	Preparation Date :	**11/16/2010**	Analysis Date :	**11/17/2010**
		Preparer(s) Initials:	**SL**	Analyst(s) Initials :	**BDA**

			Matrix Blank		Laboratory Control Sample (LCS)						MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS / MSD)												
Analyte	RL	Units	Conc. (ug/Kg) (%**)	Flag	Conc. Spiked (ug/Kg)	LCS Conc. (ug/Kg)	LCS Percent Recovery	LCL (%)	UCL (%)	Flag	Laboratory Sample ID	Sample Conc.W (ug/Kg)	Conc.W Spiked (ug/Kg)	MS Conc.W (ug/Kg)	MSD Conc.W (ug/Kg)	MS Percent Recovery	MSD Percent Recovery	LCL (%)	UCL (%)	Flag	RPD MS/MSD (%)	UCL (%)	Flag
TCMX (S)	33.0	µg/Kg	86		33.0	0.0	0	42	133	*	42026-001	27.1	33.0	0.0	0.0	0	0	42	133	*	#DIV/0!	30	#####
Aroclor 1016	330	µg/Kg	U		660	710	108	60	122		42026-001	U	660	621	776	94	118	60	122		22	30	
Aroclor 1260	330	µg/Kg	U		660	624	95	70	131		42026-001	U	660	633	669	96	101	70	131		6	30	
DCB (S)	33.0	µg/Kg	92		33.0	37.0	112	40	143		42026-001	29.4	33.0	36.0	40.3	109	122	40	143		11	30	

Codes,Flags :

U	The analyte was not detected at or above the quantitation limit	J	The analyte was detected at a conc below the quant limit but above the method detection limit
E	The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated	B	The analyte was detected in the associated method blank
*	The value is outside quality control limits	X	Matrix interference has resulted in an elevated reporting limit or distorted QC result
W	Result is always reported as "wet weight"	A	Spike recovery or precision unusable due to dilution

Comments :
**DCB (S) is added to all samples at 33.0 ug/Kg, and is therefore presented as a percent recovery in the reagent blank
Calculation factor = #/1.5 TCMX and the first Aroclor 1016 peak are interfered with on the LCS, MS, and MSD

Bethany D Arnett 11·23·10
Chemist/Date

ZH 12/3/10
Quality Assurance Officer/Date

1914 Holloway Drive Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
11776 Grand River Avenue Brighton, Michigan 48116 Telephone: (810) 220-3300 Facsimile: (810) 220-3311

Fibertec environmental services

Quality Control Report
Preparation Batch QC Summary
Trace Elements by ICP/MS
Soil/Solid

Batch ID: PT10K17E
Page: 1 of 1
Date: 11/18/10

Preparation Batch: PT10K17E **Preparation Date: 11/17/10**

	Method Blank (MB)			Laboratory Control Sample (LCS)					LCS Duplicate (LCD)				Run Code		
Parameter	Result µg/kg	PQL µg/kg	Q	Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	Rec. %	RPD %	UCL %	Q	MB	LCS	LCD
1. Aluminum	2260	1000	*	50700	50000	101	85 - 115						MB-1	LCS-1	
2. Antimony	28.7	20.0	*	9620	10000	96	85 - 115						MB-1	LCS-1	
3. Arsenic	U	20.0		9870	10000	99	85 - 115						MB-1	LCS-1	
4. Barium	U	1000		49700	50000	99	85 - 115						MB-1	LCS-1	
5. Beryllium	U	43.5		9490	10000	95	85 - 115						MB-1	LCS-1	
6. Boron	U	1000		9610	10000	96	85 - 115						MB-1	LCS-1	
7. Cadmium	U	20.0		9950	10000	99	85 - 115						MB-1	LCS-1	
8. Chromium	193	54.7	*	20400	20000	102	85 - 115						MB-1	LCS-1	
9. Cobalt	U	20.0		10200	10000	102	85 - 115						MB-1	LCS-1	
10. Copper	U	40.0		20300	20000	102	85 - 115						MB-1	LCS-1	
11. Lead	U	40.0		20100	20000	100	85 - 115						MB-1	LCS-1	
12. Lithium	U	200		10100	10000	101	85 - 115						MB-1	LCS-1	
13. Manganese	U	1000		52500	50000	105	85 - 115						MB-1	LCS-1	
14. Nickel	U	400		20500	20000	103	85 - 115						MB-1	LCS-1	
15. Selenium	U	200		9830	10000	98	85 - 115						MB-1	LCS-1	
16. Silver	U	20.0		9880	10000	99	85 - 115						MB-1	LCS-1	
17. Strontium	232	34.1	*	10000	10000	100	85 - 115						MB-1	LCS-1	
18. Thallium	U	20.0		9820	10000	98	85 - 115						MB-1	LCS-1	
19. Tin	34.0	23.4	*	10300	10000	103	85 - 115						MB-1	LCS-1	
20. Titanium	U	400		10200	10000	102	85 - 115						MB-1	LCS-1	
21. Vanadium	U	400		9910	10000	99	85 - 115						MB-1	LCS-1	
22. Zinc	U	1000		49300	50000	99	85 - 115						MB-1	LCS-1	

