AROCLOR SEDIMENT INVESTIGATION
TORCH LAKE AREA OF CONCERN
HOUGHTON COUNTY, MICHIGAN

PREPARED BY:

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1. PROJECT DESCRIPTION

The following sections summarize the project location, site history and project objectives.

1.1 PROJECT LOCATION

The Torch Lake Area of Concern (AOC) is located in Houghton County, Michigan and shown in Figure 1. The historic sediments of concern encompass three main areas along the northwest side, two areas of historical drum disposal and one area in the vicinity of the Lake Linden Bay where recent high concentration of metals and polychlorinated biphenyl's (PCB) have been detected (MDEQ 2008a and b). These high concentrations prompted an emergency response action resulting in removal of sediments and soils from the north end of the Lake (USEPA 2007).

1.2 SITE DESCRIPTION

Torch Lake, Houghton County, is currently listed as a Great Lakes AOC in part, because of elevated levels of polychlorinated biphenyls (PCBs) in fish. A fish consumption advisory due to elevated levels of PCBs was first issued for Torch Lake fish by the Michigan Department of Community Health (MDCH) in 1998, and the most recent advisory recommends restricting consumption of northern pike, smallmouth bass, and walleye from the lake.

It was postulated that the elevated concentrations in fish caught in Torch Lake may actually represent exposure to PCBs in Lake Superior since there are no barriers to fish movement between the two water bodies. In November of 2005, the MDEQ used semi-permeable membrane devices (SPMDs) to evaluate PCB concentrations in Torch Lake. The results of the SPMD study indicate the presence of a source of PCBs within the northern basin of Torch Lake along the western shoreline (MDEQ 2006).

Walleye were collected from Huron Bay, Lake Superior, in April 2006 and from Torch Lake and Portage Lake in April 2007. The fish tissue results indicate that total PCB and lipid-normalized total PCB concentrations in Torch Lake walleye collected in 2007 were equivalent to the concentrations in walleye collected in 2000. In addition, total PCB and lipid-normalized total PCB concentrations in walleye collected from Torch Lake were higher than concentrations in walleye collected from Huron Bay, and the data suggest that walleye from the two areas represent distinct groups. Total PCB concentrations in Portage Lake walleye appear similar to the concentrations in walleye collected from Huron Bay, but the comparisons are weak due to a small Portage Lake sample. The MDCH fish consumption advisories for Torch Lake and Portage Lake walleye are unlikely to be relaxed based on the total PCB concentrations measured in the 2007 samples (MDEQ 2008).

In 2007 GLNPO and MDEQ sampled sediments from 36 locations in the Lake and PCBs were detected in 16 of the 71 discrete samples, with quantified concentrations ranging from 130 micrograms/kilogram (µg/kg) to 8,900 µg/kg. PCBs were also detected at 11 of the 36 surficial (upper 2 – 3 inches of sediment) sampling locations. Surficial sediments in the Hubbell area in Torch Lake appear to have low levels (1,000 µg/kg or less) of PCB concentrations. PCB concentrations in the deeper sediments, except at the very northern

end of the sample area, were predominantly below reporting limits. Based on the data collected, the PCB sediment concentrations in the north/northwest basin of Torch Lake are below levels requiring remedial action. However, given that low levels of PCBs are detected in the surficial sediment in the Hubbell sampling area an ongoing upland source of PCBs to Torch Lake can not be ruled out (MDEQ 2008b).

1.3 PROJECT GOALS AND OBJECTIVES

The objective of this study was to evaluate surficial sediments throughout the Lake to determine if there are areas of higher PCB concentrations that might indicate a terrestrial and/or aquatic source of PCBs to the lake. This report presents the results of the 2008 sediment sampling event and provides some context for those results. In addition, the data evaluation presented here will incorporate the results of the 2007 sampling effort by MDEQ and GLNPO to provide a comprehensive evaluation of the Torch Lake sediment sample results.

2.0 SAMPLING PROCEDURES

Sediment samples were collected at randomly selected locations from the U.S. EPA Great Lakes National Program Office *RV Mudpuppy* using a ponar dredge as described in the Quality Assurance Project Plan (QAPP) (EPA 2008). During the 2007 sampling event, field staff noticed a one to two inch layer of brown organic material at the top of each ponar sample and a field call was made during that sampling event to sample only the thin brown organic material rather than compositing the entire sample. The organic layer was scraped from the top of the sample, place in a separate pan, homogenized, and then placed in the sample jars. The 2008 sampling effort followed this approach and all samples consisted of only the top 1 – 2 inch layer of organic matter; which was deposited most recently, perhaps since the cessation of mining activities in the area MDEQ 2008b. All other sampling procedures were consistent with the Torch Lake QAPP (EPA 2008). All sediment samples were transported to the EPA contract laboratory program (CLP) laboratory via overnight express delivery for chemical analysis of the sediments. The analysis consisted solely of PCBs as Aroclors.

2.0 RESULTS AND DISSCUSSION

Eighty surficial sediment samples, along with 9 duplicate samples were collected on August 26 – 28, 2008. The duplicate samples were separate aliquots from the same ponar dredge split into two jars and sent to the laboratory for separate analysis. Analytical results are presented in Table 1.

All sample locations were randomly selected prior to mobilization of the *Mudpuppy* to the Lake using ArcView ™ and Visual Sampling Plan software. The locations were reviewed and discussed with both MDEQ and the Torch Lake Public Advisory Council (TLPAC). Figure 2 presents the final 2007 and 2008 sampling locations. Figure 3 is a close up of the locations where PCBs were detected along with their associated concentrations.

