STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909O
TEL: (517) 335-9800O
FAX: (517) 335-9600O

28 July 2015O

Work Order: 1507116O

Price: $491.00O

Amy KeranenO
MDEQ-RRD-UPO
1504 W. Washington St.O
Marquette, MI 49855O

RE: ABANDONED MINING WASTES-LAKE LINDEN Ops

I certify that the analyses performed by the MDEQ Environmental Laboratory were conducted by methods O approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies .O

Sincerely, O

George KrisztianO
Laboratory DirectorO

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

MDEQ-RRD-UPb
1504 W. Washington St.b
Marquette MI, 49855b

Project:bABANDONED MINING WASTES-LAKE LINDEN Opsb
Site Code:b31000098b
Project Manager:bAmy Keranenb

Reported:p
07/28/2015

Analytical Report for Samplesp

Sample IDp	Laboratory IDp	Matrixp	Date Sampledp	Date Receivedp	Qualifierp
CHLL - SW - 09 - 4.25-5.25'b	1507116-01b	Waterb	07/08/2015b	07/13/2015b	
CHLL - SW - 10 - 4.08-5.08'b	1507116-02b	Waterb	07/08/2015b	07/13/2015b	
CHLL - SW - 11 - 44.5-45.5'b	1507116-03b	Waterb	07/09/2015b	07/13/2015b	

Notes and Definitions p

KRb	Reporting limit(s) raised due to low sample volume submitted. b
A01b	Result(s) and reporting limit(s) are estimated due to low surrogate recovery. b
NDb	Indicates compound analyzed for but not detected b
RLb	Reporting Limit b
NAb	Not Applicable b

Lab Work Order # 1507116b

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SW - 09 - 4.25-5.25'p

Lab ID: 1507116-01p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzed b Dateb	QC Batchb	Methodb	Qualifier b
Organics-PCBs as Aroclorsp									
12674-11-2b	Aroclor 1016b	NDb	0.11b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11104-28-2b	Aroclor 1221b	NDb	0.11b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11141-16-5b	Aroclor 1232b	NDb	0.11b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
53469-21-9b	Aroclor 1242b	NDb	0.11b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
12672-29-6b	Aroclor 1248b	NDb	0.11b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11097-69-1b	Aroclor 1254b	NDb	0.11b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11096-82-5b	Aroclor 1260b	NDb	0.11b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
37324-23-5b	Aroclor 1262b	NDb	0.11b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11100-14-4b	Aroclor 1268b	NDb	0.11b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
Surrogate: Decachlorobiphenyl-			*57.3 %-*	*30-150-*		*07/16/15-*	B5G1503b	*8081/8082-*	
Surrogate: Tetrachloro-m-xylene-			*36.6 %-*	*30-150-*		*07/16/15-*	B5G1503b	*8081/8082-*	

Lab Work Order # 1507116b

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SW - 10 - 4.08-5.08'p

Lab ID: 1507116-02p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzed b Dateb	QC Batchb	Methodb	Qualifier b
Organics-PCBs as Aroclorsp									
12674-11-2b	Aroclor 1016b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11104-28-2b	Aroclor 1221b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11141-16-5b	Aroclor 1232b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
53469-21-9b	Aroclor 1242b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
12672-29-6b	Aroclor 1248b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11097-69-1b	Aroclor 1254b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11096-82-5b	Aroclor 1260b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
37324-23-5b	Aroclor 1262b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11100-14-4b	Aroclor 1268b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
Surrogate: Decachlorobiphenyl-			*50.7 %-*	*30-150-*		*07/16/15-*	B5G1503b	*8081/8082-*	
Surrogate: Tetrachloro-m-xylene-			*41.1 %-*	*30-150-*		*07/16/15-*	B5G1503b	*8081/8082-*	

Lab Work Order # 1507116b

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SW - 11 - 44.5-45.5'p

Lab ID: 1507116-03p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzed b Dateb	QC Batchb	Methodb	Qualifier b
Organics-Semivolatilesp									
91-57-6b	2-Methylnaphthaleneb	NDb	5.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
83-32-9b	Acenaphtheneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
208-96-8b	Acenaphthyleneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
120-12-7	Anthraceneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
56-55-3b	Benz[a]anthraceneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
50-32-8b	Benzo[a]pyreneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
205-99-2b	Benzo[b]fluoranthene b	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
191-24-2b	Benzo[g,h,i]peryleneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
207-08-9b	Benzo[k]fluoranthene b	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
218-01-9b	Chryseneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
53-70-3b	Dibenz[a,h]anthraceneb	NDb	2.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
206-44-0b	Fluoranthene b	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
86-73-7	Fluoreneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
193-39-5b	Indeno(1,2,3-c,d)pyreneb	NDb	2.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
91-20-3b	Naphthaleneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
85-01-8b	Phenanthreneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
129-00-0b	Pyreneb	NDb	1.0b	ug/Lb	1b	07/14/15b	B5G1313b	8270b	
Surrogate: 2-Fluorobiphenyl-			*51.5 %-*	*24.1-115-*		*07/14/15-*	B5G1313b	*8270-*	
Surrogate: Nitrobenzene-d5-			*49.8 %-*	*17.8-115-*		*07/14/15-*	B5G1313b	*8270-*	
Surrogate: p-Terphenyl-d14-			*82.7 %-*	*41.8-115-*		*07/14/15-*	B5G1313b	*8270-*	
Organics-PCBs as Aroclorsp									
12674-11-2b	Aroclor 1016b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11104-28-2b	Aroclor 1221b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11141-16-5b	Aroclor 1232b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
53469-21-9b	Aroclor 1242b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
12672-29-6b	Aroclor 1248b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11097-69-1b	Aroclor 1254b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11096-82-5b	Aroclor 1260b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
37324-23-5b	Aroclor 1262b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
11100-14-4b	Aroclor 1268b	NDb	0.10b	ug/Lb	1b	07/16/15b	B5G1503b	8081/8082b	
Surrogate: Decachlorobiphenyl-			*51.1 %-*	*30-150-*		*07/16/15-*	B5G1503b	*8081/8082-*	
Surrogate: Tetrachloro-m-xylene-			*30.0 %-*	*30-150-*		*07/16/15-*	B5G1503b	*8081/8082-*	

Lab Work Order # 1507116b

DEQ

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

Please hold all PCB samples for possible future congener analysis.