Definitions/ Qualifiers:

U: The analyte was not detected at or above the PQL.
***:** Value reported is outside QC limits

Run Code (Analysis Sequence/Run Time):

MB-1	T210K17C	11/17/10 15:39
LCS-1	T210K17C	11/17/10 15:40

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:

J Haney

Jeri Haney
Group Leader, Trace Metals
Thursday, November 18, 2010
10:18:01 AM

1914 Holloway Drive, Holt, MI 48842, T: (517) 699-0345, F: (517) 699-0388
11766 E. Grand River, Brighton, MI 48116, T: (810) 220-3300, F: (810) 220-3311
8660 S. Mackinaw Trail, Cadillac, MI 49601, T: (231) 775-8368, F: (231) 775-8584
lab@fibertec.us

Fibertec environmental services

Quality Control Report
Preparation Batch QC Summary
Mercury by CVAAS
Soil/Solid

Batch ID: PM10K18
Page: 1 of 1
Date: 11/18/10

Preparation Batch: PM10K18A **Preparation Date: 11/18/10**

	Method Blank (MB)			Laboratory Control Sample (LCS)					LCS Duplicate (LCD)				Run Code		
Parameter	Result µg/kg	PQL µg/kg	Q	Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	Rec. %	RPD %	UCL %	Q	MB	LCS	LCD
1. Mercury	U	20.0		220	200	110	85 - 115						MB-1	LCS-1	

Definitions/ Qualifiers:

U: The analyte was not detected at or above the PQL.
***:** Value reported is outside QC limits

Run Code (Analysis Sequence/Run Time):

MB-1	M410K18A	11/18/10 11:54
LCS-1	M410K18A	11/18/10 11:56

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:

Michaelia Papranec

Michaelia Papranec
Chemist, Trace Metals
Thursday, November 18, 2010
12:47:42 PM

1914 Holloway Drive, Holt, MI 48842, T: (517) 699-0345, F: (517) 699-0388
11766 E. Grand River, Brighton, MI 48116, T: (810) 220-3300, F: (810) 220-3311
8660 S. Mackinaw Trail, Cadillac, MI 49601, T: (231) 775-8368, F: (231) 775-8584
lab@fibertec.us

Fibertec environmental services

Quality Control Report
Preparation Batch QC Summary
Volatile Organics by GC/MS
Soil/Solid