Of the eighty nine samples collected and analyzed, only two had detectable concentrations of PCBs, sample TL08-75 (90 micrograms per kilogram [µg/kg] J) and TL08-76 (26 µg/kg J). The J flag, in both cases indicates that the values are estimated because they are below the contract required detection limits, as required by the EPA CLP program.

Both TL08-75 and TL08-76 are in the vicinity of the samples collected in 2007 that had detectable concentrations of PCBs in the top 1-2 inches. The 2007 data from this area ranged from a low of 130 µg/kg to 1,100 µg/kg (MDEQ 2008a).

The 2007 sampling event did identify subsurface concentrations of PCBs ranging from 180 µg/kg to 8,900 µg/kg in samples ranging from 6 inches to 64 inches below the sediment surface. These samples were collected from just off the shoreline of Lake Linden (MDEQ 2008a). These subsurface samples are unlikely to pose a risk to aquatic species (benthic invertebrates and/or fish) because their depth below the surface precludes exposure.

As for the surficial sediment PCB concentrations detected in 2007 and 2008 in the Hubbell/Tamarack area, these concentrations are generally at or below the ranges of concentrations expected to impact aquatic species. Combining the two data sets results in a detectable range of PCB concentrations from a low of 26 µg/kg to a high of 1,100 µg/kg. To put a context on these concentrations, without performing a detailed ecological risk assessment, it might be helpful to look at selected clean up levels for PCBs in other large EPA sediment remedial actions. The Fox River Superfund Site, which encompasses 39 miles of the Fox River as well as Green Bay (Wisconsin), selected a clean up target of 1,000 µg/kg to achieve a final surface weighted average goal of 250 µg/kg over a 20 – 30 year time period. The Ashtabula River Great Lakes Legacy Act site, Ashtabula, Ohio, selected 5,000 µg/kg as a not-to-exceed concentration to end up with a surface weighted average of 250 µg/kg over a 10 year period. While the Fox River remedial action is on-going (expected to run through 2017), the EPA portion of the Ashtabula project is almost complete with approximately 500,000 cubic yards of sediment removed from the River for a total cost of $58 million.

3.0 REFERENCES

MDEQ, 2006, Staff Report PCB Concentrations in Torch lake Using Semi-Permeable Membrane Devices, Houghton Count, Michigan, October 20 – November 18, 2005.

MDEQ, 2008a, Staff Report a Sediment Chemistry Survey of Torch Lake, Houghton County, Michigan, August 7, 8, and 9, 2007, MI/DEQ/WB-08/011.

MDEQ, 2008b, Monitoring Report Torch Lake Superfund Site, MDEQ-RRD, June 2008.

U.S. EPA, 2007, Letter Report for Lake Linden Emergency Response Site, Lake Linden, Houghton County, Michigan.

U.S. EPA, 2008, Quality Assurance Project Plan for Aroclor Sediment Investigation, Torch Lake, Houghton County, Michigan.