Lab Work Order Number	Project Name	Matrix
1507116	Abandoned Mining Wastes - Torch Lake PCB C&H Lake Linden Ops	surface WATER

Site Code/Project Number	AY	CC Email 1	Project TAT Days	Sample Collector
31000098	13	j.binkley@westonsolutions.com		AK/JP/AB-DEQ-RRD DP
Dept-Division-District	**Index**	**CC Email 2**	**Project Due Date**	**Sample Collector Phone**
DEQ-RRD-UP District	44251	Daniel.Liebau@WestonSolutions.com		906-337-0389
State Project Manager	**PCA**	**CC Email 3**		**Contract Firm**
Amy Keranen	30872	pincumbe@michigan.gov		Weston Solutions
State Project Manager Email	**Project**	**Overflow Lab Choice 1**	**Accept Analysis hold time codes**	**Contract Firm Primary Contact**
keranena@michigan.gov	456990			Jeff Binkley
State Project Manager Phone	**Phase**	**Overflow Lab Choice 2**		**Primary Contact Phone**
906-337-0389	00			906-523-5457

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments
1	01	CHLL-SW-09 - 4.25 - 5.25'	7/8/15	1145	2 amb	
2	02	CHLL-SW-10 - 4.08 - 5.08'	7/8/15	1250	2 amb	
3	03	CHLL-SW-11 - 44.5 - 45.5'	7/9/15	1310	3 AMB	
4		CHLL-SW-				
5		CHLL-SW-				
6		CHLL-SW-				
7		CHLL-SW-				
8		CHLL-SW-				
9		CHLL-SW-				
10		CHLL-SW-				

ORGANIC CHEMISTRY

VOA - Volatile Organic Acidic
- Volatiles - Full List 1 2 3 4 5 6 7 8 9 10
- BTEX/MTBE/TMB only 1 2 3 4 5 6 7 8 9 10
- Chlorinated only 1 2 3 4 5 6 7 8 9 10
- GRO 1 2 3 4 5 6 7 8 9 10
- 1,4 Dioxane 1 2 3 4 5 6 7 8 9 10

METH - Methane, Ethane, Ethene
- Methane, Ethane, Ethene 1 2 3 4 5 6 7 8 9 10

ON - Pesticides, PCBs
- Pesticides & PCBs 1 2 3 4 5 6 7 8 9 10
- Pesticides only 1 2 3 4 5 6 7 8 9 10
- PCBs only (1) (2) (3) 4 5 6 7 8 9 10
- Toxaphene 1 2 3 4 5 6 7 8 9 10
- Chlordane 1 2 3 4 5 6 7 8 9 10

BNA - Base Neutral Acids
- BNAs 1 2 3 4 5 6 7 8 9 10
- Benzidines 1 2 3 4 5 6 7 8 9 10
- PNAs only 1 2 (3) 4 5 6 7 8 9 10
- BNs only 1 2 3 4 5 6 7 8 9 10
- Acids only 1 2 3 4 5 6 7 8 9 10

Organic Specialty Requests
- Library search - Volatiles 1 2 3 4 5 6 7 8 9 10
- Library search - SemiVols 1 2 3 4 5 6 7 8 9 10
- Finger Print 1 2 3 4 5 6 7 8 9 10
- DRO / ORO 1 2 3 4 5 6 7 8 9 10

METALS CHEMISTRY PACKAGES
- OpMemo2 - Total 1 2 3 4 5 6 7 8 9 10
- OpMemo2 - Dissolved 1 2 3 4 5 6 7 8 9 10
  (Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)
- Michigan10 - Total 1 2 3 4 5 6 7 8 9 10
- Michigan10 - Dissolved 1 2 3 4 5 6 7 8 9 10
  (As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)

MAD - DISSOLVED METALS
- Diss - Silver - Ag 1 2 3 4 5 6 7 8 9 10
- Diss - Aluminum - Al 1 2 3 4 5 6 7 8 9 10
- Diss - Arsenic - As 1 2 3 4 5 6 7 8 9 10
- Diss - Boron - B 1 2 3 4 5 6 7 8 9 10
- Diss - Barium - Ba 1 2 3 4 5 6 7 8 9 10
- Diss - Beryllium - Be 1 2 3 4 5 6 7 8 9 10
- Diss - Cadmium - Cd 1 2 3 4 5 6 7 8 9 10
- Diss - Cobalt - Co 1 2 3 4 5 6 7 8 9 10
- Diss - Chromium - Cr 1 2 3 4 5 6 7 8 9 10
- Diss - Copper - Cu 1 2 3 4 5 6 7 8 9 10
- Diss - Iron - Fe 1 2 3 4 5 6 7 8 9 10
- Diss - Mercury - Hg 1 2 3 4 5 6 7 8 9 10
- Diss - Lithium - Li 1 2 3 4 5 6 7 8 9 10
- Diss - Manganese - Mn 1 2 3 4 5 6 7 8 9 10
- Diss - Molybdenum - Mo 1 2 3 4 5 6 7 8 9 10
- Diss - Nickel - Ni 1 2 3 4 5 6 7 8 9 10
- Diss - Lead - Pb 1 2 3 4 5 6 7 8 9 10
- Diss - Antimony - Sb 1 2 3 4 5 6 7 8 9 10
- Diss - Selenium - Se 1 2 3 4 5 6 7 8 9 10
- Diss - Strontium - Sr 1 2 3 4 5 6 7 8 9 10
- Diss - Titanium - Ti 1 2 3 4 5 6 7 8 9 10
- Diss - Thallium - Tl 1 2 3 4 5 6 7 8 9 10
- Diss - Uranium - U 1 2 3 4 5 6 7 8 9 10
- Diss - Vanadium - V 1 2 3 4 5 6 7 8 9 10
- Diss - Zinc - Zn 1 2 3 4 5 6 7 8 9 10
- Diss - Calcium - Ca 1 2 3 4 5 6 7 8 9 10
- Diss - Potassium - K 1 2 3 4 5 6 7 8 9 10
- Diss - Magnesium - Mg 1 2 3 4 5 6 7 8 9 10
- Diss - Sodium - Na 1 2 3 4 5 6 7 8 9 10
- Diss - Hardness - Ca, Mg 1 2 3 4 5 6 7 8 9 10