Batch ID: V910K18B
Page: 1 of 2
Date: 11/19/10

Preparation Batch: V910K18B **Preparation Date: 11/18/10**

	Method Blank (MB)			Laboratory Control Sample (LCS)					LCS Duplicate (LCD)				Run Code		
Parameter	Result µg/kg	PQL µg/kg	Q	Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	Rec. %	RPD %	UCL %	Q	MB	LCS	LCD
1. Acetone	U	50.0		5640	5000	113	40 - 207		108	4	20		MB-1	LCS-1	LCD-1
2. Acrylonitrile	U	50.0		5920	5000	118	45 - 180		117	1	20		MB-1	LCS-1	LCD-1
3. Benzene	U	25.0		5690	5000	114	53 - 141		111	3	20		MB-1	LCS-1	LCD-1
4. Bromobenzene	U	25.0		5570	5000	111	70 - 144		112	0	20		MB-1	LCS-1	LCD-1
5. Bromochloromethane	U	25.0		6050	5000	121	42 - 161		121	0	20		MB-1	LCS-1	LCD-1
6. Bromodichloromethane	U	25.0		5560	5000	113	60 - 150		109	4	20		MB-1	LCS-1	LCD-1
7. Bromoform	U	25.0		5240	5000	105	50 - 117		104	1	20		MB-1	LCS-1	LCD-1
8. Bromomethane	U	100		7000	5000	140	58 - 217		137	2	20		MB-1	LCS-1	LCD-1
9. 2-Butanone	U	100		5310	5000	106	42 - 193		104	2	20		MB-1	LCS-1	LCD-1
10. tert-Butyl Alcohol	U	250		5400	5000	108	42 - 156		105	3	20		MB-1	LCS-1	LCD-1
11. n-Butylbenzene	U	25.0		5670	5000	113	65 - 151		113	1	20		MB-1	LCS-1	LCD-1
12. sec-Butylbenzene	U	25.0		5620	5000	112	68 - 147		111	1	20		MB-1	LCS-1	LCD-1
13. tert-Butylbenzene	U	25.0		4800	5000	96	68 - 140		96	0	20		MB-1	LCS-1	LCD-1
14. Carbon Disulfide	U	25.0		6260	5000	125	36 - 143		123	2	20		MB-1	LCS-1	LCD-1
15. Carbon Tetrachloride	U	25.0		5360	5000	107	50 - 159		104	3	20		MB-1	LCS-1	LCD-1
16. Chlorobenzene	U	25.0		5250	5000	105	72 - 135		104	1	20		MB-1	LCS-1	LCD-1
17. Chloroethane	U	250		6670	5000	133	16 - 207		134	1	20		MB-1	LCS-1	LCD-1
18. Chloroform	U	25.0		5790	5000	116	47 - 159		113	2	20		MB-1	LCS-1	LCD-1
19. Chloromethane	U	100		7020	5000	140	14 - 185		137	2	20		MB-1	LCS-1	LCD-1
20. 2-Chlorotoluene	U	25.0		5550	5000	111	73 - 141		111	0	20		MB-1	LCS-1	LCD-1
21. 4-Chlorotoluene	U	25.0		5610	5000	112	82 - 137		111	1	20		MB-1	LCS-1	LCD-1
22. Dibromochloromethane	U	25.0		5410	5000	108	59 - 130		108	0	20		MB-1	LCS-1	LCD-1
23. 1,2-Dibromo-3-chloropropane	U	25.0		5260	5000	105	34 - 164		108	2	20		MB-1	LCS-1	LCD-1
24. Dibromomethane	U	25.0		4860	5000	97	66 - 134		97	0	20		MB-1	LCS-1	LCD-1
25. 1,2-Dichlorobenzene	U	25.0		5180	5000	104	76 - 128		104	0	20		MB-1	LCS-1	LCD-1
26. 1,3-Dichlorobenzene	U	25.0		5240	5000	105	72 - 136		105	0	20		MB-1	LCS-1	LCD-1
27. 1,4-Dichlorobenzene	U	25.0		5020	5000	100	74 - 127		101	1	20		MB-1	LCS-1	LCD-1
28. trans-1,4-Dichloro-2-butene	U	50.0		6050	5000	121	56 - 153		113	7	20		MB-1	LCS-1	LCD-1
29. Dichlorodifluoromethane	U	25.0		6960	5000	139	10 - 207		133	4	20		MB-1	LCS-1	LCD-1
30. 1,1-Dichloroethane	U	25.0		6150	5000	123	42 - 157		121	2	20		MB-1	LCS-1	LCD-1
31. 1,2-Dichloroethane	U	50.0		11200	10000	112	56 - 146		109	2	20		MB-1	LCS-1	LCD-1
32. 1,1-Dichloroethene	U	25.0		6570	5000	131	34 - 165		128	2	20		MB-1	LCS-1	LCD-1
33. cis-1,2-Dichloroethene	U	25.0		5670	5000	113	43 - 170		110	3	20		MB-1	LCS-1	LCD-1
34. trans-1,2-Dichloroethene	U	25.0		6470	5000	129	49 - 162		127	2	20		MB-1	LCS-1	LCD-1
35. 1,2-Dichloropropane	U	25.0		5900	5000	118	62 - 151		116	1	20		MB-1	LCS-1	LCD-1
36. 1,3-Dichloropropane	U	25.0		5480	5000	110	77 - 132		110	0	20		MB-1	LCS-1	LCD-1
37. 2,2-Dichloropropane	U	25.0		6020	5000	120	52 - 169		115	4	20		MB-1	LCS-1	LCD-1
38. 1,1-Dichloropropene	U	25.0		5980	5000	120	52 - 153		116	3	20		MB-1	LCS-1	LCD-1
39. cis-1,3-Dichloropropene	U	25.0		5830	5000	117	45 - 156		114	2	20		MB-1	LCS-1	LCD-1
40. trans-1,3-Dichloropropene	U	25.0		5590	5000	112	40 - 157		110	2	20		MB-1	LCS-1	LCD-1
41. Diethyl Ether	U	25.0		6250	5000	125	30 - 167		121	3	20		MB-1	LCS-1	LCD-1
42. Ethyl Methacrylate	U	25.0		5480	5000	110	80 - 132		108	1	20		MB-1	LCS-1	LCD-1
43. Ethylbenzene	U	25.0		5360	5000	107	76 - 137		106	1	20		MB-1	LCS-1	LCD-1
44. Ethylene Dibromide	U	20.0		10300	10000	103	71 - 133		103	1	20		MB-1	LCS-1	LCD-1
45. Ethylene Dibromide, Low-level	U	10.0		10400	10000	104	70 - 130		103	1	20		MB-1	LCS-1	LCD-1
46. Hexachlorobutadiene	31.7	25.0	*	5130	5000	103	79 - 142		106	4	20		MB-1	LCS-1	LCD-1
47. Hexachloroethane	U	50.0		4640	5000	93	42 - 151		94	1	20		MB-1	LCS-1	LCD-1
48. 2-Hexanone	U	100		5180	5000	104	29 - 211		104	1	20		MB-1	LCS-1	LCD-1
49. Isopropylbenzene	U	25.0		5460	5000	109	68 - 153		108	2	20		MB-1	LCS-1	LCD-1
50. p-Isopropyltoluene	U	25.0		5410	5000	108	75 - 139		108	0	20		MB-1	LCS-1	LCD-1
51. Methacrylonitrile	U	100		5670	5000	113	70 - 130		111	2	20		MB-1	LCS-1	LCD-1
52. Methyl Iodide	U	25.0		6440	5000	129	17 - 150		120	7	20		MB-1	LCS-1	LCD-1