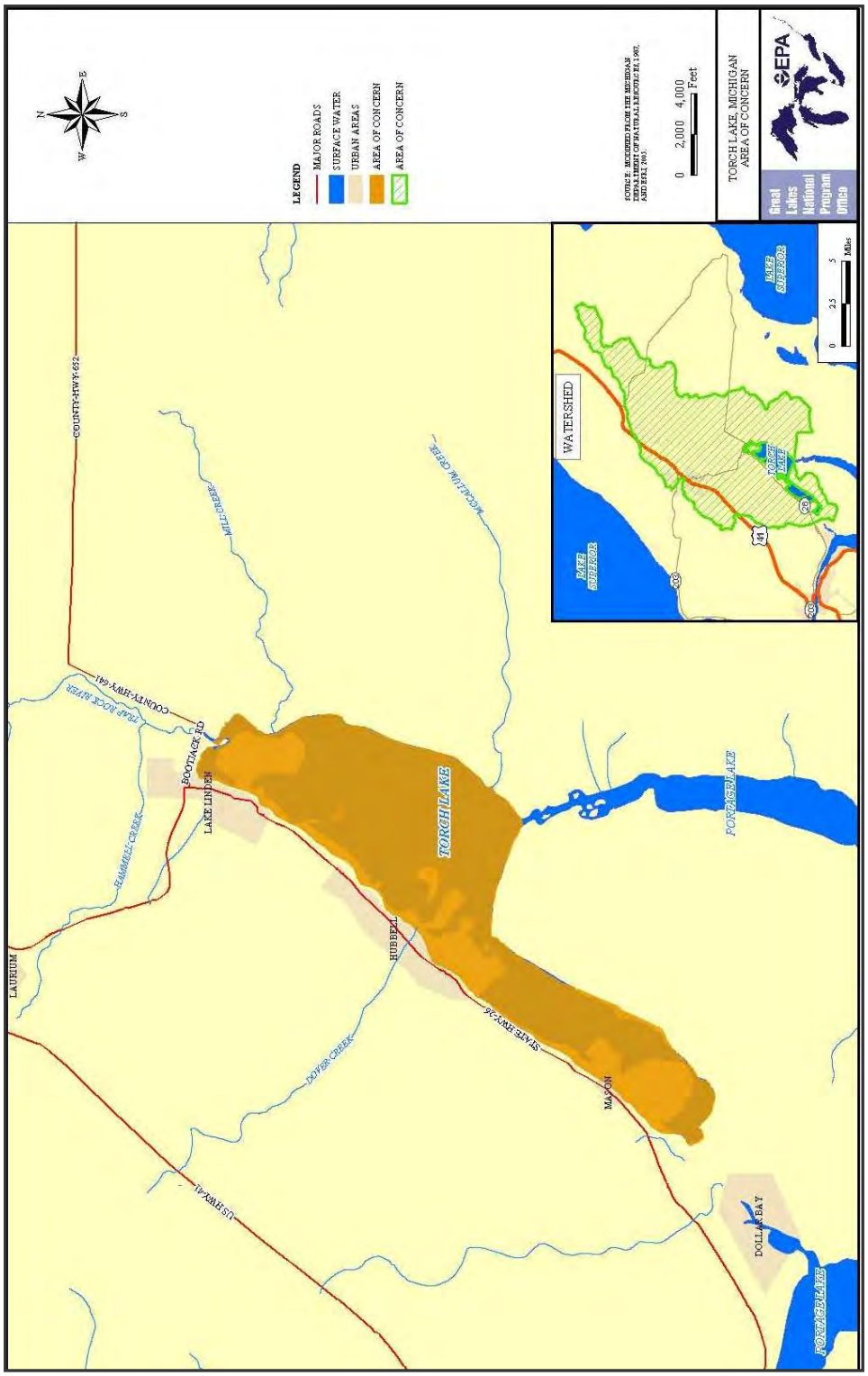


Figure 1: Torch Lake Area of Concern

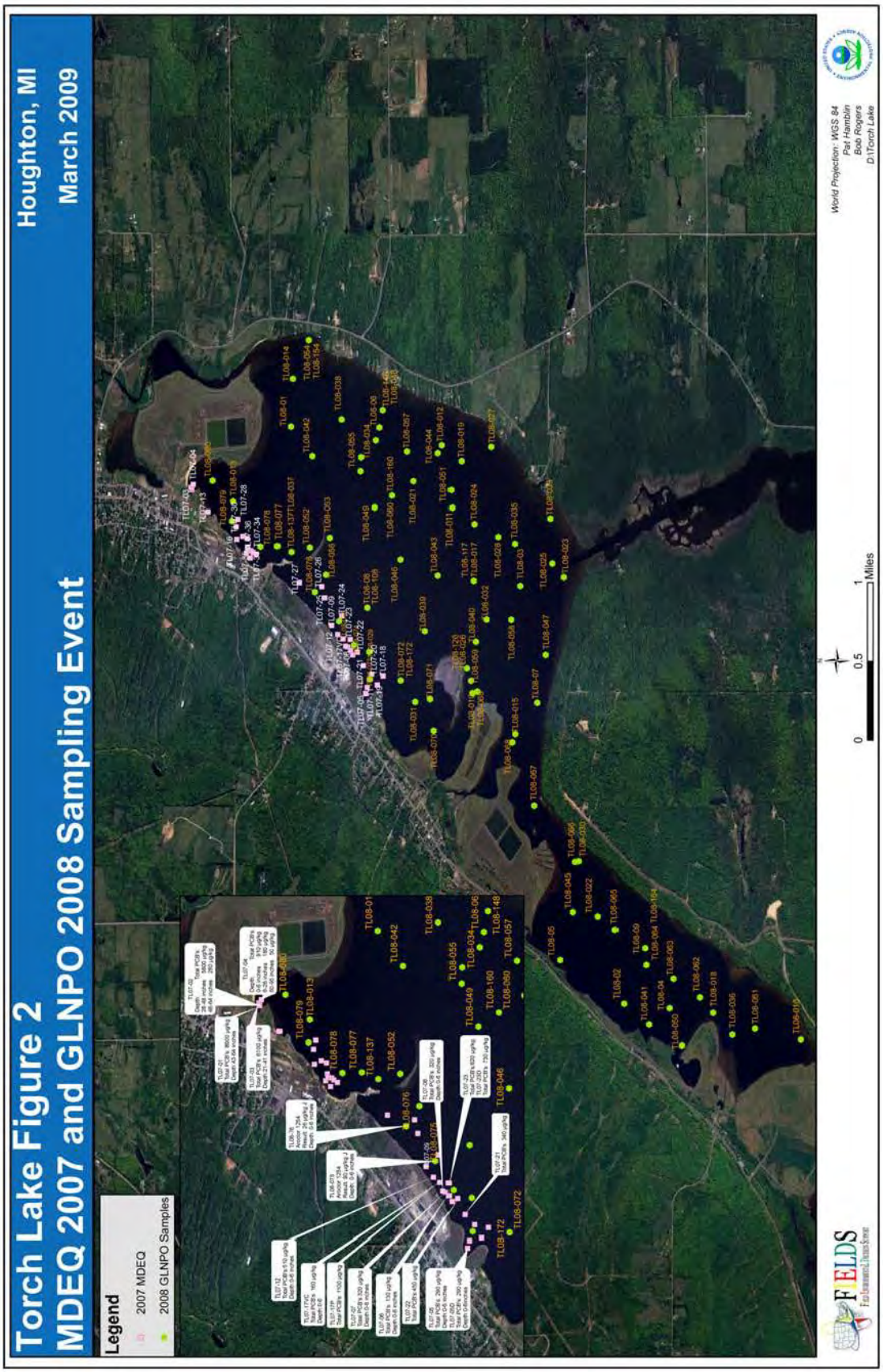
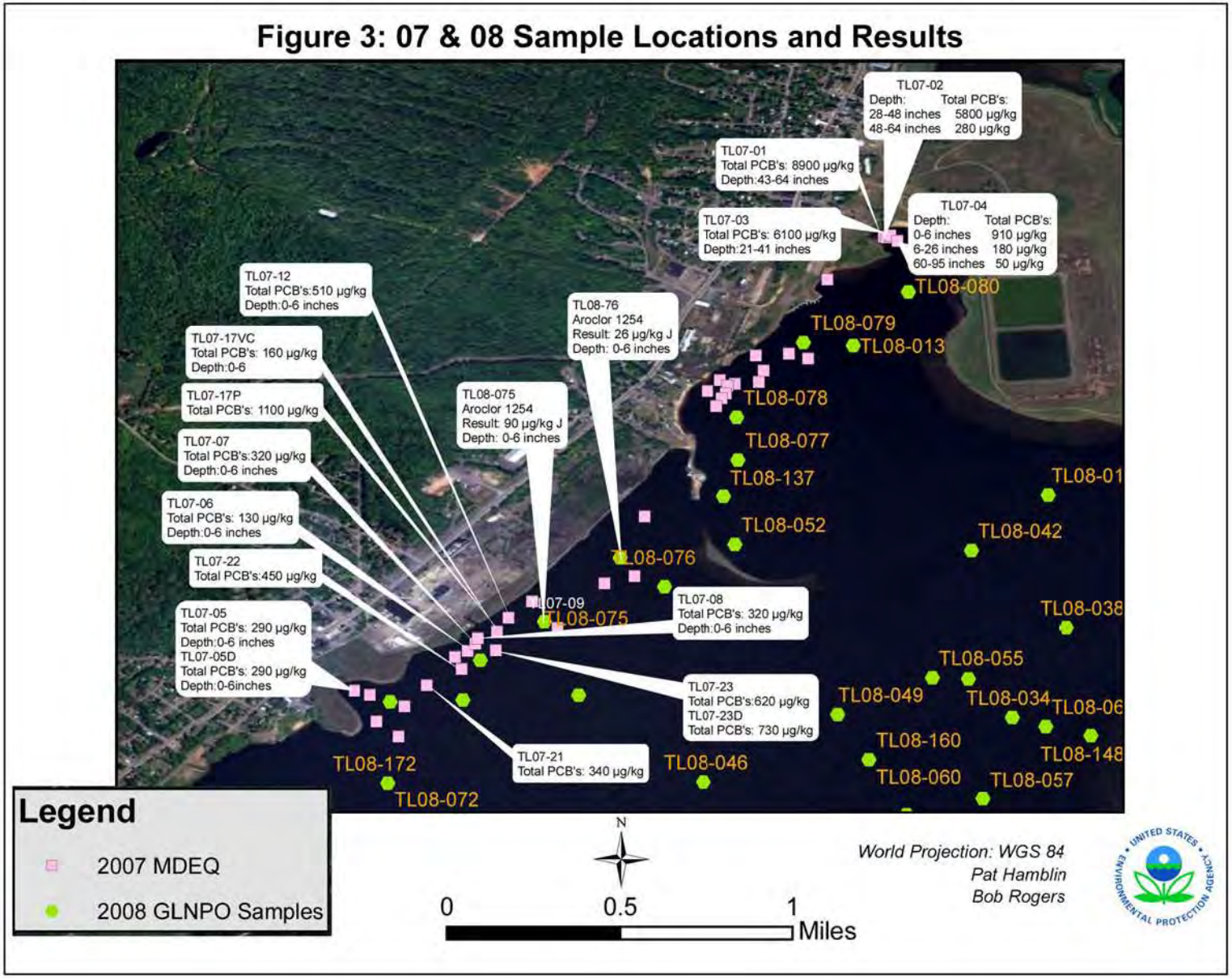