MD - Metals Dissolved
- Lab Filtration 1 2 3 4 5 6 7 8 9 10

MA - TOTAL METALS
- Silver - Ag 1 2 3 4 5 6 7 8 9 10
- Aluminum - Al 1 2 3 4 5 6 7 8 9 10
- Arsenic - As 1 2 3 4 5 6 7 8 9 10
- Boron - B 1 2 3 4 5 6 7 8 9 10
- Barium - Ba 1 2 3 4 5 6 7 8 9 10
- Beryllium - Be 1 2 3 4 5 6 7 8 9 10
- Cadmium - Cd 1 2 3 4 5 6 7 8 9 10
- Cobalt - Co 1 2 3 4 5 6 7 8 9 10
- Chromium - Cr 1 2 3 4 5 6 7 8 9 10
- Copper - Cu 1 2 3 4 5 6 7 8 9 10
- Iron - Fe 1 2 3 4 5 6 7 8 9 10
- Mercury - Hg 1 2 3 4 5 6 7 8 9 10
- Lithium - Li 1 2 3 4 5 6 7 8 9 10
- Manganese - Mn 1 2 3 4 5 6 7 8 9 10
- Molybdenum - Mo 1 2 3 4 5 6 7 8 9 10
- Nickel - Ni 1 2 3 4 5 6 7 8 9 10
- Lead - Pb 1 2 3 4 5 6 7 8 9 10
- Antimony - Sb 1 2 3 4 5 6 7 8 9 10
- Selenium - Se 1 2 3 4 5 6 7 8 9 10
- Strontium - Sr 1 2 3 4 5 6 7 8 9 10
- Titanium - Ti 1 2 3 4 5 6 7 8 9 10
- Thallium - Tl 1 2 3 4 5 6 7 8 9 10
- Uranium - U 1 2 3 4 5 6 7 8 9 10
- Vanadium - V 1 2 3 4 5 6 7 8 9 10
- Zinc - Zn 1 2 3 4 5 6 7 8 9 10
- Calcium - Ca 1 2 3 4 5 6 7 8 9 10
- Potassium - K 1 2 3 4 5 6 7 8 9 10
- Magnesium - Mg 1 2 3 4 5 6 7 8 9 10
- Sodium - Na 1 2 3 4 5 6 7 8 9 10
- Hardness - Ca, Mg 1 2 3 4 5 6 7 8 9 10

LHG - Low Level Mercury
- Mercury Low Level - Hg 1 2 3 4 5 6 7 8 9 10

GENERAL CHEMISTRY
- GB Total Cyanide - CN 1 2 3 4 5 6 7 8 9 10
- GB Amenable Cyanide - CN 1 2 3 4 5 6 7 8 9 10
- GCN Available Cyanide - CN 1 2 3 4 5 6 7 8 9 10
- CA Chlorophyll 1 2 3 4 5 6 7 8 9 10
- GN Ortho Phosphate - OP 1 2 3 4 5 6 7 8 9 10
- GN Nitrite - NO_2 1 2 3 4 5 6 7 8 9 10
- GN Nitrate - NO_3 (Calc.) 1 2 3 4 5 6 7 8 9 10
- GN Suspended Solids - SS 1 2 3 4 5 6 7 8 9 10
- GN Dissolved Solids - TDS 1 2 3 4 5 6 7 8 9 10
- MN Diss Solids - TDS (Calc.) 1 2 3 4 5 6 7 8 9 10
- GN Turbidity 1 2 3 4 5 6 7 8 9 10
- MN Total Alkalinity 1 2 3 4 5 6 7 8 9 10
- MN Bicarb/Carb Alkalinity (includes Total Alkalinity) 1 2 3 4 5 6 7 8 9 10
- MN Chloride - Cl 1 2 3 4 5 6 7 8 9 10
- MN Fluoride - F 1 2 3 4 5 6 7 8 9 10
- MN Sulfate - SO4 1 2 3 4 5 6 7 8 9 10
- MN Chromium 6 - Cr+6 1 2 3 4 5 6 7 8 9 10
- MN Conductivity 1 2 3 4 5 6 7 8 9 10
- MN pH 1 2 3 4 5 6 7 8 9 10
- GA Chem Oxyg Dem - COD 1 2 3 4 5 6 7 8 9 10
- GA Diss Org Carbon - DOC (FF) (Field - Filtered & Preserved) 1 2 3 4 5 6 7 8 9 10
- GN Diss Org Carbon - DOC (LF) (Lab - Filtered & Preserved) 1 2 3 4 5 6 7 8 9 10
- GA Total Org Carbon - TOC 1 2 3 4 5 6 7 8 9 10
- GA Ammonia - NH3 1 2 3 4 5 6 7 8 9 10
- GA Nitrate+Nitrite - NO3+NO2 1 2 3 4 5 6 7 8 9 10
- GA Kjeldahl Nitrogen - KN 1 2 3 4 5 6 7 8 9 10
- GA Total Phosphorus - TP 1 2 3 4 5 6 7 8 9 10