1914 Holloway Drive, Holt, MI 48842, T: (517) 699-0345, F: (517) 699-0388
11766 E. Grand River, Brighton, MI 48116, T: (810) 220-3300, F: (810) 220-3311
8660 S. Mackinaw Trail, Cadillac, MI 49601, T: (231) 775-8368, F: (231) 775-8584
lab@fibertec.us

Fibertec environmental services

Quality Control Report
Preparation Batch QC Summary
Volatile Organics by GC/MS
Soil/Solid

Preparation Batch: V910K18B **Preparation Date: 11/18/10**

Parameter	Method Blank (MB) Result µg/kg	PQL µg/kg	Q	Laboratory Control Sample (LCS) Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	LCS Duplicate (LCD) Rec. %	RPD %	UCL %	Q	Run Code MB	LCS	LCD
53. Methyl Methacrylate	U	25.0		5440	5000	109	70 - 130		107	1	20		MB-1	LCS-1	LCD-1
54. Methylene Chloride	U	25.0		6040	5000	121	38 - 180		120	1	20		MB-1	LCS-1	LCD-1
55. 2-Methylnaphthalene	72.2	50.0	*	5070	5000	101	42 - 202		102	1	20		MB-1	LCS-1	LCD-1
56. 4-Methyl-2-pentanone	U	50.0		5570	5000	111	55 - 161		109	2	20		MB-1	LCS-1	LCD-1
57. MTBE	U	50.0		11500	10000	115	58 - 147		113	1	20		MB-1	LCS-1	LCD-1
58. Naphthalene	33.5	25.0	*	5010	5000	100	45 - 180		101	0	20		MB-1	LCS-1	LCD-1
59. Propionitrile	U	250		5730	5000	115	70 - 130		113	1	20		MB-1	LCS-1	LCD-1
60. n-Propylbenzene	U	25.0		5760	5000	115	71 - 146		115	0	20		MB-1	LCS-1	LCD-1
61. Styrene	U	25.0		5390	5000	108	72 - 138		106	2	20		MB-1	LCS-1	LCD-1
62. 1,1,1,2-Tetrachloroethane	U	25.0		5200	5000	104	61 - 131		104	0	20		MB-1	LCS-1	LCD-1
63. 1,1,2,2-Tetrachloroethane	U	25.0		5730	5000	115	72 - 145		114	0	20		MB-1	LCS-1	LCD-1
64. Tetrachloroethene	U	10.0		5220	5000	104	50 - 151		102	3	20		MB-1	LCS-1	LCD-1
65. Tetrahydrofuran	U	50.0		5730	5000	115	26 - 169		113	2	20		MB-1	LCS-1	LCD-1
66. Toluene	U	25.0		5410	5000	108	65 - 144		105	3	20		MB-1	LCS-1	LCD-1
67. 1,2,3-Trichlorobenzene	U	25.0		4880	5000	98	50 - 161		98	1	20		MB-1	LCS-1	LCD-1
68. 1,2,4-Trichlorobenzene	26.2	25.0	*	5120	5000	102	54 - 152		102	0	20		MB-1	LCS-1	LCD-1
69. 1,1,1-Trichloroethane	U	25.0		5720	5000	114	46 - 156		111	3	20		MB-1	LCS-1	LCD-1
70. 1,1,2-Trichloroethane	U	25.0		5350	5000	107	80 - 129		105	2	20		MB-1	LCS-1	LCD-1
71. Trichloroethene	U	25.0		5440	5000	109	65 - 144		106	3	20		MB-1	LCS-1	LCD-1
72. Trichlorofluoromethane	U	25.0		5260	5000	105	31 - 226		103	2	20		MB-1	LCS-1	LCD-1
73. 1,2,3-Trichloropropane	U	25.0		5590	5000	112	74 - 139		108	3	20		MB-1	LCS-1	LCD-1
74. 1,1,2-Trichloro-1,2,2-trifluoroethane	U	25.0		5990	5000	120	52 - 156		117	2	20		MB-1	LCS-1	LCD-1
75. 1,2,3-Trimethylbenzene	U	25.0		5470	5000	109	77 - 133		109	1	20		MB-1	LCS-1	LCD-1
76. 1,2,4-Trimethylbenzene	U	25.0		5610	5000	112	71 - 139		111	1	20		MB-1	LCS-1	LCD-1
77. 1,3,5-Trimethylbenzene	U	25.0		5620	5000	112	71 - 138		111	1	20		MB-1	LCS-1	LCD-1
78. Vinyl Chloride	U	25.0		6070	5000	121	25 - 189		119	2	20		MB-1	LCS-1	LCD-1
79. m&p-Xylene	U	50.0		10700	10000	107	69 - 134		105	2	20		MB-1	LCS-1	LCD-1
80. o-Xylene	U	25.0		5550	5000	111	69 - 134		109	1	20		MB-1	LCS-1	LCD-1