Torch Lake Figure 2
MDEQ 2007 and GLNPO 2008 Sampling Event
Houghton, MI
March 2009
Legend
2007 MDEQ
2008 GLNPO Samples
0
0.5
1
Miles
World Projection: WGS 84
Pat Hamblin
Bob Rogers
D:\Torch Lake
FIELDS

Figure 3: 07 & 08 Sample Locations and Results



Tables

Table 1: Analytical Results, Torch Lake Area of Concern 2008 Sediment Sampling

Case #: 37809 SDG : E44N9
Site : TORCH LAKE AREA OF CONCERN
Lab. : MITKEM

Sample Number :	ABLK3Y		E44N9		E44P0		E44P1		E44P1MS		E44P1MSD		E44P2		E44P3		E44P4		E44P5	
Sampling Locatio			TL08-01		TL08-02		TL08-03		TL08-03		TL08-03		TL08-04		TL08-05		TL08-06		TL08-07	
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :			8/26/2008		8/26/2008		8/27/2008						8/26/2008		8/27/2008		8/27/2008		8/26/2008	
Time Sampled :																				
%Moisture :	0		74		83		81		81		81		79		54		84		64	
pH :	7.0		6.9		6.9		7.0		7.0		7.0		7.0		7.1		7.1		6.8	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	33	U	76	UJ	120	UJ	100	UJ	280	J	330	J	94	UJ	43	U	120	UJ	55	U
Aroclor-1221	33	U	76	UJ	120	UJ	100	UJ	100	UJ	100	UJ	94	UJ	43	U	120	UJ	55	U
Aroclor-1232	33	U	76	UJ	120	UJ	100	UJ	100	UJ	100	UJ	94	UJ	43	U	120	UJ	55	U
Aroclor-1242	33	U	76	UJ	120	UJ	100	UJ	100	UJ	100	UJ	94	UJ	43	U	120	UJ	55	U
Aroclor-1248	33	U	76	UJ	120	UJ	100	UJ	100	UJ	100	UJ	94	UJ	43	U	120	UJ	55	U
Aroclor-1254	33	U	76	UJ	120	UJ	100	UJ	100	UJ	100	UJ	94	UJ	43	U	120	UJ	55	U
Aroclor-1260	33	U	76	UJ	120	UJ	100	UJ	340	J	350	J	94	UJ	43	U	120	UJ	55	U
Aroclor-1262	33	U	76	UJ	120	UJ	100	UJ	100	UJ	100	UJ	94	UJ	43	U	120	UJ	55	U
Aroclor-1268	33	U	76	UJ	120	UJ	100	UJ	100	UJ	100	UJ	94	UJ	43	U	120	UJ	55	U