Chain of Custody

	Relinquished by	Received By	Date / Time
Print Name & Org.	Dan Peabody, DEQ	Amy Keranen, DEQ to UPS	7/10/15 1400 ~~7/11/15 1300~~
Signature:			
Print Name & Org.	UPS	Joshua Pung MDEQ	7/13/15 900
Signature:	1Z36 145 5783	Joshua B Pung	
Print Name & Org.	1Z 440 612 955 3		
Signature:			

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909O
TEL: (517) 335-9800O
FAX: (517) 335-9600O

29 July 2015O

Work Order: 1507118O

Price: $1,549.00O

Amy KeranenO
MDEQ-RRD-UPO
1504 W. Washington St.O
Marquette, MI 49855O

RE: ABANDONED MINING WASTES-LAKE LINDEN Ops

I certify that the analyses performed by the MDEQ Environmental Laboratory were conducted by methods O approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies .O

Sincerely, O

George KrisztianO
Laboratory DirectorO

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

MDEQ-RRD-UPb
1504 W. Washington St.b
Marquette MI, 49855b

Project:bABANDONED MINING WASTES-LAKE LINDEN Opsb
Site Code:b31000098b
Project Manager:bAmy Keranenb

Reported:p
07/29/2015

Analytical Report for Samplesp

Sample IDp	Laboratory IDp	Matrixp	Date Sampledp	Date Receivedp	Qualifierp
CHLL - SD - 98 - 0"-6"b	1507118-01b	Soil/Sedimentb	07/08/2015b	07/13/2015b	
CHLL - SD - 98 - 1'-3.25'b	1507118-02b	Soil/Sedimentb	07/08/2015b	07/13/2015b	
CHLL - SD - 98 - 1'-3.25' DUPb	1507118-03b	Soil/Sedimentb	07/08/2015b	07/13/2015b	
CHLL - SD - 99 - 0"-6"b	1507118-04b	Soil/Sedimentb	07/09/2015b	07/13/2015b	
CHLL - SD - 99 - 1'-2.5'b	1507118-05b	Soil/Sedimentb	07/09/2015b	07/13/2015b	

Notes and Definitions p

Y25b	Sample extract would not concentrate to the normal volume causing raised reporting limits. b
Y20b	Reporting Limits (RL) raised due to matrix. b
X3b	Spike recovery is not applicable due to large target analyte concentration in the source sample. b
Tb	Reported value is less than the reporting limit (RL). Result is estimated.b
JAb	Result is estimated due to multiple Aroclors present.b
A09b	Result is estimated due to high recovery of batch quality control.b
A04b	Result is estimated due to high matrix spike recovery.b
NDb	Indicates compound analyzed for but not detectedb
RLb	Reporting Limitb
NAb	Not Applicableb
dry	Sample results reported on a dry weight basisb

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SD - 98 - 0''-6''p

Lab ID: 1507118-01p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzedb Dateb	QC Batchb	Methodb	Qualifierb
Organics-PCBs as Aroclorsp									**See note Y20p**
12674-11-2b	Aroclor 1016b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11104-28-2b	Aroclor 1221b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11141-16-5b	Aroclor 1232b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
53469-21-9b	Aroclor 1242b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
12672-29-6b	Aroclor 1248b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11097-69-1b	Aroclor 1254b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11096-82-5b	Aroclor 1260b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
37324-23-5b	Aroclor 1262b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11100-14-4b	Aroclor 1268b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
Surrogate: Decachlorobiphenyl-			*77.7 %-*		*30-150-*	*07/25/15-*	B5G2020b	*8081/8082-*	
Surrogate: Tetrachloro-m-xylene-			*67.1 %-*		*30-150-*	*07/25/15-*	B5G2020b	*8081/8082-*	
Inorganics-General Chemistryp									
TSb	**% Total Solidsp**	**77.1p**	0.1b	%b	1b	07/14/15b	B5G1414b	2540 Bb	

Lab Work Order # 1507118b

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SD - 98 - 1'-3.25'p

Lab ID: 1507118-02p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzedb Dateb	QC Batchb	Methodb	Qualifierb
Organics-PCBs as Aroclorsp									**See note Y20p**
12674-11-2b	Aroclor 1016b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11104-28-2b	Aroclor 1221b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11141-16-5b	Aroclor 1232b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
53469-21-9b	Aroclor 1242b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
12672-29-6b	Aroclor 1248b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11097-69-1b	Aroclor 1254b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11096-82-5b	Aroclor 1260b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
37324-23-5b	Aroclor 1262b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11100-14-4b	Aroclor 1268b	NDb	260b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
Surrogate: Decachlorobiphenyl-			*75.1 %-*	*30-150-*		*07/25/15-*	B5G2020b	*8081/8082-*	
Surrogate: Tetrachloro-m-xylene-			*60.1 %-*	*30-150-*		*07/25/15-*	B5G2020b	*8081/8082-*	
Inorganics-General Chemistryp									
TSb	**% Total Solidsp**	**75.9p**	0.1b	%b	1b	07/14/15b	B5G1414b	2540 Bb	