System Monitoring Compounds (Surrogates):	Method Blank (MB) Result µg/kg	Spike µg/kg	Rec. %	Q	Laboratory Control Sample (LCS) Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	LCS Duplicate (LCD) Rec. %	RPD %	UCL %	Q	Run Code MB	LCS	LCD
1. Dibromofluoromethane(S)	3190	3750	85		3380	3750	90	53 - 139		86	6	20		MB-1	LCS-1	LCD-1
2. 1,2-Dichloroethane-d4(S)	3330	3750	89		3470	3750	92	64 - 135		86	7	20		MB-1	LCS-1	LCD-1
3. Toluene-d8(S)	3200	3750	85		3410	3750	91	70 - 130		85	7	20		MB-1	LCS-1	LCD-1
4. 4-Bromofluorobenzene(S)	3160	3750	84		3430	3750	91	71 - 129		86	6	20		MB-1	LCS-1	LCD-1

Definitions/ Qualifiers:

U: The analyte was not detected at or above the PQL.
***:** Value reported is outside QC limits

Run Code (Analysis Sequence/Run Time):

MB-1	V910K18B	11/19/10 03:00
LCS-1	V910K18B	11/19/10 01:38
LCD-1	V910K18B	11/19/10 02:05

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:

Joanna Wieland
Chemist, Volatile Organics
Friday, November 19, 2010
8:58:15 AM

1914 Holloway Drive, Holt, MI 48842, T: (517) 699-0345, F: (517) 699-0388
11766 E. Grand River, Brighton, MI 48116, T: (810) 220-3300, F: (810) 220-3311
8660 S. Mackinaw Trail, Cadillac, MI 49601, T: (231) 775-8368, F: (231) 775-8584
lab@fibertec.us

Fibertec environmental services

Quality Control Report
Preparation Batch QC Summary
Volatile Organics by GC/MS
Soil/Solid