Sample Number :	E44P6		E44P7		E44P8		E44P9		E44Q0		E44Q1		E44Q2		E44Q3		E44Q4		E44Q5	
Sampling Locatio	TL08-08		TL08-09		TL08-010		TL08-011		TL08-012		TL08-013		TL08-014		TL08-015		TL08-016		TL08-017	
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :	8/26/2008		8/26/2008		8/27/2008		8/26/2008		8/26/2008		8/27/2008		8/27/2008		8/27/2008		8/26/2008		8/27/2008	
Time Sampled :																				
%Moisture :	86		81		74		84		31		84		70		81		55		80	
pH :	6.8		6.8		7.2		6.9		7.1		6.8		6.9		7.0		6.8		7.0	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	140	UJ	100	UJ	76	UJ	120	UJ	29	U	120	UJ	66	UJ	100	UJ	44	U	98	UJ
Aroclor-1221	140	UJ	100	UJ	76	UJ	120	UJ	29	U	120	UJ	66	UJ	100	UJ	44	U	98	UJ
Aroclor-1232	140	UJ	100	UJ	76	UJ	120	UJ	29	U	120	UJ	66	UJ	100	UJ	44	U	98	UJ
Aroclor-1242	140	UJ	100	UJ	76	UJ	120	UJ	29	U	120	UJ	66	UJ	100	UJ	44	U	98	UJ
Aroclor-1248	140	UJ	100	UJ	76	UJ	120	UJ	29	U	120	UJ	66	UJ	100	UJ	44	U	98	UJ
Aroclor-1254	140	UJ	100	UJ	76	UJ	120	UJ	29	U	120	UJ	66	UJ	100	UJ	44	U	98	UJ
Aroclor-1260	140	UJ	100	UJ	76	UJ	120	UJ	29	U	120	UJ	66	UJ	100	UJ	44	U	98	UJ
Aroclor-1262	140	UJ	100	UJ	76	UJ	120	UJ	29	U	120	UJ	66	UJ	100	UJ	44	U	98	UJ
Aroclor-1268	140	UJ	100	UJ	76	UJ	120	UJ	29	U	120	UJ	66	UJ	100	UJ	44	U	98	UJ

Table 1: Analytical Results, Torch Lake Area of Concern 2008 Sediment Sampling

Case #: 37809 SDG : E44N9
Site : TORCH LAKE AREA OF CONCERN
Lab. : MITKEM

Sample Number :	E44Q6		E44Q7		E44Q8		ABLK3A		E44Q9		E44R0		E44R1		E44R2		E44R3		E44R4	
Sampling Locatio	TL08-018		TL08-019		TL08-020				TL08-021		TL08-022		TL08-023		TL08-024		TL08-025		TL08-026	
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :	8/26/2008		8/27/2008		8/26/2008				8/27/2008		8/27/2008		8/26/2008		8/27/2008		8/26/2008		8/27/2008	
Time Sampled :																				
%Moisture :	36		53		83		0		86		85		51		85		74		31	
pH :	7.1		6.9		6.9		7.0		7.0		7.0		7.1		6.9		6.8		7.1	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	31	U	42	U	120	UJ	33	U	140	UJ	130	UJ	40	U	130	UJ	76	UJ	29	U
Aroclor-1221	31	U	42	U	120	UJ	33	U	140	UJ	130	UJ	40	U	130	UJ	76	UJ	29	U
Aroclor-1232	31	U	42	U	120	UJ	33	U	140	UJ	130	UJ	40	U	130	UJ	76	UJ	29	U
Aroclor-1242	31	U	42	U	120	UJ	33	U	140	UJ	130	UJ	40	U	130	UJ	76	UJ	29	U
Aroclor-1248	31	U	42	U	120	UJ	33	U	140	UJ	130	UJ	40	U	130	UJ	76	UJ	29	U
Aroclor-1254	31	U	42	U	120	UJ	33	U	140	UJ	130	UJ	40	U	130	UJ	76	UJ	29	U
Aroclor-1260	31	U	42	U	120	UJ	33	U	140	UJ	130	UJ	40	U	130	UJ	76	UJ	29	U
Aroclor-1262	31	U	42	U	120	UJ	33	U	140	UJ	130	UJ	40	U	130	UJ	76	UJ	29	U
Aroclor-1268	31	U	42	U	120	UJ	33	U	140	UJ	130	UJ	40	U	130	UJ	76	UJ	29	U