Lab Work Order # 1507118b

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SD - 98 - 1'-3.25' DUPp

Lab ID: 1507118-03p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzedb Dateb	QC Batchb	Methodb	Qualifierb
Organics-PCBs as Aroclorsp									**See note Y20p**
12674-11-2b	Aroclor 1016b	NDb	250b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11104-28-2b	Aroclor 1221b	NDb	250b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11141-16-5b	Aroclor 1232b	NDb	250b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
53469-21-9b	Aroclor 1242b	NDb	250b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
12672-29-6b	Aroclor 1248b	NDb	250b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11097-69-1b	Aroclor 1254b	NDb	250b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11096-82-5b	Aroclor 1260b	NDb	250b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
37324-23-5b	Aroclor 1262b	NDb	250b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11100-14-4b	Aroclor 1268b	NDb	250b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
Surrogate: Decachlorobiphenyl-			*73.6 %-*	*30-150-*		*07/25/15-*	B5G2020b	*8081/8082-*	
Surrogate: Tetrachloro-m-xylene-			*60.8 %-*	*30-150-*		*07/25/15-*	B5G2020b	*8081/8082-*	
Inorganics-General Chemistryp									
TSb	**% Total Solidsp**	**80.2p**	0.1b	%b	1b	07/14/15b	B5G1414b	2540 Bb	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SD - 99 - 0''-6''p

Lab ID: 1507118-04p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzedb Dateb	QC Batchb	Methodb	Qualifierb
Organics-Semivolatilesp									**See note Y20, Y25p**
91-57-6b	2-Methylnaphthaleneb	NDb	9400b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
83-32-9b	Acenaphtheneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
208-96-8b	Acenaphthyleneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
120-12-7	Anthraceneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
56-55-3b	Benz[a]anthraceneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
50-32-8b	Benzo[a]pyreneb	NDb	7500b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
205-99-2b	Benzo[b]fluorantheneb	NDb	7500b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
191-24-2b	Benzo[g,h,i]peryleneb	NDb	7500b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
207-08-9b	Benzo[k]fluorantheneb	NDb	7500b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
218-01-9b	Chryseneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
53-70-3b	Dibenz[a,h]anthraceneb	NDb	7500b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
206-44-0b	Fluorantheneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
86-73-7	Fluoreneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
193-39-5b	Indeno(1,2,3-c,d)pyreneb	NDb	7500b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
91-20-3b	Naphthaleneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
85-01-8b	Phenanthreneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
129-00-0b	Pyreneb	NDb	3800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
Surrogate: 2-Fluorobiphenyl-			*74.6 %-*	*32.9-115-*		*07/23/15-*	B5G1730b	*8270-*	
Surrogate: Nitrobenzene-d5-			*63.5 %-*	*31.8-115-*		*07/23/15-*	B5G1730b	*8270-*	
Surrogate: p-Terphenyl-d14-			*72.8 %-*	*38.5-115-*		*07/23/15-*	B5G1730b	*8270-*	
Organics-PCBs as Aroclorsp									**See note Y20p**
12674-11-2b	Aroclor 1016b	NDb	300b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11104-28-2b	Aroclor 1221b	NDb	300b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11141-16-5b	Aroclor 1232b	NDb	300b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
53469-21-9b	Aroclor 1242b	NDb	300b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
12672-29-6b	**Aroclor 1248p**	**290p**	300b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	JA, Tb
11097-69-1b	**Aroclor 1254p**	**340p**	300b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	JAb
11096-82-5b	Aroclor 1260b	NDb	300b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
37324-23-5b	Aroclor 1262b	NDb	300b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11100-14-4b	Aroclor 1268b	NDb	300b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
Surrogate: Decachlorobiphenyl-			*49.5 %-*	*30-150-*		*07/25/15-*	B5G2020b	*8081/8082-*	
Surrogate: Tetrachloro-m-xylene-			*54.2 %-*	*30-150-*		*07/25/15-*	B5G2020b	*8081/8082-*	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SD - 99 - 0''-6''p

Lab ID: 1507118-04p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzed b Dateb	QC Batchb	Methodb	Qualifier b
Inorganics-General Chemistryp									
TSb	**% Total Solidsp**	**66.3p**	0.1b	%b	1b	07/14/15b	B5G1414b	2540 Bb	
Inorganics-Metalsp									
7429-90-5b	**Aluminiump**	**37000p**	1000b	mg/kg dryb	10000b	07/22/15b	B5G1701b	6020/200.8b	
7440-36-0b	**Antimonyp**	**8.5p**	0.3b	mg/kg dryb	10b	07/23/15b	B5G2111b	6020/200.8b	
7440-38-2b	**Arsenicp**	**44p**	1.0b	mg/kg dryb	20b	07/22/15b	B5G1701b	6020/200.8b	
7440-39-3b	**Bariump**	**250p**	1.0b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	
7440-41-7	**Berylliump**	**1.6p**	0.4b	mg/kg dryb	20b	07/22/15b	B5G1701b	6020/200.8b	
7440-43-9b	**Cadmiump**	**9.0p**	0.2b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	
7440-47-3b	**Chromiump**	**320p**	4.0b	mg/kg dryb	20b	07/22/15b	B5G1701b	6020/200.8b	A09b
7440-48-4b	**Cobaltp**	**28p**	1.0b	mg/kg dryb	20b	07/22/15b	B5G1701b	6020/200.8b	A09b
7440-50-8b	**Cop erp**	**11000p**	1000b	mg/kg dryb	10000b	07/22/15b	B5G1701b	6020/200.8b	
7439-89-6b	**Ironp**	**64000p**	50b	mg/kg dryb	100b	07/28/15b	B5G1701b	6010/200.7	
7439-92-1b	**Leadp**	**820p**	1.0b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	
7439-93-2b	**Lithiump**	**14p**	0.2b	mg/kg dryb	1b	07/28/15b	B5G1701b	6010/200.7	
7439-95-4b	**Magnesiump**	**26000p**	500b	mg/kg dryb	100b	07/28/15b	B5G1701b	6010/200.7	
7439-96-5b	**Manganesep**	**640p**	2.0b	mg/kg dryb	20b	07/22/15b	B5G1701b	6020/200.8b	A09b
7439-97-6b	**Mercuryp**	**0.4p**	0.08b	mg/kg dryb	1b	07/16/15b	B5G1420b	7471/245.5b	
7440-02-0b	**Nickelp**	**63p**	2.0b	mg/kg dryb	20b	07/22/15b	B5G1701b	6020/200.8b	
7782-49-2b	Seleniumb	NDb	0.4b	mg/kg dryb	20b	07/22/15b	B5G1701b	6020/200.8b	
7440-22-4b	**Silverp**	**12p**	0.1b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	
7440-28-0b	Thalliumb	NDb	0.5b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	
7440-66-6b	**Zincp**	**1000p**	2.0b	mg/kg dryb	20b	07/22/15b	B5G1701b	6020/200.8b	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SD - 99 - 1'-2.5'p