Preparation Batch: V310K16B **Preparation Date: 11/16/10**

	Method Blank (MB)			Laboratory Control Sample (LCS)					LCS Duplicate (LCD)				Run Code		
Parameter	Result µg/kg	PQL µg/kg	Q	Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	Rec. %	RPD %	UCL %	Q	MB	LCS	LCD
1. Acetone	U	40.0		2110	2000	105	40 - 207		115	9	20		MB-1	LCS-1	LCD-1
2. Acrylonitrile	U	40.0		1820	2000	91	45 - 180		85	7	20		MB-1	LCS-1	LCD-1
3. Benzene	U	10.0		1670	2000	83	63 - 141		87	4	20		MB-1	LCS-1	LCD-1
4. Bromobenzene	U	10.0		1830	2000	92	70 - 144		93	2	20		MB-1	LCS-1	LCD-1
5. Bromochloromethane	U	40.0		1860	2000	93	42 - 161		90	3	20		MB-1	LCS-1	LCD-1
6. Bromodichloromethane	U	10.0		1790	2000	89	60 - 150		90	0	20		MB-1	LCS-1	LCD-1
7. Bromoform	U	20.0		2010	2000	100	50 - 117		100	1	20		MB-1	LCS-1	LCD-1
8. Bromomethane	U	40.0		1990	2000	100	58 - 217		105	6	20		MB-1	LCS-1	LCD-1
9. 2-Butanone	U	200		1770	2000	89	42 - 193		98	10	20		MB-1	LCS-1	LCD-1
10. tert-Butyl Alcohol	U	40.0		1570	2000	78	42 - 156		78	1	20		MB-1	LCS-1	LCD-1
11. n-Butylbenzene	U	10.0		1800	2000	90	65 - 151		97	8	20		MB-1	LCS-1	LCD-1
12. sec-Butylbenzene	U	10.0		1810	2000	90	68 - 147		96	7	20		MB-1	LCS-1	LCD-1
13. tert-Butylbenzene	U	10.0		1760	2000	88	68 - 140		93	5	20		MB-1	LCS-1	LCD-1
14. Carbon Disulfide	U	10.0		1140	2000	57	36 - 143		63	10	20		MB-1	LCS-1	LCD-1
15. Carbon Tetrachloride	U	10.0		1870	2000	93	50 - 159		99	6	20		MB-1	LCS-1	LCD-1
16. Chlorobenzene	U	10.0		1630	2000	91	72 - 135		95	4	20		MB-1	LCS-1	LCD-1
17. Chloroethane	U	200		1750	2000	88	16 - 207		101	14	20		MB-1	LCS-1	LCD-1
18. Chloroform	U	10.0		1680	2000	84	47 - 159		84	1	20		MB-1	LCS-1	LCD-1
19. Chloromethane	U	10.0		1650	2000	83	14 - 185		80	3	20		MB-1	LCS-1	LCD-1
20. 2-Chlorotoluene	U	10.0		1710	2000	86	73 - 141		90	5	20		MB-1	LCS-1	LCD-1
21. 4-Chlorotoluene	U	10.0		1750	2000	88	62 - 137		91	4	20		MB-1	LCS-1	LCD-1
22. Dibromochloromethane	U	20.0		2020	2000	101	59 - 130		100	1	20		MB-1	LCS-1	LCD-1
23. 1,2-Dibromo-3-chloropropane	U	10.0		2220	2000	111	34 - 164		108	2	20		MB-1	LCS-1	LCD-1
24. Dibromomethane	U	10.0		2410	2000	120	66 - 134		119	1	20		MB-1	LCS-1	LCD-1
25. 1,2-Dichlorobenzene	U	10.0		1950	2000	98	76 - 128		99	1	20		MB-1	LCS-1	LCD-1
26. 1,3-Dichlorobenzene	U	10.0		1900	2000	95	72 - 136		99	4	20		MB-1	LCS-1	LCD-1
27. 1,4-Dichlorobenzene	U	10.0		1830	2000	92	74 - 127		95	4	20		MB-1	LCS-1	LCD-1
28. trans-1,4-Dichloro-2-butene	U	20.0		1850	2000	92	56 - 153		91	2	20		MB-1	LCS-1	LCD-1
29. Dichlorodifluoromethane	U	20.0		2060	2000	103	10 - 207		110	7	20		MB-1	LCS-1	LCD-1
30. 1,1-Dichloroethane	U	10.0		1630	2000	82	42 - 157		83	1	20		MB-1	LCS-1	LCD-1
31. 1,2-Dichloroethane	U	20.0		3690	4000	92	56 - 148		92	0	20		MB-1	LCS-1	LCD-1
32. 1,1-Dichloroethene	U	20.0		1580	2000	79	34 - 165		88	11	20		MB-1	LCS-1	LCD-1
33. cis-1,2-Dichloroethene	U	10.0		1700	2000	85	43 - 170		86	1	20		MB-1	LCS-1	LCD-1
34. trans-1,2-Dichloroethene	U	10.0		1560	2000	78	49 - 162		81	4	20		MB-1	LCS-1	LCD-1
35. 1,2-Dichloropropane	U	10.0		1820	2000	91	62 - 151		93	2	20		MB-1	LCS-1	LCD-1
36. 1,3-Dichloropropane	U	10.0		1860	2000	93	77 - 132		93	0	20		MB-1	LCS-1	LCD-1
37. 2,2-Dichloropropane	U	10.0		1660	2000	83	52 - 169		86	3	20		MB-1	LCS-1	LCD-1
38. 1,1-Dichloropropene	U	10.0		1720	2000	86	52 - 153		91	6	20		MB-1	LCS-1	LCD-1
39. cis-1,3-Dichloropropene	U	10.0		1930	2000	96	45 - 156		96	1	20		MB-1	LCS-1	LCD-1
40. trans-1,3-Dichloropropene	U	10.0		1840	2000	92	40 - 157		92	0	20		MB-1	LCS-1	LCD-1
41. Diethyl Ether	U	40.0		414	2000	21	30 - 167	*	21	2	20		MB-1	LCS-1	LCD-1
42. Ethylbenzene	U	10.0		1690	2000	85	76 - 137		90	6	20		MB-1	LCS-1	LCD-1
43. Ethylene Dibromide	U	20.0		3950	4000	99	71 - 133		97	1	20		MB-1	LCS-1	LCD-1
44. Hexachlorobutadiene	U	20.0		2400	2000	120	79 - 142		130	8	20		MB-1	LCS-1	LCD-1
45. Hexachloroethane	U	20.0		1740	2000	87	42 - 151		91	5	20		MB-1	LCS-1	LCD-1
46. 2-Hexanone	U	200		1760	2000	88	29 - 211		89	1	20		MB-1	LCS-1	LCD-1
47. Isopropylbenzene	U	10.0		1850	2000	92	68 - 153		98	6	20		MB-1	LCS-1	LCD-1
48. p-Isopropyltoluene	U	10.0		1860	2000	93	75 - 139		99	6	20		MB-1	LCS-1	LCD-1
49. Methyl Iodide	U	40.0		1720	2000	86	17 - 150		96	12	20		MB-1	LCS-1	LCD-1
50. Methylene Chloride	U	20.0		1540	2000	77	38 - 180		77	0	20		MB-1	LCS-1	LCD-1
51. 2-Methylnaphthalene	U	40.0		2470	2000	123	42 - 202		122	1	20		MB-1	LCS-1	LCD-1
52. 4-Methyl-2-pentanone	U	40.0		1740	2000	87	55 - 161		84	3	20		MB-1	LCS-1	LCD-1