Sample Number :	E44R5		E44R6		E44R6MS		E44R6MSD		E44R7		E44R8		E44R9		E44S0		E44S1		E44S2	
Sampling Locatio	TL08-027		TL08-028		TL08-028		TL08-028		TL08-029		TL08-030		TL08-031		TL08-032		TL08-033		TL08-034	
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :	8/26/2008		8/27/2008						8/26/2008		8/27/2008		8/27/2008		8/27/2008		8/26/2008		8/27/2008	
Time Sampled :																				
%Moisture :	21		85		85		85		86		80		81		83		22		85	
pH :	6.6		6.9		6.9		6.9		7.1		7.0		7.0		7.1		6.8		7.0	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	25	U	130	UJ	480	J	460	J	140	UJ	98	UJ	100	UJ	120	UJ	25	U	130	UJ
Aroclor-1221	25	U	130	UJ	130	UJ	130	UJ	140	UJ	98	UJ	100	UJ	120	UJ	25	U	130	UJ
Aroclor-1232	25	U	130	UJ	130	UJ	130	UJ	140	UJ	98	UJ	100	UJ	120	UJ	25	U	130	UJ
Aroclor-1242	25	U	130	UJ	130	UJ	130	UJ	140	UJ	98	UJ	100	UJ	120	UJ	25	U	130	UJ
Aroclor-1248	25	U	130	UJ	130	UJ	130	UJ	140	UJ	98	UJ	100	UJ	120	UJ	25	U	130	UJ
Aroclor-1254	25	U	130	UJ	130	UJ	130	UJ	140	UJ	98	UJ	100	UJ	120	UJ	25	U	130	UJ
Aroclor-1260	25	U	130	UJ	530	J	490	J	140	UJ	98	UJ	100	UJ	120	UJ	25	U	130	UJ
Aroclor-1262	25	U	130	UJ	130	UJ	130	UJ	140	UJ	98	UJ	100	UJ	120	UJ	25	U	130	UJ
Aroclor-1268	25	U	130	UJ	130	UJ	130	UJ	140	UJ	98	UJ	100	UJ	120	UJ	25	U	130	UJ

Table 1: Analytical Results, Torch Lake Area of Concern 2008 Sediment Sampling

Case #: 37809 SDG : E44N9
Site : TORCH LAKE AREA OF CONCERN
Lab. : MITKEM

Sample Number :	E44S3		E44S4		E44S5		E44S6		E44S7		E44S8		ABLK1A		E44S9		E44T0		E44T1	
Sampling Locatio	TL08-035		TL08-036		TL08-037		TL08-038		TL08-039		TL08-040				TL08-041		TL08-042		TL08-043	
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :	8/27/2008		8/26/2008		8/27/2008		8/27/2008		8/26/2008		8/27/2008				8/26/2008		8/26/2008		8/27/2008	
Time Sampled :																				
%Moisture :	55		66		55		82		81		73		0		78		82		85	
pH :	7.1		6.9		7.2		6.8		7.2		6.9		7.0		6.8		7.2		7.1	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	44	U	58	U	44	U	110	UJ	100	UJ	73	UJ	33	U	90	UJ	110	UJ	130	UJ
Aroclor-1221	44	U	58	U	44	U	110	UJ	100	UJ	73	UJ	33	U	90	UJ	110	UJ	130	UJ
Aroclor-1232	44	U	58	U	44	U	110	UJ	100	UJ	73	UJ	33	U	90	UJ	110	UJ	130	UJ
Aroclor-1242	44	U	58	U	44	U	110	UJ	100	UJ	73	UJ	33	U	90	UJ	110	UJ	130	UJ
Aroclor-1248	44	U	58	U	44	U	110	UJ	100	UJ	73	UJ	33	U	90	UJ	110	UJ	130	UJ
Aroclor-1254	44	U	58	U	44	U	110	UJ	100	UJ	73	UJ	33	U	90	UJ	110	UJ	130	UJ
Aroclor-1260	44	U	58	U	44	U	110	UJ	100	UJ	73	UJ	33	U	90	UJ	110	UJ	130	UJ
Aroclor-1262	44	U	58	U	44	U	110	UJ	100	UJ	73	UJ	33	U	90	UJ	110	UJ	130	UJ
Aroclor-1268	44	U	58	U	44	U	110	UJ	100	UJ	73	UJ	33	U	90	UJ	110	UJ	130	UJ

Sample Number :	E44T1MS		E44T1MSD		E44T2		E44T3		E44T4		E44T5		E44T6		E44T7		E44T8		E44T9	
Sampling Locatio	TL08-043		TL08-043		TL08-044		TL08-045		TL08-046		TL08-047		TL08-048		TL08-049		TL08-050		TL08-051	
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :					8/27/2008		8/27/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008	
Time Sampled :																				
%Moisture :	85		85		58		87		85		51		55		86		41		85	
pH :	7.1		7.1		6.9		7.0		6.7		7.0		6.8		7.0		6.7		6.7	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	450	J	380	J	47	U	150	UJ	130	UJ	40	U	44	U	140	UJ	33	U	130	UJ
Aroclor-1221	130	UJ	130	UJ	47	U	150	UJ	130	UJ	40	U	44	U	140	UJ	33	U	130	UJ
Aroclor-1232	130	UJ	130	UJ	47	U	150	UJ	130	UJ	40	U	44	U	140	UJ	33	U	130	UJ
Aroclor-1242	130	UJ	130	UJ	47	U	150	UJ	130	UJ	40	U	44	U	140	UJ	33	U	130	UJ
Aroclor-1248	130	UJ	130	UJ	47	U	150	UJ	130	UJ	40	U	44	U	140	UJ	33	U	130	UJ
Aroclor-1254	130	UJ	130	UJ	47	U	150	UJ	130	UJ	40	U	44	U	140	UJ	33	U	130	UJ
Aroclor-1260	530	J	480	J	47	U	150	UJ	130	UJ	40	U	44	U	140	UJ	33	U	130	UJ
Aroclor-1262	130	UJ	130	UJ	47	U	150	UJ	130	UJ	40	U	44	U	140	UJ	33	U	130	UJ
Aroclor-1268	130	UJ	130	UJ	47	U	150	UJ	130	UJ	40	U	44	U	140	UJ	33	U	130	UJ