Lab ID: 1507118-05p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzedb Dateb	QC Batchb	Methodb	Qualifierb
Organics-Semivolatilesp									**See note Y20p**
91-57-6b	2-Methylnaphthalene	NDb	2200b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
83-32-9b	Acenaphthene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
208-96-8b	Acenaphthylene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
120-12-7	Anthracene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
56-55-3b	Benz[a]anthracene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
50-32-8b	Benzo[a]pyrene	NDb	1800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
205-99-2b	Benzo[b]fluoranthene	NDb	1800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
191-24-2b	Benzo[g,h,i]perylene	NDb	1800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
207-08-9b	Benzo[k]fluoranthene	NDb	1800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
218-01-9b	Chrysene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
53-70-3b	Dibenz[a,h]anthracene	NDb	1800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
206-44-0b	Fluoranthene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
86-73-7	Fluorene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
193-39-5b	Indeno(1,2,3-c,d)pyrene	NDb	1800b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
91-20-3b	Naphthalene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
85-01-8b	Phenanthrene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
129-00-0b	Pyrene	NDb	880b	ug/kg dryb	1b	07/23/15b	B5G1730b	8270b	
Surrogate: 2-Fluorobiphenyl-			*69.3 %-*	*32.9-115-*		*07/23/15-*	B5G1730b	*8270-*	
Surrogate: Nitrobenzene-d5-			*63.0 %-*	*31.8-115-*		*07/23/15-*	B5G1730b	*8270-*	
Surrogate: p-Terphenyl-d14-			*71.5 %-*	*38.5-115-*		*07/23/15-*	B5G1730b	*8270-*	
Organics-PCBs as Aroclorsp									**See note Y20p**
12674-11-2b	Aroclor 1016b	NDb	350b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11104-28-2b	Aroclor 1221b	NDb	350b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11141-16-5b	Aroclor 1232b	NDb	350b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
53469-21-9b	Aroclor 1242b	NDb	350b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
12672-29-6b	Aroclor 1248b	NDb	350b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11097-69-1b	Aroclor 1254b	NDb	350b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11096-82-5b	Aroclor 1260b	NDb	350b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
37324-23-5b	Aroclor 1262b	NDb	350b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
11100-14-4b	Aroclor 1268b	NDb	350b	ug/kg dryb	1b	07/25/15b	B5G2020b	8081/8082b	
Surrogate: Decachlorobiphenyl-			*68.8 %-*	*30-150-*		*07/25/15-*	B5G2020b	*8081/8082-*	
Surrogate: Tetrachloro-m-xylene-			*60.3 %-*	*30-150-*		*07/25/15-*	B5G2020b	*8081/8082-*	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITYC
ENVIRONMENTAL LABORATORYC

P.O. Box 30270O
Lansing, MI 48909
TEL: (517) 335-9800O
FAX: (517) 335-9600O

Client ID: CHLL - SD - 99 - 1'-2.5'p

Lab ID: 1507118-05p

CAS #b	Analyteb	Resultb	RLb	Unitsb	Dilutionb	Analyzed b Dateb	QC Batchb	Methodb	Qualifier b
Inorganics-General Chemistryp									
TSb	**% Total Solidsp**	**56.6p**	0.1b	%b	1b	07/14/15b	B5G1414b	2540 Bb	
Inorganics-Metalsp									
7429-90-5b	**Aluminiump**	**28000p**	1000b	mg/kg dryb	10000b	07/22/15b	B5G1701b	6020/200.8b	
7440-36-0b	**Antimonyp**	**0.6p**	0.3b	mg/kg dryb	10b	07/23/15b	B5G2111b	6020/200.8b	
7440-38-2b	**Arsenicp**	**28p**	5.0b	mg/kg dryb	100b	07/22/15b	B5G1701b	6020/200.8b	
7440-39-3b	**Bariump**	**72p**	1.0b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	A04b
7440-41-7	Berylliumb	NDb	2.0b	mg/kg dryb	100b	07/22/15b	B5G1701b	6020/200.8b	
7440-43-9b	**Cadmiump**	**0.3p**	0.2b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	
7440-47-3b	**Chromiump**	**120p**	20b	mg/kg dryb	100b	07/22/15b	B5G1701b	6020/200.8b	A09b
7440-48-4b	**Cobaltp**	**50p**	5.0b	mg/kg dryb	100b	07/22/15b	B5G1701b	6020/200.8b	A09b
7440-50-8b	**Cop erp**	**4300p**	1000b	mg/kg dryb	10000b	07/22/15b	B5G1701b	6020/200.8b	
7439-89-6b	**Ironp**	**47000p**	5.0b	mg/kg dryb	10b	07/28/15b	B5G1701b	6010/200.7	
7439-92-1b	**Leadp**	**39p**	1.0b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	A04b
7439-93-2b	**Lithiump**	**16p**	0.2b	mg/kg dryb	1b	07/28/15b	B5G1701b	6010/200.7	
7439-95-4b	**Magnesiump**	**34000p**	500b	mg/kg dryb	100b	07/28/15b	B5G1701b	6010/200.7	
7439-96-5b	**Manganesep**	**810p**	10b	mg/kg dryb	100b	07/22/15b	B5G1701b	6020/200.8b	A09b
7439-97-6b	**Mercuryp**	**0.4p**	0.09b	mg/kg dryb	1b	07/16/15b	B5G1420b	7471/245.5b	
7440-02-0b	**Nickelp**	**100p**	10b	mg/kg dryb	100b	07/22/15b	B5G1701b	6020/200.8b	
7782-49-2b	Seleniumb	NDb	2.0b	mg/kg dryb	100b	07/22/15b	B5G1701b	6020/200.8b	
7440-22-4b	**Silverp**	**8.1p**	0.1b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	
7440-28-0b	Thalliumb	NDb	0.5b	mg/kg dryb	10b	07/20/15b	B5G1701b	6020/200.8b	
7440-66-6b	**Zincp**	**450p**	10b	mg/kg dryb	100b	07/22/15b	B5G1701b	6020/200.8b	