1914 Holloway Drive, Holt, MI 48842, T: (517) 699-0345, F: (517) 699-0388
11766 E. Grand River, Brighton, MI 48116, T: (810) 220-3300, F: (810) 220-3311
8660 S. Mackinaw Trail, Cadillac, MI 49601, T: (231) 775-8368, F: (231) 775-8584
lab@fibertec.us

Fibertec environmental services

Quality Control Report
Preparation Batch QC Summary
Volatile Organics by GC/MS
Soil/Solid

Preparation Batch: V310K16B **Preparation Date: 11/16/10**

	Method Blank (MB)			Laboratory Control Sample (LCS)					LCS Duplicate (LCD)				Run Code		
Parameter	Result µg/kg	PQL µg/kg	Q	Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	Rec. %	RPD %	UCL %	Q	MB	LCS	LCD
53. MTBE	U	20.0		3510	4000	88	58 - 147		85	3	20		MB-1	LCS-1	LCD-1
54. Naphthalene	U	10.0		2340	2000	117	45 - 180		115	1	20		MB-1	LCS-1	LCD-1
55. n-Propylbenzene	U	10.0		1690	2000	85	71 - 146		89	6	20		MB-1	LCS-1	LCD-1
56. Styrene	U	10.0		1870	2000	93	72 - 138		96	3	20		MB-1	LCS-1	LCD-1
57. 1,1,1,2-Tetrachloroethane	U	20.0		1890	2000	95	61 - 131		97	2	20		MB-1	LCS-1	LCD-1
58. 1,1,2,2-Tetrachloroethane	U	20.0		1790	2000	90	72 - 145		88	2	20		MB-1	LCS-1	LCD-1
59. Tetrachloroethene	U	10.0		2090	2000	105	50 - 151		113	8	20		MB-1	LCS-1	LCD-1
60. Tetrahydrofuran	U	200		1640	2000	82	28 - 169		78	5	20		MB-1	LCS-1	LCD-1
61. Toluene	U	10.0		1810	2000	90	65 - 144		94	3	20		MB-1	LCS-1	LCD-1
62. 1,2,3-Trichlorobenzene	U	10.0		2180	2000	109	50 - 161		111	2	20		MB-1	LCS-1	LCD-1
63. 1,2,4-Trichlorobenzene	U	10.0		2100	2000	105	54 - 152		109	4	20		MB-1	LCS-1	LCD-1
64. 1,1,1-Trichloroethane	U	10.0		1690	2000	84	46 - 156		88	4	20		MB-1	LCS-1	LCD-1
65. 1,1,2-Trichloroethane	U	10.0		1820	2000	91	80 - 129		91	0	20		MB-1	LCS-1	LCD-1
66. Trichloroethene	U	10.0		1910	2000	96	65 - 144		100	4	20		MB-1	LCS-1	LCD-1
67. Trichlorofluoromethane	U	40.0		1920	2000	96	31 - 226		113	16	20		MB-1	LCS-1	LCD-1
68. 1,2,3-Trichloropropane	U	20.0		1820	2000	91	74 - 139		89	3	20		MB-1	LCS-1	LCD-1
69. 1,1,2-Trichloro-1,2,2-trifluoroethane	U	40.0		1590	2000	80	52 - 156		91	13	20		MB-1	LCS-1	LCD-1
70. 1,2,3-Trimethylbenzene	U	10.0		1710	2000	85	77 - 133		89	4	20		MB-1	LCS-1	LCD-1
71. 1,2,4-Trimethylbenzene	U	10.0		1770	2000	88	71 - 139		93	4	20		MB-1	LCS-1	LCD-1
72. 1,3,5-Trimethylbenzene	U	10.0		1720	2000	86	71 - 138		92	6	20		MB-1	LCS-1	LCD-1
73. Vinyl Chloride	U	10.0		1570	2000	79	25 - 189		83	5	20		MB-1	LCS-1	LCD-1
74. m&p-Xylene	U	20.0		3380	4000	85	69 - 134		90	6	20		MB-1	LCS-1	LCD-1
75. o-Xylene	U	10.0		1810	2000	90	69 - 134		95	5	20		MB-1	LCS-1	LCD-1