Table 1: Analytical Results, Torch Lake Area of Concern 2008 Sediment Sampling

Case #: 37809 SDG : E44N9
Site : TORCH LAKE AREA OF CONCERN
Lab. : MITKEM

Sample Number :	E44W0		E44W1		E44W2		E44W3		E44W4		E44W5		E44W6		E44W7		E44W8		ABLK3R	
Sampling Locatio	TL08-052		TL08-053		TL08-054		TL08-055		TL08-056		TL08-057		TL08-058		TL08-059		TL08-060			
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :	8/27/2008		8/26/2008		8/27/2008		8/26/2008		8/26/2008		8/27/2008		8/27/2008		8/27/2008		8/26/2008			
Time Sampled :																				
%Moisture :	82		24		41		85		66		86		85		74		72		0	
pH :	6.9		7.1		6.9		7.1		7.3		7.0		7.0		7.1		7.0		7.0	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	110	UJ	26	U	33	U	130	UJ	58	U	140	UJ	130	UJ	75	UJ	70	UJ	33	U
Aroclor-1221	110	UJ	26	U	33	U	130	UJ	58	U	140	UJ	130	UJ	75	UJ	70	UJ	33	U
Aroclor-1232	110	UJ	26	U	33	U	130	UJ	58	U	140	UJ	130	UJ	75	UJ	70	UJ	33	U
Aroclor-1242	110	UJ	26	U	33	U	130	UJ	58	U	140	UJ	130	UJ	75	UJ	70	UJ	33	U
Aroclor-1248	110	UJ	26	U	33	U	130	UJ	58	U	140	UJ	130	UJ	75	UJ	70	UJ	33	U
Aroclor-1254	110	UJ	26	U	33	U	130	UJ	58	U	140	UJ	130	UJ	75	UJ	70	UJ	33	U
Aroclor-1260	110	UJ	26	U	33	U	130	UJ	58	U	140	UJ	130	UJ	75	UJ	70	UJ	33	U
Aroclor-1262	110	UJ	26	U	33	U	130	UJ	58	U	140	UJ	130	UJ	75	UJ	70	UJ	33	U
Aroclor-1268	110	UJ	26	U	33	U	130	UJ	58	U	140	UJ	130	UJ	75	UJ	70	UJ	33	U

Sample Number :	E44W9		E44X0		E44X0MS		E44X0MSD		E44X1		E44X2		E44X3		E44X4		E44X5		E44X6	
Sampling Locatio	TL08-061		TL08-062		TL08-062		TL08-062		TL08-063		TL08-064		TL08-065		TL08-066		TL08-067		TL08-068	
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :	8/28/2008		8/28/2008						8/28/2008		8/28/2008		8/28/2008		8/28/2008		8/28/2008		8/28/2008	
Time Sampled :																				
%Moisture :	74		76		76		76		80		83		87		78		75		79	
pH :	6.7		6.9		6.9		6.9		6.8		6.8		6.7		6.8		6.9		7.0	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	76	UJ	82	UJ	250	J	270	J	98	UJ	120	UJ	150	UJ	89	UJ	78	UJ	94	UJ
Aroclor-1221	76	UJ	82	UJ	82	UJ	82	UJ	98	UJ	120	UJ	150	UJ	89	UJ	78	UJ	94	UJ
Aroclor-1232	76	UJ	82	UJ	82	UJ	82	UJ	98	UJ	120	UJ	150	UJ	89	UJ	78	UJ	94	UJ
Aroclor-1242	76	UJ	82	UJ	82	UJ	82	UJ	98	UJ	120	UJ	150	UJ	89	UJ	78	UJ	94	UJ
Aroclor-1248	76	UJ	82	UJ	82	UJ	82	UJ	98	UJ	120	UJ	150	UJ	89	UJ	78	UJ	94	UJ
Aroclor-1254	76	UJ	82	UJ	82	UJ	82	UJ	98	UJ	120	UJ	150	UJ	89	UJ	78	UJ	94	UJ
Aroclor-1260	76	UJ	82	UJ	230	J	260	J	98	UJ	120	UJ	150	UJ	89	UJ	78	UJ	94	UJ
Aroclor-1262	76	UJ	82	UJ	82	UJ	82	UJ	98	UJ	120	UJ	150	UJ	89	UJ	78	UJ	94	UJ
Aroclor-1268	76	UJ	82	UJ	82	UJ	82	UJ	98	UJ	120	UJ	150	UJ	89	UJ	78	UJ	94	UJ