DEQ

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

Please hold all PCB samples for possible future congener analysis.

Lab Work Order Number	Project Name	Matrix
1507118	Abandoned Mining Wastes - Torch Lake PCB C&H Lake Linden Ops	SEDIMENT

Site Code/Project Number: 31000098	AY: 13	CC Email 1: j.binkley@westonsolutions.com	Project TAT Days:	Sample Collector: AK/JP/AB-DEQ-RRD DP	
Dept-Division-District: DEQ-RRD-UP District	Index: 44251	CC Email 2: daniel.liebau@westonsolutions.com	Project Due Date:	Sample Collector Phone: 906-337-0389	
State Project Manager: Amy Keranen	PCA: 30872	CC Email 3: pincumbej@michigan.com		Contract Firm: Weston Solutions	
State Project Manager Email: keranenan@michigan.gov	Project: 456990	Overflow Lab Choice 1:	Accept Analysis hold time codes:	Contract Firm Primary Contact: Jeff Binkley	
State Project Manager Phone: 906-337-0389	Phase: 00	Overflow Lab Choice 2:		Primary Contact Phone: 906-523-5457	

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments
1	01	CHLL-SD-98-0"-6"	7/8/15	1015	1	
2	02	CHLL-SD-98-1'-3.25'	7/8/15	1020	1	
3	03	CHLL-SD-98-1'-3.25' dup	7/8/15	1020	1	
4	—	CHLL-SD-				
5	—	CHLL-SD-				
6	—	CHLL-SD-				
7	—	CHLL-SD-				
8	—	CHLL-SD-				
9	—	CHLL-SD-				
10	—	CHLL-SD-				

ORGANIC CHEMISTRY

VOA - Volatile Organic Acidic

Volatiles - Full List	1 2 3 4 5 6 7 8 9 10
BTEX/MTBE/TMB only	1 2 3 4 5 6 7 8 9 10
Chlorinated only	1 2 3 4 5 6 7 8 9 10
GRO	1 2 3 4 5 6 7 8 9 10
1,4 Dioxane	1 2 3 4 5 6 7 8 9 10

OS - Pesticides, PCBs

Pesticides & PCBs	1 2 3 4 5 6 7 8 9 10
Pesticides only	1 2 3 4 5 6 7 8 9 10
PCBs only	(1) (2) (3) 4 5 6 7 8 9 10
Toxaphene	1 2 3 4 5 6 7 8 9 10

BNA - Base Neutral Acids

BNAs	1 2 3 4 5 6 7 8 9 10
PNAs only	1 2 3 4 5 6 7 8 9 10
BNs only	1 2 3 4 5 6 7 8 9 10

Organic Specialty Requests

Library search - Volatiles	1 2 3 4 5 6 7 8 9 10
Library search - SemiVols	1 2 3 4 5 6 7 8 9 10
Finger Print	1 2 3 4 5 6 7 8 9 10
DRO / ORO	1 2 3 4 5 6 7 8 9 10

METALS CHEMISTRY PACKAGES

OpMemo2 - Total	1 2 3 4 5 6 7 8 9 10
(Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)	
Michigan10 - Total	1 2 3 4 5 6 7 8 9 10
(As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)	

MS - TOTAL METALS

Silver - Ag	1 2 3 4 5 6 7 8 9 10
Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Arsenic - As	1 2 3 4 5 6 7 8 9 10
Barium - Ba	1 2 3 4 5 6 7 8 9 10
Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Copper - Cu	1 2 3 4 5 6 7 8 9 10
Iron - Fe	1 2 3 4 5 6 7 8 9 10
Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Lithium - Li	1 2 3 4 5 6 7 8 9 10
Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Lead - Pb	1 2 3 4 5 6 7 8 9 10
Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Selenium - Se	1 2 3 4 5 6 7 8 9 10
Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Thallium - Tl	1 2 3 4 5 6 7 8 9 10
Uranium - U	1 2 3 4 5 6 7 8 9 10
Vanadium - V	1 2 3 4 5 6 7 8 9 10
Zinc - Zn	1 2 3 4 5 6 7 8 9 10
Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Potassium - K	1 2 3 4 5 6 7 8 9 10
Magnesium - Mg	1 2 3 4 5 6 7 8 9 10
Sodium - Na	1 2 3 4 5 6 7 8 9 10

GENERAL CHEMISTRY

GS - General Chemistry

Total Cyanide - CN	1 2 3 4 5 6 7 8 9 10
Available Cyanide - CN	1 2 3 4 5 6 7 8 9 10
Chem Oxyg Dem - COD	1 2 3 4 5 6 7 8 9 10
Total Org Carbon - TOC	1 2 3 4 5 6 7 8 9 10
Kjeldahl Nitrogen - KN	1 2 3 4 5 6 7 8 9 10
Total Phosphorus - TP	1 2 3 4 5 6 7 8 9 10

Chain of Custody

	Relinquished by	Received By	Date / Time
Print Name & Org.	Dan Peabody, DEQ	Amy Keranen, DEQ	7/10/15 1400
Signature:		to UPS	~~7/9/15 1330~~
Print Name & Org.	UPS	Joshua Pung MDEQ	7/13/15 918
Signature:	1236 1145 5746 3	Joshua R Pung	
Print Name & Org.	N 410 612 955 3		
Signature:			

DEQ

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

Please hold all PCB samples for possible future congener analysis.