	Method Blank (MB)				Laboratory Control Sample (LCS)					LCS Duplicate (LCD)				Run Code		
System Monitoring Compounds (Surrogates):	Result µg/kg	Spike µg/kg	Rec. %	Q	Result µg/kg	Spike µg/kg	Rec. %	LCL - UCL %	Q	Rec. %	RPD %	UCL %	Q	MB	LCS	LCD
1. Dibromofluoromethane(S)	1020	1000	102		995	1000	99	63 - 139		94	5	20		MB-1	LCS-1	LCD-1
2. 1,2-Dichloroethane-d4(S)	1010	1000	101		1140	1000	114	64 - 135		95	18	20		MB-1	LCS-1	LCD-1
3. Toluene-d8(S)	1130	1000	113		1160	1000	116	70 - 130		115	1	20		MB-1	LCS-1	LCD-1
4. 4-Bromofluorobenzene(S)	1070	1000	107		1090	1000	109	71 - 129		110	1	20		MB-1	LCS-1	LCD-1

Definitions/ Qualifiers:

U: The analyte was not detected at or above the PQL.
***:** Value reported is outside QC limits

Run Code (Analysis Sequence/Run Time):

MB-1	V310K16B	11/16/10 11:41
LCS-1	V310K16B	11/16/10 10:04
LCD-1	V310K16B	11/16/10 10:36

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:

Joanna Wieland
Chemist, Volatile Organics
Tuesday, November 16, 2010
2:20:59 PM

Joanna Wieland

1914 Holloway Drive, Holt, MI 48842, T: (517) 699-0345, F: (517) 699-0388
11766 E. Grand River, Brighton, MI 48116, T: (810) 220-3300, F: (810) 220-3311
8660 S. Mackinaw Trail, Cadillac, MI 49601, T: (231) 775-8368, F: (231) 775-8584
lab@fibertec.us

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 # 102684
PAGE 1 of 1

Client Name: SME
Contact Person: Davin Ojala ojala@sme-usa.com
Project Name/ Number: M-222 Slope Evaluation KG59756
Purchase Order#

Lab Sample #	Date	Time	Client Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PRESERVED (Y/N)	PARAMETERS: PCBs	MI 10 Metals	VOCs	PNAs
	11/10/10	930	1	B101 0"-36"	S	4	Y	X			
	11/10/10	1110	2	B102 0"-26"	S	4	Y	X			
	11/10/10	1205	3	B103 0"-66"	S	4	Y	X			
	11/10/10	1020	4	B104 0"-26"	S	4	Y	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; GW Ground Water; W Water; SW Surface Water; A Air; WW Waste Water; O Oil; X Other: Specify; P Wipe

Remarks:
HOLD all except PCBs
HOLD all except PCBs
HOLD all except PCBs
HOLD all except PCBs

Comments: all samples are saturated sediment samples
MDNRE Methods + MDLs

	Date/ Time	Received By:
Relinquished By:	11/10/10 1600	SME cold storage
Relinquished By: SME cold storage	11/12/10 10:15	Received By:
Relinquished By:	11/12/10 15:20	Received By Laboratory:

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

COC Revision: April, 2006

TERMS & CONDITIONS ON BACK

RCVD ON