Table 1: Analytical Results, Torch Lake Area of Concern 2008 Sediment Sampling

Case #: 37809 SDG : E44N9
Site : TORCH LAKE AREA OF CONCERN
Lab. : MITKEM

Sample Number :	E44X7		E44X8		E44X9		E44Y0		E44Y1		E44Y2		E44Y3		E44Y4		E44Y5		E44Y6	
Sampling Locatio	TL08-069		TL08-070		TL08-071		TL08-072		TL08-073		TL08-074		TL08-075		TL08-076		TL08-077		TL08-078	
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :	8/28/2008		8/28/2008		8/28/2008		8/28/2008		8/28/2008		8/28/2008		8/28/2008		8/28/2008		8/28/2008		8/28/2008	
Time Sampled :																				
%Moisture :	55		80		77		72		81		87		84		86		85		78	
pH :	6.9		7.0		6.9		7.3		6.8		7.1		6.9		6.9		6.9		6.8	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	44	U	98	UJ	86	UJ	70	UJ	100	UJ	150	UJ	120	UJ	140	UJ	130	UJ	89	UJ
Aroclor-1221	44	U	98	UJ	86	UJ	70	UJ	100	UJ	150	UJ	120	UJ	140	UJ	130	UJ	89	UJ
Aroclor-1232	44	U	98	UJ	86	UJ	70	UJ	100	UJ	150	UJ	120	UJ	140	UJ	130	UJ	89	UJ
Aroclor-1242	44	U	98	UJ	86	UJ	70	UJ	100	UJ	150	UJ	120	UJ	140	UJ	130	UJ	89	UJ
Aroclor-1248	44	U	98	UJ	86	UJ	70	UJ	100	UJ	150	UJ	120	UJ	140	UJ	130	UJ	89	UJ
Aroclor-1254	44	U	98	UJ	86	UJ	70	UJ	100	UJ	150	UJ	90	J	26	J	130	UJ	89	UJ
Aroclor-1260	44	U	98	UJ	86	UJ	70	UJ	100	UJ	150	UJ	120	UJ	140	UJ	130	UJ	89	UJ
Aroclor-1262	44	U	98	UJ	86	UJ	70	UJ	100	UJ	150	UJ	120	UJ	140	UJ	130	UJ	89	UJ
Aroclor-1268	44	U	98	UJ	86	UJ	70	UJ	100	UJ	150	UJ	120	UJ	140	UJ	130	UJ	89	UJ

Sample Number :	E44Y7		E44Y8		E44Y9		ABLK3B		E44X3MS		E44X3MSD		E44Z0		E44Z1		E44Z2		E44Z3	
Sampling Locatio	TL08-079		TL08-080		TL08-108				TL08-065		TL08-065		TL08-117		TL08-126		TL08-137		TL08-148	
Matrix :	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :	8/28/2008		8/28/2008		8/26/2008								8/27/2008		8/27/2008		8/27/2008		8/26/2008	
Time Sampled :																				
%Moisture :	85		58		83		0		87		87		83		32		49		54	
pH :	6.9		6.9		6.8		7.0		6.7		6.7		7.0		7.0		7.9		6.4	
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	130	UJ	47	U	120	UJ	33	U	410	J	420	J	120	UJ	29	U	39	U	43	U
Aroclor-1221	130	UJ	47	U	120	UJ	33	U	150	UJ	150	UJ	120	UJ	29	U	39	U	43	U
Aroclor-1232	130	UJ	47	U	120	UJ	33	U	150	UJ	150	UJ	120	UJ	29	U	39	U	43	U
Aroclor-1242	130	UJ	47	U	120	UJ	33	U	150	UJ	150	UJ	120	UJ	29	U	39	U	43	U
Aroclor-1248	130	UJ	47	U	120	UJ	33	U	150	UJ	150	UJ	120	UJ	29	U	39	U	43	U
Aroclor-1254	130	UJ	47	U	120	UJ	33	U	150	UJ	150	UJ	120	UJ	29	U	39	U	43	U
Aroclor-1260	130	UJ	47	U	120	UJ	33	U	520	J	510	J	120	UJ	29	U	39	U	43	U
Aroclor-1262	130	UJ	47	U	120	UJ	33	U	150	UJ	150	UJ	120	UJ	29	U	39	U	43	U
Aroclor-1268	130	UJ	47	U	120	UJ	33	U	150	UJ	150	UJ	120	UJ	29	U	39	U	43	U

Table 1: Analytical Results, Torch Lake Area of Concern 2008 Sediment Sampling

Case #: 37809 SDG : E44N9
Site : TORCH LAKE AREA OF CONCERN
Lab. : MITKEM

Sample Number :	E44Z4		E44Z5		E44Z6		E44Z7	
Sampling Locatio	TL08-154		TL08-160		TL08-172		TL08-164	
Matrix :	Soil		Soil		Soil		Soil	
Units :	ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Date Sampled :	8/27/2008		8/26/2008		8/28/2008		8/28/2008	
Time Sampled :								
%Moisture :	22		72		78		83	
pH :	7.0		7.3		7.7		7.1	
Dilution Factor :	1.0		1.0		1.0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	25	U	71	UJ	90	UJ	120	UJ
Aroclor-1221	25	U	71	UJ	90	UJ	120	UJ
Aroclor-1232	25	U	71	UJ	90	UJ	120	UJ
Aroclor-1242	25	U	71	UJ	90	UJ	120	UJ
Aroclor-1248	25	U	71	UJ	90	UJ	120	UJ
Aroclor-1254	25	U	71	UJ	90	UJ	120	UJ
Aroclor-1260	25	U	71	UJ	90	UJ	120	UJ
Aroclor-1262	25	U	71	UJ	90	UJ	120	UJ
Aroclor-1268	25	U	71	UJ	90	UJ	120	UJ

Qualifiers	Data Qualifier Definitions
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is an approximate
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the action limit of quantitation necessary to accurately and precisely measure the analyte in the sample.