Lab Work Order Number	Project Name	Matrix
1507118	Abandoned Mining Wastes - Torch Lake PCB C&H Lake Linden Ops	SEDIMENT

Site Code/Project Number	AY	CC Email 1	Project TAT Days	Sample Collector
31000098	13	j.binkley@westonsolutions.com		AK/JP/AB-DEQ-RRD
Dept-Division-District	**Index**	**CC Email 2**	**Project Due Date**	**Sample Collector Phone**
DEQ-RRD-UP District	44251	daniel.llebau@westonsolutions.com		906-337-0389
State Project Manager	**PCA**	**CC Email 3**		**Contract Firm**
Amy Keranen	30872	pincumbel@michigan.com		Weston Solutions
State Project Manager Email	**Project**	**Overflow Lab Choice 1**	**Accept Analysis hold time codes**	**Contract Firm Primary Contact**
keranenan@michigan.gov	456990			Jeff Binkley
State Project Manager Phone	**Phase**	**Overflow Lab Choice 2**		**Primary Contact Phone**
906-337-0389	00			906-523-5457

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments
1	04	CHLL-SD-99-0"-6"	7/9/15	1500	1	Jar Labelled CHLL-SD-34-0-6"
2	05	CHLL-SD-99-1'-2.5'	7/9/15	1505	1	Jar Labelled CHLL-SD-34-1-2.5
3	—	CHLL-SD-				
4	—	CHLL-SD-				
5	—	CHLL-SD-				
6	—	CHLL-SD-				
7	—	CHLL-SD-				
8	—	CHLL-SD-				
9	—	CHLL-SD-				
10	—	CHLL-SD-				

ORGANIC CHEMISTRY

VOA - Volatile Organic Acidic
- Volatiles - Full List: 1 2 3 4 5 6 7 8 9 10
- BTEX/MTBE/TMB only: 1 2 3 4 5 6 7 8 9 10
- Chlorinated only: 1 2 3 4 5 6 7 8 9 10
- GRO: 1 2 3 4 5 6 7 8 9 10
- 1,4 Dioxane: 1 2 3 4 5 6 7 8 9 10

OS - Pesticides, PCBs
- Pesticides & PCBs: 1 2 3 4 5 6 7 8 9 10
- Pesticides only: 1 2 3 4 5 6 7 8 9 10
- PCBs only: (1) (2) 3 4 5 6 7 8 9 10
- Toxaphene: 1 2 3 4 5 6 7 8 9 10

BNA - Base Neutral Acids
- BNAs: 1 2 3 4 5 6 7 8 9 10
- PNAs only: (1) (2) 3 4 5 6 7 8 9 10
- BNs only: 1 2 3 4 5 6 7 8 9 10

Organic Specialty Requests
- Library search - Volatiles: 1 2 3 4 5 6 7 8 9 10
- Library search - SemiVols: 1 2 3 4 5 6 7 8 9 10
- Finger Print: 1 2 3 4 5 6 7 8 9 10
- DRO / ORO: 1 2 3 4 5 6 7 8 9 10

METALS CHEMISTRY PACKAGES

- OpMemo2 - Total: 1 2 3 4 5 6 7 8 9 10 (Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)
- Michigan10 - Total: 1 2 3 4 5 6 7 8 9 10 (As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)

MS - TOTAL METALS

Silver - Ag	(1) (2) 3 4 5 6 7 8 9 10
Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Arsenic - As	1 2 3 4 5 6 7 8 9 10
Barium - Ba	1 2 3 4 5 6 7 8 9 10
Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Copper - Cu	1 2 3 4 5 6 7 8 9 10
Iron - Fe	1 2 3 4 5 6 7 8 9 10
Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Lithium - Li	1 2 3 4 5 6 7 8 9 10
Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Lead - Pb	1 2 3 4 5 6 7 8 9 10
Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Selenium - Se	1 2 3 4 5 6 7 8 9 10
Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Thallium - Tl	(1) (2) 3 4 5 6 7 8 9 10
Uranium - U	1 2 3 4 5 6 7 8 9 10
Vanadium - V	1 2 3 4 5 6 7 8 9 10
Zinc - Zn	(1) (2) 3 4 5 6 7 8 9 10
Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Potassium - K	1 2 3 4 5 6 7 8 9 10
Magnesium - Mg	(1) (2) 3 4 5 6 7 8 9 10
Sodium - Na	1 2 3 4 5 6 7 8 9 10

GENERAL CHEMISTRY

GS - General Chemistry
- Total Cyanide - CN: 1 2 3 4 5 6 7 8 9 10
- Available Cyanide - CN: 1 2 3 4 5 6 7 8 9 10
- Chem Oxyg Dem - COD: 1 2 3 4 5 6 7 8 9 10
- Total Org Carbon - TOC: 1 2 3 4 5 6 7 8 9 10
- Kjeldahl Nitrogen - KN: 1 2 3 4 5 6 7 8 9 10
- Total Phosphorus - TP: 1 2 3 4 5 6 7 8 9 10

Chain of Custody

	Relinquished by	Received By	Date / Time
Print Name & Org.	DAN PEABODY DEQ	UPS	7/10/15 1400
Signature:			
Print Name & Org.	UPS	Joshua Pung MDEQ	7/13/15 918
Signature:	J236 145 578 3	Joshua R Pung	
Print Name & Org.	N410 612 955 3		
Signature:			